C&K Switches Catalog

Pushbutton

Tactile

Navigation

Keyswitch

Detect

Toggle

Rocker

Dip

Slides

Snap

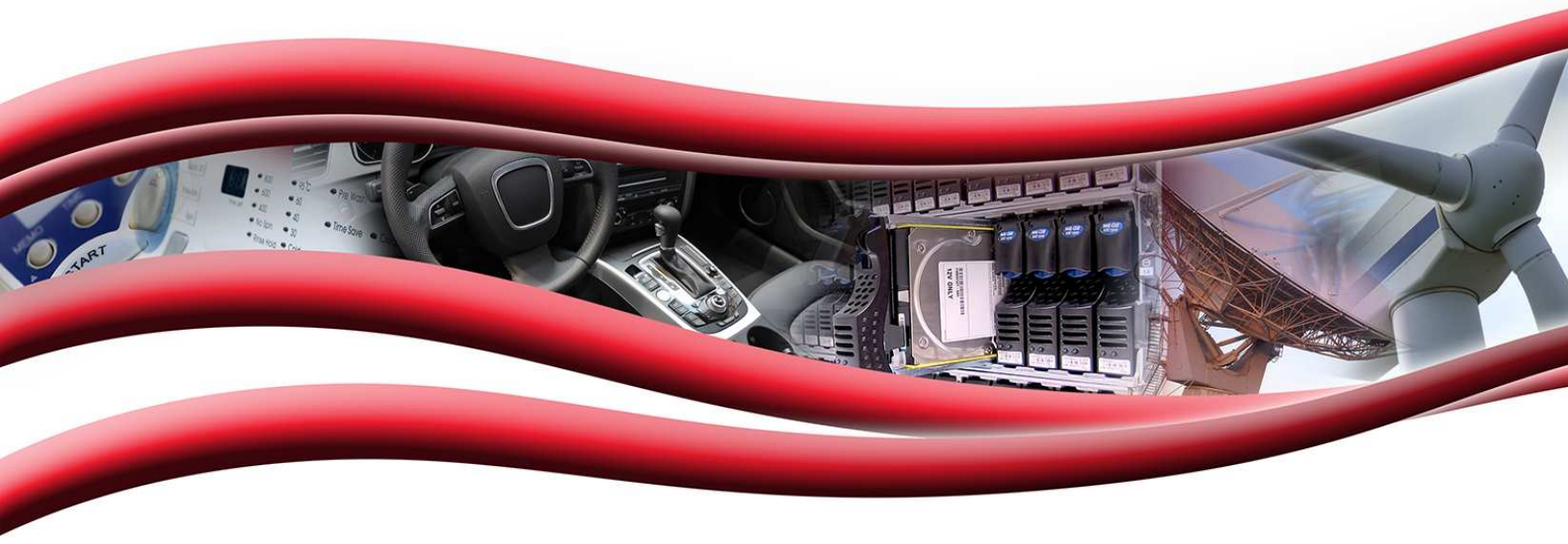
Rotary

Rotary (Encoder)

Switchlock

Thumbwheel

Smartcard Connector



Pushbutton
Product Selection Guide

Pushbutton									
Series	**ELUM**	**EP**	**TP**	**E020**	**8020**	**E010**	**8060**	**8500**	**KM**
Switch Type	Mom./ Latching	Tiny	Tiny	Snap-acting Mom.	Snap-acting Mom.	Miniature	Alternate Action	Sub-miniature	Sub-miniature
Poles/Throws	SPDT	SPST, SPDT, DPST	SPST, SPDT, DPST	SPDT, DPDT	SPDT, DPDT, 3PDT, 4PDT	SPDT	SPDT, DPDT	SPST	SPST, SPDT
Max. Current	3.5 VA	1 Amp	1 Amp	1 Amp	1 Amp	4 Amps	6 Amps	3 Amps	1 Amp
Process Sealed		•		•		•			
Illuminated	•				•		•	•	
PCB Mount Options									
Thru-hole	•	•	•	•	•	•	•	•	•
Vertical		•	•	•	•	•	•	•	•
Right Angle	•	•	•	•	•	•	•	•	•
Surface Mount	•	•							
Panel Mount			•		•	•	•	•	•
Page No.	A-4	A-9	A-15	A-21	A-29	A-46	A-52	A-62	A-67

Pushbutton							
Series	**8600**	**8700**	**GP**	**PN**	**PHB**	**F**	**NE-18**
Switch Type	Micro-miniature	Over Travel	Ultra-miniature	Alternate & Mom. Action	Short Stroke	Alternate & Mom. Action	Mains / Power
Poles/Throws	SPST	SPST	SPST, SPDT	SPDT, DPDT, 4PDT	DPDT, 4PDT	DPDT, 4PDT, 6PDT, 8PDT, 10PDT	DPST, DPDT Varied
Max. Current	500 mA	1 Amp	0.4 VA	200 mA	100 mA	500 mA	6 A
Process Sealed			•				
PCB Mount Options							
Thru-hole	•	•	•	•	•	•	•
Vertical	•	•	•				
Right Angle			•	•	•	•	•
Surface Mount			•				
Panel Mount	•	•				•	•
Page No.	A-71	A-74	A-77	A-81	A-84	A-87	A-96

Pushbutton
Product Selection Guide

Pushbutton								
Series	**FP**	**AP**	**APB**	**HP**	**NP**	**PBA**	**PB**	**PS**
Switch Type	Ultra Miniature	Industrial	Industrial	Hall Effect	Sealed Power	Snap-acting Mom.	Miniature	Sub-miniature Microminiature
Poles/Throws	SPST	SPST	SPST	Linear Output	SPDT	DPST	DPDT 4PDT	SPDT DPDT
Max. Current	0.4 VA	400mA	400mA	10 mA	5 Amp	250mA	0.3A / 1A	0.1 / 1A 0.3 / 2A
Process Sealed	•	IP67	IP67	IP68	IP68			
PCB Mount Options								
Thru-hole	•	•	•		•	•	•	•
Vertical	•	•	•	•	•			•
Right Angle	•					•	•	•
Panel Mount		•	•	•	•			•
Wire Leads		•	•	•	•			
Solder Lug		•	•					
Surface Mount								
Quick Connect								
Page No.	A-105	A-108	A-114	A-118	A-120	A-127	A-131	A-139

ELUM™ Series
Right Angle Illuminated Latching Pushbutton

LEAD FREE COMPATIBLE OPTION

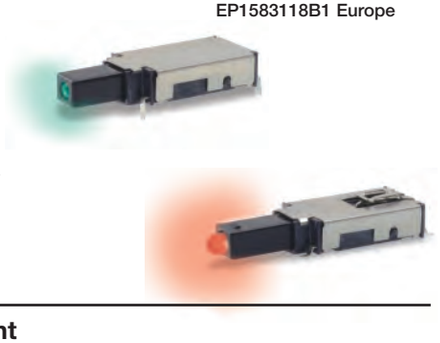
Features/Benefits

- ***SPDT (N.O. & N.C.)***
- ***Low height above PCB***
- ***Reliable self-cleaning contact***
- ***Surface-mount or thru-hole PCB***
- ***Standard or custom actuator***
- ***Central LED illumination***
- ***Latching or Momentary***
- ***Long travel. Smooth feel***
- ***RoHS compliant and compatible***

Typical Applications

- ***Telecom network equipment***
- ***Automotive electronics***
- ***Consumer electronics***
- ***Computer, server, modem, data storage***
- ***Professional instrumentation, medical***

Patent Numbers
6,974,924 B2 US
EP1583118B1 Europe



Materials

FIXED CONTACTS: Stainless steel, silver plated with gold flash
TERMINALS: Stainless steel, silver plated
MOVABLE CONTACTS: Copper alloy, silver plated with gold flash
BASE: Glass filled LCP (UL94V-0)
ACTUATOR: Glass filled nylon 4/6 (UL94V-0)
COVER: Stainless steel

Electrical

MAXIMUM POWER: 3.5 VA
MIN./MAX. VOLTAGE: 20 mV – 50 VDC
MIN./MAX. CURRENT: 0.01 mA – 250 mA
DIELECTRIC STRENGTH: ≥ 250 Vrms
CONTACT RESISTANCE: ≤ 50 mΩ
INSULATION RESISTANCE: ≥ 10^9 Ω
BOUNCE TIME: ≤1 ms
LED SPECIFICATIONS: See page A-5

Mechanical

OPERATING FORCE: 2.5 N at Full Travel
SWITCHING TRAVEL: .067" (1.7 mm)
LATCH TRAVEL: .131" (3.6 mm)
FULL TRAVEL: .200" (5.1 mm)

Operating Environment

OPERATING TEMPERATURE: -40°C TO 80°C.
STORAGE TEMPERATURE: -40°C TO 80°C.
RELATIVE HUMIDITY: 90% R.H. @ 80°C.
OPERATING LIFE: 30,000 Cycles.
VIBRATION: Per EIA 186-E Method
MECHANICAL SHOCK: Per EIA 186-E Method 12.
OVERLOAD: Withstands 40 N for 1 minute without damage

Process Environment

SOLDERABILITY: According to Mil STD 202F Method 208D or EIA RS-186E Method 9.
LEAD FREE PROCESS COMPATIBLE: 260°C peak, 10 seconds Max. above 250° C.
WASHING PROCESS: No clean process compatible (SMT)
Bottom wash compatible (Thru-hole)
SHEAR TEST (SWITCH/PCB): > 40 N

Packaging

"SA" Terminal Style SMT: Tape and reel per EIA 481-2 (450/reel)
"TH" Terminal Style PC: Tray (60/tray)

NOTE: Any models supplied with Q, contact material are RoHS compliant.

NOTE: Specifications and materials listed above are for switches with standard options.
For information on specific and custom switches, please contact Customer Service.

Build-A-Switch

To order, simply select desired option from each category and place in the appropriate box.

E	L	U	M					Q				

Designation
ELUM ELUM Series

Switch Function
OA Momentary
OC* ** Momentary short travel
EE Latching (push-push)

Terminal Style
TH Right Angle, PC thru-hole
SA Right Angle, surface mount

Contact Material*
Q Silver with gold flash

Illumination
(NONE) Models without illumination
1 LED White
2 LED Bi-color – Red (Green)
3 LED Red
5 LED Amber
6 LED Green
7 LED Blue
8 LED Bi-Color – Amber (Green)

Actuator Style**
C02 Black without window
C12 Black with window
C22 Black with window and snap feature for custom actuators

* Other plating options available, please contact Customer Service.
** Custom actuators available, please contact Customer Service.
*** Short travel available in momentary only.

Third Angle Projection

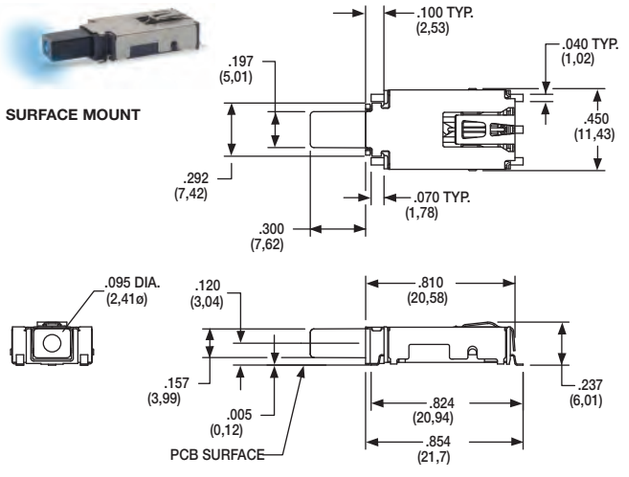
Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

ELUM™ Series
Right Angle Illuminated Latching Pushbutton

STANDARD OPTIONS

ELUMEESAQ7C12

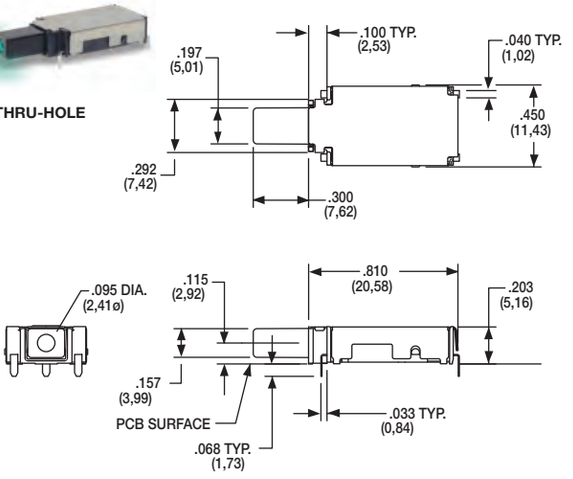
SURFACE MOUNT



ACTUATOR SHOWN EXTENDED POSITION

ELUMOATHQ6C12

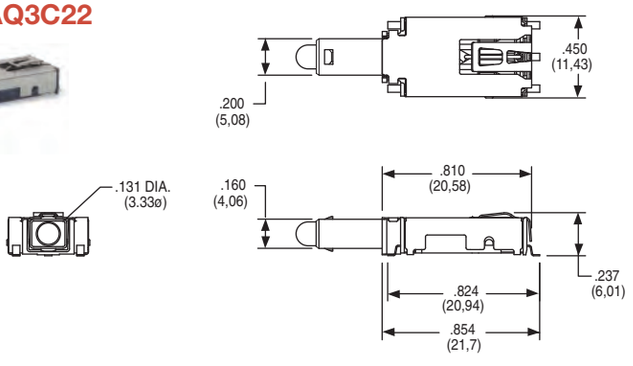
PC THRU-HOLE



ACTUATOR SHOWN EXTENDED POSITION

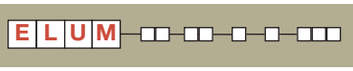
ELUMEESAQ3C22

SURFACE MOUNT



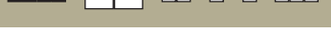
ACTUATOR SHOWN EXTENDED POSITION

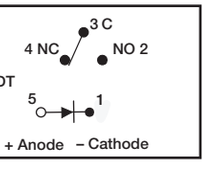
DESIGNATION



ELUM ELUM SERIES, Illuminated Latching Pushbutton

SWITCH FUNCTION

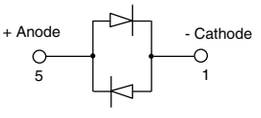


OPTION CODE	NO. OF POLES	POSITION 1 SWITCH FUNCTION	POSITION 1 CONNECTED TERMINALS	POSITION 2 SWITCH FUNCTION	POSITION 2 CONNECTED TERMINALS	SCHEMATIC
OA / OC	SP Momentary	ON	3 – 4	ON (Mom.)	3 – 2	
EE	SP Latching (Push-Push)	ON	3 – 4	ON	3 – 2	

For SPST N.O. function, only terminals 3 & 2 are used.
For SPST N.C. function, only terminals 3 & 4 are used.
Circuit: Make before break

LED pins 1 & 5 are independent of switch function.

NOTE:
For bi-color LED's the polarity must be reversed to alternate the color



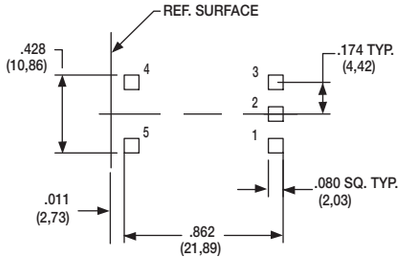
Third Angle Projection

Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

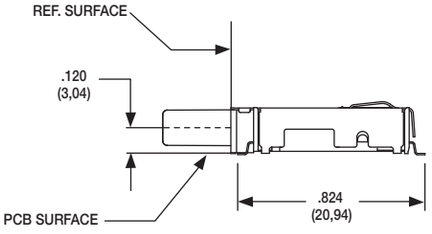
ELUM™ Series
Right Angle Illuminated Latching Pushbutton

TERMINAL STYLE

SA RIGHT ANGLE, SURFACE MOUNT

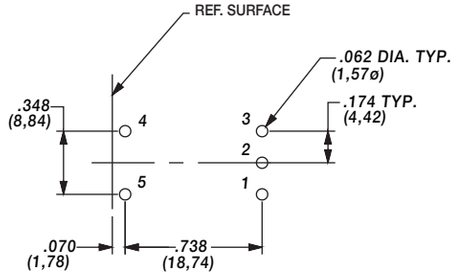


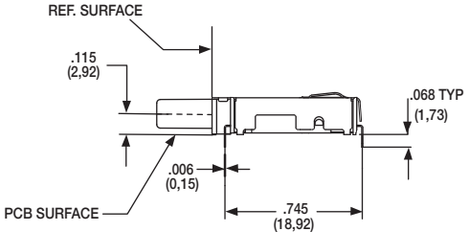
PCB MOUNTING



Terminal 5 = LED Anode

TH RIGHT ANGLE, PC THRU-HOLE





Terminal 5 = LED Anode

CONTACT MATERIAL

OPTION CODE	CONTACT MATERIAL	TERMINAL PLATING	RATINGS
Q	SILVER WITH GOLD FLASH	SILVER	250 mA

* Note: See Technical Data section of this catalog for RoHS compliant and compatible definitions and specifications.

FIXED CONTACTS AND TERMINALS: Stainless steel, silver plated with gold flash
MOVABLE CONTACTS: Copper alloy, silver plated with gold flash

NOTE: Any models supplied with Q, contact material are RoHS compliant.

ILLUMINATION

OPTION CODE	ILLUMINATION TYPE	TYPICAL INTENSITY* MIN	MAX	PEAK WAVELENGTH	Vf Forward Voltage
		(mcd)		(nm)	
0	Model without illumination	N/A		N/A	
1	LED Super White	4,000	5,000	N/A	3.5
2	LED Bi-Color – Red (Green)	10	20	635/565	2.0
3	LED Red	4	8	700	2.0
5	LED Amber	35	50	610	2.0
6	LED Green	35	50	565	2.0
7	LED Super Blue	800	1,500	470	3.8
8	LED Bi-Color – Amber (Green)	10	10	585/565	2.0

*LED FORWARD CURRENT: 20 mA
LED FORWARD VOLTAGE: see chart above
LED REVERSE VOLTAGE: 5.0 V MAX

* For information on specific and custom LED, please contact Customer Service.

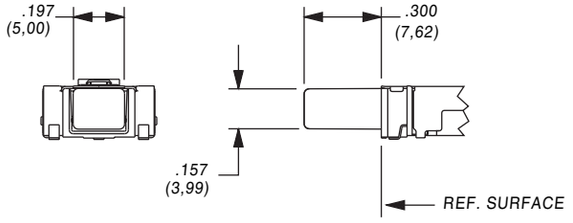
Third Angle Projection

Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

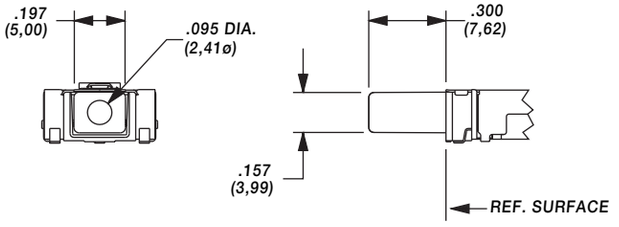
ELUM™ Series
Right Angle Illuminated Latching Pushbutton

ACTUATOR STYLE*

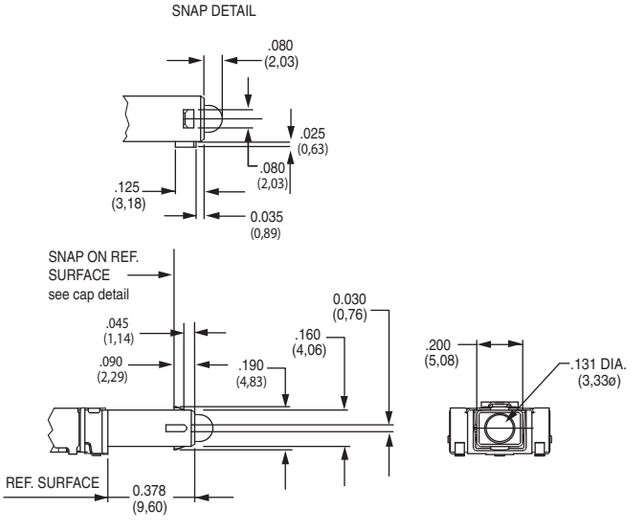
C02 BLACK WITHOUT WINDOW



C12 BLACK WITH WINDOW

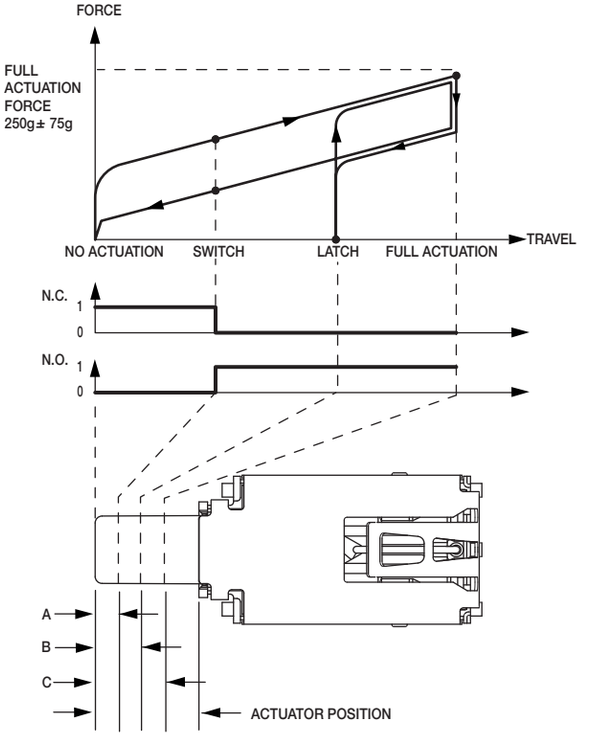


C22 BLACK WITH WINDOW AND SNAP FEATURE TO ACCEPT CUSTOM CAP



* Custom actuators available, please contact Customer Service.

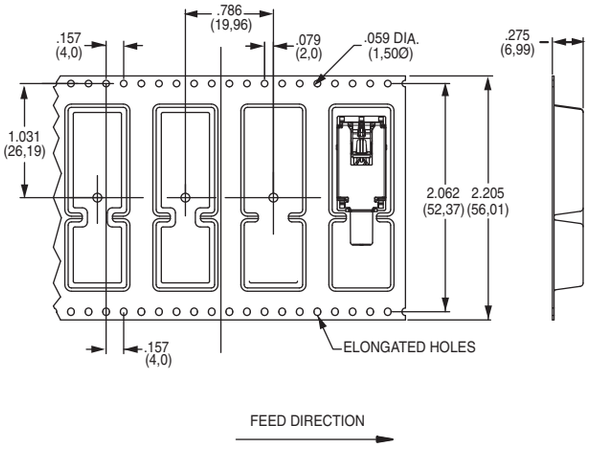
FORCE TRAVEL DIAGRAM



OA, EE ACTUATOR POSITION			
A	SWITCH POINT	.067 ±.020	1,7 ± 0.5mm
B	LATCH	.131 ±.020	3,3 ± 0.5mm
C	FULL ACTUATION	.200 ±.020	5,1 ± 0.5mm

OC ACTUATOR POSITION			
A	SWITCH POINT	.067 ±.020	1,7 ± 0.5mm
C	FULL ACTUATION	.098 ±.020	2,5 ± 0.5mm

TAPE & REEL



Third Angle Projection

Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

ELUM™ Series
Right Angle Illuminated Latching Pushbutton

AVAILABLE HARDWARE

Cap

PART NO.

957C00000 High temperature black cap with universal standby symbol

956C02000 High temperature black cap with no symbol

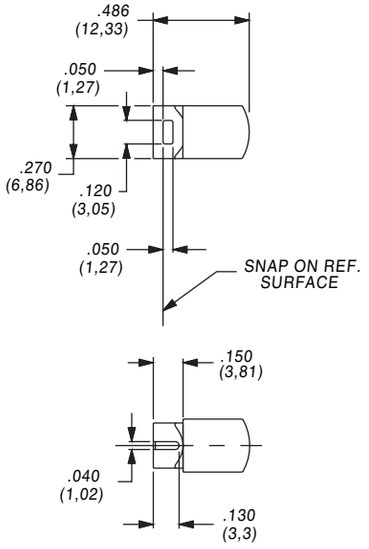
Material: 4/6 Nylon SMT compatible

Cap

PART NO.

181D01000 Paint and Laser Etched with black paint and universal standby symbol

Material: Clear polycarbonate



Cap

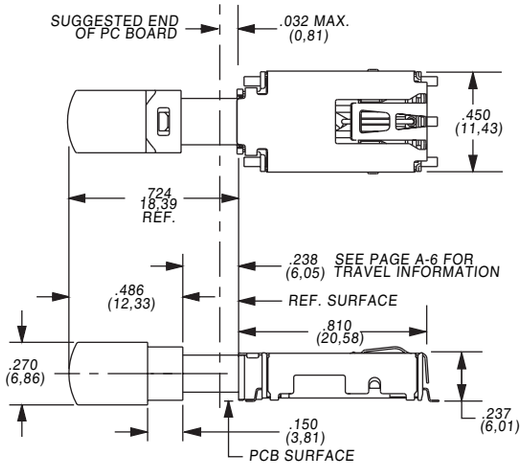
PART NO.

181D00000 Paint and laser etched with white paint underlay and black paint with universal standby symbol.

Material: Clear polycarbonate

NOTE: Caps are for use with the C22 actuator style. Other colors and symbols available, consult Customer Service Center.

CAP INSTALLATION



VIEW WITH 957C CAP INSTALLED

Third Angle Projection

Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

EP Series
Sealed Tiny Pushbutton Switches

Features/Benefits

- ***Sealed against solder & cleaning processes***
- ***Thru-hole and surface mount models***
- ***Snap-fitting actuator accepts standard caps***
- ***Tape & reel packaging available***
- ***RoHS compliant models available***

c UL us
Models Available

Typical Applications

- ***Telecommunications and networking equipment***
- ***Computers and peripherals***
- ***Instrumentation and controls***

Specifications

CONTACT RATING: B contact material: 0.4 VA max. @ 20 V AC or DC max. See page A-13 for additional ratings.

ELECTRICAL LIFE: EP11, EP21 models: 60,000 make-and-break cycles at full load. EP12 models: 30,000 cycles.

CONTACT RESISTANCE: Below 20 mΩ typ. initial @ 2-4 V DC, 100 mA, for both silver and gold plated contacts.

INSULATION RESISTANCE: 10^9 Ω min.

DIELECTRIC STRENGTH: 1000 Vrms min. @ sea level.

OPERATING TEMPERATURE: –30°C to 85°C.

SOLDERABILITY: Per MIL-STD-202F method 208D, or EIA RS-186E method 9 (1 hour steam aging).

DEGREE OF PROTECTION: IP57; Protection against harmful dust deposit, full-scale voltage protection, temporary immersion.

PACKAGING: Surface mount switches standard in anti-static tape and reel packaging per EIA 481-3, see page A-14 for drawings and reel information. Tape and cover strip are conductive for use near statically sensitive components, consult Customer Service Center.

Materials

CASE & BUSHING: High temperature material, glass filled nylon 4/6, flame retardant, heat stabilized (UL 94V-0) on EP11 / EP12 models; glass filled nylon 6/6 on EP21.

PLUNGER: Thermoplastic polyester or glass filled nylon (UL 94V-0), with internal o-ring seal. SA surface mount: High temperature material, glass filled LCP (UL 94V-0).

SWITCH SUPPORT: Brass, matte-tin plated.

CONTACTS & TERMINALS: B contact material: Copper alloy, with gold plate over nickel plate. See page A-13 for additional contact materials.

TERMINAL SEAL: Epoxy.

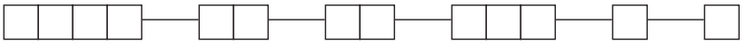
NOTE: Any models supplied with Q, B, P, S, R or G contact material are RoHS compliant.

NOTE: Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.

CAUTION: PC mounting layouts and pads as shown are designed to be compatible with the latest equipment and reflow techniques. Care should be taken in the design and location of PC lands to suit individual needs. Orientation relative to reflow direction may significantly impact solder joint integrity.

Build-A-Switch

To order, simply select desired option from each category and place in the appropriate box. Available options are shown and described on pages A-10 thru A-14. For additional options not shown in catalog, consult Customer Service Center. All models are process sealed to withstand machine soldering temperatures and pressure wash cleaning methods.



Switch Function
EP11 SPST Off-Mom.
EP12 SPDT On-Mom.
EP21 DPST Off-Mom.

Plunger
S .215" high
S1 .110" high
S2 .465" high
FP Flush
R Snap-fitting, .215 high

Bushing
D1 Unthreaded

Terminations
A Right angle, PC thru-hole
C PC Thru-hole
AV Vertical right angle, PC thru-hole
AV3 Vertical right angle, snap-in, PC thru-hole
SA Right angle, surface mount
SA1 Right angle, surface mount rear facing
V3 Vertical mount, v-bracket
V31 Vertical mount, v-bracket, snap-in (EP11 & EP12 only)
W Wire wrap

Contact Material
B Gold
P Gold, matte-tin
Q Silver
S Silver, matte-tin
G Gold over silver
R Gold over silver, matte tin

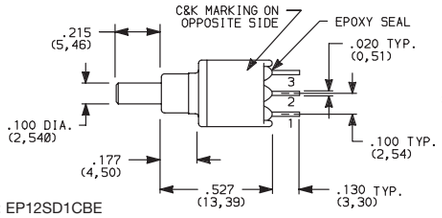
Seal
E Epoxy

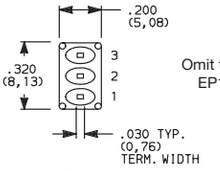
EP Series
Sealed Tiny Pushbutton Switches

SWITCH FUNCTION

NO. POLES	MODEL NO.	SWITCH FUNCTION POS. 1 (C&K marking on opposite side)	SWITCH FUNCTION POS. 2 (C&K marking on opposite side)	CONNECTED TERMINALS POS. 1 (C&K marking on opposite side)	CONNECTED TERMINALS POS. 2 (C&K marking on opposite side)	SCHEMATIC
SP	EP11	OFF	MOM.	OPEN	1-3	SPST 1 3
	EP12	ON	MOM.	2-1	2-3	SPDT NC 1, 2 (COMM), 3 NO

SPDT





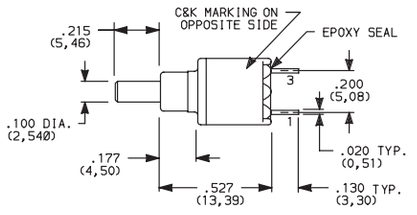
Omit terminal 2 for EP11 models.

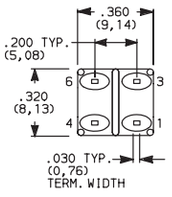
Terminal Nos. For Reference Only

Part number shown: EP12SD1CBE

DP	EP21	OFF	MOM.	OPEN	1-3,4-6	DPST 1 3 4 6

DPST





Terminal Nos. For Reference Only

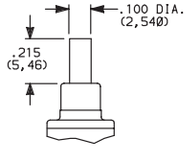
Part number shown: EP21SD1CBE

MOM. = Momentary

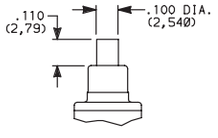
All models cULus with all options when ordered with G, Q, R or S contact material.

PLUNGER

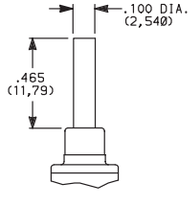
S .215" HIGH



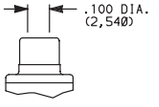
S1 .110" HIGH



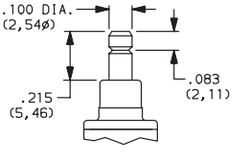
S2 .465" HIGH



FP FLUSH PLUNGER



R SNAP-FITTING



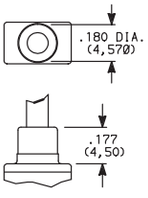
S1& S2 actuators are not available with EP12 & EP21 models.

FP & R actuators are not available with EP21 model.

NOTE: Caps available for plunger options, see page A-14.

BUSHING

D1 UNTHREADED



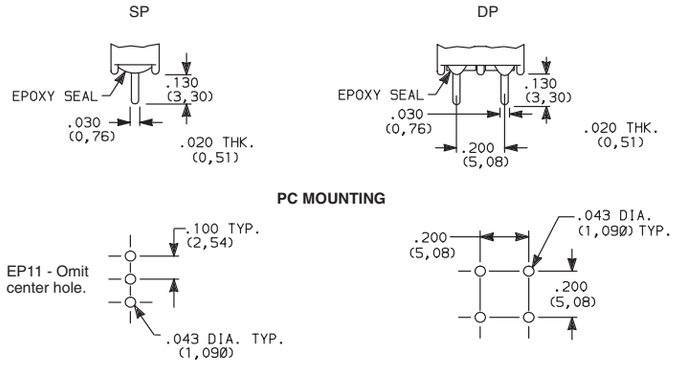
NOTE: Internal actuator o-ring standard.

Third Angle Projection

Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

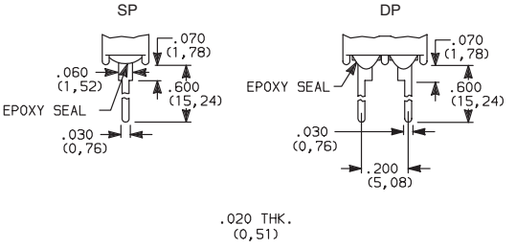
TERMINATIONS

C PC THRU-HOLE



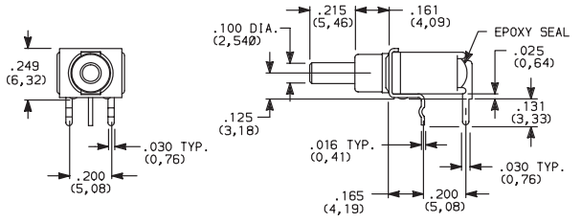
SP and DP

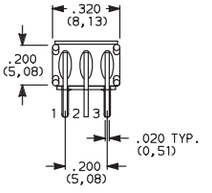
W WIRE WRAP



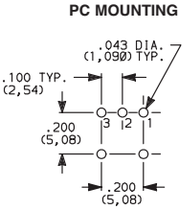
SP and DP

A RIGHT ANGLE, PC THRU-HOLE





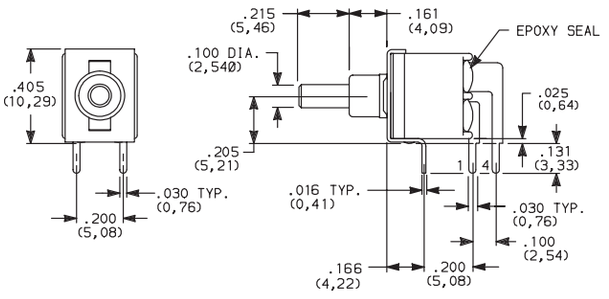
EP11 Models:
omit terminal 2.

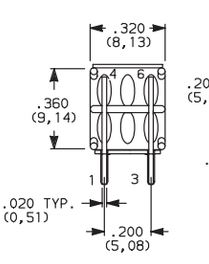


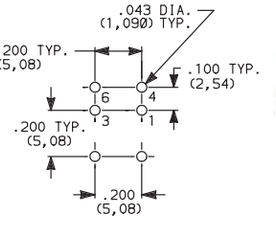
EP11 Models:
omit thru-hole 2.

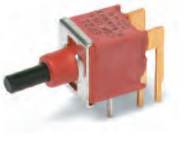
EP12SD1ABE
SPDT

A RIGHT ANGLE, PC THRU-HOLE



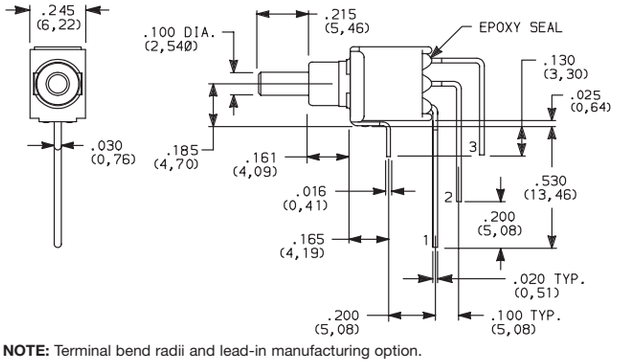


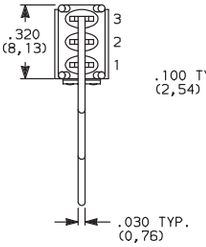




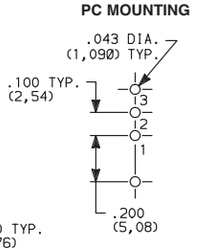
EP21SD1ABE
DPST

AV VERTICAL RIGHT ANGLE, PC THRU-HOLE





EP11 Models:
omit terminal 2.



EP11 Models:
omit hole 2.

EP12SD1AVBE
SPDT

NOTE: Terminal bend radii and lead-in manufacturing option.

Third Angle
Projection

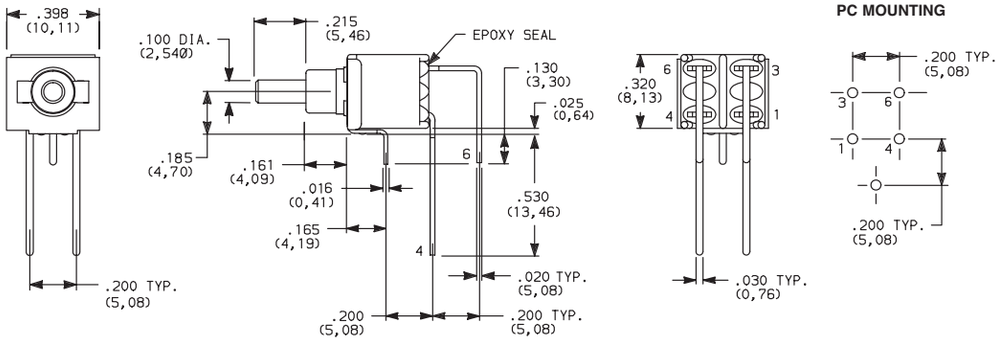
Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

EP Series
Sealed Tiny Pushbutton Switches

TERMINATIONS

AV VERTICAL RIGHT ANGLE, THRU-HOLE

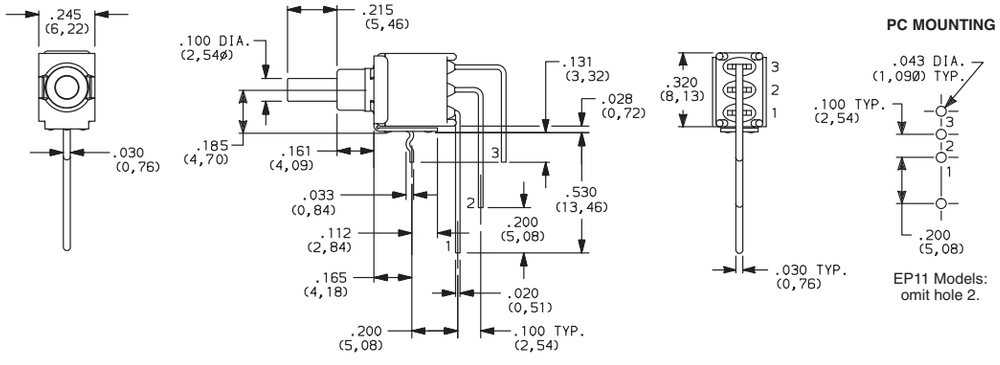
EP21SD1AVBE
DPST



NOTE: Terminal bend radii and lead-in manufacturing option.

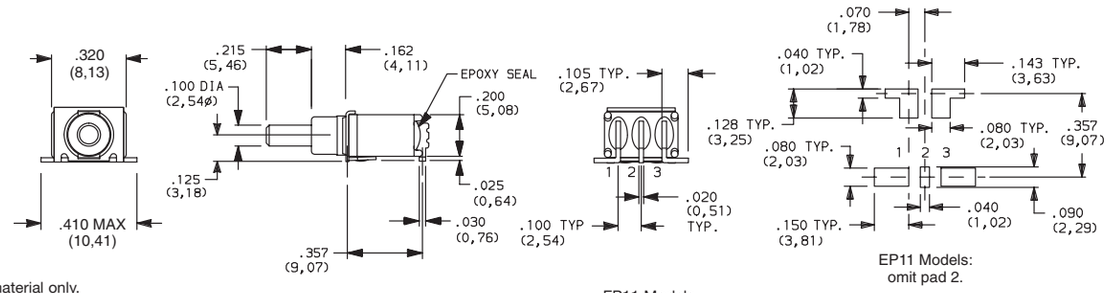
AV3 VERTICAL RIGHT ANGLE, SNAP-IN, PC THRU-HOLE

EP12SD1AV3BE
SPST



SA RIGHT ANGLE, SURFACE MOUNT

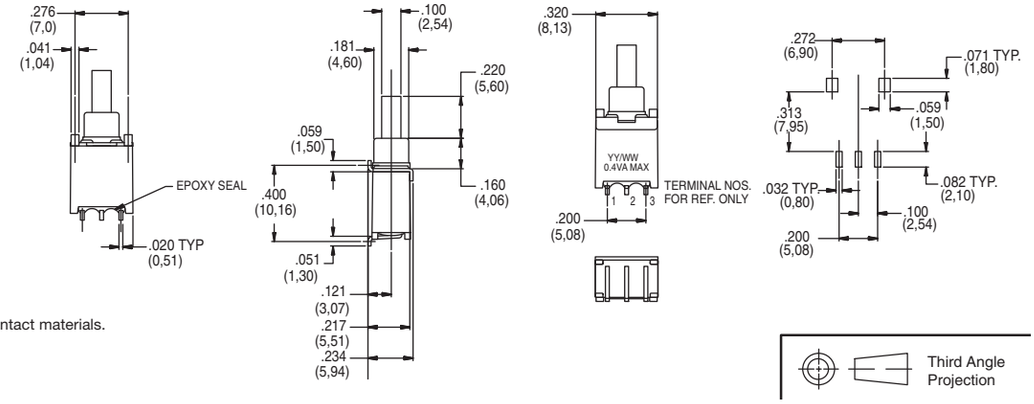
EP12SD1SAPE
SPDT



Available with P contact material only.
Not Available on DPST models.

SA1 RIGHT ANGLE, SURFACE MOUNT

EP12SD1SA1BE
SPDT



SA1 is only available with B and P contact materials.
Not Available on DPST models.

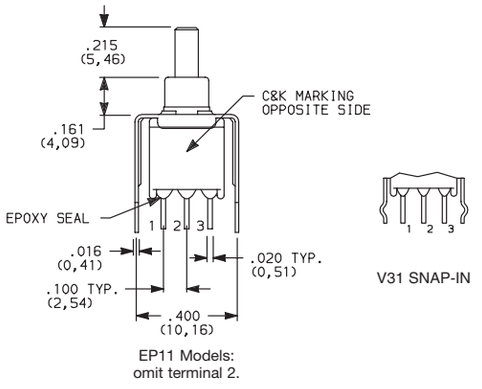
Third Angle Projection

Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

TERMINATIONS

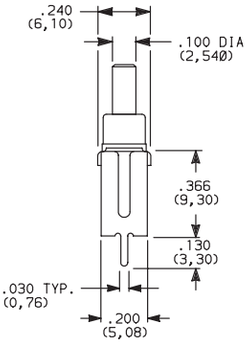
V3 VERTICAL MOUNT, V-BRACKET

V31 VERTICAL MOUNT, V-BRACKET, SNAP-IN

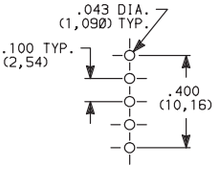


EP11 Models:
omit terminal 2.

V31 SNAP-IN



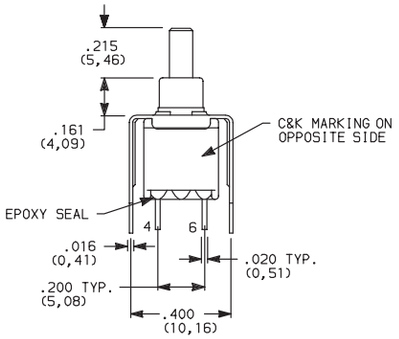
PC MOUNTING

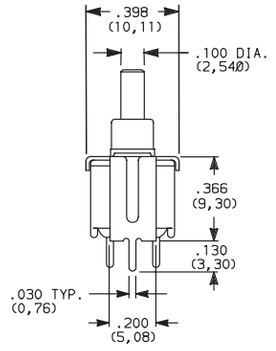


EP11 Models:
omit centerhole.

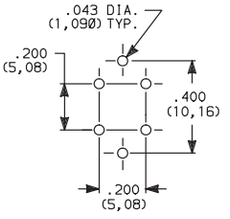
EP12SD1V3BE
SPDT

V3 VERTICAL MOUNT, V-BRACKET





PC MOUNTING



EP21SD1V3BE
DPST

CONTACT MATERIAL

OPTION CODE	CONTACT MATERIAL	TERMINAL PLATING	RATINGS	
B	GOLD [1]	GOLD [1]	LOW LEVEL/DRY CIRCUIT	0.4 VA MAX. @ 20 V AC OR DC MAX.
P		MATTE-TIN [6]		
Q	SILVER [4,5]	SILVER [5]	POWER	1 AMP @ 120 V AC OR 28 V DC.
S		MATTE-TIN [6]		
G	GOLD OVER SILVER [2,3]	GOLD [3]	LOW LEVEL/DRY CIRCUIT OR POWER	0.4 VA MAX @ 20 V AC OR DC MAX. OR 1 AMP @ 120 V AC OR 28 V DC.
R		MATTE-TIN [6]		

* Note: See Technical Data section of this catalog for RoHS compliant and compatible definitions and specifications.

[1] CONTACTS & TERMINALS: Copper alloy, with gold plate over nickel plate.

[2] END CONTACTS: Coin silver, with gold plate over nickel plate.

[3] CENTER CONTACTS & ALL TERMINALS: Copper alloy, with gold plate over nickel plate.

[4] END CONTACTS: Coin silver, silver plated.

[5] CENTER CONTACT & ALL TERMINALS: Copper alloy, silver plated.

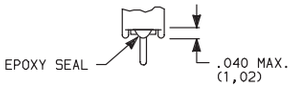
[6] TERMINALS: Copper alloy, with matte tin over nickel plate.

NOTE: Any models supplied with Q, B P, S ,R or G contact material are RoHS compliant.

All models cULus with all options when ordered with G, S, R or Q contact material.

SEAL

E EPOXY SEAL



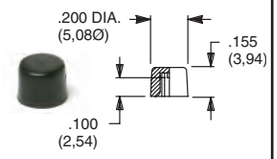
Third Angle Projection

Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

EP Series
Sealed Tiny Pushbutton Switches

AVAILABLE HARDWARE

Cap



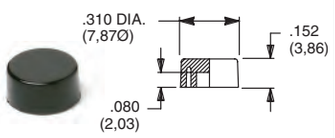
PART NO.

508101000	WHITE
508102000	BLACK
508103000	RED

Material: Nylon
Finish: Gloss

Not for use on S1 plunger

Cap



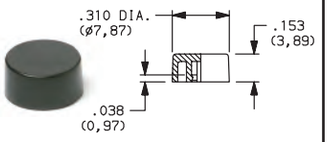
PART NO.

465801000	WHITE
465802000	BLACK
465803000	RED

Material: Nylon
Finish: Gloss

Not for use on S1 plunger

Cap
Compatible with snap-fitting plungers EP11 & EP12 Models. R option only.

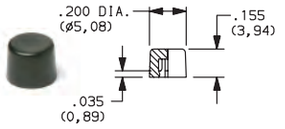


PART NO.

585A01000	WHITE
585A02000	BLACK
585A03000	RED

Material: Nylon
Finish: Gloss

Cap
Compatible with snap-fitting plungers EP11 & EP12 Models. R option only.



PART NO.

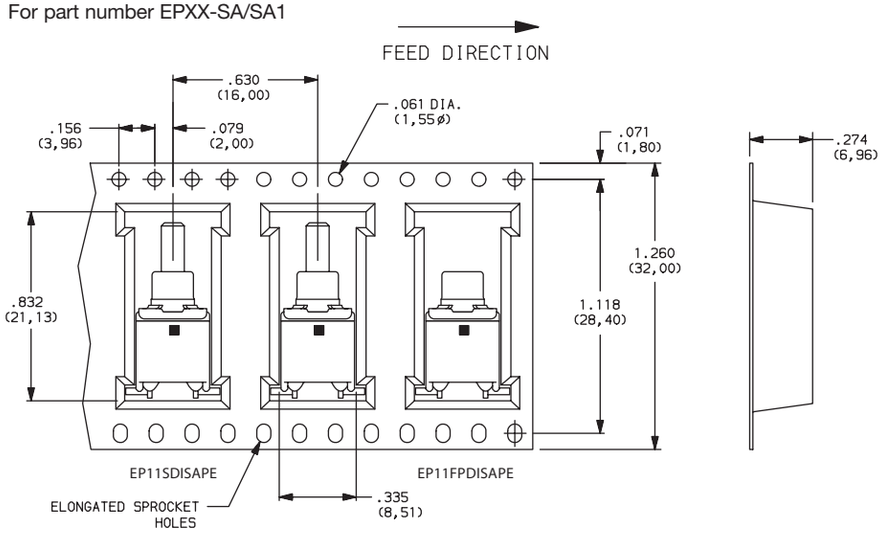
785A01000	WHITE
785A02000	BLACK
785A03000	RED

Material: Nylon
Finish: Gloss

NOTE: Other colors available, consult Customer Service Center.

TAPE & REEL

For part number EPXX-SA/SA1



REEL INFORMATION	
OUTSIDE DIAMETER	13.00 (330,0)
PILOT HOLE	.512 (13,0)
QUANTITY PER REEL	600

Third Angle Projection

Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

TP Series
Tiny Pushbutton Switches

Features/Benefits

- ***Subminiature size—capable of switching 1 AMP***
- ***Vertical & right angle terminations***
- ***PC & panel mount models***
- ***Snap-in front panel mounting available***
- ***Epoxy terminal seal-compatible with bottom wash cleaning***
- ***RoHS compliant models available***

Models Available

Typical Applications

- ***Telecommunications and networking equipment***
- ***Computers and peripherals***
- ***Instrumentation and controls***

Specifications

CONTACT RATING: B contact material: 0.4 VA max. @ 20 V AC or DC max. Q contact material: 1 AMP @ 120 V AC or 28 V DC. See page A-19 for additional ratings.

ELECTRICAL LIFE: TP11, TP21 MODELS: 60,000 make-and-break cycles at full load. TP12 MODELS: 30,000 cycles.

CONTACT RESISTANCE: Below 20 mΩ typ. initial @ 2-4 V DC, 100 mA, for both silver and gold plated contacts.

INSULATION RESISTANCE: $10^9\Omega$ min.

DIELECTRIC STRENGTH: 1000 Vrms min. @ sea level.

OPERATING TEMPERATURE: –30°C to 85°C.

SOLDERABILITY: Per MIL-STD-202F method 208D, or EIA RS-186E method 9 (1 hour steam aging).

NOTE: Any models supplied with Q, B, P, R or G contact material are RoHS compliant.

NOTE: Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.

Materials

CASE: Glass filled nylon 4/6 or 6/6, flame retardant, heat stabilized or diallyl phthalate (DAP), (UL 94V-0).

PLUNGER: Thermoplastic polyester (UL 94V-0).

CAP & FRAME: Nylon, black standard.

BUSHING: Brass, nickel plated.

HOUSING: Stainless steel.

SWITCH SUPPORT: Brass, matte-tin plated.

END CONTACTS: B contact material: Copper alloy, with gold plate over nickel plate. Q contact material: Coin silver, silver plated. See page A-19 for additional contact materials.

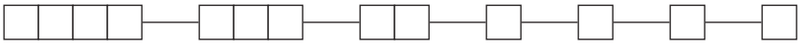
CENTER CONTACT & ALL TERMINALS: B contact material: Copper alloy, with gold plate over nickel plate. Q contact material: Copper alloy, silver plated. See page A-19 for additional contact materials.

TERMINAL SEAL: Epoxy. Refer to soldering and cleaning in Technical Data Chapter

HARDWARE: Nut & Locking Ring: Brass nickel plated. Lockwasher: Steel, nickel plated.

Build-A-Switch

To order, simply select desired option from each category and place in the appropriate box. Available options are shown and described on pages A-16 thru A-20. For additional options not shown in catalog, consult Customer Service Center. All models have epoxy terminal seal and are compatible with all “bottom-wash” PCB cleaning methods.



Switch Function
- **TP11** SPST Off-Mom.
- **TP12** SPDT On-Mom.
- **TP21** DPST Off-Mom.

Actuator or Bushing
- **SH** .155" high plunger, threaded, .220" high bushing, flat
- **SH8** .155" high plunger, unthreaded, .220" high bushing, round
- **SH9** .155" high plunger, unthreaded, .220" high bushing, flat
- **J81** Snap-in with frame
- **LT** .215" high plunger, threaded, .310" high bushing, flat
- **LT9** .215" high plunger, unthreaded, .310" high bushing, flat
- **MS9** .130" high plunger, .020" high bushing, round

Terminations
- **A** Right angle, PC thru-hole
- **C** PC Thru-hole
- **Z** Solder lug
- **AV** Vertical right angle, PC thru-hole
- **V3** Vertical mount, v-bracket
- **W** Wire wrap

Contact Material
- **B** Gold
- **P** Gold, matte-tin
- **Q** Silver
- **G** Gold over silver
- **R** Gold over silver, matte-tin

Seal
- **E** Epoxy

Cap Color
- **2** Black
- **NONE** Models with no cap
- **1** White

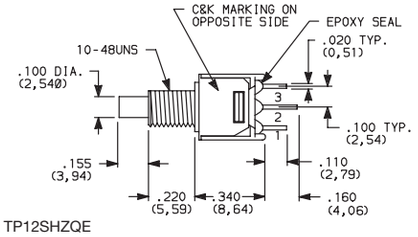
Frame Color
- **2** Black
- **NONE** Models with no frame

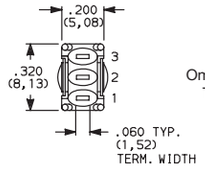
TP Series
Tiny Pushbutton Switches

SWITCH FUNCTION

NO. POLES	MODEL NO.	SWITCH FUNCTION POS. 1 (C&K marking on opposite side)	SWITCH FUNCTION POS. 2 (C&K marking on opposite side)	CONNECTED TERMINALS POS. 1 (C&K marking on opposite side)	CONNECTED TERMINALS POS. 2 (C&K marking on opposite side)	SCHEMATIC
SP	TP11	OFF	MOM.	OPEN	1-3	SPST 1 3
	TP12	ON	MOM.	2-1	2-3	SPDT NC 1, 2 (COMMON), 3 NO

SPDT





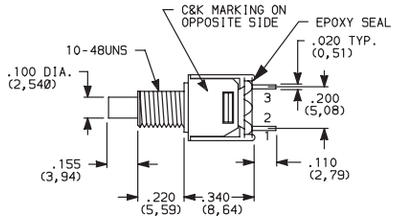
Omit terminal 2 for TP11 models.

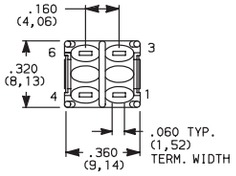
Part number shown: TP12SHZQE

Terminal Nos. For Reference Only

DP	TP21	OFF	MOM.	OPEN	1-3,4-6	DPST 1 3 4 6

DPST





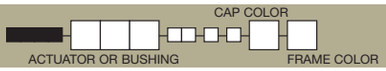
Terminal Nos. For Reference Only

Part number shown: TP21SHZQE

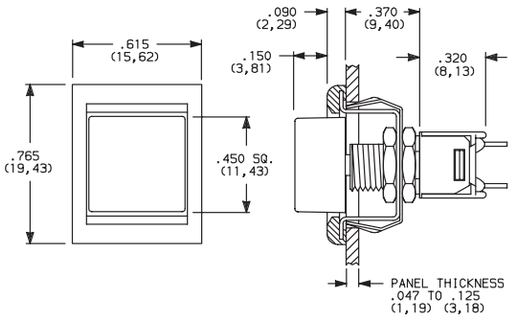
MOM. = Momentary

All models with all options when ordered with G, Q or R contact material.

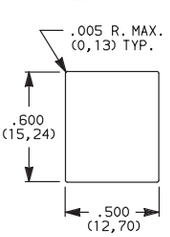
ACTUATOR—SNAP-IN FRONT MOUNT



J81 SNAP-IN WITH FRAME



PANEL MOUNTING



OPTION CODE	CAP COLOR
2	BLACK
1	WHITE

OPTION CODE	FRAME COLOR
2	BLACK
NONE	No Frame Color (J80 option)

Cap and Frame Finish: matte. Other colors available, consult Customer Service Center.

NOTE: Available with Z, C, or W terminations.

NOTE: Caps & frames available separately, see page A-20.

Third Angle Projection

Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

SH .155" HIGH PLUNGER, .220" HIGH BUSHING, THREADED, FLAT

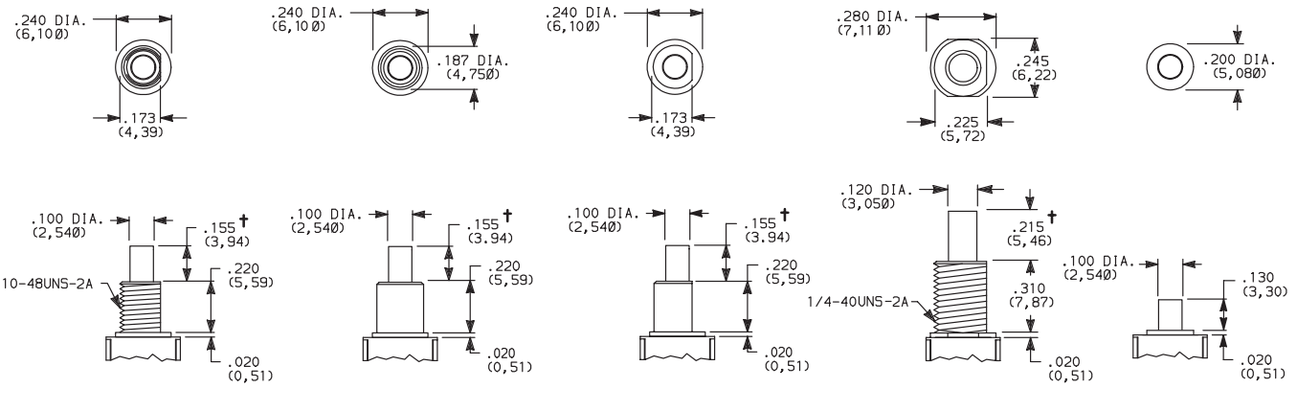
SH8 .155" HIGH PLUNGER, .220" HIGH BUSHING, UNTHREADED

SH9 .155" HIGH PLUNGER, .220" HIGH BUSHING, UNTHREADED, FLAT

LT .215" HIGH PLUNGER, .310" HIGH BUSHING, THREADED

LT9 .215" HIGH PLUNGER, .310" HIGH BUSHING, UNTHREADED

MS9 .130" HIGH PLUNGER



Standard with Z, C, W terminations.

Standard with A, AV, V3 terminations.

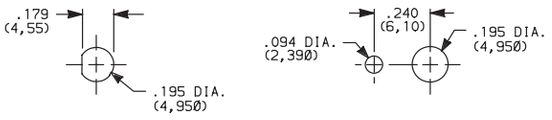
Not available with Z terminations.

† Subtract .016 (0,41) for models with A, AV or V3 terminations.

NOTE: Caps available for plunger options, see page A-20.

PANEL MOUNTING

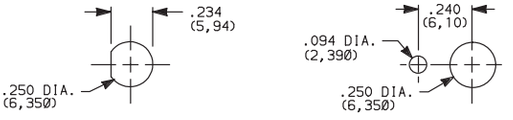
10-48 BUSHING



Without locking ring

With standard locking ring

1/4 IN. BUSHING



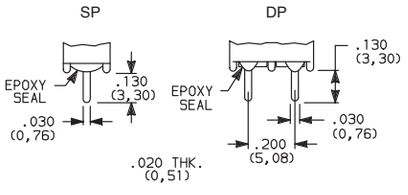
Without locking ring

With standard locking rin

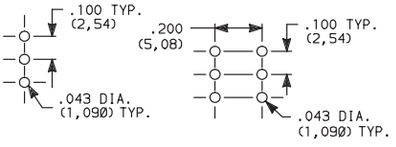
NOTE: One mounting nut, locking ring and lockwasher supplied standard with 10-48 threaded bushings (two nuts with 1/4-40 bushings). Optional mounting nut and locking ring styles and finishes available separately, see section "Technical Data and Additional Hardware".

TERMINATIONS

C PC THRU-HOLE

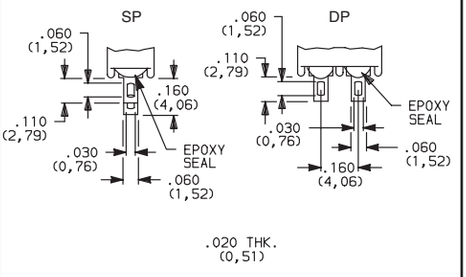


PC MOUNTING



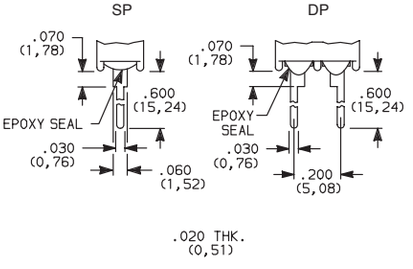
Omit center holes for TP11 models

Z SOLDER LUG



Not available with MS9 bushing or P or R contact material.

W WIRE WRAP



Third Angle Projection

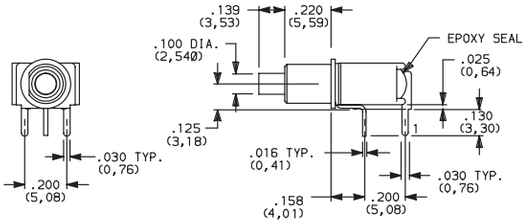
Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

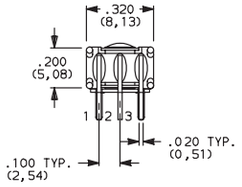
TP Series
Tiny Pushbutton Switches

TERMINATIONS

A RIGHT ANGLE, PC THRU-HOLE

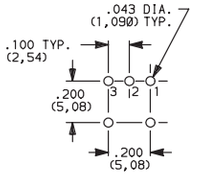
TP12SH9ABE
SPDT





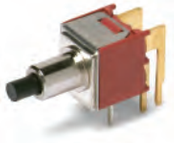
TP11 Models:
omit terminal 2.

PC MOUNTING

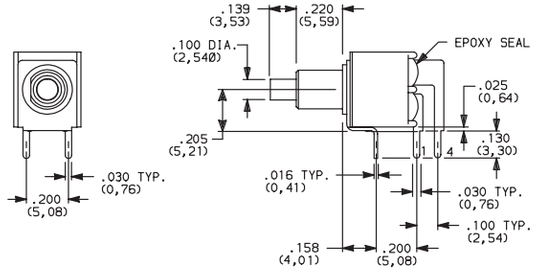


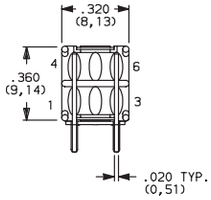
TP11 Models:
omit hole 2.

A RIGHT ANGLE, PC THRU-HOLE

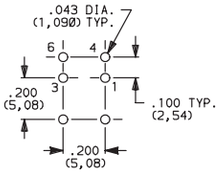


TP21SH9ABE
DPST



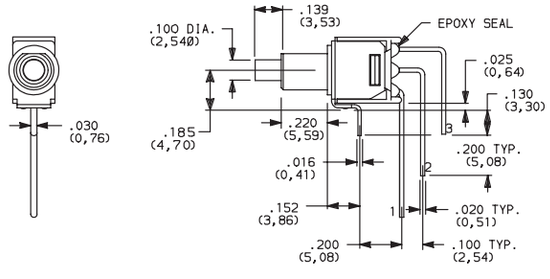


PC MOUNTING

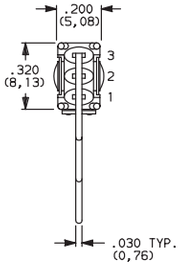


AV VERTICAL RIGHT ANGLE, PC THRU-HOLE

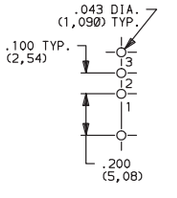
TP12SH9AVBE
SPDT



TP11 Models:
omit terminal 2.



PC MOUNTING

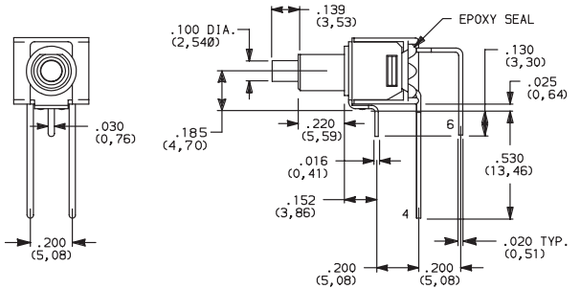


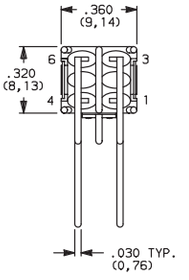
TP11 Models:
omit hole 2.

NOTE: Terminal bend radii and lead-in manufacturing option.

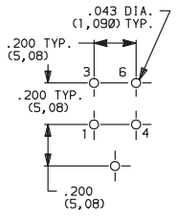
AV VERTICAL RIGHT ANGLE, PC THRU-HOLE

TP21SH9AVBE
DPST





PC MOUNTING



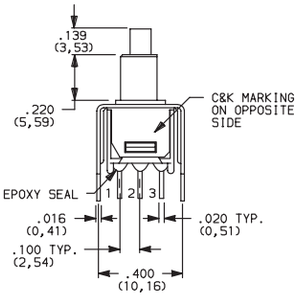
NOTE: Terminal bend radii and lead-in manufacturing option.

Third Angle Projection

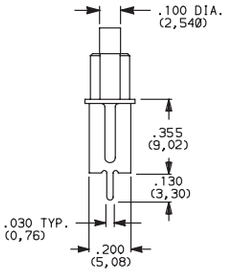
Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

TERMINATIONS

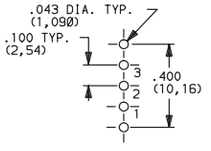
V3 VERTICAL MOUNT, V-BRACKET



TP11 Models:
omit terminal 2.



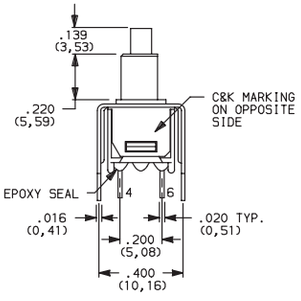
PC MOUNTING

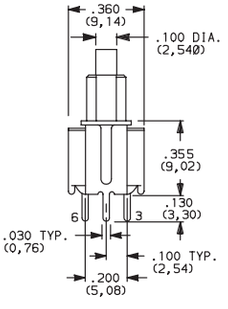


TP11 Models:
omit hole 2.

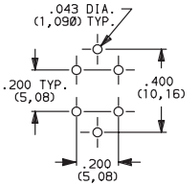
TP12SH9V3BE
SPDT

V3 VERTICAL MOUNT, V-BRACKET





PC MOUNTING



TP21SH9V3BE
DPST

CONTACT MATERIAL

OPTION CODE	CONTACT MATERIAL	TERMINAL PLATING	RATINGS	
B	GOLD [1]	GOLD [1]	LOW LEVEL/DRY CIRCUIT	0.4 VA MAX. @ 20 V AC OR DC MAX.
P		MATTE-TIN [6]		
Q	SILVER [4,5]	SILVER [5]	POWER	1 AMP @ 120 V AC OR 28 V DC.
G	GOLD OVER SILVER [2,3]	GOLD [3]	LOW LEVEL/DRY CIRCUIT OR POWER	0.4 VA MAX @ 20 V AC OR DC MAX. OR 1 AMP @ 120 V AC OR 28 V DC.
R		MATTE-TIN [6]		

* Note: See Technical Data section of this catalog for RoHS compliant and compatible definitions and specifications.

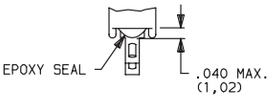
[1] CONTACTS & TERMINALS: Copper alloy, with gold plate over nickel plate.
[2] END CONTACTS: Coin silver, with gold plate over nickel plate.
[3] CENTER CONTACTS & ALL TERMINALS: Copper alloy, with gold plate over nickel plate.
[4] END CONTACTS: Coin silver, silver plated.
[5] CENTER CONTACT & ALL TERMINALS: Copper alloy, silver plated.
[6] TERMINALS: Copper alloy, with matte-tin over nickel plate.

NOTE: Any models supplied with P, R, Q, B or G contact material are RoHS compliant.

All models with all options when ordered with R, G, or Q contact material.
B contact material standard with A, AV, V3 & W terminations.
Q contact material standard with C & Z terminations
P, R contact materials not available with Z terminations.

SEAL

E EPOXY SEAL



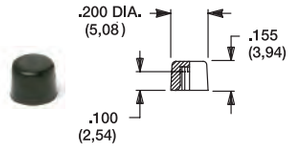
Third Angle Projection

Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

TP Series
Tiny Pushbutton Switches

AVAILABLE HARDWARE

Cap, .100" DIA. Plungers

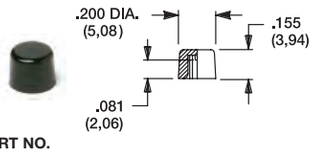


PART NO.

508101000 WHITE
508102000 BLACK

Material: Nylon
Finish: Gloss

Cap, .100" DIA. Plungers
(Recommended for S9 plunger)

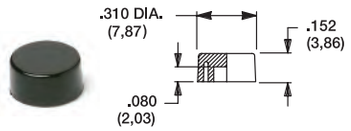


PART NO.

538701000 WHITE
538702000 BLACK

Material: Nylon
Finish: Gloss

Cap, .100" DIA. Plungers

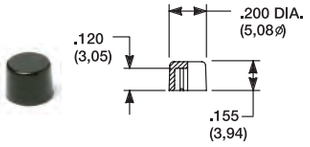


PART NO.

465801000 WHITE
465802000 BLACK

Material: Nylon
Finish: Gloss

Cap, .120" DIA. Plungers

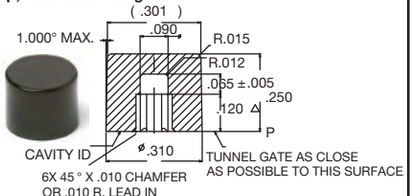


PART NO.

708901000 WHITE
708902000 BLACK

Material: Nylon
Finish: Gloss

Cap, .120" DIA. Plungers

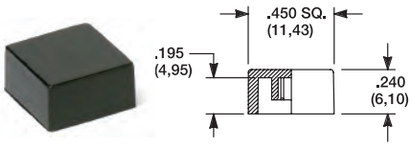


PART NO.

891D01000 WHITE
891D02000 BLACK

Material: Nylon
Finish: Gloss

Cap, J81 option only



PART NO.

484601000 WHITE
484602000 BLACK

Material: Nylon
Finish: Gloss

PART NO.

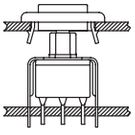
798201000 WHITE
798202263 BLACK

Material: Nylon
Finish: Matte

NOTE: Additional nuts, locking rings and lockwashers available separately, see section "Technical Data and Additional Hardware".
Other cap colors available, consult Customer Service Center.

Frames snap into panel opening and are independent from switch mounting. Accurate positioning of the PC mounted switch relative to the panel opening is necessary to provide proper clearance between actuator and frame. Available in two basic styles and four panel thicknesses .047-.125 in. Material: Nylon. Finish: Matte.

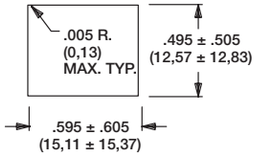
TYPICAL APPLICATION



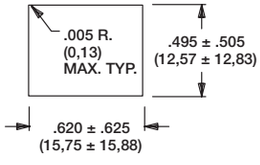
.047" (1,19) PANEL THK.	.062" (1,57) PANEL THK.	.090" (2,29) PANEL THK.	.125" (3,18) PANEL THK.
PART NO.	**PART NO.**	**PART NO.**	**PART NO.**
432502263	432602263	432702263	432802263 BLACK

PANEL MOUNTING

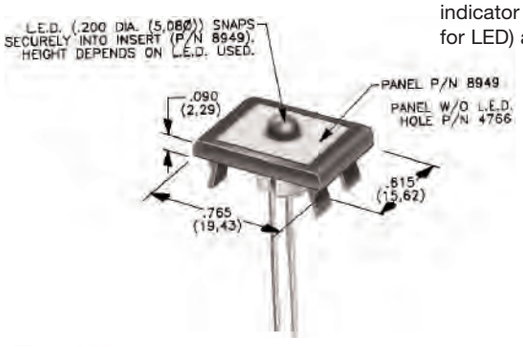
For part numbers
432502263, 432602263



For part numbers
432702263, 432802263



Panel Inserts



Above frames (part nos. 432XXXXXX) are also available with insert which accepts LED for indicator light assembly. Order insert separately from frame. Blank insert panel (without hole for LED) also available. **LED not included.**

PANEL INSERT WITH HOLE FOR LED	BLANK PANEL INSERT WITHOUT HOLE FOR LED
PART NO.	**PART NO.**
894902000	476602000 BLACK

Third Angle Projection

Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

E020 Series
Sealed Snap-acting Momentary Pushbutton Switches

Features/Benefits

- ***Process sealed with disposable splashproof boot***
- ***Long life contact design***
- ***Snap-fitting plunger available***
- ***RoHS compliant models available***

Typical Applications

- ***Instrumentation***
- ***Telecommunications and networking equipment***
- ***Computers and peripherals***

c UL us
Models Available

Specifications

CONTACT RATING: B contact material (EX25 Models): 0.4 VA max. @ 20 V AC or DC max. G contact material (EX21 Models): 1 AMP @120 V AC or 28 V DC or 0.4 VA max. @ 20 V AC or DC max. Note: Break-before-make contacts. Multi-pole contacts do not make and break simultaneously. See page A-26 for additional ratings.

ELECTRICAL LIFE: 60,000 make-and-break cycles at full load.

CONTACT RESISTANCE: Below 50 mΩ typ. initial @ 2–4 V DC, 100 mA, for both silver and gold plated contacts.

INSULATION RESISTANCE: $10^9\Omega$ min.

DIELECTRIC STRENGTH: 1000 Vrms min. @ sea level.

OPERATING TEMPERATURE: –30°C to 75°C.

CAP INSTALLATION FORCE: 10 lbs. max. permissible.

SOLDERABILITY: Per MIL-STD-202F method 208D, or EIA RS-186E method 9 (1 hour steam aging).

NOTE: Any models supplied with P, R, B or G contact material are RoHS compliant.

NOTE: Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.

Materials

CASE & BUSHING: Glass filled nylon 6/6, flame retardant (UL 94V-0).

PLUNGER: Glass filled nylon or glass filled polyester (PBT) (UL 94V-0).

SWITCH SUPPORT: Brass or steel, matte-tin.

SWITCH SUPPORT RETAINER: Stainless steel.

N.O. & N.C. CONTACTS: EX25 MODELS: B contact material: Copper alloy, with gold plate over nickel plate. EX21 MODELS: G contact material: Coin silver, with gold plate over nickel plate. See page A-26 for additional contact materials.

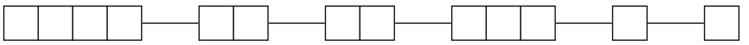
COMMON CONTACTS & ALL TERMINALS: Copper alloy, with gold plate over nickel plate. See page A-26 for additional contact materials.

TERMINAL SEAL: Epoxy.

DISPOSABLE BOOT: Vinyl splashproof boot supplied standard. Remove and discard only after soldering and cleaning processes are complete.

Build-A-Switch

To order, simply select desired option from each category and place in the appropriate box. Available options are shown and described on pages A-22 thru A-28. For additional options not shown in catalog, consult our Customer Service Center. All models are process sealed to withstand machine soldering temperatures and pressure wash cleaning methods.



Switch Function
E121 SPDT On-Mom. 1 Amp
E221 DPDT On-Mom. 1 Amp
E125 SPDT On-Mom. 0.4VA
E225 DPDT On-Mom. 0.4VA

Plunger
S .282" high
M .331" high, snap-fitting
S1 .332" high

Bushing
D1 Unthreaded
D3 .180" high, unthreaded

Terminations
A Right angle, PC thru-hole
AV2 Vertical right angle, PC thru-hole
C PC Thru-hole
A3 Right angle, snap-in, PC thru-hole
AV3 Vertical right angle, snap-in, PC thru-hole
V3 .460" high, V-bracket
V4 .630" high, V-bracket
V6 .460" high, V-bracket
V8 .953" high, V-bracket
V31 .460" high, snap-in V-bracket
V41 .630" high, snap-in V-bracket
V61 .460" high, snap-in V-bracket

Contact Material
B Gold
G Gold over silver
P Gold, matte-tin
R Gold over silver, matte-tin

Seal
E Epoxy and disposable splashproof boot

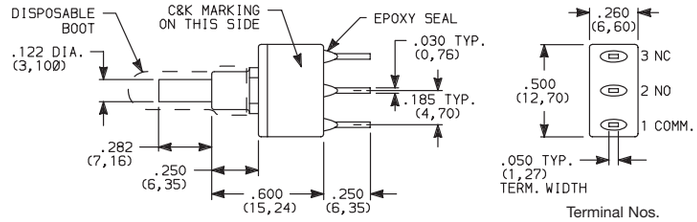
Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

E020 Series
Sealed Snap-acting Momentary Pushbutton Switches

SWITCH FUNCTION

NO. POLES	MODEL NO.	SWITCH FUNCTION POS. 1 (C&K marking this side)	SWITCH FUNCTION POS. 2 (C&K marking this side)	CONNECTED TERMINALS POS. 1 (C&K marking this side)	CONNECTED TERMINALS POS. 2 (C&K marking this side)	SCHEMATIC
SP	E121	ON	MOM.	1-3	1-2	SPDT
	E125	ON	MOM.			

SPDT

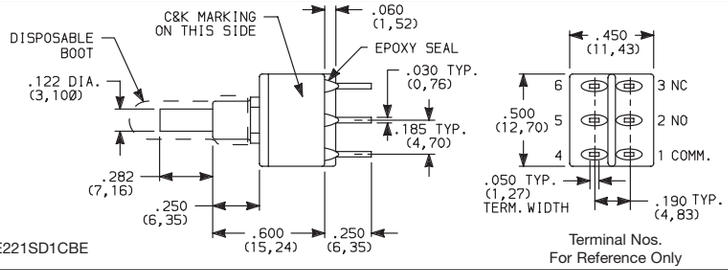


Part number shown: E121SD1CGE

Terminal Nos. For Reference Only

NO. POLES	MODEL NO.	SWITCH FUNCTION POS. 1 (C&K marking this side)	SWITCH FUNCTION POS. 2 (C&K marking this side)	CONNECTED TERMINALS POS. 1 (C&K marking this side)	CONNECTED TERMINALS POS. 2 (C&K marking this side)	SCHEMATIC
DP	E221	ON	MOM.	1-3,4-6	1-2,4-5	DPDT
	E225	ON	MOM.			

DPDT



Part number shown: E221SD1CBE

Terminal Nos. For Reference Only

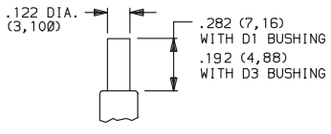
MOM. = Momentary

E121, E221 models c UL us with all options when ordered with G or R contact material.

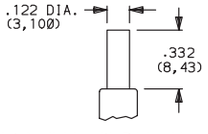
EX25 models must be ordered with B or P contact material.
EX21 models must be ordered with G or R contact material.

PLUNGER

S .282" HIGH

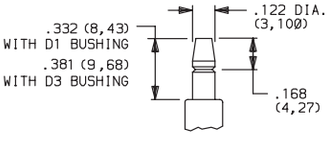


S1 .332" HIGH



Not Available with D1 bushing.

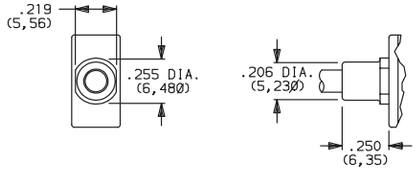
M .332" HIGH SNAP-FITTING



NOTE: Caps available for all plunger options, see page A-27.

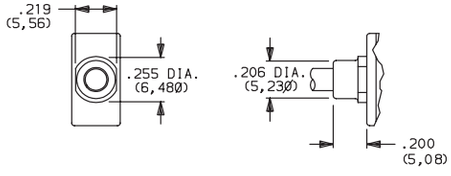
BUSHING

D1 UNTHREADED



Not available with S1 actuator.

D3 .180" HIGH UNTHREADED



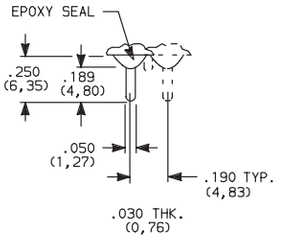
NOTE: Disposable splashproof vinyl over actuator and bushing supplied std., see page A-26.

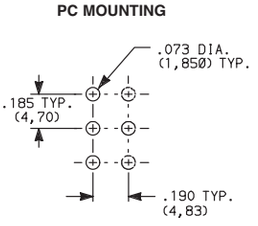
Third Angle Projection

Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

TERMINATIONS

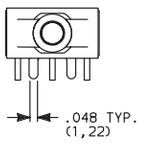
C PC THRU-HOLE

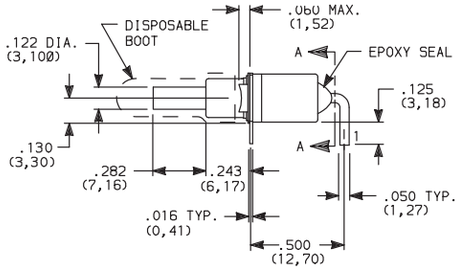


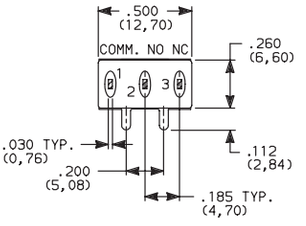


SPDT and DPDT

A RIGHT ANGLE, PC THRU-HOLE



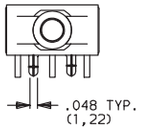


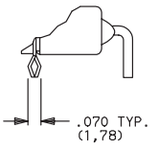


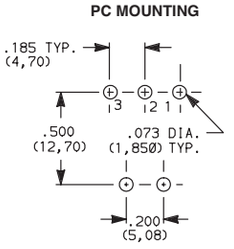
SECTION A-A

E121SD1AGE
SPDT

A3 RIGHT ANGLE, SNAP-IN, PC THRU-HOLE

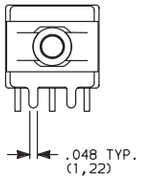


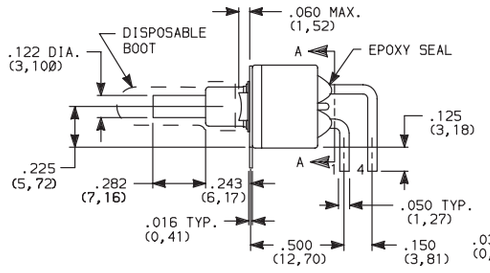


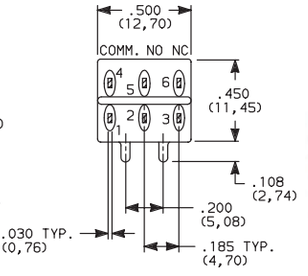


NOTE: Terminal bend radii and lead-in manufacturing option.

A RIGHT ANGLE, PC THRU-HOLE



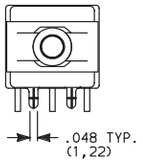


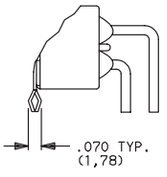


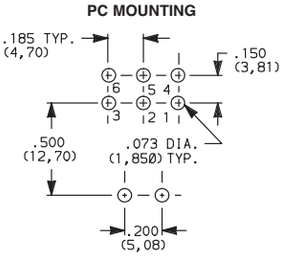
SECTION A-A

E221SD1AGE
DPDT

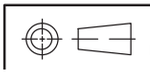
A3 RIGHT ANGLE, SNAP-IN, PC THRU-HOLE







NOTE: Terminal bend radii and lead-in manufacturing option.

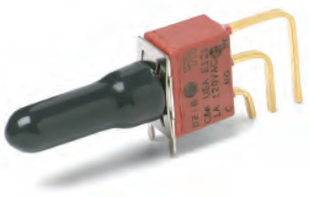


Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

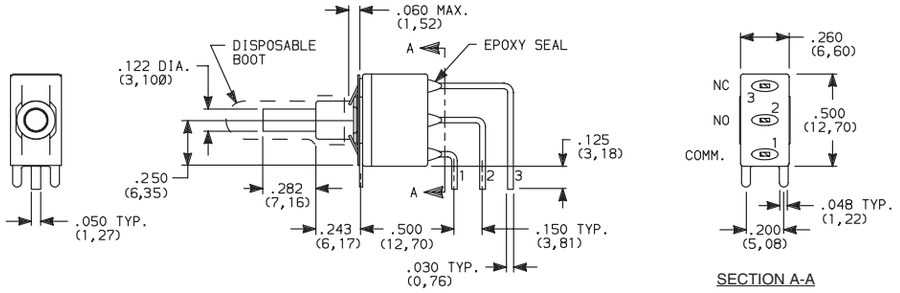
E020 Series
Sealed Snap-acting Momentary Pushbutton Switches

TERMINATIONS

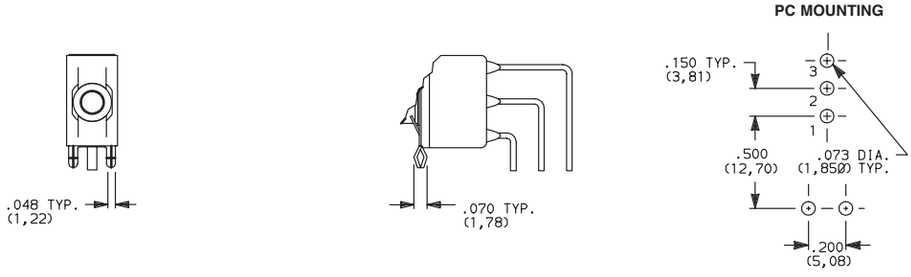
AV2 VERTICAL RIGHT ANGLE, PC THRU-HOLE, .150" PITCH



E121SD1AV2GE
SPDT



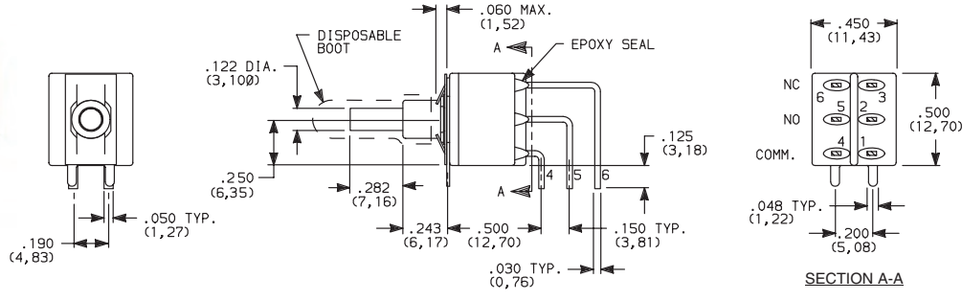
AV3 VERTICAL RIGHT ANGLE, SNAP-IN, PC THRU-HOLE, .150" PITCH



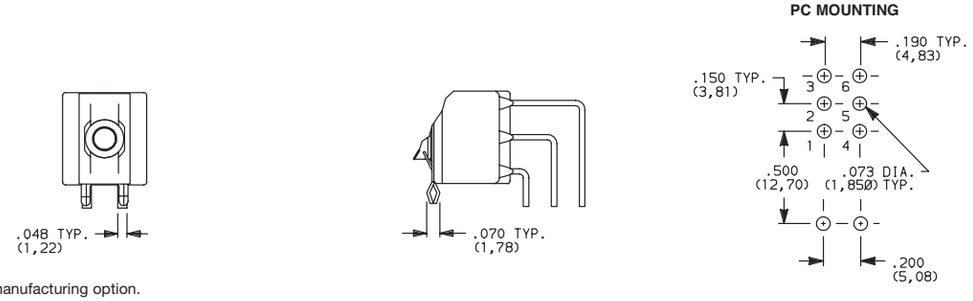
NOTE: Terminal bend radii and lead-in manufacturing option.

AV2 VERTICAL RIGHT ANGLE, PC THRU-HOLE, .150" PITCH

E221SD1AV2GE
DPDT



AV3 VERTICAL RIGHT ANGLE, SNAP-IN, PC THRU-HOLE, .150" PITCH



NOTE: Terminal bend radii and lead-in manufacturing option.

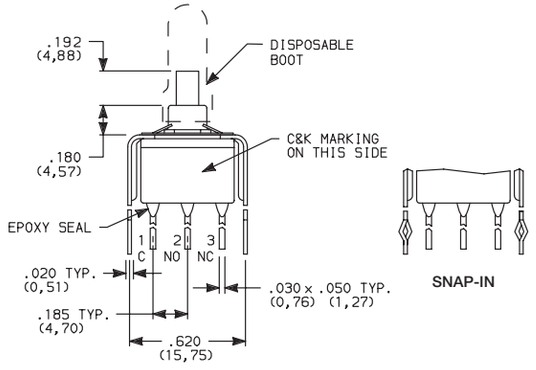
Third Angle Projection

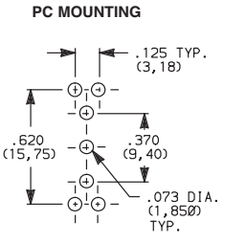
Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

TERMINATIONS

V3, V4 VERTICAL MOUNT, V-BRACKET

V31, V41 VERTICAL MOUNT, V-BRACKET, SNAP-IN



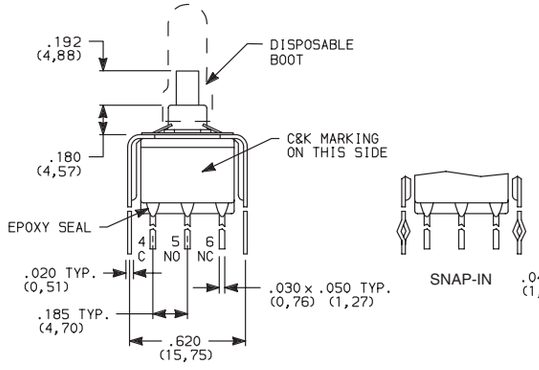


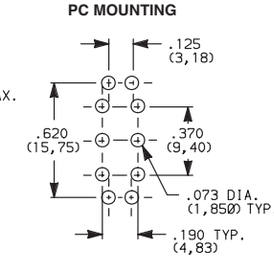
E121SD3__GE
SPDT

OPTION CODE	DIM 'A'
V3, V31	.460 (11,68)
V4, V41	.630 (16,00)

V3, V4 VERTICAL MOUNT, V-BRACKET

V31, V41 VERTICAL MOUNT, V-BRACKET, SNAP-IN



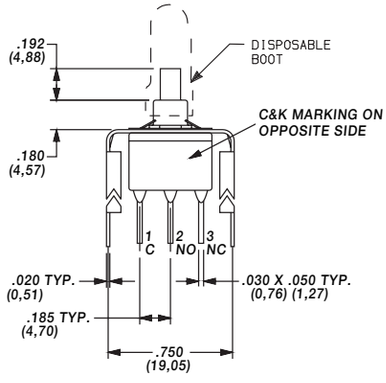


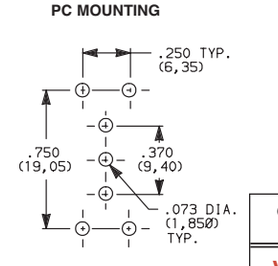
E221SD3__GE
DPDT

OPTION CODE	DIM 'A'
V3, V31	.460 (11,68)
V4, V41	.630 (16,00)

V6, V8 VERTICAL MOUNT, V-BRACKET

V61, V81 VERTICAL MOUNT, V-BRACKET, SNAP-IN





E121SD3__GE
SPDT

OPTION CODE	DIM 'A'
V6, V61	.460 (11,68)
V8, V81	.953 (24,21)

Third Angle Projection

Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

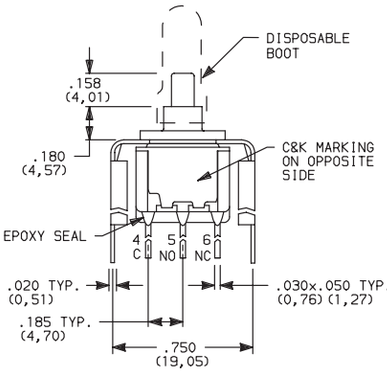
E020 Series
Sealed Snap-acting Momentary Pushbutton Switches

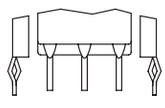
TERMINATIONS

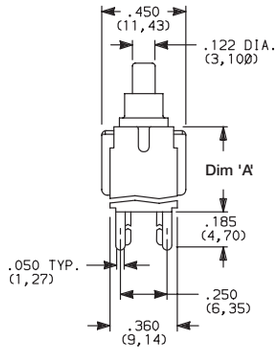
V6, V8 VERTICAL MOUNT, V-BRACKET

V61, V81 VERTICAL MOUNT, V-BRACKET, SNAP-IN

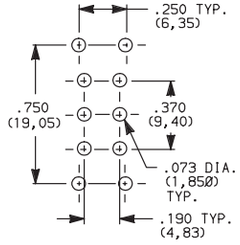
E221SD3V6GE
DPDT







PC MOUNTING



OPTION CODE	DIM 'A'
V6, V61	.460 (11,68)
V8, V81	.953 (24,21)

CONTACT MATERIAL

OPTION CODE	CONTACT MATERIAL	TERMINAL PLATING	RATINGS	
B	GOLD [1]	GOLD [1]	LOW LEVEL/DRY CIRCUIT	EX25 MODELS ONLY: 0.4 VA MAX. @ 20 V AC OR DC MAX.
P		MATTE-TIN [4]		
G	GOLD OVER SILVER [2,3]	GOLD [3]	LOW LEVEL/DRY CIRCUIT OR POWER	EX21 MODELS ONLY: 0.4 VA MAX @ 20 V AC OR DC MAX. OR 1 AMP @ 120 V AC OR 28 V DC.
R		MATTE-TIN [4]		

* Note: See Technical Data section of this catalog for RoHS compliant and compatible definitions and specifications.

[1] CONTACTS & TERMINALS: Copper alloy, with gold plate over nickel plate.

[2] N.O. AND N.C. CONTACTS: Coin silver, with gold plate over nickel plate.

[3] COMMON CONTACTS & ALL TERMINALS: Copper alloy, with gold plate over nickel plate.

[4] TERMINALS: Copper alloy, with matte-tin alloy over nickel plate.

NOTE: Any models supplied with P, R, B or G contact material are RoHS compliant.

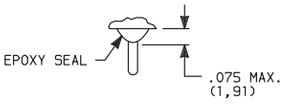
E121, E221 models c UL us with all options when ordered with mandatory G, or R contact material.

P or B contact material must be ordered with EX25 models.

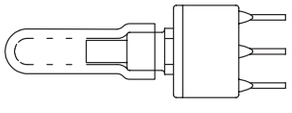
R or G contact material must be ordered with EX21 models.

SEAL

E EPOXY SEAL AND DISPOSABLE SPLASHPROOF BOOT



Disposable splashproof boot supplied standard. Remove and discard boot *only after* soldering and cleaning processes are complete.

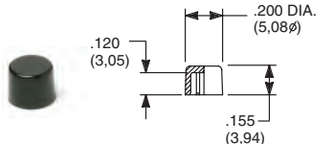


Third Angle Projection

Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

AVAILABLE HARDWARE

Cap

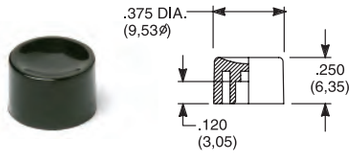


PART NO.

708901000	WHITE
708902000	BLACK
708903000	RED

Material: Nylon
Finish: Gloss

Cap

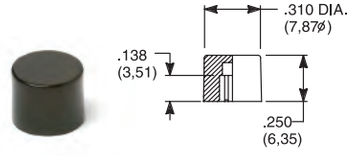


PART NO.

752701000	WHITE
752702000	BLACK
752703000	RED

Material: Nylon
Finish: Gloss

Cap

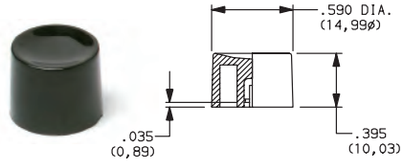


PART NO.

801801000	WHITE
801802000	BLACK
801803000	RED

Material: Nylon
Finish: Gloss

Cap, Snap-fitting plunger

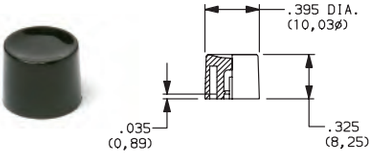


PART NO.

452D01000	WHITE
452D02000	BLACK
452D03000	RED

Material: Nylon
Finish: Gloss

Cap, Snap-fitting plunger

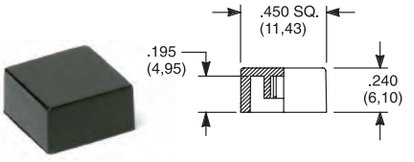


PART NO.

894101000	WHITE
894102000	BLACK
894103000	RED

Material: Nylon
Finish: Gloss

Cap



PART NO.

484601000	WHITE
484602000	BLACK
484603000	RED

Material: Nylon
Finish: Gloss

PART NO.

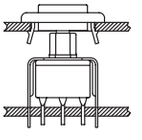
798201000	WHITE
798202263	BLACK
798203000	RED

Material: Nylon
Finish: Matte

NOTE: Other cap colors available, consult Customer Service Center.

Frames snap into panel opening and are independent from switch mounting. Accurate positioning of the PC mounted switch relative to the panel opening is necessary to provide proper clearance between actuator and frame. Available in two basic styles and four panel thicknesses .047-.125 in. Material: Nylon. Finish: Matte.

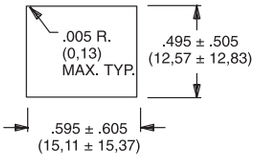
TYPICAL APPLICATION



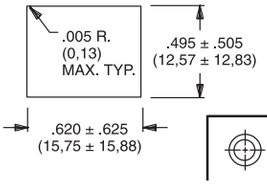
.047" (1,19) PANEL THK.	.062" (1,57) PANEL THK.	.090" (2,29) PANEL THK.	.125" (3,18) PANEL THK.
PART NO.	**PART NO.**	**PART NO.**	**PART NO.**
432502263	432602263	432702263	432802263 BLACK

PANEL MOUNTING

For part numbers
4325xxxxx, 4326xxxxx



For part numbers
4327xxxxx, 4328xxxxx



Third Angle Projection

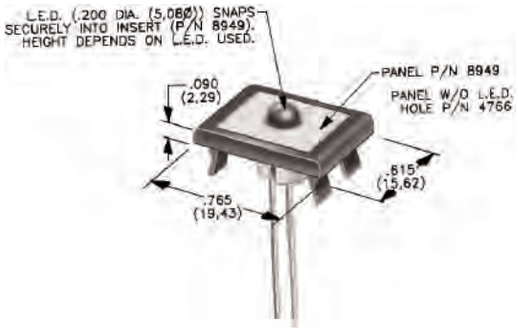
Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

E020 Series
Sealed Snap-acting Momentary Pushbutton Switches

AVAILABLE HARDWARE

PANEL INSERTS

Above frames (part nos. 432XXXXXX) are also available with insert which accepts LED for indicator light assembly. Order insert separately from frame. Blank insert panel (without hole for LED) also available. **LED not included.**



PANEL INSERT WITH HOLE FOR LED	BLANK PANEL INSERT WITHOUT HOLE FOR LED	
PART NO.	**PART NO.**	
894902000	476602000	BLACK

Special colors, custom markings available, consult Customer Service Center.

Third Angle Projection

Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

8020 Series
Snap-acting Momentary Pushbutton Switches

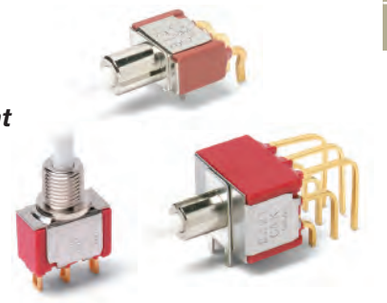
Features/Benefits

- ***Positive tactile feel***
- ***Multi-positions available***
- ***Wide variety of termination options***
- ***Epoxy terminal seal compatible with bottom wash cleaning***
- ***RoHS compliant models available***

Models Available

Typical Applications

- ***Instrumentation***
- ***Computer peripherals***
- ***Telecommunications equipment***



Specifications

CONTACT RATING: B contact material (8X25 Models): 0.4 VA max. @ 20 V AC or DC maximum. G contact material (8X21, U8X1 Models): 1 AMP @ 120 V AC or 28 V DC or 0.4 VA max. @ 20 V AC or DC max. Note: Break-before-makecontacts. Multi-pole contacts do not make and break simultaneously. See page A-43 for additional ratings.

ELECTRICAL LIFE: 60,000 make-and-break cycles at full load.

CONTACT RESISTANCE: Below 50 mΩ typ. initial @ 2-4 V DC, 100 mA, for both silver and gold plated contacts.

INSULATION RESISTANCE: $10^9\Omega$ min.

DIELECTRIC STRENGTH: 1,000 Vrms min. @ sea level.

OPERATING TEMPERATURE: 8X2X MODELS: –30°C to 75°C. U8X1 MODELS: –30°C to 65°C.

CAP INSTALLATION FORCE: 10 lbs. max. permissible.

SOLDERABILITY: Per MIL-STD-202F method 208D, or EIA RS-186E method 9 (1 hour steam aging).

NOTE: Any models supplied with B, P, R, or G contact material are RoHS compliant.

NOTE: Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.

Materials

CASE: Glass filled nylon 6/6 or diallyl phthalate (DAP), flame retardant (UL 94V-0).

PLUNGER: Glass filled nylon or glass filled polyester (PBT) (UL 94V-0).

CAP & FRAME: Nylon, black, standard.

BUSHING: Brass or zinc, nickel plated.

HOUSING: Stainless steel.

SWITCH SUPPORT: Brass or steel, matte-tin plated.

N.O. & N.C. CONTACTS: 8X21, U8X1 MODELS: G contact material: Coin silver, with gold plate over nickel plate. See page A-43 for additional contact materials.
8X25 MODELS: B contact material: Copper alloy, with gold plate over nickel plate. See page A-43 for additional contact materials.

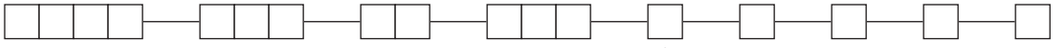
COMMON CONTACT & ALL TERMINALS: Copper alloy, with gold plate over nickel plate.

TERMINAL SEAL: Epoxy. Refer to soldering and cleaning Technical Data Chapter.

HARDWARE: Nut & Locking Ring: Brass, nickel plated; Lockwasher: Steel, nickel plated.

Build-A-Switch

To order, simply select desired option from each category and place in the appropriate box. Available options are shown and described on pages A-30 thru A-45. For additional options not shown in catalog, consult Customer Service Center. All models have epoxy terminal seal and are compatible with all "bottom-wash" PCB cleaning methods.



Switch Function
- **8121** SPDT On-Mom. 1 Amp
- **8125** SPDT On-Mom. 0.4VA
- **8221** DPDT On-Mom. 1 Amp
- **8225** DPDT On-Mom. 0.4VA
- **8321** 3PDT On-Mom. 1 Amp
- **8325** 3PDT On-Mom. 0.4VA
- **8421** 4PDT On-Mom. 1 Amp
- **8425** 4PDT On-Mom. 0.4VA

Note: UL models available, see page A-30 and A-31.

Actuator or Plunger
- **S** Plunger
- **NONE** Snap-in
- **J80** Snap-in
- **J81** Snap-in w/frame
- **J82** Snap-in w/frame for LED
- **J83** Snap-in w/frame & flush cap
- **J84** Snap-in w/frame for LED, flush cap
- **J85** Snap-in w/frame & LED
- **J95** PC w/V-bracket & LED
- **L** Plunger
- **M** Snap-fitting plunger

Bushing
- **D9** .280" high, keyway
- **H** .250" high, flat
- **NONE** No bushing choice required
- **D** .280" high, keyway
- **D2** .288" high, flat
- **D3** .180" high
- **D8** .288" high, flat
- **H9** .250" high, flat, hi torque
- **Y** .350" high, keyway
- **Y3** 6.35mm high, keyway, hi torque
- **Y4** .378" high, flat, hi torque
- **Y9** .350" high, keyway

Contact Material
- **B** Gold
- **P** Gold, matte-tin
- **G** Gold over silver
- **R** Gold over silver, matte-tin

Seal
- **E** Epoxy
- **I** Epoxy potted base

Cap Color
- **2** Black
- **NONE** Models without caps
- **1** White
- **3** Red
- **4** Orange
- **5** Yellow
- **6** Green
- **7** Blue
- **9** Gray

Frame Color
- **2** Black
- **NONE** Models without frame
- **1** White
- **3** Red
- **5** Yellow
- **6** Green
- **9** Gray

LED Color
- **3** Red
- **NONE** Models without LED
- **5** Yellow
- **6** Green

Terminations
- **A** Right angle, PC thru-hole
- **AV2** Vertical right angle, PC thru-hole
- **C** PC Thru-hole
- **Z** Solder lug
- **A2** Right angle, PC thru-hole
- **A3** Right angle, snap-in, PC thru-hole
- **A4** Right angle, PC thru-hole, reversed terminals
- **A6** Right angle, PC thru-hole
- **AV1** Vertical right angle, PC thru-hole
- **AV3** Vertical right angle, snap-in, PC thru-hole
- **R** Right angle with PCB
- **R2** Right angle with PCB, reversed terminals
- **V2** .555" high, V-bracket
- **V3** .460" high, V-bracket
- **V4** .630" high, V-bracket
- **V6** .460" high, V-bracket
- **V7** .630" high, V-bracket
- **V8** .953" high, V-bracket
- **V9** 1.150" high, V-bracket
- **V31** .460" high, snap-in V-bracket
- **V61** .460" high, snap-in V-bracket
- **W** .750" long, wire wrap
- **W1** .964" long, wire wrap
- **W3** .425" long, wire wrap
- **W4** 1.062" long, wire wrap
- **Z3** Quick connect

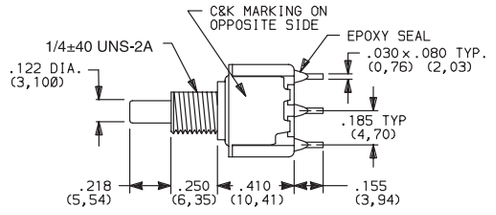
Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

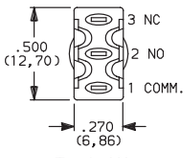
8020 Series
Snap-acting Momentary Pushbutton Switches

SWITCH FUNCTION

NO. POLES	MODEL NO.	UL/CSA* MODEL NO.	SWITCH FUNCTION POS. 1 (C&K marking on opposite side)	SWITCH FUNCTION POS. 2 (C&K marking on opposite side)	CONNECTED TERMINALS POS. 1 (C&K marking on opposite side)	CONNECTED TERMINALS POS. 2 (C&K marking on opposite side)	SCHEMATIC
SP	8121	U811	ON	MOM.	1-3	1-2	SPDT
	8125		ON	MOM.			

SPDT



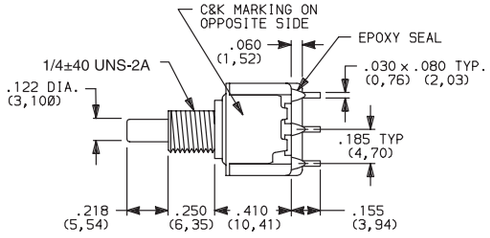


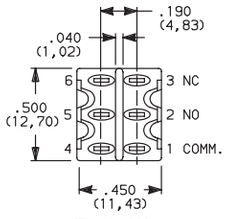
Terminal Nos.
For Reference Only

Part number shown: 8121SHZGE

NO. POLES	MODEL NO.	UL/CSA* MODEL NO.	SWITCH FUNCTION POS. 1 (C&K marking on opposite side)	SWITCH FUNCTION POS. 2 (C&K marking on opposite side)	CONNECTED TERMINALS POS. 1 (C&K marking on opposite side)	CONNECTED TERMINALS POS. 2 (C&K marking on opposite side)	SCHEMATIC
DP	8221	U821	ON	MOM.	1-3,4-6	1-2,4-5	DPDT
	8225		ON	MOM.			

DPDT



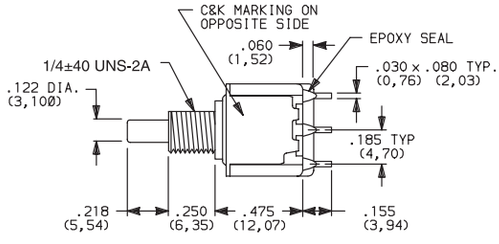


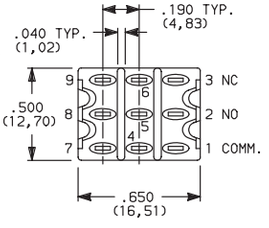
Terminal Nos.
For Reference Only

Part number shown: 8221SHZGE

NO. POLES	MODEL NO.	UL/CSA* MODEL NO.	SWITCH FUNCTION POS. 1 (C&K marking on opposite side)	SWITCH FUNCTION POS. 2 (C&K marking on opposite side)	CONNECTED TERMINALS POS. 1 (C&K marking on opposite side)	CONNECTED TERMINALS POS. 2 (C&K marking on opposite side)	SCHEMATIC
3P	8321	U831	ON	MOM.	1-3,4-6,7-9	1-2,4-5,7-8	3PDT
	8325		ON	MOM.			

3PDT





Terminal Nos.
For Reference Only

Part number shown: 8321SHZGE

MOM. = Momentary

*U811 thru U841 model numbers cULus with all options (except R, R2 terminations) when ordered with G or R contact material.

8X25 models must be ordered with B or P contact material.

8X21 and U8X1 models must be ordered with G or R contact material.

Third Angle Projection

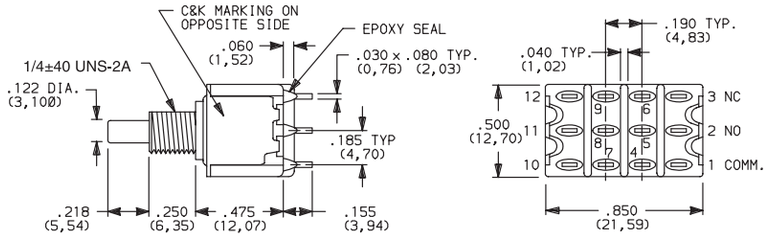
Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

8020 Series
Snap-acting Momentary Pushbutton Switches

SWITCH FUNCTION

NO. POLES	MODEL NO.	UL/CSA* MODEL NO.	SWITCH FUNCTION POS. 1	SWITCH FUNCTION POS. 2	CONNECTED TERMINALS POS. 1	CONNECTED TERMINALS POS. 2	SCHEMATIC
			C&K marking on opposite side		C&K marking on opposite side		
4P	8421	U841	ON	MOM.	1-3,4-6,7-9,10-12	1-2,4-5,7-8,10-11	4PDT
	8425		ON	MOM.			

4PDT



Part number shown: 8421SHZGE

Terminal Nos.
For Reference Only

MOM. = Momentary

* U811 thru U841 model numbers c UL us with all options (except R, R2 terminations) when ordered with G or R contact material.

8X25 models must be ordered with B or P contact material.

8X21 and U8X1 models must be ordered with G or R contact material.

ACTUATOR—SNAP-IN FRONT MOUNT

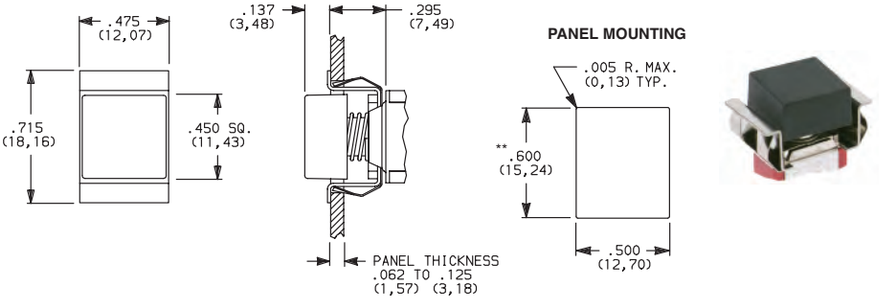
CAP COLOR
ACTUATOR OR PLUNGER
FRAME COLOR

OPTION CODE	CAP AND FRAME COLOR
2	BLACK
NONE	No Frame Color (J80 option)
1	WHITE
3	RED
4	ORANGE
5	YELLOW
6	GREEN
7	BLUE
9	GRAY

Other colors available, consult Customer Service Center. Cap and Frame Finish: matte.

NOTE: Caps and frames available separately, see pages A-44 and A-45.

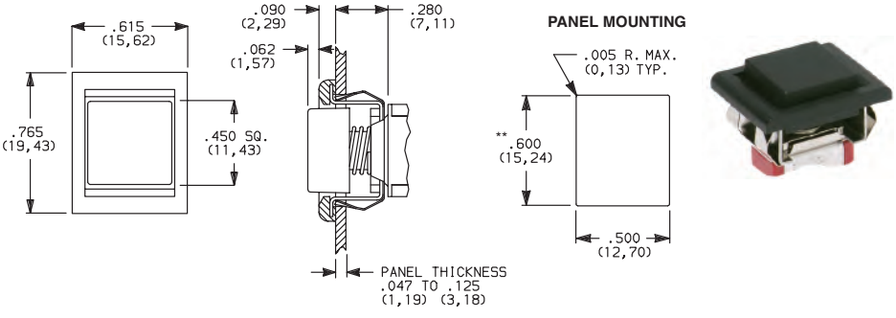
J80 SNAP-IN



NOTE: No frame color choice required.

** Increase this dim. to .620/.625 (15,75/15,88) for .091/.125 (2,31/3,18) thk. panels.

J81 SNAP-IN WITH FRAME



NOTE: Available with C, W-W4, Z or Z3 terminations and SPDT and DPDT models only.

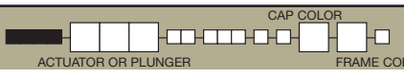
** Increase this dim. to .620/.625 (15,75/15,88) for .091/.125 (2,31/3,18) thk. panels.

Third Angle Projection

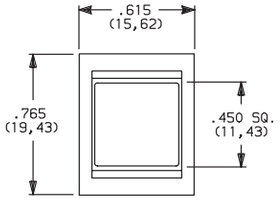
Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

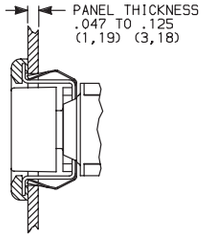
8020 Series
Snap-acting Momentary Pushbutton Switches

ACTUATOR—SNAP-IN FRONT MOUNT

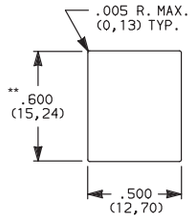


J83 SNAP-IN WITH FRAME AND FLUSH CAP

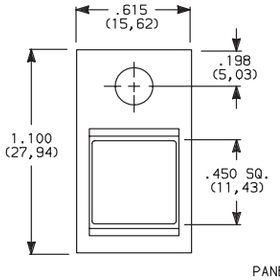


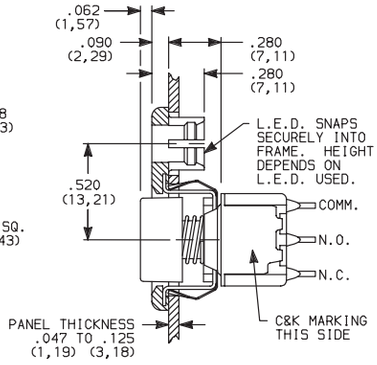


PANEL MOUNTING

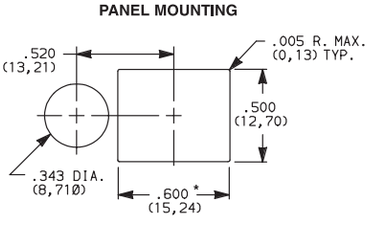


J82 SNAP-IN WITH FRAME FOR LED





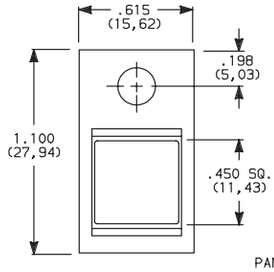
PANEL MOUNTING

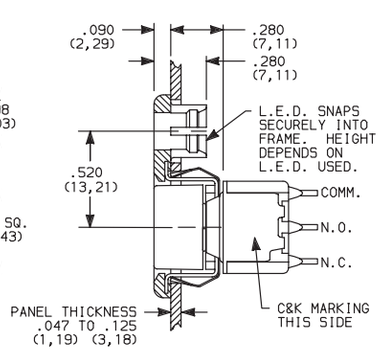


* Increase this dim. to .620/.625 (15,75/15,88) for .091/.125 (2,31/3,18) thk. panels.

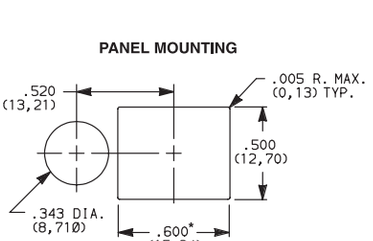
LED not included.
For LED information, see page A-45.

J84 SNAP-IN WITH FRAME FOR LED, FLUSH CAP





PANEL MOUNTING



* Increase this dim. to .620/.625 (15,75/15,88) for .091/.125 (2,31/3,18) thk. panels.

LED not included.
For LED information, see page A-45.

OPTION CODE	CAP AND FRAME COLOR
2	BLACK
1	WHITE
3	RED
4	ORANGE
5	YELLOW
6	GREEN
7	BLUE
9	GRAY

Other colors available, consult Customer Service Center.
Cap and Frame Finish: matte.

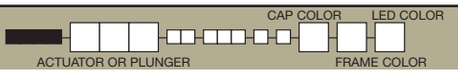
Available with C, W-W4, Z or Z3 terminations and SPDT and DPDT models only.

NOTE: Caps and frames available separately, see pages A-44 and A-45.

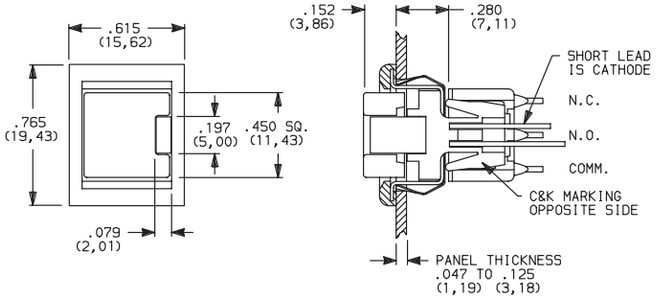
Third Angle Projection

Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

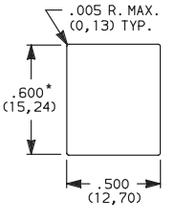
ACTUATOR—SNAP-IN FRONT MOUNT



J85 SNAP-IN WITH FRAME AND LED



PANEL MOUNTING



* Increase this dim. to .620/.625 (15,75/15,88) for .091/.125 (2,31/3,18) thk. panels.

8121J85ZGE223
SPST

Available with C, W-W4, Z or Z3 terminations and SPDT models only.
For LED information see page A-45.

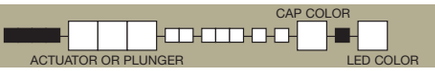
NOTE: Caps & frames available separately, see pages A-44 and A-45.

OPTION CODE	CAP AND FRAME COLOR
2	BLACK
1	WHITE
3	RED
4	ORANGE
5	YELLOW
6	GREEN
7	BLUE
9	GRAY

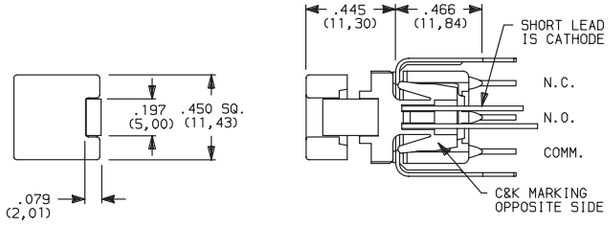
OPTION CODE	LED COLOR
3	RED
5	YELLOW
6	GREEN

For LED information see page A-45.

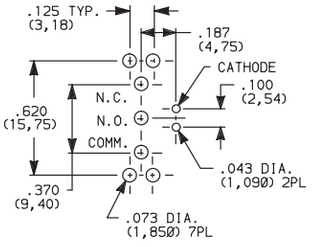
ACTUATOR—PC MOUNT



J95 PC WITH V-BRACKET AND LED



PC MOUNTING



8121J95V3GE23
SPST

OPTION CODE	CAP AND FRAME COLOR
2	BLACK
1	WHITE
3	RED
4	ORANGE
5	YELLOW
6	GREEN
7	BLUE
9	GRAY

OPTION CODE	LED COLOR
3	RED
5	YELLOW
6	GREEN

For LED information see page A-45.

NOTE: Caps available separately, see page A-44.
Available with V3 terminations and SPDT models only.

Third Angle Projection

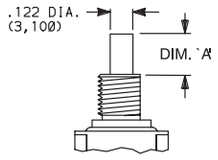
Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

8020 Series
Snap-acting Momentary Pushbutton Switches

PLUNGER

ACTUATOR OR PLUNGER

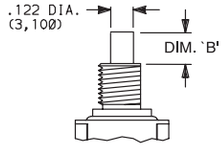
S PLUNGER



NONE NO PLUNGER CHOICE REQUIRED (JXX ACTUATORS)

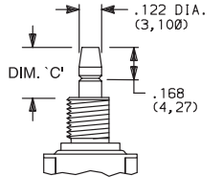
AVAILABLE BUSHINGS	DIM. 'A' FOR C, W-W4, Z & Z3 TERMINATIONS	DIM. 'A' FOR A, A2, A3, A4, A6, AV-A3, R & R2 TERMINATIONS	DIM. 'A' FOR V3-V61 TERMINATIONS
D, D9	.244 (6,20)	.228 (5,79)	.224 (5,69)
H, H9	.218 (5,54)	.202 (5,13)	.198 (5,03)
Y, Y9	.203 (5,16)	.187 (4,75)	.183 (4,65)
Y3	(5,54)	(5,13)	(5,03)
Y4	.185 (4,70)	.169 (4,29)	.165 (4,19)
D2, D8	N/A	.232 (5,89)	.228 (5,79)
D3	N/A	.162 (4,11)	.158 (4,01)

L PLUNGER



AVAILABLE BUSHINGS	DIM. 'B' FOR C, W-W4, Z & Z3 TERMINATIONS	DIM. 'B' FOR A, A2, A3, A4, A6, AV-A3, R & R2 TERMINATIONS	DIM. 'B' FOR V3-V61 TERMINATIONS
Y, Y9	.178 (4,52)	.162 (4,11)	.158 (4,01)
Y4	.090 (2,29)	.074 (1,88)	.070 (1,78)

M SNAP-FITTING PLUNGER



AVAILABLE BUSHINGS	DIM. 'C' FOR C, W-W4, Z & Z3 TERMINATIONS	DIM. 'C' FOR A, A2, A3, A4, A6, AV-A3, R & R2 TERMINATIONS	DIM. 'C' FOR V3-V61 TERMINATIONS
D, D9	.297 (7,54)	.281 (7,14)	.277 (7,04)
H, H9	.267 (6,78)	.251 (6,38)	.247 (6,27)
Y, Y9	.259 (6,58)	.243 (6,17)	.239 (6,07)
Y3	(6,78)	(6,37)	(6,27)
Y4	.259 (6,58)	.243 (6,17)	.239 (6,07)
D2, D8	N/A	.273 (6,93)	.269 (6,83)
D3	N/A	.361 (9,17)	.357 (9,07)

N/A = NOT AVAILABLE

NOTE: When selecting plunger option, bushing selection must also be made, see next page. No plunger option is required when any JXX actuator option is selected. Additional plunger lengths are available on SPDT and DPDT models, consult Customer Service Center. Not all plunger lengths sufficient for use with caps, see page A-44.

BUSHING

NONE NO BUSHING CHOICE REQUIRED (JXX ACTUATORS)

D .280" HIGH THREADED, KEYWAY

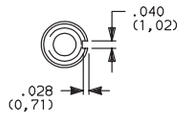
D9 .280" HIGH UNTHREADED, KEYWAY

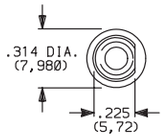
H .250" HIGH THREADED, FLAT

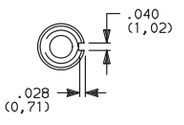
H9 .250" HIGH UNTHREADED, FLAT

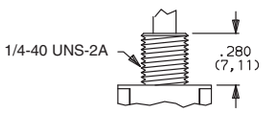
Y .350" HIGH THREADED, KEYWAY

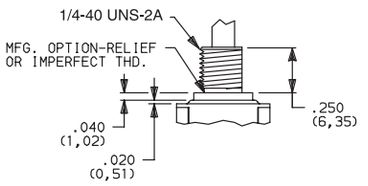
Y9 .350" HIGH UNTHREADED, KEYWAY

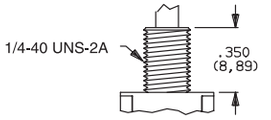












D9 bushing standard with A-A6, R, R2 AV-AV3 terminations.

H bushing standard with C, W-W4, Z or Z3 terminations. H, H9 bushings not available on single pole models with A3-A6, R, R2 terminations.

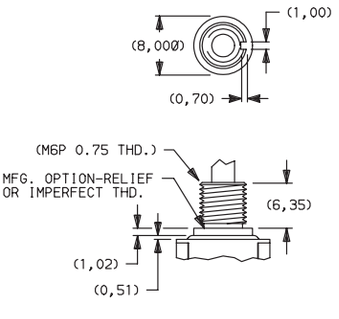
Will withstand 12 in./lbs. of torque with no distortion.

Third Angle Projection

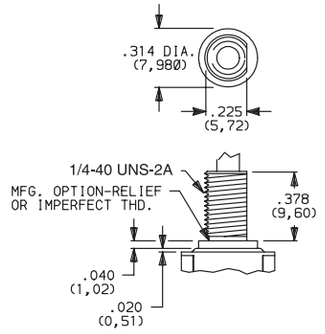
Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

BUSHING

Y3 6.35mm THREADED, KEYWAY



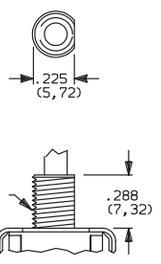
Y4 .378" HIGH THREADED, FLAT



Y3 & Y4 bushings not available on single pole models with A3-A6, R, R2 terminations. Will withstand 12 in./lbs. of torque with no distortion.

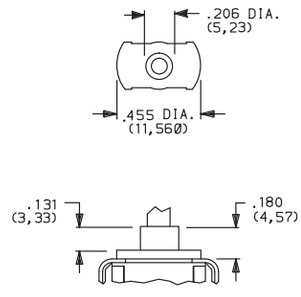
D2 .288" HIGH THREADED, FLAT

D8 .288" HIGH UNTHREADED, FLAT



D2, D8 bushings not available with C, W-W4, Z, Z3 terminations.

D3 .180" HIGH UNTHREADED

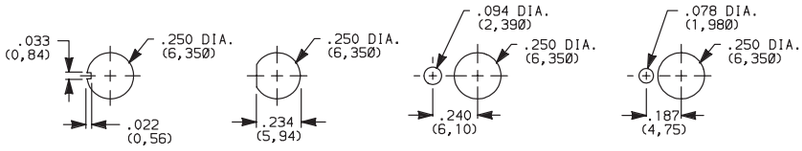


D3 bushing available with A, A2, A3, AV, AV2, AV3 and V2-V61 terminations only.

NOTE: No bushing option choice required when JXX actuator option is selected. When selecting bushing option, plunger selection must also be made, see previous page. Plunger lengths vary with bushing and termination options selected.

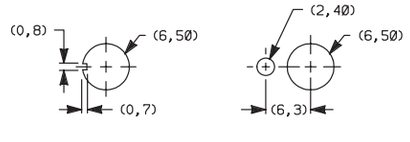
PANEL MOUNTING

1/4 INCH BUSHING



Without locking ring | With standard locking ring | With small locking ring

METRIC BUSHING

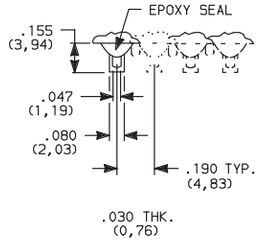


Without locking ring | With locking ring

NOTE: Two mounting nuts, locking ring and lockwasher supplied standard with threaded bushings.
Optional mounting nut and locking ring styles available, see section "Technical Data and Additional Hardware".

TERMINATIONS

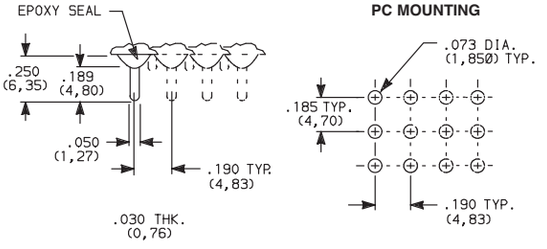
Z SOLDER LUG



SPDT thru 4PDT

Not available with J95 actuator, P or R contact material.

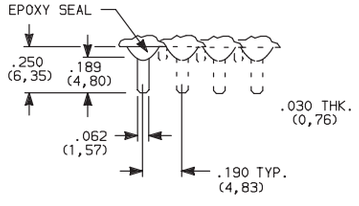
C PC THRU-HOLE



SPDT thru 4PDT

Not available with J95 actuator option.

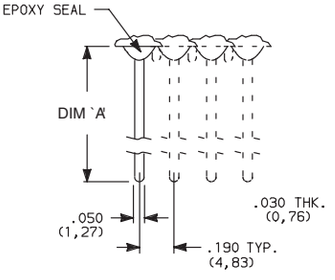
Z3 QUICK CONNECT



SPDT thru 4PDT

Not available with J95 actuator, P or R contact material. Mating quick connector available, order part number 530100000, page A-44.

W W1, W3, W4 WIRE WRAP



OPTION CODE	DIM 'A'
W	.750 (19,05)
W1	.964 (24,49)
W3	.425 (10,80)
W4	1.062 (26,97)

SPDT thru 4PDT

Not available with J95 actuator option.

Third Angle Projection

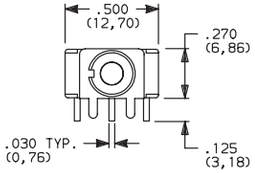
Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

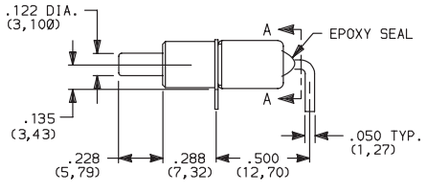
8020 Series
Snap-acting Momentary Pushbutton Switches

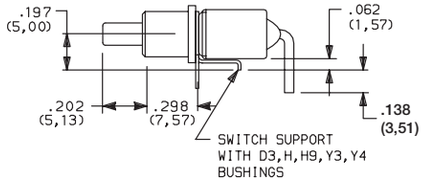
TERMINATIONS

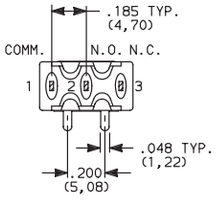
A RIGHT ANGLE, PC THRU-HOLE

8121SD9AGE
SPDT







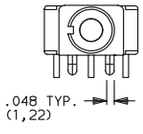


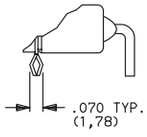
SECTION A-A

Terminal Nos.
For Reference Only.

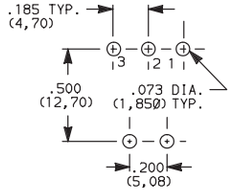
Part Number 8121SH9AGE

A3 RIGHT ANGLE, SNAP-IN, PC THRU-HOLE





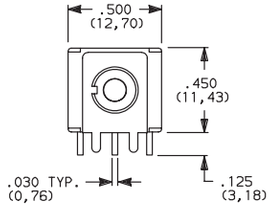
PC MOUNTING

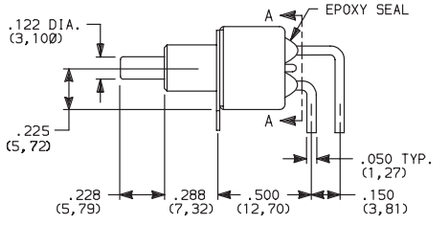


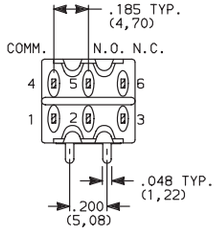
Not available with JXX actuators and I seal.
Terminal bend radii and lead-in manufacturing option.

A RIGHT ANGLE, PC THRU-HOLE

8221SD9AGE
DPDT

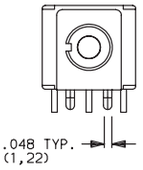


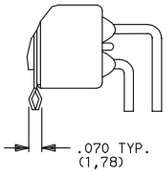




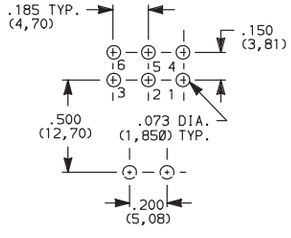
SECTION A-A

A3 RIGHT ANGLE, SNAP-IN, PC THRU-HOLE





PC MOUNTING



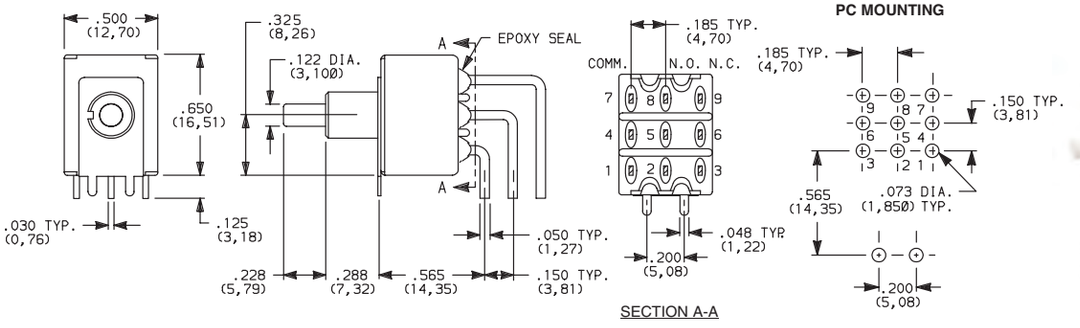
Not available with JXX actuators and I seal option.
Terminal bend radii and lead-in manufacturing option.

Third Angle Projection

Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

TERMINATIONS

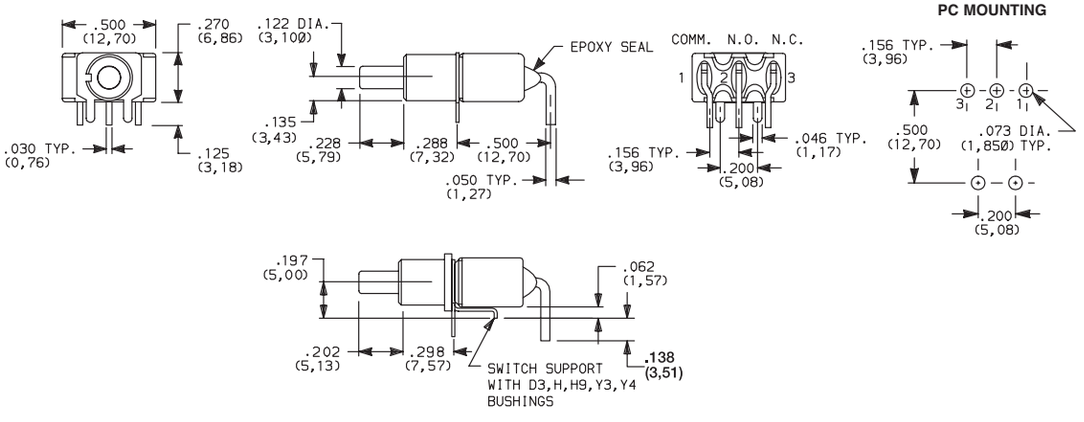
A RIGHT ANGLE, PC THRU-HOLE



8321SD9AGE
3PDT

Not available with JXX actuators and I seal option.
Terminal bend radii and lead-in manufacturing option.

A2 RIGHT ANGLE, PC THRU-HOLE

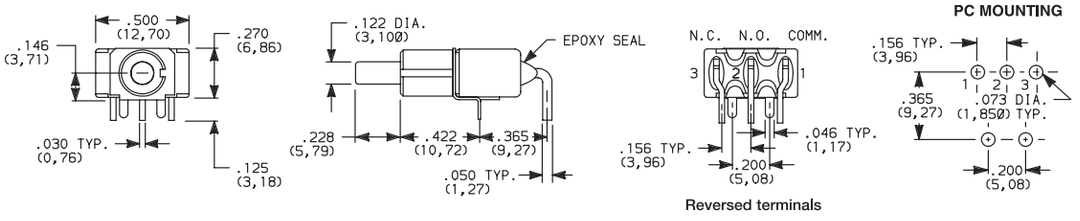


Part Number 8121SH9A2GE

8121SD9A2GE
SPDT

Not available with JXX actuators, I seal option.
Terminal bend radii and lead-in manufacturing option.

A4 RIGHT ANGLE, PC THRU-HOLE, REVERSED TERMINALS



Reversed terminals

8121SD9A4GE
SPDT

Not available with JXX actuators, D3, H, H9, Y3, Y4 bushings and I seal.
Terminal bend radii and lead-in manufacturing option.

The A4 and R2 termination options are functionally identical and fit the same PC mounting pattern. The switches, however, are shifted relative to the mounting holes. The PC pattern must clear the switch support legs. Unlike the R2, the A4 option is available with UL/CSA.

Third Angle Projection

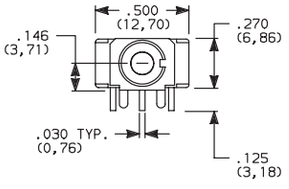
Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

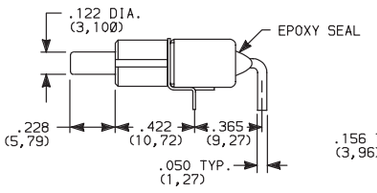
8020 Series
Snap-acting Momentary Pushbutton Switches

TERMINATIONS

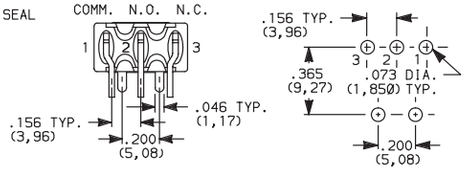
A6 RIGHT ANGLE, PC THRU-HOLE

8121SD9A6GE
SPDT





PC MOUNTING

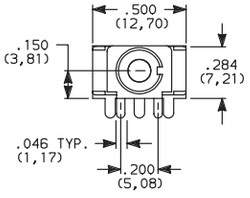


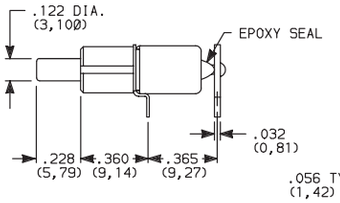
Not available with JXX actuators, D3, H, H9, Y3, Y4 bushings and I seal.
Terminal bend radii and lead-in manufacturing option.

The A6 and R termination options are functionally identical and fit the same PC mounting pattern, The switches, however, are shifted relative to the mounting holes. The PC pattern must clear the switch support legs. Unlike the R, the A6 option is available with UL/CSA.

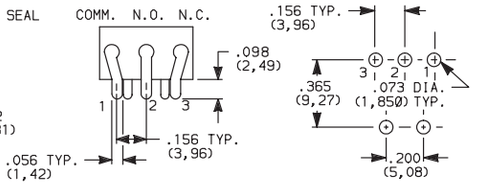
R RIGHT ANGLE WITH PCB

8121SD9RGE
SPDT





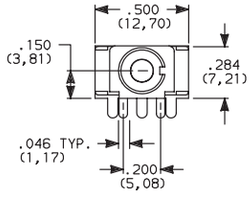
PC MOUNTING

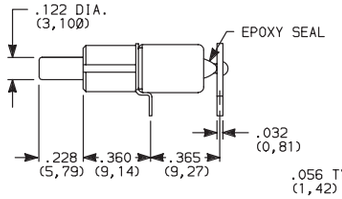


Not available with JXX actuators, D3, H, H9, Y3, Y4 bushings, I seal option.
R termination not UL/CSA approved.

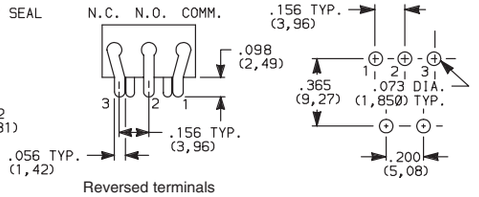
R2 RIGHT ANGLE WITH PCB, REVERSED TERMINALS

8121SD9R2GE
SPDT





PC MOUNTING



Reversed terminals

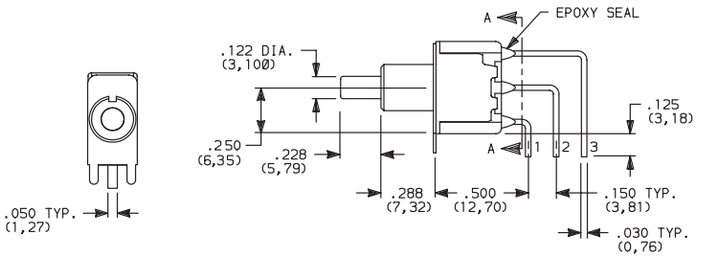
Not available with JXX actuators, D3, H, H9, Y3, Y4 bushings, I seal option.
R2 termination not UL/CSA approved.

Third Angle Projection

Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

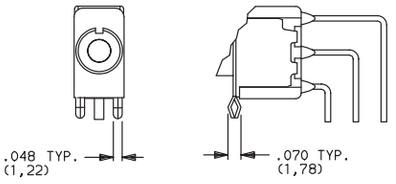
TERMINATIONS

AV2 VERTICAL RIGHT ANGLE, PC THRU-HOLE, .150" PITCH

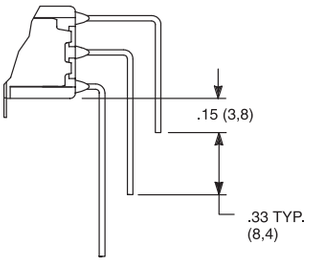


8121SD9AV2GE
SPDT

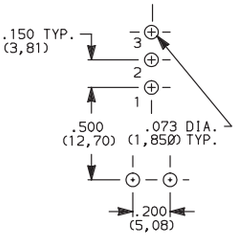
AV3 VERTICAL RIGHT ANGLE, SNAP-IN,, PC THRU-HOLE, .150" PITCH



AV1 VERTICAL RIGHT ANGLE, EXTENDED, PC THRU-HOLE, .150" PITCH

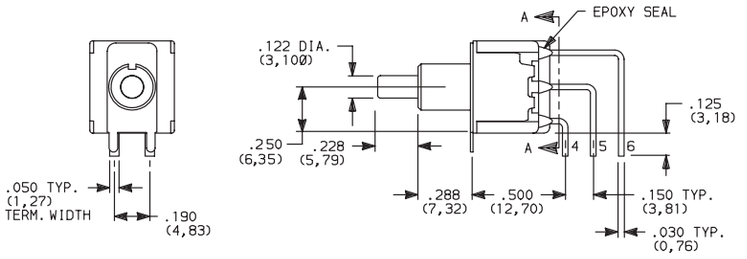


PC MOUNTING



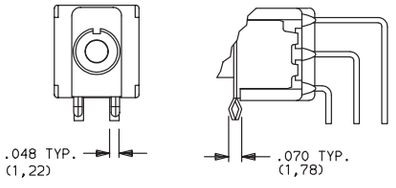
Not available with JXX actuators and I seal.
Terminal bend radii and lead-in manufacturing option.

AV2 VERTICAL RIGHT ANGLE, PC THRU-HOLE, .150" PITCH

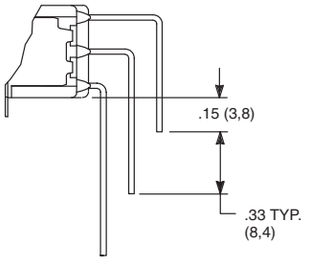


8221SD9AV2GE
DPDT

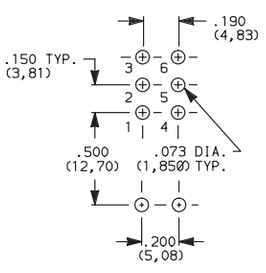
AV3 VERTICAL RIGHT ANGLE, SNAP-IN, PC THRU-HOLE, .150" PITCH



AV1 VERTICAL RIGHT ANGLE, EXTENDED, PC THRU-HOLE, .150" PITCH



PC MOUNTING



Not available with JXX actuators and I seal.
Terminal bend radii and lead-in manufacturing option.

Third Angle Projection

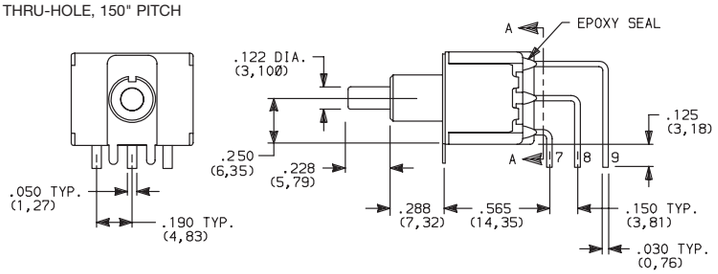
Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

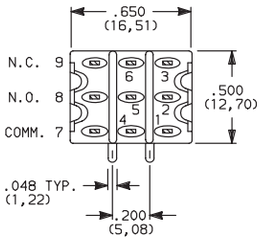
8020 Series
Snap-acting Momentary Pushbutton Switches

TERMINATIONS

AV2 VERTICAL RIGHT ANGLE, PC THRU-HOLE, 150" PITCH

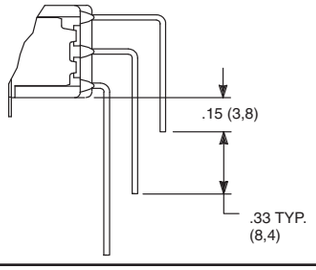
8321SD9AV2GE
3PDT



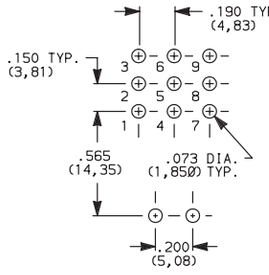


SECTION A-A

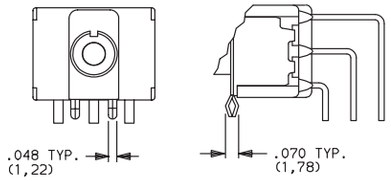
AV1 VERTICAL RIGHT ANGLE, EXTENDED, PC THRU-HOLE, .150" PITCH



PC MOUNTING



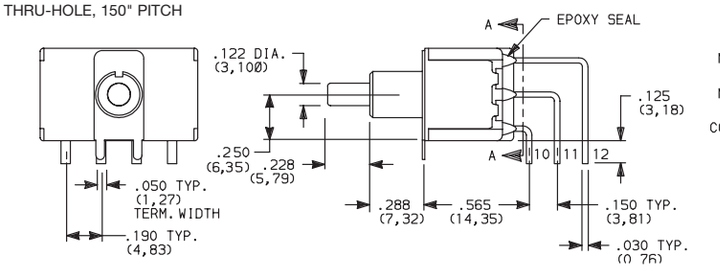
AV3 VERTICAL RIGHT ANGLE, SNAP-IN, PC THRU-HOLE, .150" PITCH

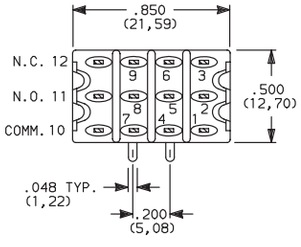


Not available with JXX actuators and I seal.
Terminal bend radii and lead-in manufacturing option.

AV2 VERTICAL RIGHT ANGLE, PC THRU-HOLE, 150" PITCH

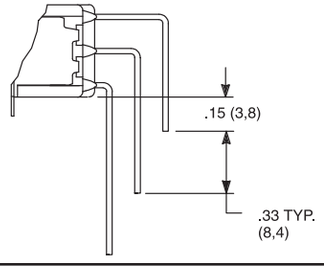
8421SD9AV2GE
4PDT



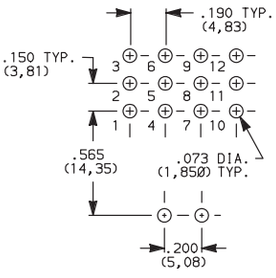


SECTION A-A

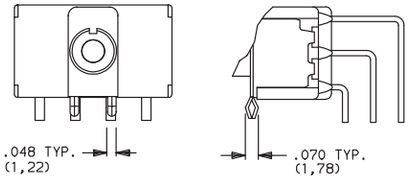
AV1 VERTICAL RIGHT ANGLE, EXTENDED, PC THRU-HOLE, .150" PITCH



PC MOUNTING



AV3 VERTICAL RIGHT ANGLE, SNAP-IN, PC THRU-HOLE, .150" PITCH

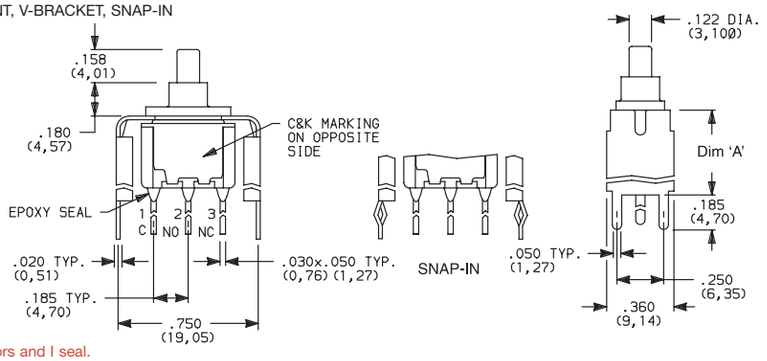


Not available with JXX actuators and I seal.
Terminal bend radii and lead-in manufacturing option.

V2, V6, V7, V8 VERTICAL MOUNT, V-BRACKET

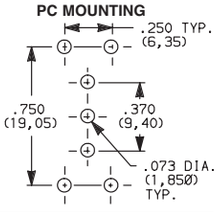
V61 VERTICAL MOUNT, V-BRACKET, SNAP-IN

8121SD3__GE
SPDT



Not available with JXX actuators and I seal.

PC MOUNTING



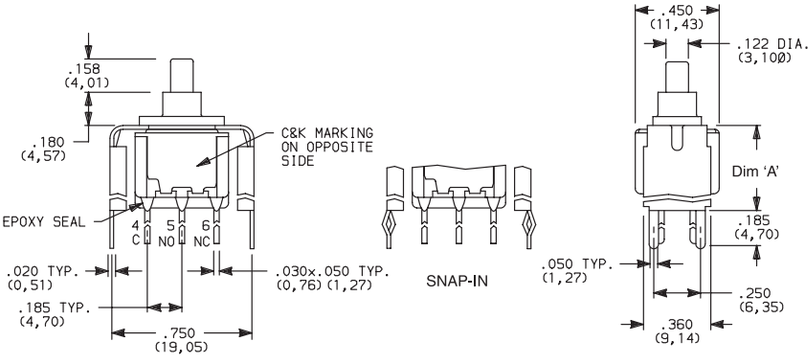
OPTION CODE	DIM 'A'
V2	.555 (14,10)
V6, V61	.460 (11,68)
V7	.630 (16,00)
V8	.953 (24,21)

Third Angle Projection

Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

TERMINATIONS

V2, V6, V7, V8 VERTICAL MOUNT, V-BRACKET
V61 VERTICAL MOUNT, V-BRACKET, SNAP-IN

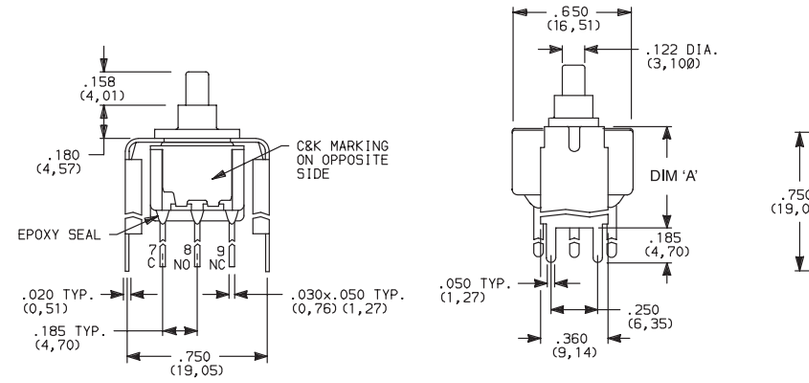


8221SD3__GE
DPDT

OPTION CODE	DIM 'A'
V2	.555 (14,10)
V6, V61	.460 (11,68)
V7	.630 (16,00)
V8	.953 (24,21)

Not available with JXX actuators and I seal.

V2, V7, V8 VERTICAL MOUNT, V-BRACKET

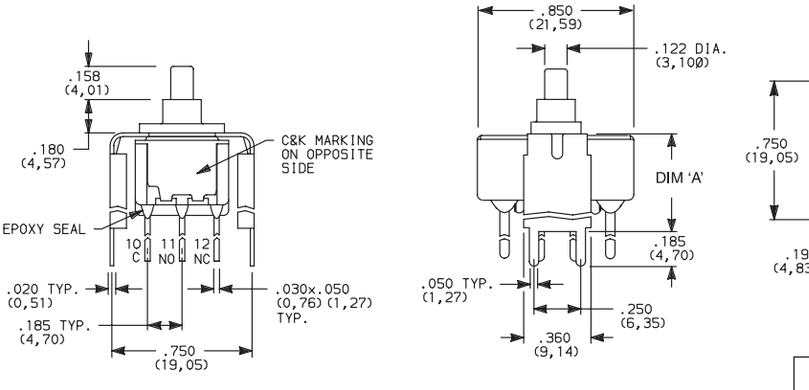


8321SD3__GE
3PDT

OPTION CODE	DIM 'A'
V2	.555 (14,10)
V7	.630 (16,00)
V8	.953 (24,21)

Not available with JXX actuators and I seal.

V2, V7, V8 VERTICAL MOUNT, V-BRACKET



8421SD3__GE
4PDT

OPTION CODE	DIM 'A'
V2	.555 (14,10)
V7	.630 (16,00)
V8	.953 (24,21)

Not available with JXX actuators and I seal.

Third Angle Projection

Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

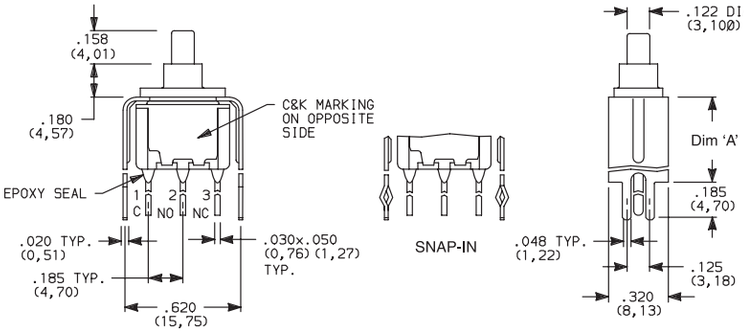
8020 Series
Snap-acting Momentary Pushbutton Switches

TERMINATIONS

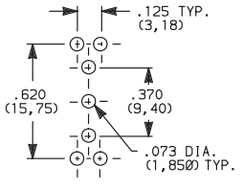
V3, V4, V9 VERTICAL MOUNT, V-BRACKET

V31 VERTICAL MOUNT, V-BRACKET, SNAP-IN

8121SD3__GE
SPDT



PC MOUNTING



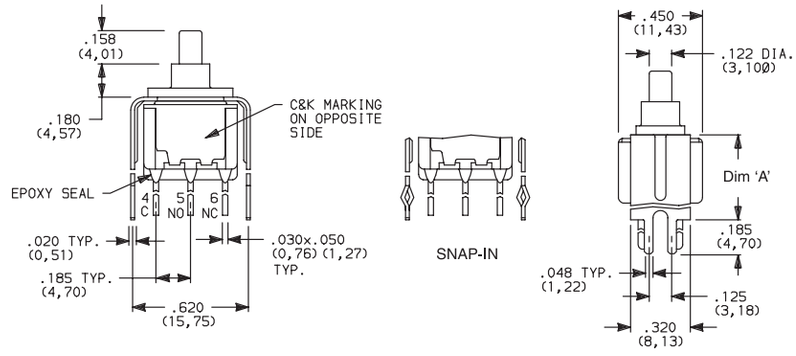
OPTION CODE	DIM 'A'
V3, V31	.460 (11,68)
V4	.630 (16,00)
V9	1.150 (29,21)

Not available with J8X actuators and I seal.

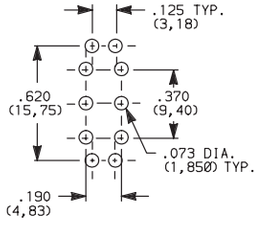
V3, V4, V9 VERTICAL MOUNT, V-BRACKET

V31 VERTICAL MOUNT, V-BRACKET, SNAP-IN

8221SD3__GE
DPDT



PC MOUNTING

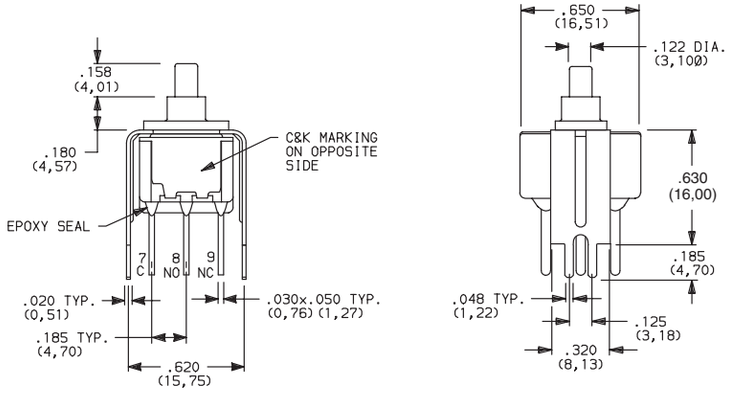


OPTION CODE	DIM 'A'
V3, V31	.460 (11,68)
V4	.630 (16,00)
V9	1.150 (29,21)

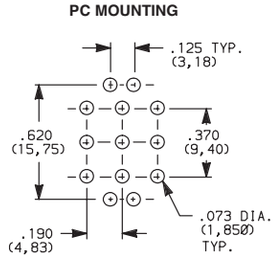
Not available with J8X actuators and I seal.

V4, V9 VERTICAL MOUNT, V-BRACKET

8321SD3V4GE
3PDT



PC MOUNTING



OPTION CODE	DIM 'A'
V4	.630 (16,00)
V9	1.150 (29,21)

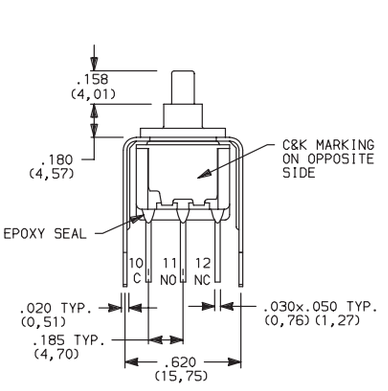
Not available with JXX actuators and I seal.

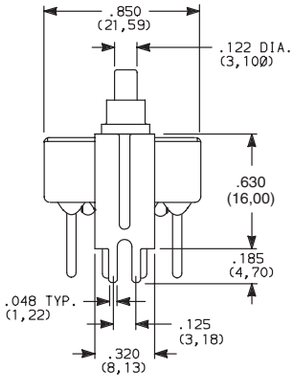
Third Angle Projection

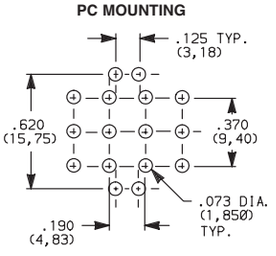
Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

TERMINATIONS

V4, V9 VERTICAL MOUNT, V-BRACKET







8421SD3V4GE
4PDT

OPTION CODE	DIM 'A'
V4	.630 (16,00)
V9	1.150 (29,21)

Not available with JXX actuators and I seal.

CONTACT MATERIAL

OPTION CODE	CONTACT MATERIAL	TERMINAL PLATING	RATINGS	
B	GOLD [1]	GOLD [1]	LOW LEVEL/DRY CIRCUIT	8x25 MODELS ONLY: 0.4 MAX. @ 20 V AC OR DC MAX.
P		MATTE-TIN [4]		
G	GOLD OVER SILVER [2,3]	GOLD [3]	LOW LEVEL/DRY CIRCUIT OR POWER	8X21, U8X1 MODELS ONLY: 0.4 VA MAX @ 20 V AC OR DC MAX. OR 1 AMP @ 120 V AC OR 28 V DC.
R		MATTE-TIN [4]		

* Note: See Technical Data section of this catalog for RoHS compliant and compatible definitions and specifications.

[1] ALL CONTACTS & TERMINALS: Copper alloy, with gold plate over nickel plate.

[2] N.O. AND N.C. CONTACTS: Coin silver, with gold plate over nickel plate.

[3] COMMON CONTACTS & ALL TERMINALS: Copper alloy, with gold plate over nickel plate.

[4] TERMINALS: Copper alloy, with matte-tin over nickel plate.

NOTE: Any models supplied with B, P, R or G contact material are RoHS compliant.

U811-U841 models with all options (except R, R2 terminations) when ordered with mandatory G or R contact material.

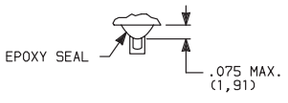
B or P contact material must be ordered with 8X25 models.

G or R contact material must be ordered with 8X21, U8X1 models.

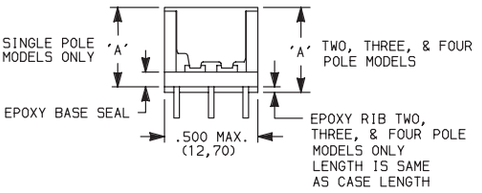
P or R contact material not available with Z, Z3 terminations.

SEAL

E EPOXY SEAL



I EPOXY POTTED BASE



NO. POLES	DIM 'A'
SP	.410 (10,41)
DP	.440 (11,18)
3P	.505 (12,83)
4P	.505 (12,83)

NOTE: Available with C, W-W4, Z, Z3 terminations only.

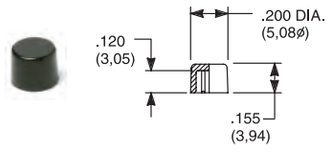
Third Angle Projection

Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

8020 Series
Snap-acting Momentary Pushbutton Switches

AVAILABLE HARDWARE

Cap

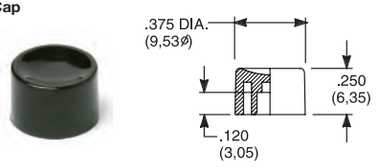


PART NO.

708901000	WHITE
708902000	BLACK
708903000	RED
708904000	ORANGE
708905000	YELLOW
708906000	GREEN
708907000	BLUE
708909000	GRAY

Material: Nylon
Finish: Gloss

Cap

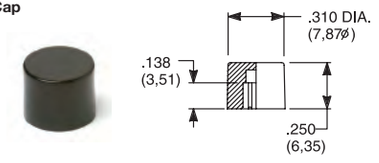


PART NO.

752701000	WHITE
752702000	BLACK
752703000	RED
752704000	ORANGE
752705000	YELLOW
752706000	GREEN
752707000	BLUE
752709000	GRAY

Material: Nylon
Finish: Gloss

Cap

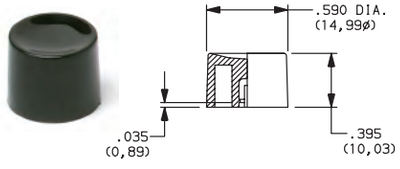


PART NO.

801801000	WHITE
801802000	BLACK
801803000	RED
801804000	ORANGE
801805000	YELLOW
801806000	GREEN
801807000	BLUE
801809000	GRAY

Material: Nylon
Finish: Gloss

Cap, Snap-fitting plunger

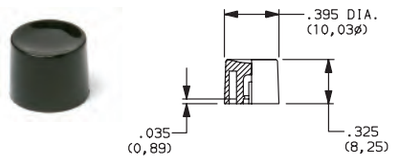


PART NO.

452D01000	WHITE
452D02000	BLACK
452D03000	RED
452D04000	ORANGE
452D05000	YELLOW
452D06000	GREEN
452D07000	BLUE
452D09000	GRAY

Material: Nylon
Finish: Gloss

Cap, Snap-fitting plunger

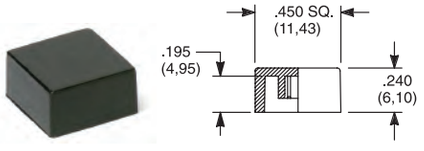


PART NO.

894101000	WHITE
894102000	BLACK
894103000	RED
894104000	ORANGE
894105000	YELLOW
894106000	GREEN
894107000	BLUE
894109000	GRAY

Material: Nylon
Finish: Gloss

Cap, J80, J81, J82, J83 & J84 options only



PART NO.

484601000	WHITE
484602000	BLACK
484603000	RED
484604000	ORANGE
484605000	YELLOW
484606000	GREEN
484607000	BLUE
484609000	GRAY

Material: Nylon
Finish: Gloss

PART NO.

798201000	WHITE
798202263	BLACK
798203000	RED
798204000	ORANGE
798205000	YELLOW
798206000	GREEN
798207000	BLUE
798209000	GRAY

Material: Nylon
Finish: Matte

Frame

PART NO.

615602263 BLACK

Material: Nylon
Finish: Matte

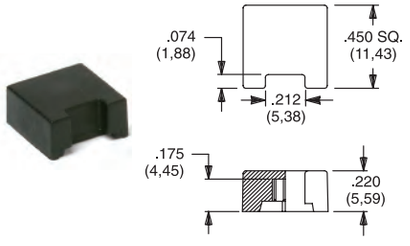
Frame

PART NO.

613302263 BLACK

Material: Nylon
Finish: Matte

Cap, J85 & J95 options only



PART NO.

459701000	
459702000	
459703000	
459704000	
459705000	
459706000	
459707000	
459709000	

Material: Nylon
Finish: Gloss

PART NO.

476801000	WHITE
476802000	BLACK
476803000	RED
476804000	ORANGE
476805000	YELLOW
476806000	GREEN
476807000	BLUE
476809000	GRAY

Material: Nylon
Finish: Matte

Fits Z3 Termination female connector

PART NO.

530100000

Available in loose pieces.

NOTE: Additional nuts, locking rings and lockwashers available separately, see section "Technical Data and Additional Hardware".
Other cap & frame colors available, consult Customer Service Center.

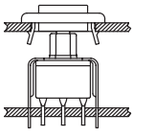
Third Angle Projection

Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

AVAILABLE HARDWARE

Frames snap into panel opening and are independent from switch mounting. Accurate positioning of the PC mounted switch relative to the panel opening is necessary to provide proper clearance between actuator and frame. Available in two basic styles and four panel thicknesses .047-.125 in. Material: Nylon. Finish: Matte.

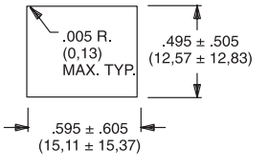
TYPICAL APPLICATION



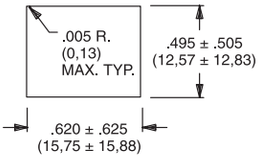
.047" (1,19) PANEL THK.	.062" (1,57) PANEL THK.	.090" (2,29) PANEL THK.	.125" (3,18) PANEL THK.
PART NO.	**PART NO.**	**PART NO.**	**PART NO.**
432502263	432602263	432702263	432802263 BLACK

PANEL MOUNTING

For part numbers
4325xxxxx, 4326xxxxx

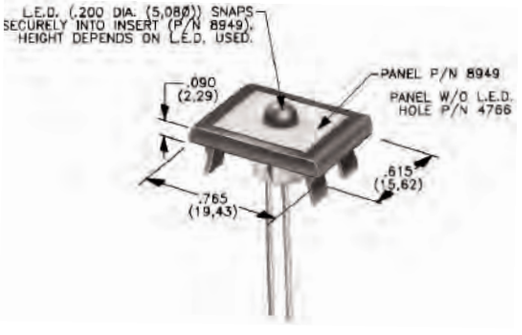


For part numbers
4327xxxxx, 4328xxxxx



Panel Inserts

Above frames (part nos. 432XXXXXX) are also available with insert which accepts LED for indicator light assembly. Order insert separately from frame. Blank insert panel (without hole for LED) also available. **LED not included.**



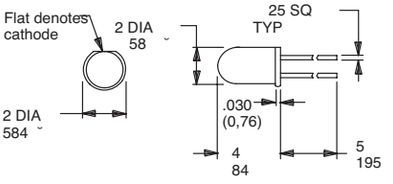
PANEL INSERT WITH HOLE FOR LED	BLANK PANEL INSERT WITHOUT HOLE FOR LED
PART NO.	**PART NO.**
894902000	476602000 BLACK

Special colors, custom markings available, consult Customer Service Center.

LED INFORMATION

SWITCHES WITH LED SUPPLIED: J85, J95 OPTIONS:
Rectangular LEDs are supplied on 8020 Series pushbutton switches with J85 and J95 options. These LEDs are factory installed and are not replaceable. The following specifications apply:

OPTION CODE	COLOR	TYP. INTENSITY	TYP. FORWARD VOLTAGE	TYP. FORWARD CURRENT	MAX RATINGS AT 25°C AMBIENT TEMPERATURE		
					FORWARD VOLTAGE	CONTINUOUS FORWARD CURRENT	POWER DISSIPATION
6	Green	1.0 mcd	2.1 V	20 mA	2.5 V	50 mA	125 mW
3	Red*	0.5 mcd		10 mA		30 mA	75 mW
5	Yellow	4.0 mcd		20 mA		50 mA	125 mW



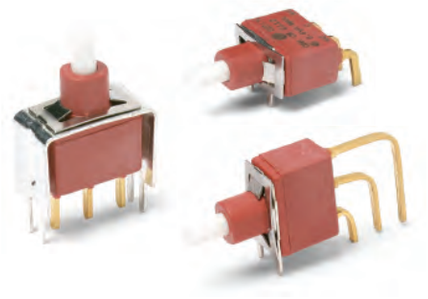
Suggested LED for J82 & J84 options
Dimensions for reference only

Process Information: Soldering to LED leads must be completed within 5 seconds at 500°F (260°C) maximum.
Caution: Circuit elements must limit forward current of LED to 50mA max. continuous.
* Extra-bright red LED available (typ. intensity 4.5 mcd), consult Customer Service Center.
LEDs are not supplied with J82, J84 options. LED snaps into switch frame surrounding actuator and is wired externally.

Third Angle Projection

Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

E010 Series
Sealed Momentary Pushbutton Switches



Features/Benefits

- *Process sealed, withstands soldering and cleaning*
- *Long life contact design*
- *Snap-fitting plunger available, accepts a variety of caps*
- *RoHS compliant models available*

Typical Applications

- *Instrumentation*
- *Telecommunications and networking equipment*
- *Computers and peripherals*

c UL us
Models Available

Specifications

CONTACT RATING: Q contact material: 4 AMPS @ 125 V AC or 28 V DC. See page A-50 for additional ratings.

ELECTRICAL LIFE: 40,000 make-and-break cycles at full load.

CONTACT RESISTANCE: Below 20 mΩ typ. initial @ 2–4 V DC, 100 mA, for both silver and gold plated contacts.

INSULATION RESISTANCE: $10^9\Omega$ min.

DIELECTRIC STRENGTH: 1000 Vrms min. @ sea level.

OPERATING TEMPERATURE: -30°C to 75°C.

CAP INSTALLATION FORCE: 10 lbs. max. permissible.

SOLDERABILITY: Per MIL-STD-202F method 208D, or EIA RS-186E method 9 (1 hour steam aging).

NOTE: Any models supplied with P, Q, B or G contact material are RoHS compliant.

NOTE: Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.

Materials

CASE & BUSHING: Glass filled nylon 6/6, flame retardant (UL 94V-0).

PLUNGER: Glass filled nylon or glass filled polyester (PBT) (UL 94V-0), with internal o-ring seal standard.

SWITCH SUPPORT: Brass or steel, matte-tin plated.

SWITCH SUPPORT RETAINER: Stainless steel.

END CONTACTS: Q contact material: Coin silver, silver plated. See A-50 for additional ratings.

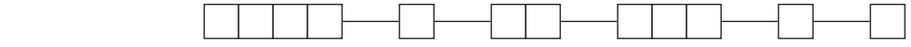
CENTER CONTACTS & ALL TERMINALS: Q contact material: Copper alloy, silver plated. See page A-50 for additional ratings.

TERMINAL SEAL: Epoxy.

HARDWARE: Nut & locking ring-Brass, nickel plated. Lockwasher-Steel, nickel plated.

Build-A-Switch

To order, simply select desired option from each category and place in the appropriate box. Available options are shown and described on pages A-47 thru A-51. For additional options not shown in catalog, consult Customer Service Center. All models are process sealed to withstand machine soldering temperatures and pressure wash cleaning methods.



Switch Function
E112 SPDT On-Mom.

Plunger
S .222" high
L .338" high
M .331" high, snap-fitting

Bushing
D1 Unthreaded
Y Threaded, keyway

Terminations
A Right angle, PC thru-hole
AV2 Vertical right angle, PC thru-hole
C PC Thru-hole
A3 Right angle, snap-in, PC thru-hole
AV3 Vertical right angle, snap-in, PC thru-hole
R2 Right angle with PCB
V3 .460" high, V-bracket
V4 .630" high, V-bracket
V6 .460" high, V-bracket
V8 .953" high, V-bracket
V31 .460" high, snap-in V-bracket
V81 .953" high, snap-in V-bracket
V91 1.150" high, snap-in V-bracket
W .750" long, wire wrap
Z Solder lug

Contact Material
B Gold
P Gold, matte-tin
Q Silver
G Gold over silver

Seal
E Epoxy

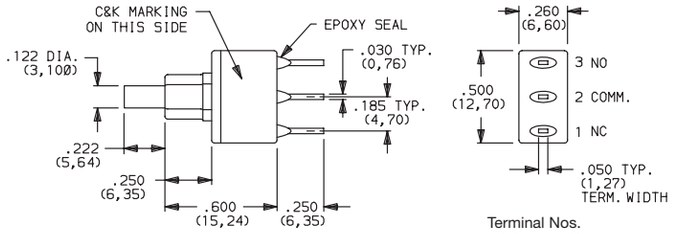
Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

E010 Series
Sealed Momentary Pushbutton Switches

SWITCH FUNCTION

NO. POLES	MODEL NO.	SWITCH FUNCTION POS. 1 (C&K marking this side)	SWITCH FUNCTION POS. 2 (C&K marking this side)	CONNECTED TERMINALS POS. 1	CONNECTED TERMINALS POS. 2	SCHEMATIC
SP	E112	ON	MOM.	2-1	2-3	SPDT: 2 (COMM), NC 1, 3 NO

SPDT



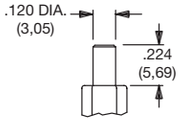
Part number shown: E112SD1CQE

MOM. = Momentary

All models cULus with all options when ordered with G or Q contact material.

PLUNGER

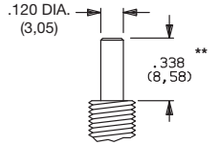
S .218" HIGH



Standard with D1 bushing (as shown).

† Subtract .100 (2,54) from plunger length when ordered with Y bushing.

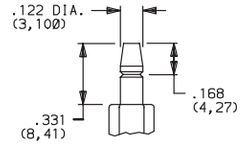
L .338" HIGH



Standard with Y bushing (as shown).

** Add .100 (2,54) from plunger length when ordered with D1 bushing.

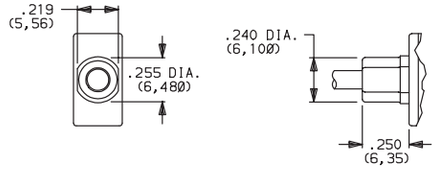
M .331" HIGH, SNAP-FITTING



NOTE: Caps available for all plunger options, see pages A-50 and A-51.

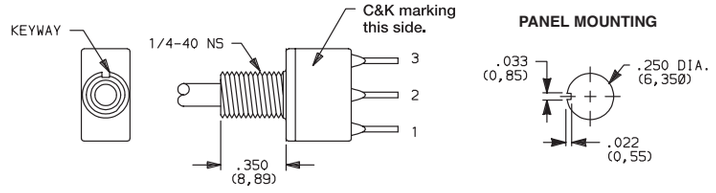
BUSHING

D1 UNTHREADED



S plunger standard with D1 bushing.

Y THREADED, KEYWAY



L plunger standard with Y bushing. Available only with C, Z terminations.
Hardware: One dress nut part number 299D01201, one hex nut and lockwasher supplied standard.

Withstands 4 in./lbs. without distortion.

NOTE: Internal o-ring actuator seal standard for all bushing options.

Third Angle Projection

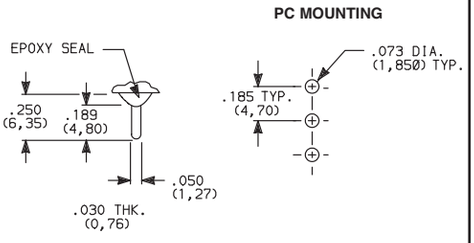
Dimensions are shown: Inches (mm)

Specifications and dimensions subject to change

E010 Series
Sealed Momentary Pushbutton Switches

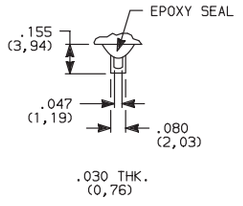
TERMINATIONS

C PC THRU-HOLE



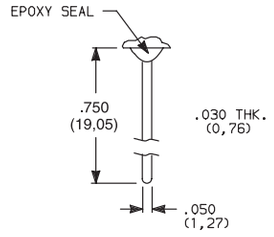
SPDT

Z SOLDER LUG



SPDT Not available with P contact materials.

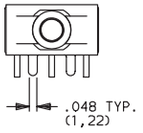
W WIRE WRAP

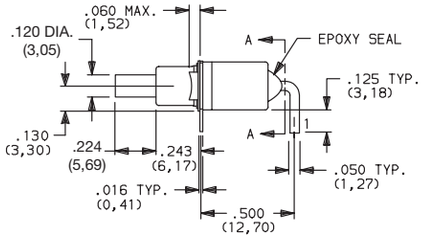


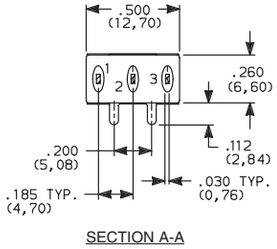
SPDT

A RIGHT ANGLE, PC THRU-HOLE

E112SD1ABE
SPDT

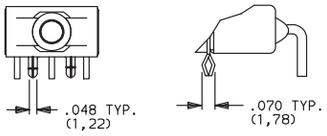




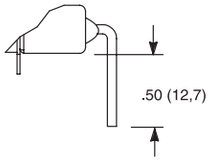


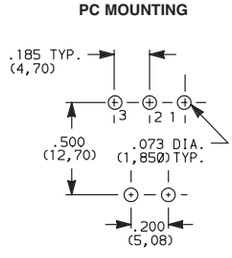
SECTION A-A

A3 RIGHT ANGLE, SNAP-IN, PC THRU-HOLE



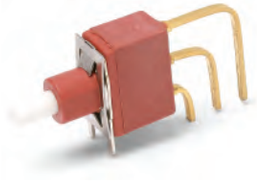
AW RIGHT ANGLE, EXTENDED, PC THRU-HOLE



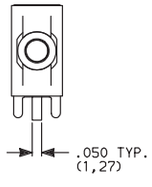


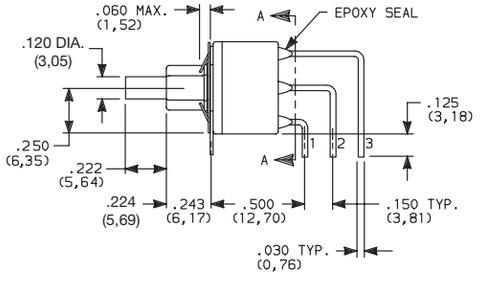
NOTE: Terminal bend radii and lead-in manufacturing option.
Available with D1 bushing only.

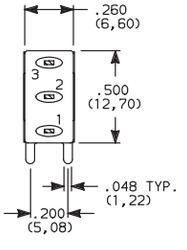
AV2 VERTICAL RIGHT ANGLE, PC THRU-HOLE, .150" PITCH



E112SD1AV2BE
SPDT

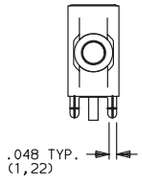


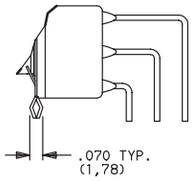


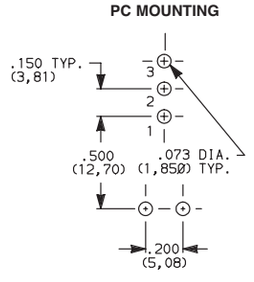


SECTION A-A

AV3 VERTICAL RIGHT ANGLE, SNAP-IN, PC THRU-HOLE, .150" PITCH







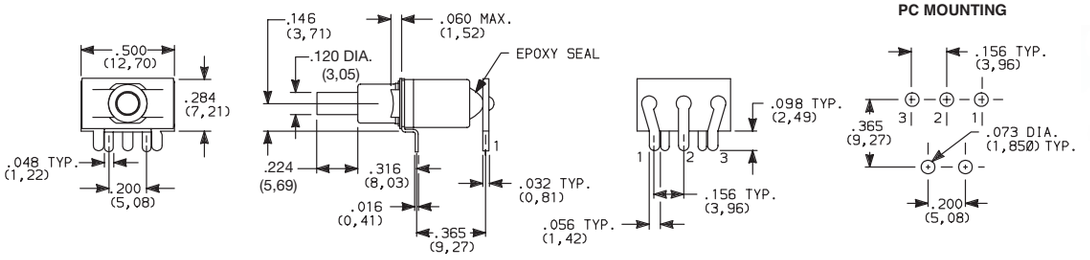
NOTE: Terminal bend radii and lead-in manufacturing option.
Available with D1 bushing only.

Third Angle Projection

Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

TERMINATIONS

R2 RIGHT ANGLE WITH PCB

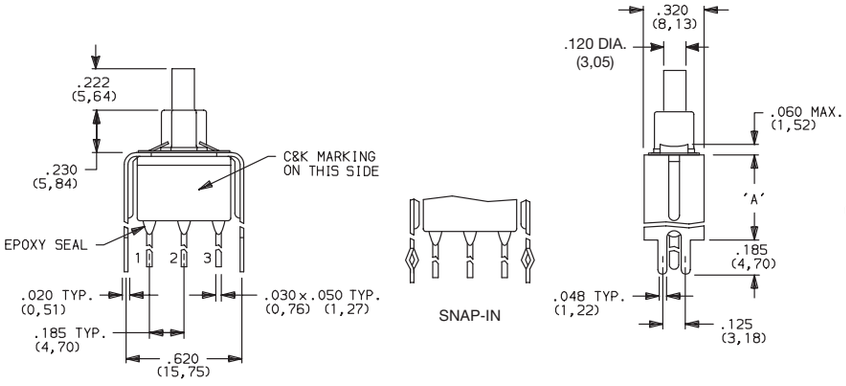


E112SD1R2BE
SPDT

NOTE: Available with D1 bushing and B contact material only.

V3, V4 VERTICAL MOUNT, V-BRACKET

V31, V91 VERTICAL MOUNT, V-BRACKET, SNAP-IN



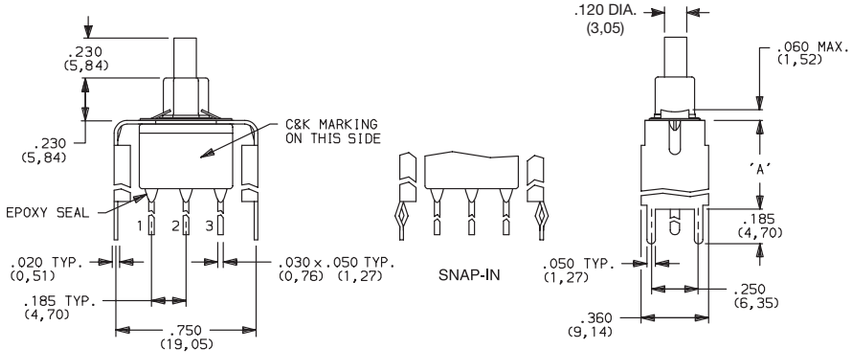
E112SD1__BE
SPDT

OPTION CODE	DIM 'A'
V3, V31	.460 (11,68)
V4	.630 (16,00)
V91	1.150 (29,21)

NOTE: Available with D1 bushing only.

V6, V8 VERTICAL MOUNT, V-BRACKET

V81 VERTICAL MOUNT, V-BRACKET, SNAP-IN



E112SD1__BE
SPDT

OPTION CODE	DIM 'A'
V6	.460 (11,68)
V8, V81	.953 (24,21)

NOTE: Available with D1 bushing only.

Third Angle Projection

Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

E010 Series
Sealed Momentary Pushbutton Switches

CONTACT MATERIAL

OPTION CODE	CONTACT MATERIAL	TERMINAL PLATING	RATINGS	
B	GOLD [1]	GOLD [1]	LOW LEVEL/DRY CIRCUIT	0.4 VA MAX. @ 20 V AC OR DC MAX.
P		MATTE-TIN [6]		
Q	SILVER [4,5]	SILVER [5]	POWER	4 AMPS @ 125 V AC 0R 28 V DC.
G	GOLD OVER SILVER [2,3]	GOLD [3]	LOW LEVEL/DRY CIRCUIT OR POWER	0.4 VA MAX. @ 20 V AC OR DC MAX. OR 4 AMPS @ 125 V AC 0R 28 V DC.

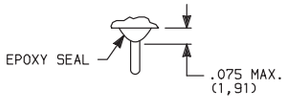
* Note: See Technical Data section of this catalog for RoHS compliant and compatible definitions and specifications.

[1] CONTACTS & TERMINALS: Copper alloy, with gold plate over nickel plate.
[2] END CONTACTS: Coin silver, with gold plate over nickel plate.
[3] CENTER CONTACTS & ALL TERMINALS: Coin silver, with gold plate over nickel plate.
[4] END CONTACTS: Coin silver, silver plated.
[5] CENTER CONTACTS & ALL TERMINALS: Copper alloy, silver plated.
[6] TERMINALS: Copper alloy, with matte-tin over nickel plate.

NOTE: Any models supplied with P, Q, B or G contact material are RoHS compliant.
All models cULus with all options when ordered with G or Q contact material.
B contact material standard with all terminations except C, Z.
B contact material must be ordered with R2 terminations.
Q contact material standard with C, Z terminations.
P contact materials not available with Z terminations.

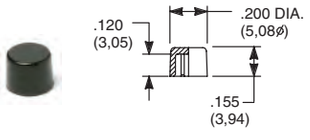
SEAL

E EPOXY SEAL



AVAILABLE HARDWARE

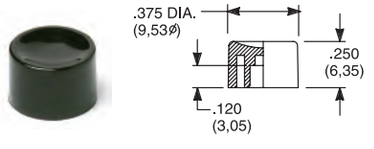
Cap



PART NO.
708901000 WHITE
708902000 BLACK
708903000 RED

Material: Nylon
Finish: Gloss

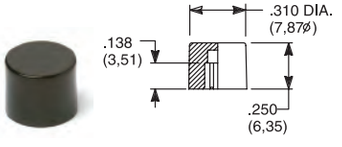
Cap



PART NO.
752701000 WHITE
752702000 BLACK
752703000 RED

Material: Nylon
Finish: Gloss

Cap



PART NO.
801801000 WHITE
801802000 BLACK
801803000 RED

Material: Nylon
Finish: Gloss

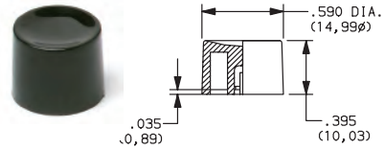
NOTE: Additional nuts, locking rings and lockwashers available separately, see section "Technical Data and Additional Hardware".
Other cap colors available, consult Customer Service Center.

Third Angle Projection

Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

AVAILABLE HARDWARE

Cap, Snap-fitting plunger

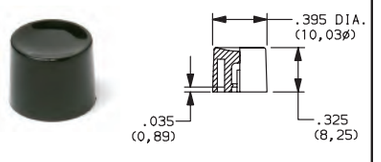


PART NO.

452D01000	WHITE
452D02000	BLACK
452D03000	RED

Material: Nylon
Finish: Gloss

Cap, Snap-fitting plunger

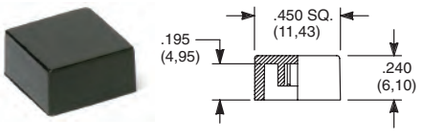


PART NO.

894101000	WHITE
894102000	BLACK
894103000	RED

Material: Nylon
Finish: Gloss

Cap



PART NO.

484601000	WHITE
484602000	BLACK
484603000	RED

Material: Nylon
Finish: Gloss

PART NO.

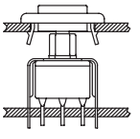
798201000	WHITE
798202263	BLACK
798203000	RED

Material: Nylon
Finish: Matte

NOTE: Additional nuts, locking rings and lockwashers available separately, see section "Technical Data and Additional Hardware".
Other cap colors available, consult Customer Service Center.

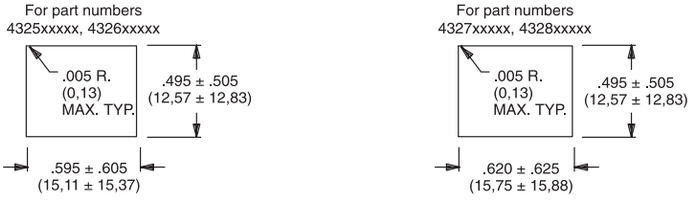
Frames snap into panel opening and are independent from switch mounting. Accurate positioning of the PC mounted switch relative to the panel opening is necessary to provide proper clearance between actuator and frame. Available in two basic styles and four panel thicknesses .047-.125 in. Material: Nylon. Finish: Matte.

TYPICAL APPLICATION



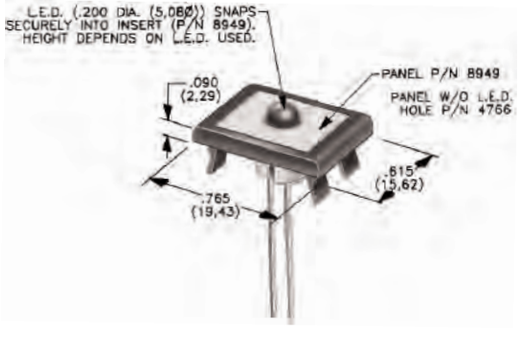
.047" (1,19) PANEL THK.	.062" (1,57) PANEL THK.	.090" (2,29) PANEL THK.	.125" (3,18) PANEL THK.
PART NO.	**PART NO.**	**PART NO.**	**PART NO.**
432502263	432602263	432702263	432802263 BLACK

PANEL MOUNTING



Panel Inserts

Above frames (part nos. 432XXXXXX) are also available with insert which accepts LED for indicator light assembly. Order insert separately from frame. Blank insert panel (without hole for LED) also available. **LED not included.**



PANEL INSERT WITH HOLE FOR LED	BLANK PANEL INSERT WITHOUT HOLE FOR LED
PART NO.	**PART NO.**
894902000	476602000 BLACK

Special colors, custom markings available, consult Customer Service Center.

Third Angle Projection

Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

8060 Series
Alternate Action and Momentary Pushbutton Switches

Features/Benefits

- *Long travel*
- *Available with LED*
- *Long life contact design*
- *Epoxy terminal seal compatabile with bottom wash cleaning*
- *RoHS compliant models available*

Typical Applications

- *Instrumentation*
- *Computers and peripherals*
- *Telecommunications and networking equipment*

c UL us
Models Available

Specifications

CONTACT RATING: Q contact material: 6 AMPS @ 120 V AC or 28 V DC; 3 AMPS @ 250 V AC. See page A-59 for additional ratings.

ELECTRICAL LIFE: 50,000 make-and-break cycles at full load.

CONTACT RESISTANCE: Below 20 mΩ typ. initial @ 2-4 V DC, 100 mA, for both silver and gold plated contacts.

INSULATION RESISTANCE: $10^9\Omega$ min.

DIELECTRIC STRENGTH: 1,000 Vrms min. @ sea level.

OPERATING TEMPERATURE: –30°C to 65°C

SOLDERABILITY: Per MIL-STD-202F method 208D, or EIA RS-186E method 9 (1 hour steam aging).

CAP INSTALLATION FORCE: 10 lbs. maximum permissible.

NOTE: Any models supplied with P, R, S, Q, B or G contact material are RoHS compliant.

NOTE: Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.

Materials

CASE: Glass filled nylon 6/6 or diallyl phthalate (DAP), flame retardant (UL 94V-0).

PLUNGER: S, S1, S2 Options: Glass filled nylon or glass filled polyester (PBT) (UL 94V-0). L, L1 Options: Brass, nickel plated.

CAP & FRAME: Nylon, black standard.

BUSHING: Brass or zinc, nickel plated.

HOUSING: Stainless steel.

SWITCH SUPPORT: Brass or steel, matte-tin plated.

END CONTACTS: Q contact material: Coin silver, silver plated. See page A-59 for additional contact materials.

CENTER CONTACT & ALL TERMINALS: Q contact material: Copper alloy, silver plated. See page A-59 for additional contact materials.

TERMINAL SEAL: Epoxy. Refer to soldering and cleaning in Technical Data Chapter.

HARDWARE: Nut & Locking Ring: Brass, nickel plated; Lockwasher: Steel, nickel plated.

Build-A-Switch

To order, simply select desired option from each category and place in the appropriate box. Available options are shown and described on pages A-53 thru A-61. For additional options not shown in catalog, consult Customer Service Center. All models have epoxy terminal seal and are compatible with all “bottom-wash” PCB cleaning methods.

Switch Function
- **8161** SPDT On-On
- **8168** SPDT On-Mom.
- **8261** DPDT On-On

Actuator or Plunger
- **S** .710" high plunger with .375" dia. cap
- **J80** Snap-in
- **J81** Snap-in with frame
- **J82** Snap-in with frame for LED
- **J86** Snap-in with frame & LED
- **L** .740" high plunger with .395" dia. cap
- **L1** .740" high plunger with .590" dia. cap
- **S1** .615" high plunger with .200" dia. cap
- **S2** .710" high plunger with .310" dia. cap

Bushing
- **H** .300" high, flat, hi torque
- **H9** .300" high, flat, hi torque
- **NONE** No bushing choice required
- **Y3** 7.6mm, keyway

Terminations
- **A** Right angle, PC thru-hole
- **AV2** Vertical right angle, PC thru-hole
- **C** PC Thru-hole
- **Z** Solder lug
- **A3** Right angle, snap-in, PC thru-hole
- **AV3** Vertical right angle, snap-in, PC thru-hole
- **V3** .460" high, V-bracket
- **V4** .630" high, V-bracket
- **V6** .460" high, V-bracket
- **V21** .555" high, snap-in V-bracket
- **V31** .460" high, snap-in V-bracket
- **W** .750" long, wire wrap
- **Z3** Quick connect

Contact Material
- **B** Gold
- **P** Gold, matte-tin
- **Q** Silver
- **S** Silver, matte-tin
- **G** Gold over silver
- **R** Gold over silver, matte-tin

Seal
- **E** Epoxy
- **I** Epoxy potted base

Cap Color
- **2** Black
- **1** White
- **3** Red
- **4** Orange
- **5** Yellow
- **9** Gray

Frame Color
- **2** Black

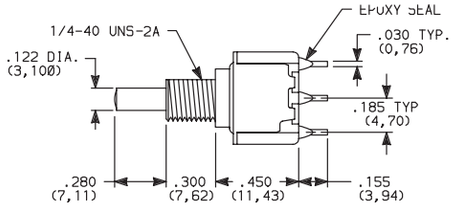
LED Color
- **3** Red
- **NONE** Models without LED

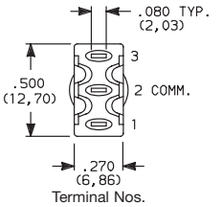
8060 Series
Alternate Action and Momentary Pushbutton Switches

SWITCH FUNCTION

NO. POLES	MODEL NO.	SWITCH FUNCTION POS. 1 (C&K marking this side)	SWITCH FUNCTION POS. 2 (C&K marking this side)	CONNECTED TERMINALS POS. 1 (C&K marking this side)	CONNECTED TERMINALS POS. 2 (C&K marking this side)	SCHEMATIC
SP	8161	ON	ON	2-3	2-1	SPDT
	8168	ON	MOM.	2-3	2-1	

SPDT



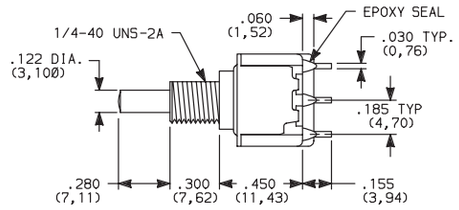


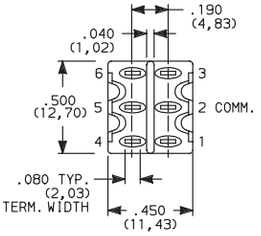
Terminal Nos.
For Reference Only

Part number shown: 8161SHZQE

NO. POLES	MODEL NO.	SWITCH FUNCTION POS. 1	SWITCH FUNCTION POS. 2	CONNECTED TERMINALS POS. 1	CONNECTED TERMINALS POS. 2	SCHEMATIC
DP	8261	ON	ON	2-3,5-6	2-1,5-4	DPDT

DPDT





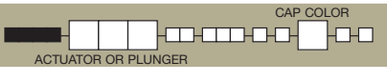
Terminal Nos.
For Reference Only

Part number shown: 8261SHZQE

MOM. = Momentary

All models cULus with all options when ordered with G or Q contact material.

ACTUATOR—SNAP-IN FRONT MOUNT



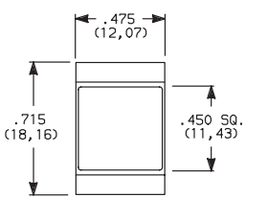
OPTION CODE	CAP COLOR
2	BLACK
1	WHITE
3	RED
4	ORANGE
5	YELLOW
9	GRAY

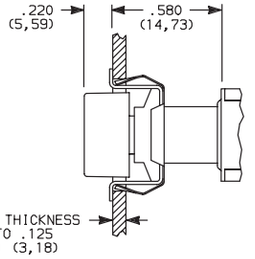
Cap Finish: matte.
Other colors available, consult Customer Service Center.

Available with C, W, Z or Z3 terminations.

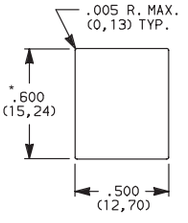
NOTE: Caps & frames available separately, see pages A-60 and A-61.

J80 SNAP-IN



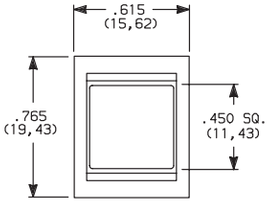


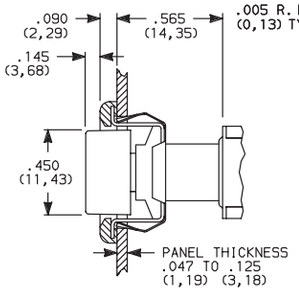
PANEL MOUNTING



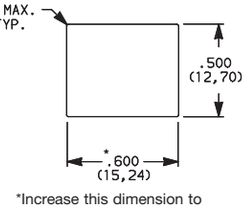
*Increase this dimension to .620/.625 (15,75/15,88) for .091/.125 (2,41/2,18) thick panels.

J81 SNAP-IN WITH BLACK FRAME





PANEL MOUNTING



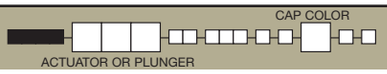
*Increase this dimension to .620/.625 (15,75/15,88) for .091/.125 (2,41/2,18) thick panels.

Third Angle Projection

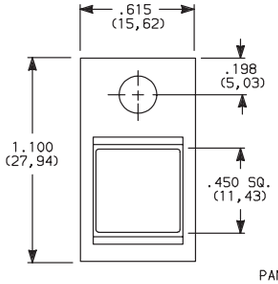
Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

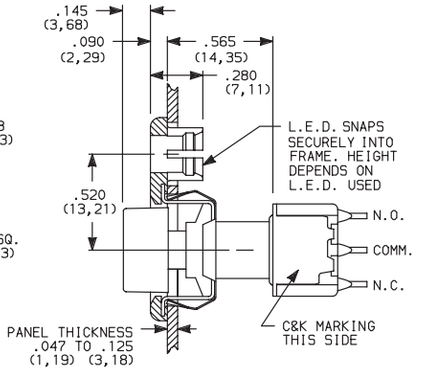
8060 Series
Alternate Action and Momentary Pushbutton Switches

ACTUATOR—SNAP-IN FRONT MOUNT

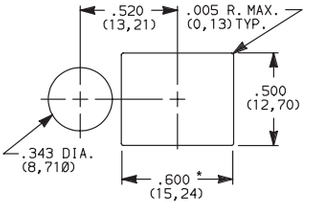


J82 SNAP-IN WITH BLACK FRAME FOR LED





PANEL MOUNTING



* Increase this dimension to .620/.625 (15,75/15,88) for .091/.125 (2,31/3,18) thick panels.

Available with C, W, Z or Z3 terminations.

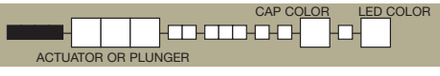
LED not included.
For LED information, see page A-61.

NOTE: Caps & frames available separately, see pages A-60 and A-61.

Other colors available, consult Customer Service Center.

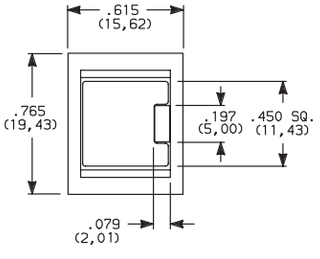
OPTION CODE	CAP COLOR
2	BLACK
1	WHITE
3	RED
4	ORANGE
5	YELLOW
9	GRAY

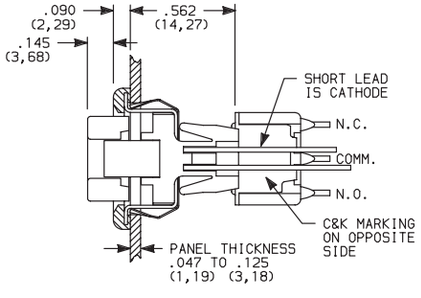
ACTUATOR—SNAP-IN FRONT MOUNT



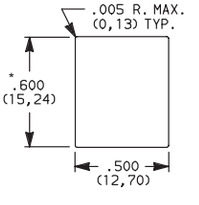
J86 SNAP-IN WITH BLACK FRAME AND LED

8161J86ZQE223
SPDT





PANEL MOUNTING



* Increase this dimension to .620/.625 (15,75/15,88) for .091/.125 (2,31/3,18) thick panels.

Available with C, W, Z or Z3 terminations and SPDT models only.

NOTE: Caps & frames available separately, see pages A-60 and A-61.

Other colors available, consult Customer Service Center.

OPTION CODE	CAP COLOR
2	BLACK
1	WHITE
3	RED
4	ORANGE
5	YELLOW
9	GRAY

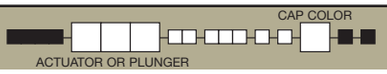
OPTION CODE	LED COLOR
3	RED

For LED information, see page A-61.

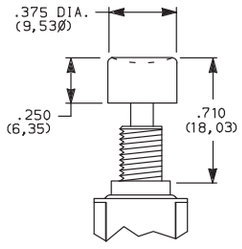
Third Angle Projection

Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

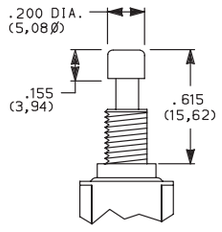
PLUNGER



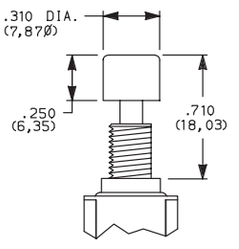
S PLUNGER WITH CAP P/N 7527



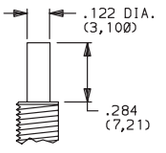
S1 PLUNGER WITH CAP P/N 7089



S2 PLUNGER WITH CAP P/N 8018

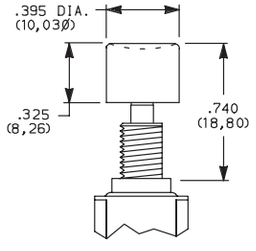


S, S1, S2 plunger dimensions.

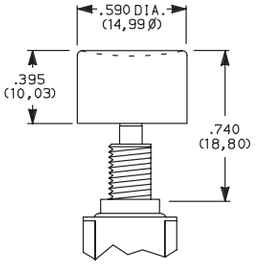


Plunger material: Glass filled nylon or glass filled polyester (UL 94V-0).

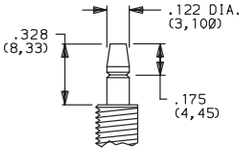
L PLUNGER WITH CAP P/N 8941



L1 PLUNGER WITH CAP P/N 8940



L, L1 plunger dimensions.



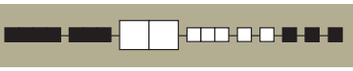
Plunger Material: Brass, chrome plated.

OPTION CODE	CAP COLOR
2	BLACK
1	WHITE
3	RED
4	ORANGE
5	YELLOW
9	GRAY

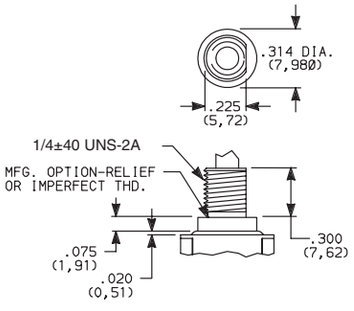
Cap Finish: gloss. Cap supplied not installed. Other colors available, consult Customer Service Center.

NOTE: When selecting plunger and cap option, bushing selection must also be made, see below.

BUSHING



H .300" HIGH THREADED, FLAT
H9 .300" HIGH UNTHREADED, FLAT

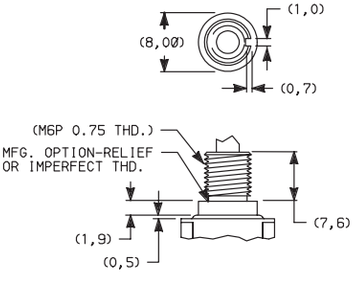


H bushing standard with C, W, Z or Z3 terminations.
H9 bushing standard with A, A3, AV2, AV3, or V3-V31 terminations.

Withstands 12 in./lbs. of torque with no distortion.

NONE NO BUSHING CHOICE REQUIRED (JXX ACTUATORS)

Y3 7.6mm THREADED, KEYWAY

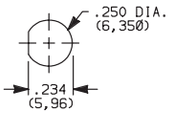


Withstands 12 in./lbs. of torque with no distortion.

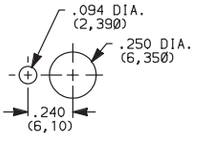
NOTE: When selecting bushing option, plunger selection must also be made, see above. No bushing option choice required when any JXX actuator option is selected.

PANEL MOUNTING

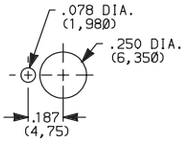
1/4 IN. BUSHING



Without Locking Ring

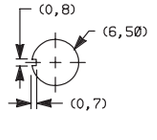


With Standard Locking Ring

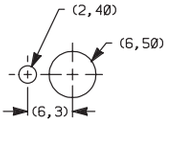


With Small Locking Ring

METRIC BUSHING

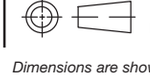


Without Locking Ring



With Locking Ring

NOTE. Two mounting nuts, locking ring and lockwasher supplied standard with threaded bushings. Optional mounting nut and locking ring styles and finishes available, see section "Technical Data and Additional Hardware".

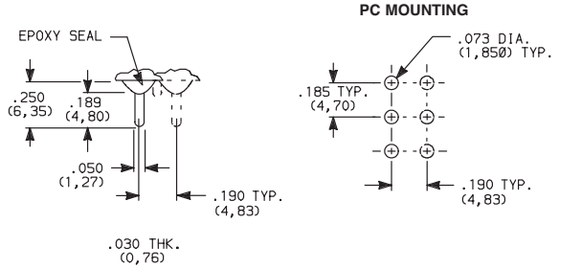


Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

8060 Series
Alternate Action and Momentary Pushbutton Switches

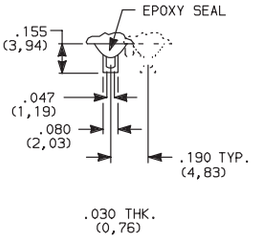
TERMINATIONS

C PC THRU-HOLE



SPDT and DPDT

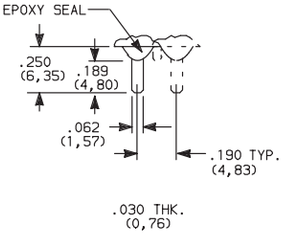
Z SOLDER LUG



SPDT and DPDT

Not available with P, S or R contact material.

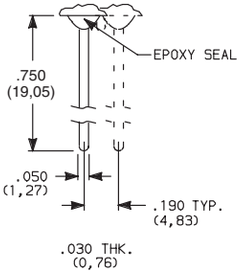
Z3 QUICK CONNECT



SPDT and DPDT

Not available with P, S or R contact material.
Mating quick connector available;
order part number 530100000, page A-61.

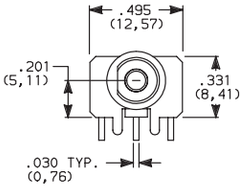
W WIRE WRAP

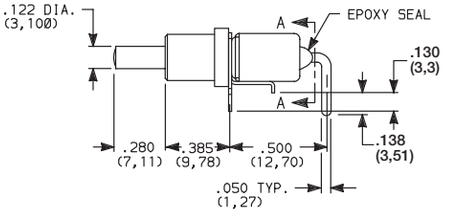


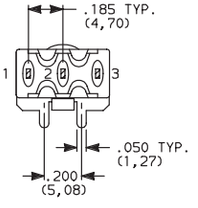
SPDT and DPDT

A RIGHT ANGLE, PC THRU-HOLE

8161SH9ABE2
SPDT

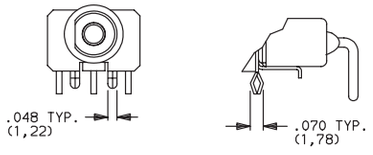




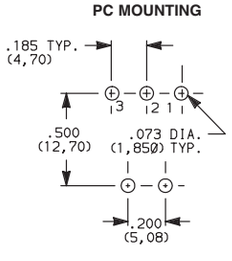


SECTION A-A

A3 RIGHT ANGLE, SNAP-IN, PC THRU-HOLE



Not available with I seal.
Terminal bend radii and lead-in manufacturing option.



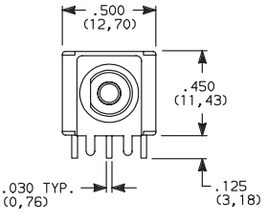
NOTE: PC pattern must clear switch support leg.

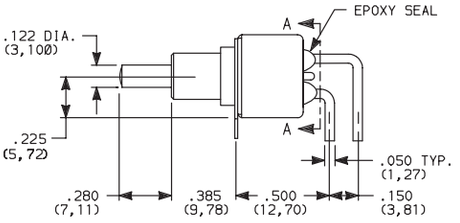
Third Angle Projection

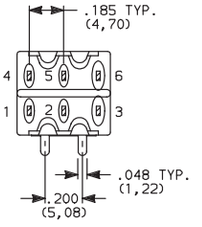
Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

TERMINATIONS

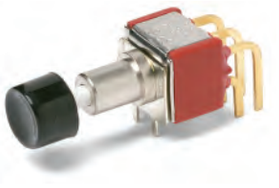
A RIGHT ANGLE, PC THRU-HOLE





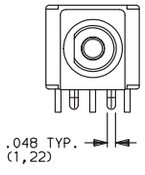


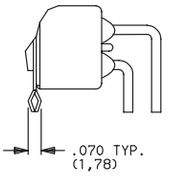
SECTION A-A



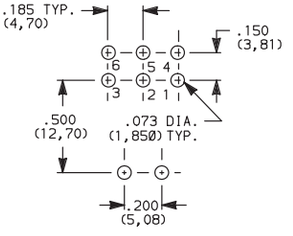
8261SH9ABE2
DPDT

A3 RIGHT ANGLE, SNAP-IN, PC THRU-HOLE



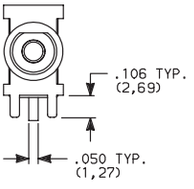


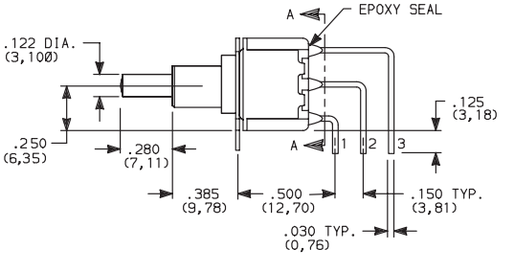
PC MOUNTING

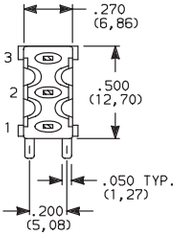


Not available with I seal.
Terminal bend radii and lead-in manufacturing option.

AV2 VERTICAL RIGHT ANGLE, PC THRU-HOLE, .150" PITCH



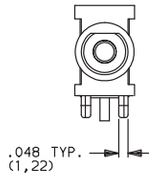


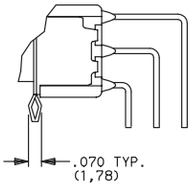


SECTION A-A

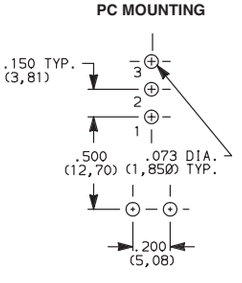
8161SH9AV2BE2
SPDT

AV3 VERTICAL RIGHT ANGLE, SNAP-IN, PC THRU-HOLE, .150" PITCH





PC MOUNTING



Not available with I seal.
Terminal bend radii and lead-in manufacturing option.

Third Angle Projection

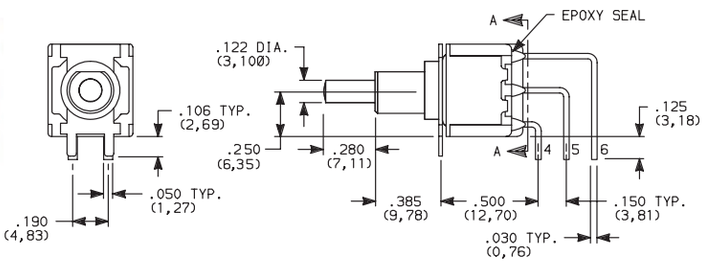
Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

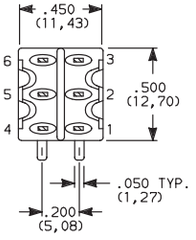
8060 Series
Alternate Action and Momentary Pushbutton Switches

TERMINATIONS

AV2 VERTICAL RIGHT ANGLE, PC THRU-HOLE, .150" PITCH

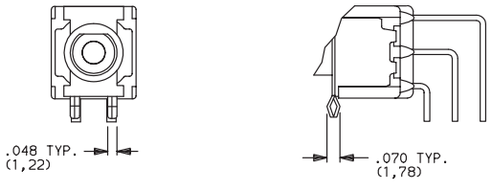
8261SH9AV2BE2
DPDT



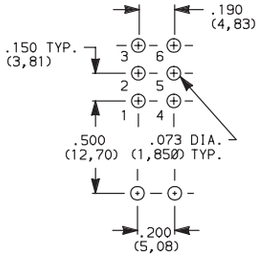


SECTION A-A

AV3 VERTICAL RIGHT ANGLE, SNAP-IN, PC THRU-HOLE, .150" PITCH



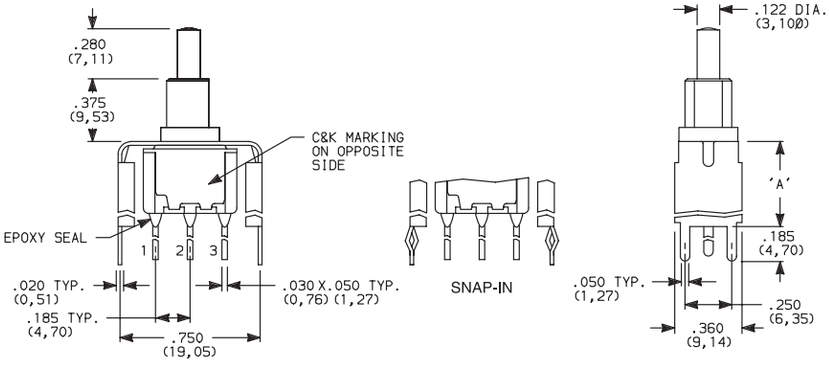
PC MOUNTING



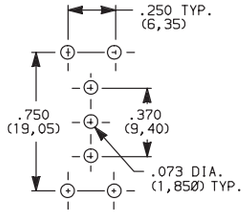
Not available with I seal.
Terminal bend radii and lead-in manufacturing option.

V6 VERTICAL MOUNT, V-BRACKET
V21 VERTICAL MOUNT, V-BRACKET, SNAP-IN

8161SH9__BE2
SPDT



PC MOUNTING

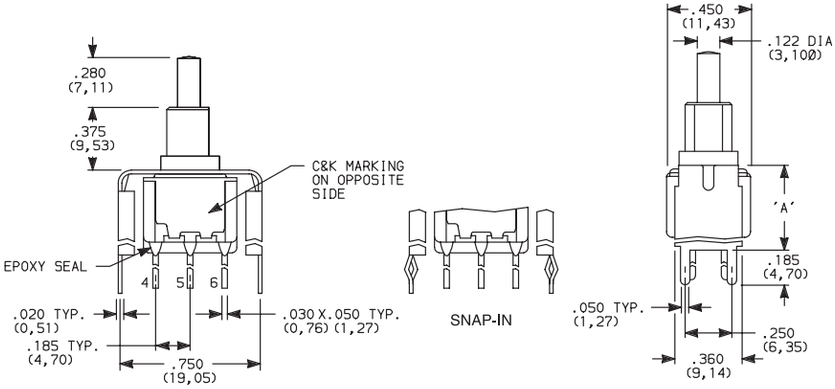


OPTION CODE	DIM 'A'
V21	.555 (14,10)
V6	.460 (11,68)

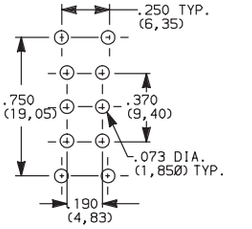
Not available with I seal.

V6 VERTICAL MOUNT, V-BRACKET
V21 VERTICAL MOUNT, V-BRACKET, SNAP-IN

8261SH9__BE2
DPDT



PC MOUNTING



OPTION CODE	DIM 'A'
V21	.555 (14,10)
V6	.460 (11,68)

Not available with I seal.

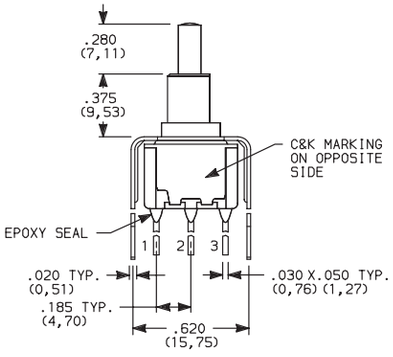
Third Angle Projection

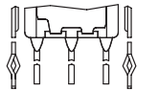
Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

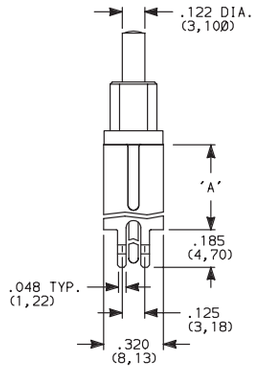
TERMINATIONS

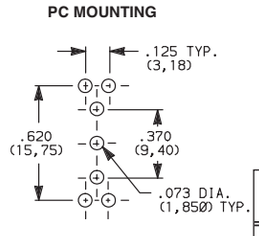
V3, V4 VERTICAL MOUNT, V-BRACKET

V31 VERTICAL MOUNT, V-BRACKET, SNAP-IN









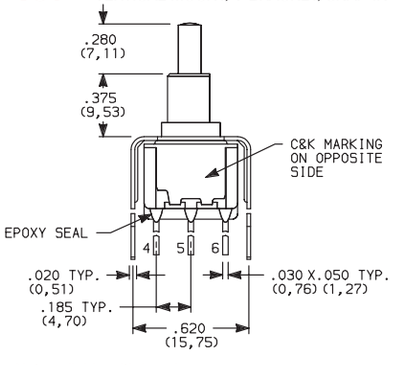
8161SH9__BE2
SPDT

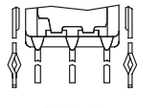
OPTION CODE	DIM 'A'
V3, V31	.460 (11,68)
V4	.630 (16,00)

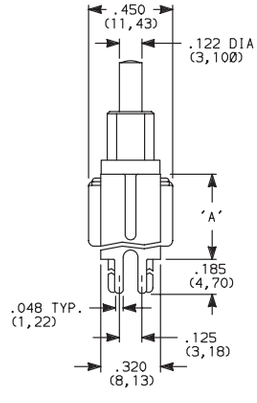
Not available with I seal.

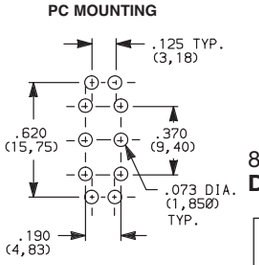
V3, V4 VERTICAL MOUNT, V-BRACKET

V31 VERTICAL MOUNT, V-BRACKET, SNAP-IN









8261SH9__BE2
DPDT

OPTION CODE	DIM 'A'
V3, V31	.460 (11,68)
V4	.630 (16,00)

Not available with I seal.

CONTACT MATERIAL

OPTION CODE	CONTACT MATERIAL	TERMINAL PLATING	RATINGS	
B	GOLD [1]	GOLD [1]	LOW LEVEL/DRY CIRCUIT	0.4 VA MAX. @ 20 V AC OR DC MAX.
P		MATTE-TIN [6]		
Q	SILVER [4,5]	SILVER [5]	POWER	6 AMPS @ 120 V AC OR 28 V DC; 3 AMPS @ 250 V AC.
S		MATTE-TIN [6]		
G	GOLD OVER SILVER [2,3]	GOLD [3]	LOW LEVEL/DRY CIRCUIT OR POWER	0.4 VA MAX @ 20 V AC OR DC MAX. OR 6 AMPS @ 120 V AC OR 28 V DC; 3 AMPS @ 250 V AC.
R		MATTE-TIN [6]		

* Note: See Technical Data section of this catalog for RoHS compliant and compatible definitions and specifications.

[1] CONTACTS & TERMINALS: Copper alloy, with gold plate over nickel plate.

[2] END CONTACTS: Coin silver, with gold plate over nickel plate.

[3] CENTER CONTACTS & ALL TERMINALS: Copper alloy, with gold plate over nickel plate.

[4] END CONTACTS: Coin silver, silver plated.

[5] CENTER CONTACT & ALL TERMINALS: Copper alloy, silver plated.

[6] TERMINALS: Copper alloy, with matte-tin over nickel plate.

NOTE: Any models supplied with P, S, R,Q, B or G contact material are RoHS compliant.

All models c UL us with all options when ordered with S, R, G, or Q contact material.

B contact material standard with all terminations except C, Z & Z3.

Q contact material standard with C, Z & Z3 terminations.

P, S & R contact materials not available with Z & Z3 terminations.

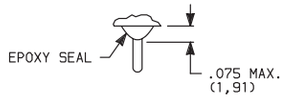
Third Angle Projection

Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

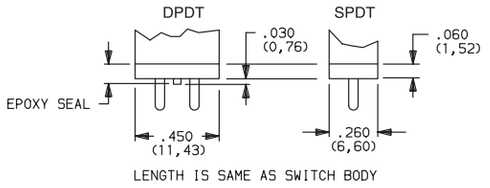
8060 Series
Alternate Action and Momentary Pushbutton Switches

SEAL

E EPOXY SEAL



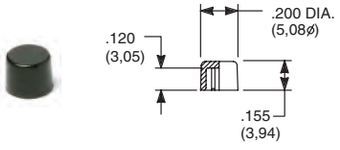
I EPOXY POTTED BASE



NOTE: Available with C, W, Z, Z3 terminations only.

AVAILABLE HARDWARE

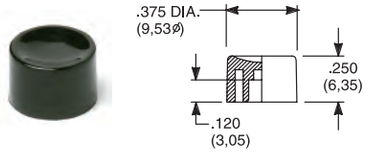
Cap



PART NO.	
708901000	WHITE
708902000	BLACK
708903000	RED
708904000	ORANGE
708905000	YELLOW
708909000	GRAY

Material: Nylon
Finish: Gloss

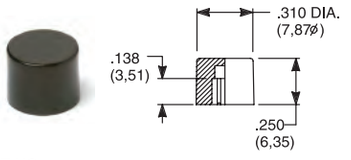
Cap



PART NO.	
752701000	WHITE
752702000	BLACK
752703000	RED
752704000	ORANGE
752705000	YELLOW
752709000	GRAY

Material: Nylon
Finish: Gloss

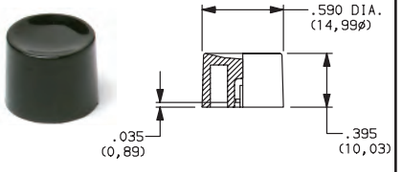
Cap



PART NO.	
801801000	WHITE
801802000	BLACK
801803000	RED
801804000	ORANGE
801805000	YELLOW
801809000	GRAY

Material: Nylon
Finish: Gloss

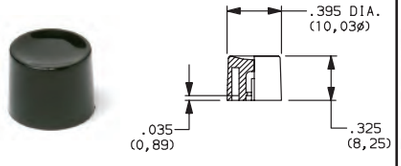
Cap, Snap-fitting plunger



PART NO.	
452D01000	WHITE
452D02000	BLACK
452D03000	RED
452D04000	ORANGE
452D05000	YELLOW
452D09000	GRAY

Material: Nylon
Finish: Gloss

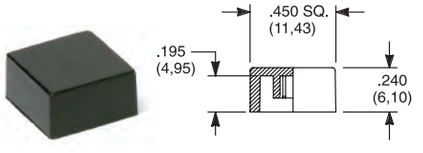
Cap, Snap-fitting plunger



PART NO.	
894101000	WHITE
894102000	BLACK
894103000	RED
894104000	ORANGE
894105000	YELLOW
894109000	GRAY

Material: Nylon
Finish: Gloss

Cap, J80, J81 & J82 options only

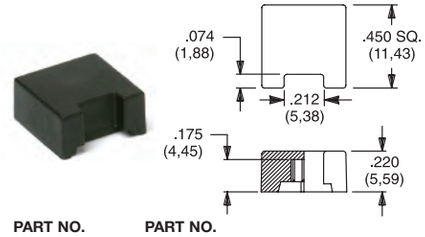


PART NO.		PART NO.	
484601000	WHITE	798201000	WHITE
484602000	BLACK	798202263	BLACK
484603000	RED	798203000	RED
484604000	ORANGE	798204000	ORANGE
484605000	YELLOW	798205000	YELLOW
484609000	GRAY	798209000	GRAY

Material: Nylon
Finish: Gloss

Material: Nylon
Finish: Matte

Cap, J86 & J96 options only



PART NO.	PART NO.	
459701000	476801000	WHITE
459702000	476802000	BLACK
459703000	476803000	RED
459704000	476804000	ORANGE
459705000	476805000	YELLOW
459709000	476809000	GRAY

Material: Nylon
Finish: Gloss

Material: Nylon
Finish: Matte

Frame

PART NO.	
615602263	BLACK

Material: Nylon
Finish: Matte

Frame

PART NO.	
613302263	BLACK

Material: Nylon
Finish: Matte

NOTE: Additional nuts, locking rings and lockwashers available separately, see section "Technical Data and Additional Hardware".
Other cap & frame colors available, consult Customer Service Center.

Third Angle Projection

Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

AVAILABLE HARDWARE

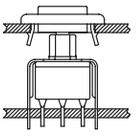
Fits Z3 Termination female connector

PART NO.
530100000

Available in loose pieces.

Frames snap into panel opening and are independent from switch mounting. Accurate positioning of the PC mounted switch relative to the panel opening is necessary to provide proper clearance between actuator and frame. Available in two basic styles and four panel thicknesses .047-.125 in. Material: Nylon. Finish: Matte.

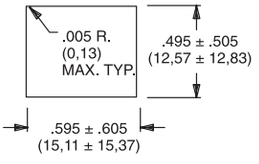
TYPICAL APPLICATION



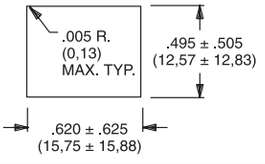
.047" (1,19) PANEL THK.	.062" (1,57) PANEL THK.	.090" (2,29) PANEL THK.	.125" (3,18) PANEL THK.
PART NO.	**PART NO.**	**PART NO.**	**PART NO.**
432502263	432602263	432702263	432802263 BLACK

PANEL MOUNTING

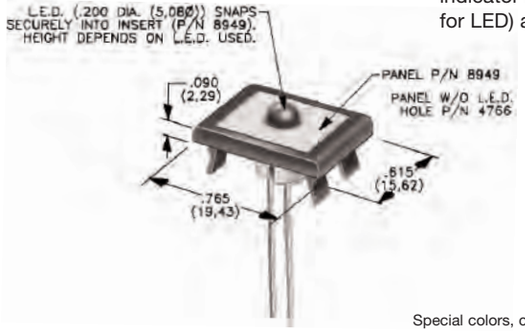
For part numbers 4325xxxxx, 4326xxxxx



For part numbers 4327xxxxx, 4328xxxxx



Panel Inserts



Above frames (part nos. 432XXXXXX) are also available with insert which accepts LED for indicator light assembly. Order insert separately from frame. Blank insert panel (without hole for LED) also available. **LED not included.**

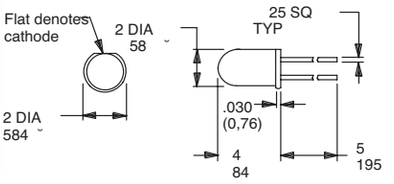
PANEL INSERT WITH HOLE FOR LED	BLANK PANEL INSERT WITHOUT HOLE FOR LED
PART NO.	**PART NO.**
894902000	476602000 BLACK

Special colors, custom markings available, consult Customer Service Center.

LED INFORMATION

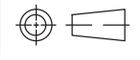
SWITCHES WITH LED SUPPLIED: J86 OPTION:
Rectangular LEDs are supplied on 8060 Series pushbutton switches with J86 option. These LEDs are factory installed and are not replaceable. The following specifications apply:

OPTION CODE	COLOR	TYP. INTENSITY	TYP. FORWARD VOLTAGE	TYP. FORWARD CURRENT	MAX RATINGS AT 25°C AMBIENT TEMPERATURE		
					FORWARD VOLTAGE	CONTINUOUS FORWARD CURRENT	POWER DISSIPATION
6	Green	1.0 mcd	2.1 V	20 mA	2.5 V	50 mA	125 mW
3	Red*	0.5 mcd		10 mA		30 mA	75 mW
5	Yellow	4.0 mcd		20 mA		50 mA	125 mW



Suggested LED for J82 & J84 options
Dimensions for reference only

Process Information: Soldering to LED leads must be completed within 5 seconds at 500°F (260°C) maximum.
Caution: Circuit elements must limit forward current of LED to 50mA max. continuous.
* Extra-bright red LED available (typ. intensity 4.5 mcd), consult Customer Service Center.
LEDs are not supplied with J82 & J84 options. LED snaps into switch frame surrounding actuator and is wired externally.



Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

8500 Series
Subminiature Pushbutton Switches

Features/Benefits

- *Pre-travel or over-travel models available*
- *Ratings up to 3 AMPS*
- *Reliable contact design*
- *RoHS compliant*

Typical Applications

- *Detection*
- *Telecommunications and networking equipment*
- *Computers and peripherals*

Models Available

Specifications

CONTACT RATING: Q contact material (853X Models): 1 AMP @ 120 V AC or 28 V DC; (855X Models): 3 AMPS @ 120 V AC or 28 V DC. See page A-65 for additional ratings.

ELECTRICAL LIFE:
853X MODELS: 250,000 actuations at full load.
855X MODELS: 10,000 actuations at full load.

CONTACT RESISTANCE: Below 30 mΩ typ. initial @ 2-4 V DC, 100 mA, for both silver and gold plated contacts.

INSULATION RESISTANCE: $10^9\Omega$ min.

DIELECTRIC STRENGTH: 1,000 Vrms min. @ sea level.

OPERATING TEMPERATURE: –30°C to 65°C.

TORQUE SPECS: T, T1 15/32" bushings - 50 in. lbs max. All other 1/4 -40 bushing types 12 in. lbs max.

Materials

CASE: Glass filled phenolic or diallyl phthalate (DAP) (UL 94V-0).

PLUNGER: Phenolic or glass filled polyester, black standard(UL94V-0).

CAP & FRAME: Nylon, black, standard.

BUSHING: Brass, nickel plated.

CONTACTS: Q contact material: Coin silver, silver plated. See page A-65 for additional contact materials.

TERMINALS: Q contact material: Copper alloy, silver plated. See page A-65 for additional contact materials.

TERMINAL SEAL: Epoxy.

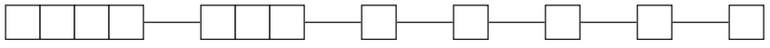
HARDWARE: Nut: Brass, nickel plated; Lockwasher: Steel, bright nickel plated.

NOTE: Any models supplied with Q, B or G contact material are RoHS compliant.

NOTE: Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.

Build-A-Switch

To order, simply select desired option from each category and place in the appropriate box. Available options are shown and described on pages A-63 thru A-66. For additional options not shown in catalog, consult Customer Service Center. All models have epoxy terminal seal and are compatible with all "bottom-wash" PCB cleaning methods.



Switch Function
- **8531** SPST Off-Mom. 1 Amp
- **8532** SPST Off-Mom. 1 Amp
- **8533** SPST On-Mom. 1 Amp
- **8534** SPST On-Mom. 1 Amp
- **8551** SPST Off-Mom. 3 Amps
- **8552** SPST Off-Mom. 3 Amps

Actuator or Plunger
- **M** .150" high
- **J81** Snap-in with frame
- **J82** Snap-in with frame for LED
- **S** .210" high
- **T** 15/32 bushing
- **T1** 15/32 bushing with frame (8532 and 8534 only)

Terminations
- **Z** Solder lug
- **AV*** Right angle, PC thru-hole
- **C** PC Thru-hole

Contact Material
- **Q** Silver
- **B** Gold
- **G** Gold over silver

Seal
- **E** Epoxy
- **D** No epoxy seal

Cap or Plunger Color
- **2** Black
- **1** White
- **3** Red
- **9** Gray

Frame Color
- **2** Black
- **NONE** Models without frame

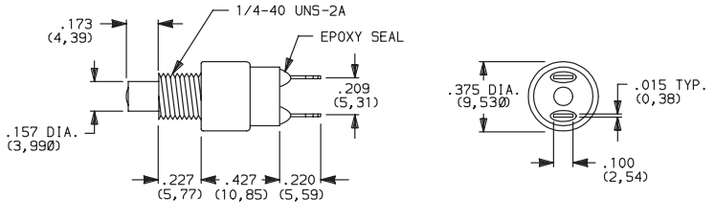
* Available with M or S plunger models, and B contact material only.

Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

SWITCH FUNCTION

NO. POLES	MODEL NO.	RATING	SWITCH FUNCTION POS. 1	SWITCH FUNCTION POS. 2	TOTAL TRAVEL	ACTUATION FORCE	SCHEMATIC
SP	8531	1 AMP	OFF	MOM.	.095 (2,41) TYP. with overtravel .042 (1,07) TYP.	7.7 oz (220g) TYP.	N.O. with overtravel
	8551	3 AMPS					

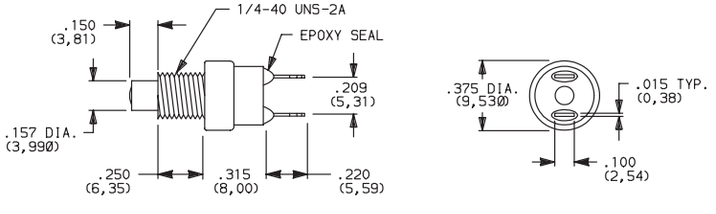
SPST



Part number shown: 8531MZQE2

NO. POLES	MODEL NO.	RATING	SWITCH FUNCTION POS. 1	SWITCH FUNCTION POS. 2	TOTAL TRAVEL	ACTUATION FORCE	SCHEMATIC
SP	8532	1 AMP	OFF	MOM.	.050 (1,27) TYP.	6 oz (170g) TYP.	N.O.
	8552	3 AMPS					

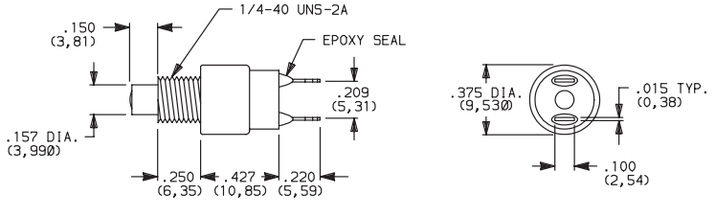
SPST



Part number shown: 8532MZQE2

NO. POLES	MODEL NO.	RATING	SWITCH FUNCTION POS. 1	SWITCH FUNCTION POS. 2	TOTAL TRAVEL	ACTUATION FORCE	SCHEMATIC
SP	8533	1 AMP	ON	MOM.	.080 (2,03) TYP. with pretravel .057 (1,45) TYP.	11.5 oz (456 g) TYP.	N.C. with pretravel
	8534	1 AMP	ON	MOM.	.032 (0,81) TYP. with overtravel .028 (0,71) TYP.	10.3 oz (282g) TYP.	N.C. with overtravel

SPST



Part number shown: 8533MZQE2

MOM. = Momentary

All models with all options when ordered with G or Q contact material.

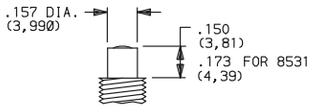
Third Angle Projection

Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

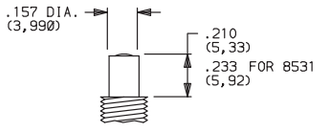
8500 Series
Subminiature Pushbutton Switches

PLUNGER

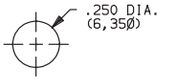
M .150" HIGH PLUNGER



S .210" HIGH PLUNGER



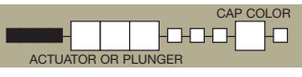
PANEL MOUNTING



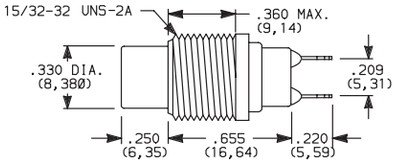
OPTION CODE	PLUNGER COLOR
2	BLACK
3	RED

NOTE: One mounting nut and lockwasher supplied with all actuators (except T actuator: two nuts supplied).

ACTUATOR

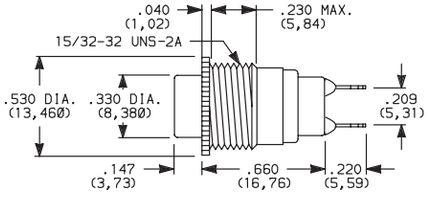


T 15/32 BUSHING



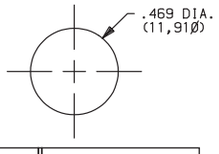
NOTE: No frame color choice required.

T1 15/32 BUSHING WITH FRAME



NOTE: No frame color choice required.
Available with 8532 and 8534 models only.

PANEL MOUNTING



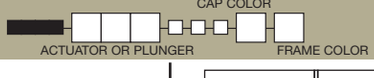
OPTION CODE	CAP COLOR
2	BLACK
1	WHITE
3	RED
9	GRAY

Cap Finish: gloss. Other colors available, consult Customer Service Center.

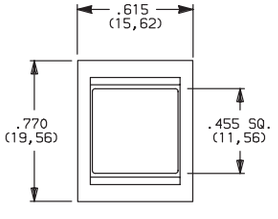
One mounting nut and lockwasher supplied with all actuators (except T actuator: two nuts supplied).

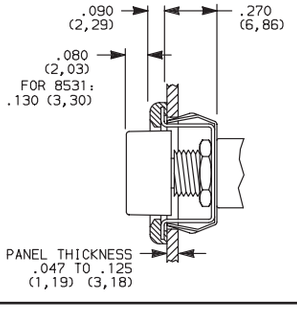
NOTE: Caps available for plunger options, see page A-65.

ACTUATOR—SNAP-IN FRONT MOUNT



J81 SNAP-IN WITH FRAME





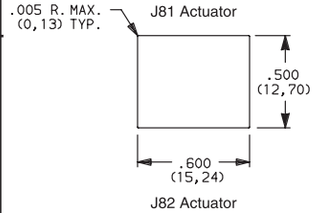
OPTION CODE	CAP AND FRAME COLOR
2	BLACK

Cap and Frame Finish: matte.
Other colors available,
consult Customer Service Center.

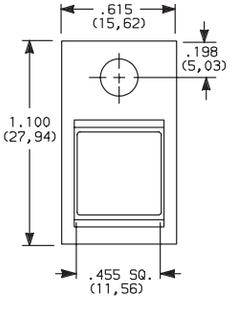
One mounting nut and lockwasher supplied with all actuators.

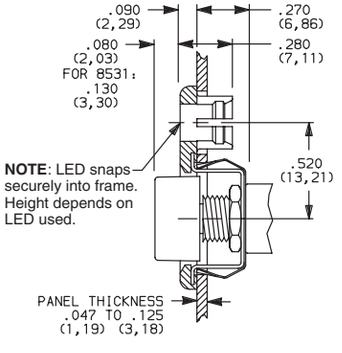
NOTE: Caps & frames available separately, see pages A-65 and A-66.

PANEL MOUNTING



J82 SNAP-IN WITH FRAME FOR LED

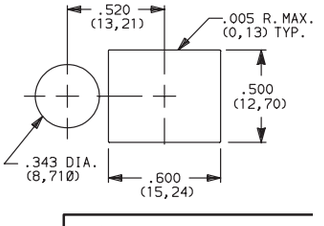




NOTE: LED snaps securely into frame. Height depends on LED used.

LED not included.
For LED information, see page A-66.

J82 Actuator

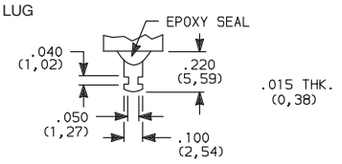


Third Angle Projection

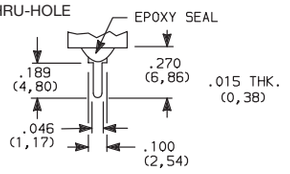
Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

TERMINATIONS

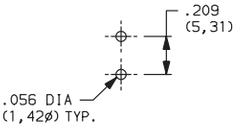
Z SOLDER LUG



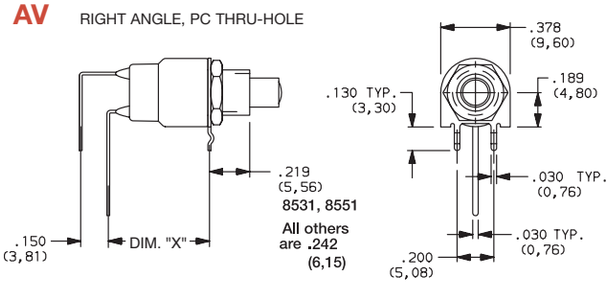
C PC THRU-HOLE



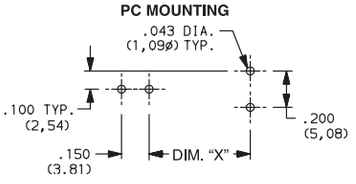
PC MOUNTING



AV RIGHT ANGLE, PC THRU-HOLE



PC MOUNTING



Available with

MODEL NO.	DIM "X"
8531, 8533	0.550
8532, 8534	0.438

NOTE: Available with M or S plunger models, and B contact material only.

CONTACT MATERIAL

OPTION CODE	RoHS COMPLIANT *	RoHS COMPATIBLE *	TERMINAL PLATING	CONTACT MATERIAL	RATINGS	
B	YES	YES	GOLD [1]	GOLD	LOW LEVEL/DRY CIRCUIT	0.4 VA MAX. @ 20 V AC OR DC MAX.
Q	YES	YES	SILVER [4]	SILVER [5]	POWER	853X MODELS: 1 AMP @ 120 V AC OR 28 V DC. 855X MODELS: 3 AMPS @ 120 V AC OR 28 V DC.
G	YES	YES	GOLD OVER SILVER [2]	GOLD [3]	LOW LEVEL/DRY CIRCUIT OR POWER	0.4 V MAX @20 V AC OR DC MAX. OR 853X MODELS: 1 AMP @ 120 V AC OR 28 V DC. 855X MODELS: 3 AMPS @120 V AC OR 28 V DC.

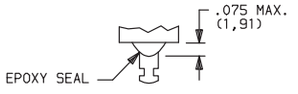
* Note: See Technical Data section of this catalog for RoHS compliant and compatible definitions and specifications.

[1] CONTACTS & TERMINALS: Copper alloy, with gold plate over nickel plate.
[2] CONTACTS: Coin silver, with gold plate over nickel plate.
[3] TERMINALS: Copper alloy, with gold plate over nickel plate.
[4] CONTACTS: Coin silver, silver plated.
[5] TERMINALS: Copper alloy, silver plated.

NOTE: Any models supplied with Q, B or G contact material are RoHS compliant.
All models ® with all options when ordered with G or Q contact material.
Q contact material standard with C, Z terminations.
8551 & 8552 available with Q contact material only.

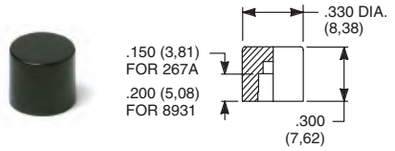
SEAL

E EPOXY SEAL



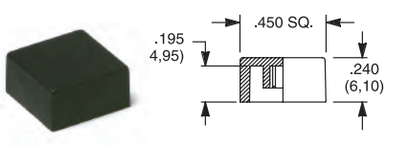
REPLACEMENT HARDWARE

Cap for 0.157" dia. plungers



PART NO.		PART NO.	
267A01000	WHITE	893101000	WHITE
267A02000	BLACK	893102000	BLACK
267A03000	RED	893103000	RED
267A09000	GRAY	893109000	GRAY
85X2T, 8534T models only		85X1T, 8532T1, 8533T, 8534T1 models only	
Material: Nylon Finish: Gloss		Material: Nylon Finish: Gloss	

Cap, J80, J81 & J 82 options only



PART NO.

448901000	WHITE
448902000	BLACK
448903000	RED
448909000	GRAY

Material: Nylon
Finish: Gloss or matte

Frame

PART NO.

613302263 BLACK

Material: Nylon
Finish: Matte

Other colors available, consult Customer Service Center.

Third Angle Projection

Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

8500 Series
Subminiature Pushbutton Switches

AVAILABLE HARDWARE

Frame

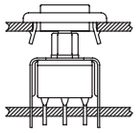
PART NO.
615602263 BLACK

Material: Nylon
Finish: Matte

NOTE: Additional nuts, locking rings and lockwashers available separately, see section "Technical Data and Additional Hardware".
Other colors available, consult Customer Service Center.

Frames snap into panel opening and are independent from switch mounting. Accurate positioning of the PC mounted switch relative to the panel opening is necessary to provide proper clearance between actuator and frame. Available in two basic styles and four panel thicknesses .047-.125 in. Material: Nylon. Finish: Matte.

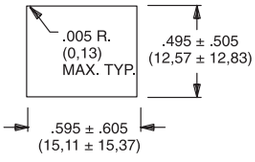
TYPICAL APPLICATION



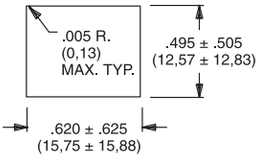
.047" (1,19) PANEL THK.	.062" (1,57) PANEL THK.	.090" (2,29) PANEL THK.	.125" (3,18) PANEL THK.
PART NO.	**PART NO.**	**PART NO.**	**PART NO.**
432502263	432602263	432702263	432802263 BLACK

PANEL MOUNTING

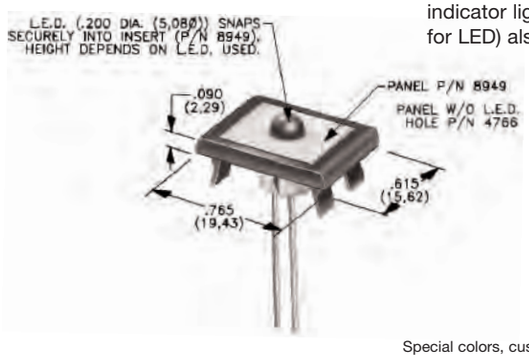
For part numbers
4325xxxxx, 4326xxxxx



For part numbers
4327xxxxx, 4328xxxxx



Panel Inserts



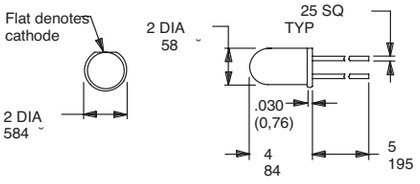
Above frames (part nos. 432XXXXXX) are also available with insert which accepts LED for indicator light assembly. Order insert separately from frame. Blank insert panel (without hole for LED) also available. **LED not included.**

PANEL INSERT WITH HOLE FOR LED	BLANK PANEL INSERT WITHOUT HOLE FOR LED
PART NO.	**PART NO.**
894902000	476602000 BLACK

Special colors, custom markings available, consult Customer Service Center.

LED INFORMATION

Process Information: Soldering to LED leads must be completed within 5 seconds at 500°F (260°C) maximum.
LEDs are not supplied with J82 option. LED snaps into switch frame surrounding actuator and is wired externally.



Suggested LED for J82 option
Dimensions for reference only

Third Angle Projection

Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

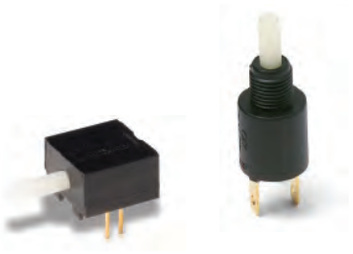
KM Series
Subminiature Pushbutton Switches

Features/Benefits

- ***Reliable contact design***
- ***Available with pretravel and overtravel***
- ***RoHS compliant***

Typical Applications

- ***Alarm systems***
- ***Computers***
- ***Detector switch application***



Models Available

Specifications

CONTACT RATING: Q contact material (KM11, KM12 Models): 0.25 AMPS @ 125 V AC or DC (UL); (KM33 Model): 1 AMP @ 125 V AC or 28 V DC. See page A-69 for additional ratings.

ELECTRICAL LIFE: 10,000 actuations min. at full load.

CONTACT RESISTANCE: Below 30 mΩ typ. initial @ 2-4 V DC, 100 mA, for both silver and gold plated contacts.

INSULATION RESISTANCE: $10^9\Omega$ min.

DIELECTRIC STRENGTH: 1,000 Vrms min. @ sea level.

OPERATING TEMPERATURE: –30°C to 85°C.

CAP INSTALLATION FORCE: 10 lbs. max. permissible.

NOTE: Any models supplied with Q or B contact material are RoHS compliant.

NOTE: Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.

Materials

HOUSING & BUSHING: 6/6 nylon (UL94V-2), black.

ACTUATOR: 6/6 nylon (UL 94V-2), natural. Internal o-ring seal, available on KM11 & KM33 models.

MOVABLE CONTACT: B contact material: Bronze or copper, with gold plate over nickel plate. See page A-69 for additional contact materials.

STATIONARY CONTACTS & TERMINALS: B contact material: Copper, with gold plate over nickel plate. See page A-69 for additional contact materials.

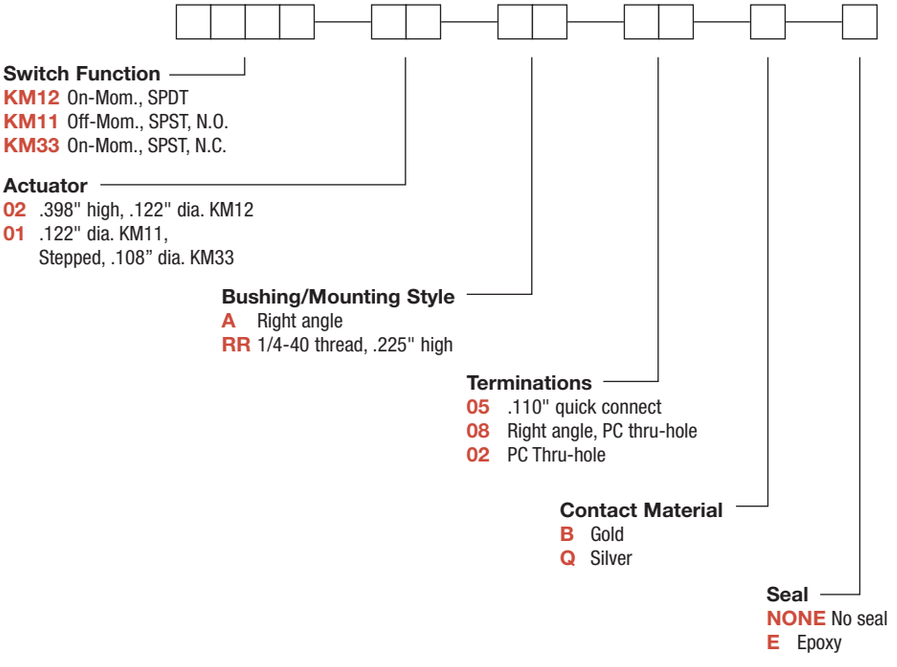
RETURN SPRING: Music wire, phosphor coated.

MOUNTING NUT: Brass, nickel plated.

TERMINAL SEAL: Epoxy.

Build-A-Switch

To order, simply select desired option from each category and place in the appropriate box. Available options are shown and described on pages A-68 and A-70. For additional options not shown in catalog, consult Customer Service Center.



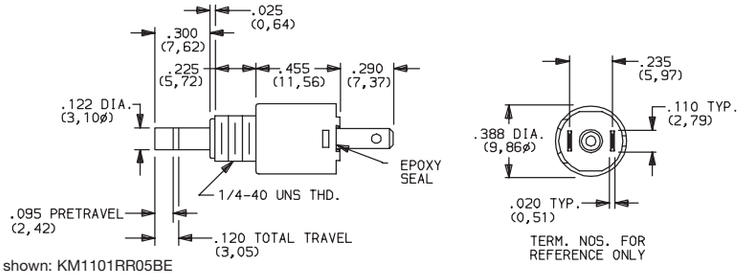
Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

KM Series
Subminiature Pushbutton Switches

SWITCH FUNCTION

NO. POLES	MODEL NO.	SWITCH FUNCTION POS. 1	SWITCH FUNCTION POS. 2	CONNECTED TERMINALS POS. 1	CONNECTED TERMINALS POS. 2	SCHEMATIC
SP	KM11	OFF	MOM.	OPEN	2-1	SPST N.O.
	KM33	ON	MOM.	2-1	OPEN	SPST N.C.

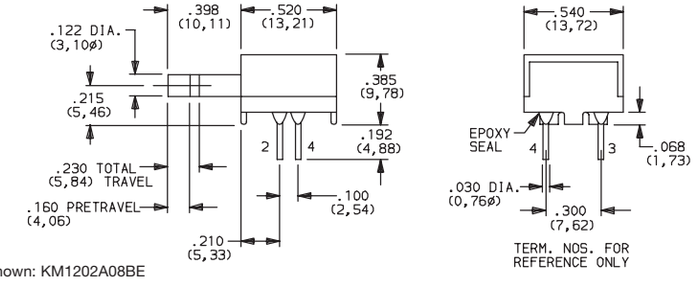
SPST



Part number shown: KM1101RR05BE

NO. POLES	MODEL NO.	SWITCH FUNCTION POS. 1	SWITCH FUNCTION POS. 2	CONNECTED TERMINALS POS. 1	CONNECTED TERMINALS POS. 2	SCHEMATIC
SP	KM12	ON	MOM.	2-1	4-3	SPDT

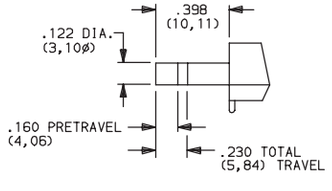
SPDT



Part number shown: KM1202A08BE

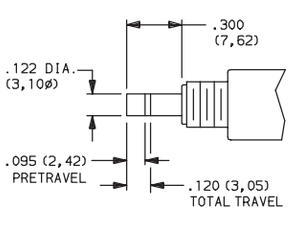
ACTUATOR

02 .398" HIGH, .122" DIA.

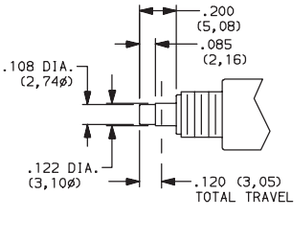


KM12 models only.

01 .122" DIA.



KM11 models only.



KM33 models only.

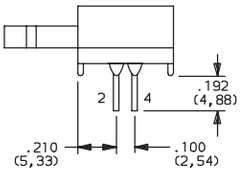
NOTE: Caps available for plunger options, see page A-70.

Third Angle Projection

Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

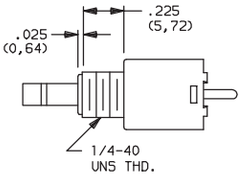
BUSHING/ MOUNTING STYLE

A RIGHT ANGLE



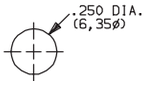
KM12 models only.

RR 1/4-40 THREAD, .225" HIGH



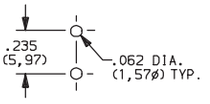
KM11 & KM33 models only.

PANEL MOUNTING

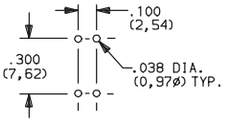


KM11 & KM33 models.

PC MOUNTING



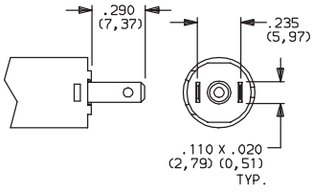
KM11 models only.



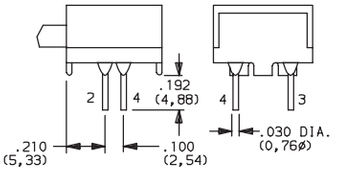
KM12 models only.

TERMINATIONS

05 .110" QUICK CONNECT

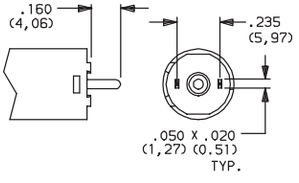


08 RIGHT ANGLE, PC THRU-HOLE



KM12 models only.

02 PC THRU-HOLE



KM11 models only.

CONTACT MATERIAL

OPTION CODE	RoHS COMPLIANT *	RoHS COMPATIBLE *	CONTACT AND TERMINAL MATERIAL	RATINGS	
B	YES	YES	GOLD [1]	LOW LEVEL/DRY CIRCUIT	0.4 VA MAX. @ 20 V AC OR DC MAX.
Q	YES	YES	SILVER [2]	POWER	0.25 AMPS @ 125 V AC OR DC (KM11, KM12) (UL) 1 AMP @ 125 V AC OR 28 V DC (KM33).

* Note: See Technical Data section of this catalog for RoHS compliant and compatible definitions and specifications.

[1] STATIONARY CONTACTS & TERMINALS: Copper, with gold plate over nickel plate.
MOVABLE CONTACT: Phosphor bronze or beryllium copper, with gold plate over nickel plate.

[2] STATIONARY CONTACTS & TERMINALS: Copper, silver plated (standard with all termination options).
MOVABLE CONTACT: Phosphor bronze or beryllium copper, silver plated.

[3] STATIONARY CONTACTS & TERMINALS: Copper, with gold plate over nickel plate over silver plate.
MOVABLE CONTACT: Phosphor bronze or beryllium copper, with gold plate over nickel plate over silver plate.

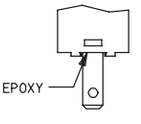
NOTE: Any models supplied with Q or B contact material are RoHS compliant.

KM11, KM12 models ⓤ when ordered with 'Q' contact material.

SEAL

NONE NO SEAL

E EPOXY SEAL



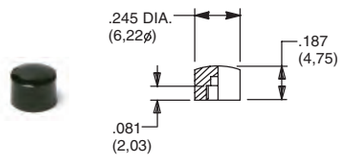
Third Angle Projection

Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

KM Series
Subminiature Pushbutton Switches

AVAILABLE HARDWARE

Cap, KM33 models

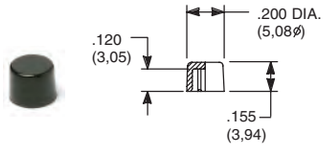


PART NO.

785101000	WHITE
785102000	BLACK
785103000	RED

Material: Nylon
Finish: Gloss

Cap, KM11 and KM12 models

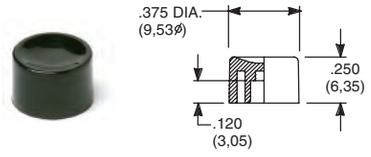


PART NO.

708901000	WHITE
708902000	BLACK
708903000	RED

Material: Nylon
Finish: Gloss

Cap, KM11 and KM12 models

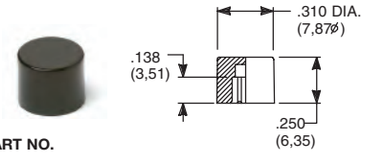


PART NO.

752701000	WHITE
752702000	BLACK
752703000	RED

Material: Nylon
Finish: Gloss

Cap, KM11 and KM12 models

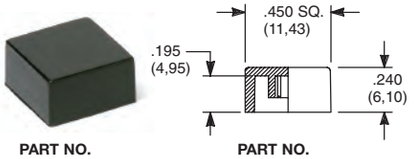


PART NO.

801801000	WHITE
801802000	BLACK
801803000	RED

Material: Nylon
Finish: Gloss

Cap, KM11 models



PART NO.

484601000	WHITE
484602000	BLACK
484603000	RED

Material: Nylon
Finish: Gloss

PART NO.

798201000	WHITE
798202263	BLACK
798203000	RED

Material: Nylon
Finish: Matte

NOTE: Other cap colors available, consult Customer Service Center.

Third Angle Projection

Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

8600 Series
Microminiature Pushbutton Switches

Features/Benefits

- ***Available with overtravel***
- ***Normally closed models available***
- ***Microminiature size ideal for applications where space is limited***
- ***RoHS compliant***

Typical Applications

- ***Detection***
- ***Telecommunications and networking equipment***
- ***Computers and peripherals***

Models Available

Specifications

CONTACT RATING: Q contact material (8631, 8632 Models): 500 mA @ 120 V AC or 28 V DC; 250 mA @ 250 V AC; (8633 Model): 250 mA @ 120 V AC or 28 V DC; 125 mA @ 250 V AC. See page A-73 for additional ratings.

ELECTRICAL LIFE:
8631 and 8633 MODELS: 250,000 actuations at full load.
8632 MODEL: 100,000 actuations at full load.

CONTACT RESISTANCE: Below 30 mΩ typ. initial @ 2-4 V DC, 100 mA, for both silver and gold plated contacts.

INSULATION RESISTANCE: 109 Ω min.

DIELECTRIC STRENGTH: 500 Vrms min. @ sea level.

OPERATING TEMPERATURE: –30°C to 65°C.

SOLDERABILITY: Per MIL-STD-202F method 208D, or EIA RS-186E method 9.

Materials

CASE: Glass filled phenolic or diallyl phthalate (DAP), (UL94V-0).

PLUNGER: Glass filled nylon (UL94V-0), black standard.

BUSHING: Brass, nickel plated.

CONTACTS: Q contact material: Coin silver, silver plated. See page A-73 for additional contact materials.

TERMINALS:
8631, 8632 MODELS: Copper alloy, silver plated.
8633 MODEL: Q contact material: Coin silver.
See page A-73 for additional contact materials.

TERMINAL SEAL:
8633 MODEL: Epoxy.
8631, 8632 MODELS: Terminals insert molded.

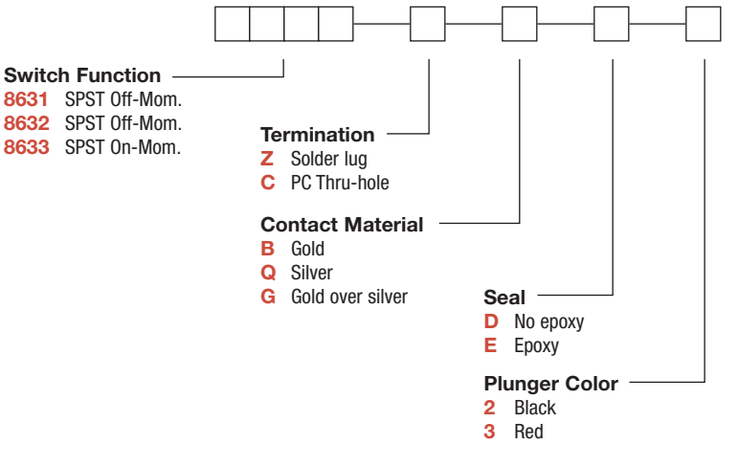
HARDWARE: Nut: Brass, nickel plated.

NOTE: Any models supplied with Q, B or G contact material are RoHS compliant.

NOTE: Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.

Build-A-Switch

To order, simply select desired option from each category and place in the appropriate box. Available options are shown and described on pages A-72 and A-73. For additional options not shown in catalog, consult Customer Service Center.

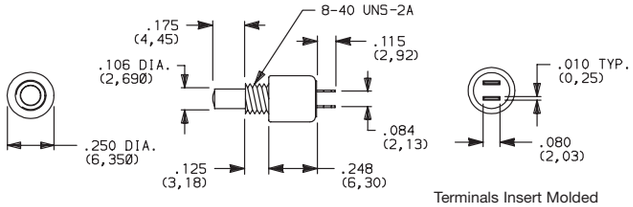


8600 Series
Microminiature Pushbutton Switches

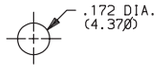
SWITCH FUNCTION

NO. POLES	MODEL NO.	SWITCH FUNCTION POS. 1	SWITCH FUNCTION POS. 2	TOTAL TRAVEL	ACTUATION FORCE	SCHEMATIC
SP	8631	OFF	MOM.	.040 (1,02) TYP.	5 oz (140g) TYP.	N.O.

SPST



PANEL MOUNTING

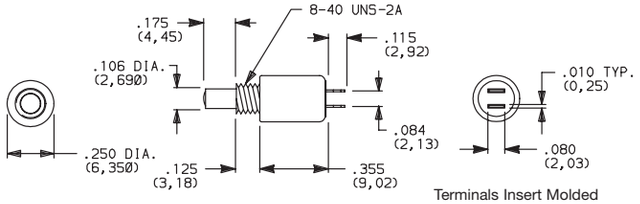


Part number shown: 8631ZQD2

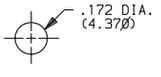
Terminals Insert Molded

SP	8632	OFF	MOM.	.106 (2,69) TYP. with overtravel .024 (0,61) TYP.	6.25 oz (177g) TYP.	N.O. with overtravel

SPST



PANEL MOUNTING

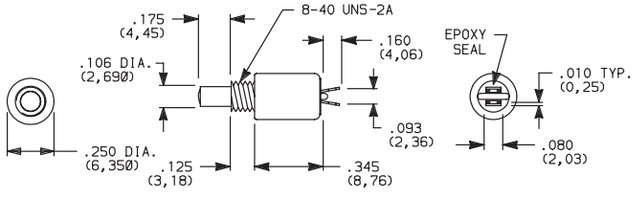


Part number shown: 8632ZQD2

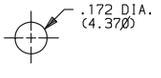
Terminals Insert Molded

SP	8633	ON	MOM.	.048 (1,22) TYP.	5 oz (140g) TYP.	N.C.

SPST



PANEL MOUNTING



Part number shown: 8633ZQE2

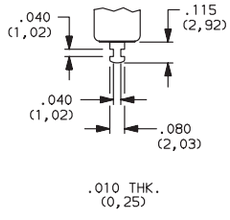
MOM. = Momentary

NOTE: Caps available for plunger options, see page A-73.

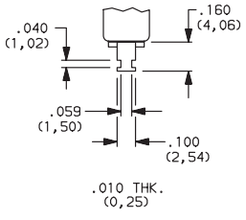
TERMINATIONS

Z SOLDER LUG

8631, 8632 models only.

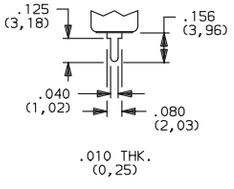


8633 models only.

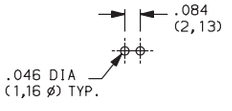


C PC THRU-HOLE

8631, 8632 models only.



PC MOUNTING



Third Angle Projection

Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

CONTACT MATERIAL

OPTION CODE	RoHS COMPLIANT *	RoHS COMPATIBLE *	CONTACT MATERIAL	TERMINAL PLATING	RATINGS	
B	YES	YES	GOLD [1]	GOLD [1]	LOW LEVEL/ DRY CIRCUIT	0.4 VA MAX. @ 20 V AC OR DC MAX.
Q	YES	YES	SILVER [4]	SILVER [5]	POWER	8631, 8632 MODELS: 500 mA @ 120 V AC OR 28 V DC; 250 mA @ 250 V AC. 8633 MODELS: 250 mA @ 120 V AC OR 28 V DC; 125 mA @ 250 V AC.
G	YES	YES	GOLD OVER SILVER [4]	GOLD [3]	LOW LEVEL/DRY CIRCUIT OR POWER	0.4 VA MAX @ 20 V AC OR DC MAX. OR 8631, 8632 MODELS: 500 mA @ 120 V AC OR 28 V DC; 250 mA @ 250 V AC. 8633 MODELS: 250 mA @ 120 V AC OR 28 V DC; 125 mA @ 250 V AC.

* Note: See Technical Data section of this catalog for RoHS compliant and compatible definitions and specifications.

[1] CONTACTS & TERMINALS: Copper alloy, with gold plate over nickel plate.

[2] CONTACTS: Coin silver, with gold plate over nickel plate.

[3] TERMINALS: Copper alloy, with gold plate over nickel plate.
8633 model only: Coin silver, with gold plate over nickel plate.

[4] CONTACTS: Coin silver, silver plated.

[5] TERMINALS: Copper alloy, silver plated. 8633 model only: coin silver.

NOTE: Any models supplied with Q, B or G contact material are RoHS compliant.

8631, 8632 models ® with all options when ordered with G or Q contact material.

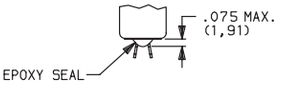
Q contact material standard with C, Z terminations.

SEAL

D NO EPOXY SEAL

Not available on 8633 model.
Standard on 8631, 8632 models.

E EPOXY SEAL



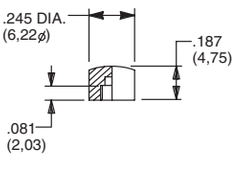
Not available on 8631, 8632 models.
Standard on 8633 model only.

PLUNGER COLOR

OPTION CODE	COLOR
2	BLACK
3	RED

AVAILABLE HARDWARE

Cap



PART NO.

785101000	WHITE
785102000	BLACK
785103000	RED

Material: Nylon
Finish: Gloss

NOTE: Other cap colors available, consult Customer Service Center.

Third Angle Projection

Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

8700 Series
Overtravel Pushbutton Switches

Features/Benefits

- *Extended pre-travel or over-travel*
- *Heavy-duty brass plunger*
- *Long electrical life — 100K cycles*
- *RoHS compliant*

Typical Applications

- *Telecommunications*
- *High end Instrumentation*
- *Medical & test equipment*
- *Detection*

Specifications

CONTACT RATING: Q contact material: 1 AMP @ 120 V AC or 28 V DC. See page A-76 for additional ratings.

ELECTRICAL LIFE: 100,000 actuations at full load.

CONTACT RESISTANCE: Below 30 mΩ typ. Initial @ 2-4 V DC, 100 mA.

INSULATION RESISTANCE: $10^3\Omega$ min.

DIELECTRIC STRENGTH: 1,000 Vrms min. @ sea level.

OPERATING TEMPERATURE: –30°C to 65°C.

NOTE: Any models supplied with Q, or B contact material are RoHS compliant.

NOTE: Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.

Materials

CASE: Diallyl phthalate (DAP) (UL 94V-0).

PLUNGER:
8731 – .390" brass, nickel plated.
8732 – .390" PBT polyester, black.

BUSHING: brass, nickel plated.

CONTACTS: Q contact material: Coin silver, silver plated. See page A-76 for additional contact materials.

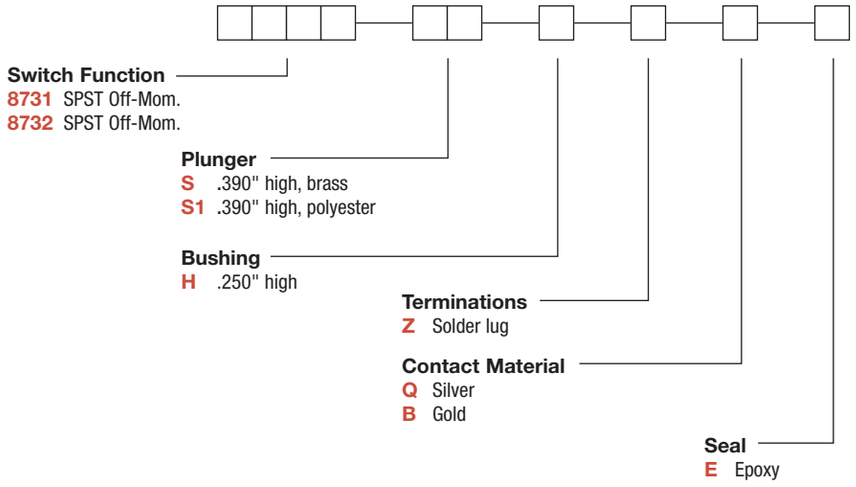
TERMINALS: Q contact material: Copper alloy, silver plated. See page A-76 for additional contact materials.

TERMINAL SEAL: Epoxy.

HARDWARE: Nut: Brass, nickel plated; lockwasher: Steel, bright nickel plate. One mounting nut & lockwasher supplied with all switches.

Build-A-Switch

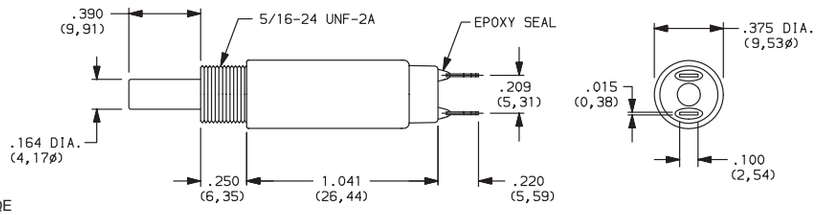
To order, simply select desired option from each category and place in the appropriate box. Available options are shown and described on pages A-75 and A-76. For additional options not shown in catalog, consult Customer Service Center. All models have epoxy terminal seal and are compatible with all “bottom-wash” PCB cleaning methods.



SWITCH FUNCTION

NO. POLES	MODEL NO.	SWITCH FUNCTION POS. 1	SWITCH FUNCTION POS. 2	TOTAL TRAVEL	ACTUATION FORCE	SCHEMATIC
SP	8731	OFF	MOM.	.390 (9,91) TYP. with overtravel .311 TYP.	4.7 oz TYP.	N.O. with overtravel SPST

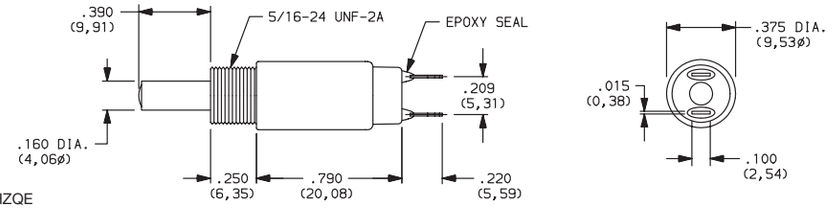
SPST



Part number shown: 8731SHZQE

NO. POLES	MODEL NO.	SWITCH FUNCTION POS. 1	SWITCH FUNCTION POS. 2	TOTAL TRAVEL	ACTUATION FORCE	SCHEMATIC
SP	8732	OFF	MOM.	.390 (9,91) TYP. with overtravel .350 TYP.	2.2 oz TYP.	N.O. with overtravel SPST

SPST

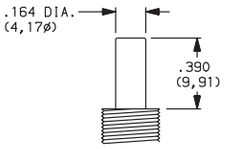


Part number shown: 8732S1HZQE

MOM. = Momentary

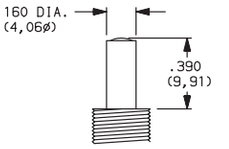
PLUNGER

S .390" HIGH, BRASS



Available with 8731 model only.

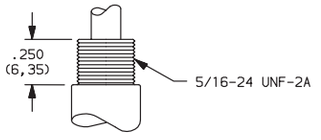
S1 .390" HIGH, PBT POLYESTER



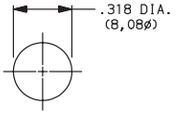
Available with 8732 model only.

BUSHING

H .250" HIGH



PANEL MOUNTING



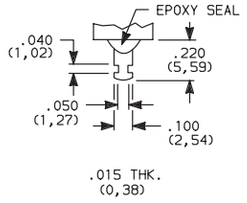
Third Angle Projection

Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

8700 Series
Overtravel Pushbutton Switches

TERMINATIONS

Z SOLDER LUG



CONTACT MATERIAL

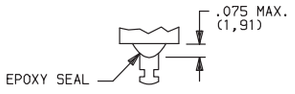
OPTION CODE	RoHS COMPLIANT *	RoHS COMPATIBLE *	CONTACT MATERIAL	TERMINAL PLATING	RATINGS	
Q	YES	YES	SILVER	SILVER	POWER	1 AMP @ 125 V AC OR 28 V DC.
B	YES	YES	GOLD	GOLD	LOW LEVEL/DRY CIRCUIT	0.4 VA MAX. @ 20 V AC OR DC MAX.

* Note: See Technical Data section of this catalog for RoHS compliant and compatible definition and specifications.

NOTE: Any models supplied with Q, or B contact material are RoHS compliant.

SEAL

E EPOXY SEAL



Third Angle Projection

Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

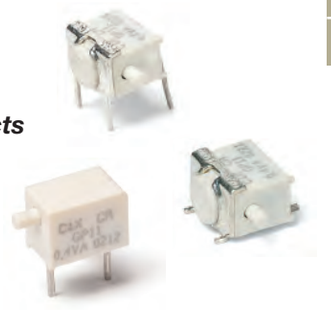
GP Series
Sealed Ultraminiature Pushbutton Switches

Features/Benefits

- ***Ultraminiature design saves space***
- ***Process compatible, withstands most soldering and washing processes***
- ***Thru-hole and surface mount models available***
- ***Sealed construction—internal o-ring and epoxy base***
- ***RoHS compliant***

Typical Applications

- ***Telecommunications and network equipment***
- ***Computers and peripheral products***
- ***Instrumentation***
- ***Medical Applications***



Specifications

CONTACT RATING: 0.4 VA max. @ 20 V AC or DC max.

MECHANICAL & ELECTRICAL LIFE: 40,000 make-and-break cycles at full load.

CONTACT RESISTANCE: Below 50 mΩ typ. initial @ 2-4 V DC, 100 mA.

INSULATION RESISTANCE: $10^9\Omega$ min.

DIELECTRIC STRENGTH: 500 Vrms min. @ sea level.

OPERATING TEMPERATURE: –40°C to 85°C.

SOLDERABILITY: Per MIL-STD-202F method 208D, or EIA RS-186E method 9 (1 hour steam aging).

DEGREE OF PROTECTION: IP57; Protection against harmful dust deposit, full-scale voltage protection, temporary immersion.

PACKAGING: Surface mount switches standard in anti-static tape and reel packaging per EIA 481-3, see page A-80 for drawings and reel information. Thru-Hole parts are shipped in trays.

All models are RoHS compliant and compliant.

Materials

HOUSING & BASE: Glass filled nylon 4/6, flame retardant, heat stabilized (UL 94V-0).

ACTUATOR: Glass filled nylon 4/6, flame retardant (UL 94V-0) with standard internal o-ring seal.

SWITCH SUPPORT: Brass, tin plated.

MOVABLE CONTACT: Copper alloy, with gold plate over nickel plate.

STATIONARY CONTACTS Copper alloy, with gold plate over nickel plate.

TERMINALS: Copper alloy, with gold flash over nickel plate.

TERMINAL SEAL: Epoxy/Urethane. All terminals insert molded.

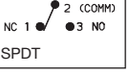
NOTE: Any models supplied with B contact material are RoHS compliant and compatible.

NOTE: Materials listed above are general specifications. Specifications available for specific and custom switches, consult Customer Service Center.

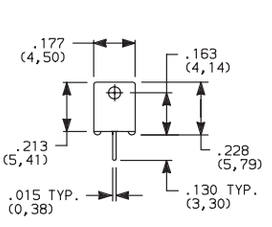
CAUTION: PC mounting layouts and pads as shown are designed to be compatible with the latest equipment and reflow techniques. Care should be taken in the design and location of PC lands to suit individual needs. Orientation relative to reflow direction may significantly impact solder joint integrity.

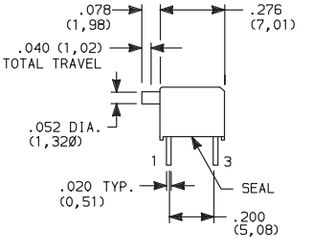
How To Order

Complete part numbers for GP Series Sealed Ultraminiature Pushbutton Switches are shown on pages A-78 thru A-80.

PART NUMBER	SWITCH FUNCTION POS.1	SWITCH FUNCTION POS. 2	SCHEMATIC
GP11MCBE	OFF	MOM.	
Conn. Terms.	OPEN	1-3	SPST
GP12MCBE	ON	MOM.	
Conn. Terms.	2-1	2-3	SPDT

MOM. = Momentary

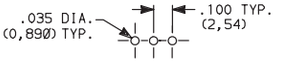




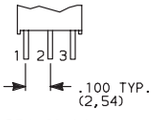
Terminal nos. for reference only.

GP11MCBE
SPST

PC MOUNTING



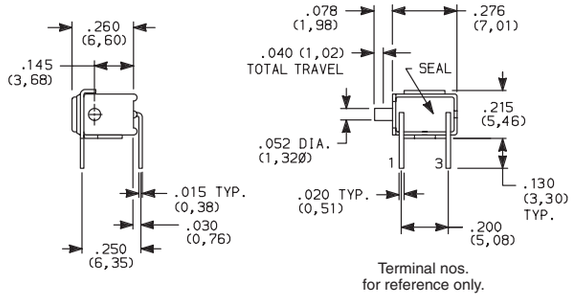
GP11– omit center hole.



GP12 Model

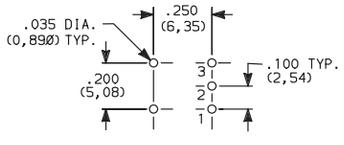
GP Series
Sealed Ultraminiature Pushbutton Switches

GP11MABE
SPST

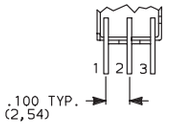


Terminal nos.
for reference only.

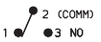
PC MOUNTING



GP11– omit hole 2.

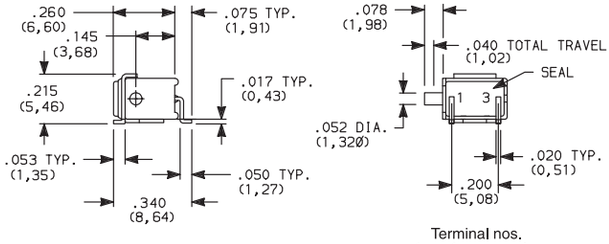


GP12 Model

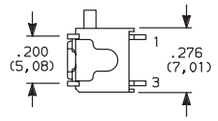
PART NUMBER	SWITCH FUNCTION POS.1	SWITCH FUNCTION POS. 2	SCHEMATIC
GP11MABE	OFF	MOM.	SPST
Conn. Terms.	OPEN	1-3	
GP12MABE	ON	MOM.	 SPDT
Conn. Terms.	2-1	2-3	

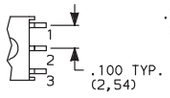
MOM. = Momentary

GP11MSABE
SPST



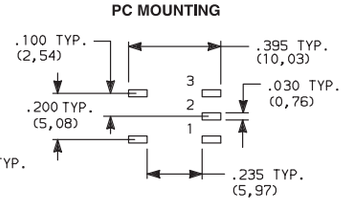
Terminal nos.
for reference only.



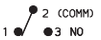


GP12 Model

PC MOUNTING

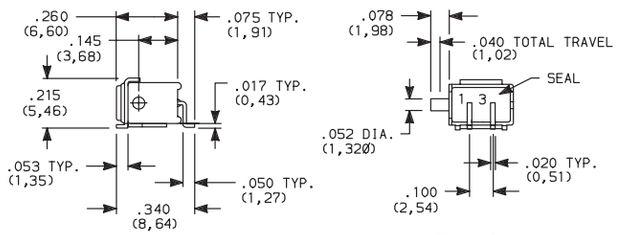


GP11– omit pad 2.

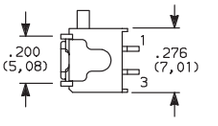
PART NUMBER	SWITCH FUNCTION POS.1	SWITCH FUNCTION POS. 2	SCHEMATIC
GP11MSABE	OFF	MOM.	SPST
Conn. Terms.	OPEN	1-3	
GP12MSABE	ON	MOM.	 SPDT
Conn. Terms.	2-1	2-3	

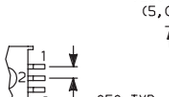
MOM. = Momentary

GP11MSA1BE
SPST



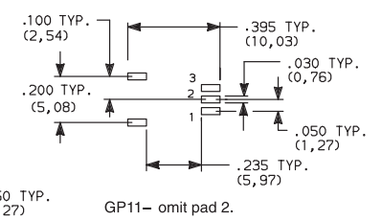
Terminal nos.
for reference only.



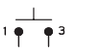


GP12 Model

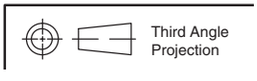
PC MOUNTING



GP11– omit pad 2.

PART NUMBER	SWITCH FUNCTION POS.1	SWITCH FUNCTION POS. 2	SCHEMATIC
GP11MSA1BE	OFF	MOM.	 SPST
Conn. Terms.	OPEN	1-3	
GP12MSA1BE	ON	MOM.	SPDT
Conn. Terms.	2-1	2-3	

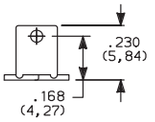
MOM. = Momentary

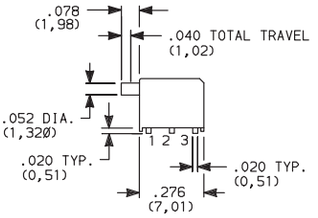


Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

PART NUMBER	SWITCH FUNCTION POS.1	SWITCH FUNCTION POS. 2	SCHEMATIC
GP12MSCBE	ON	MOM.	2 (COMM) NC 1 3 NO
Conn. Terms.	2-1	2-3	SPDT

MOM. = Momentary

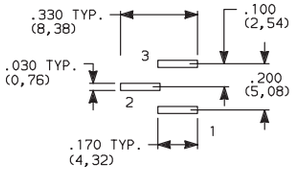


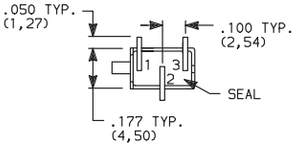


Terminal nos.
for reference only.

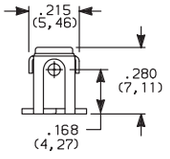
GP12MSCBE
SPDT

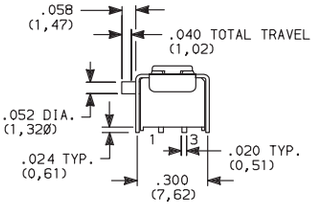
PC MOUNTING





NOTE: Recommended for infrequent use applications only
For increased switch mounting strength, order, SV1 termination style with support bracket (see below).



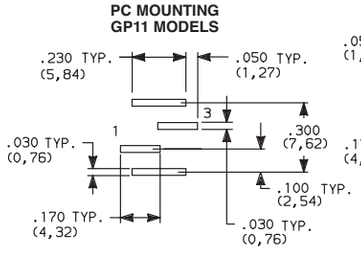


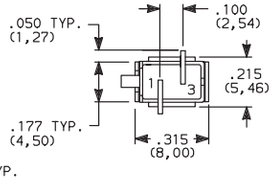
GP11MSV1BE
SPST

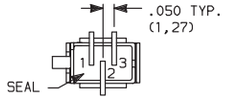
PART NUMBER	SWITCH FUNCTION POS.1	SWITCH FUNCTION POS. 2	SCHEMATIC
GP11MSV1BE	OFF	MOM.	1 3
Conn. Terms.	OPEN	1-3	SPST
GP12MSV1BE	ON	MOM.	2 (COMM) NC 1 3 NO
Conn. Terms.	2-1	2-3	SPDT

MOM. = Momentary

PC MOUNTING
GP11 MODELS



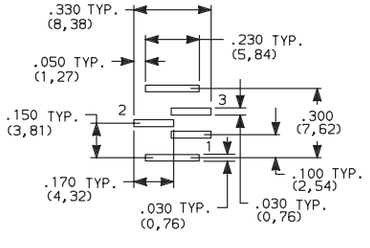




GP12 Model

Terminal nos.
for reference only.

PC MOUNTING
GP12 Models



Third Angle Projection

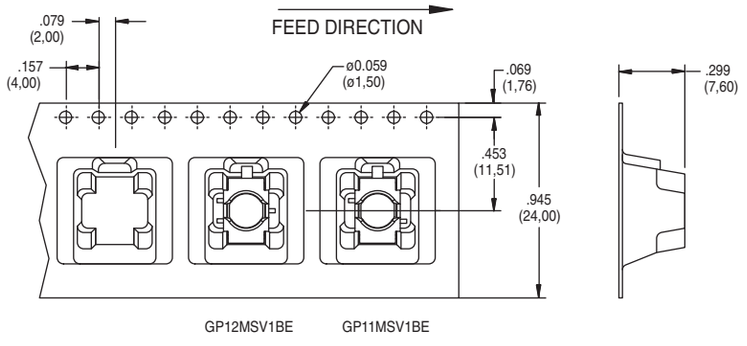
Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

GP Series
Sealed Ultraminiature Pushbutton Switches

TAPE & REEL

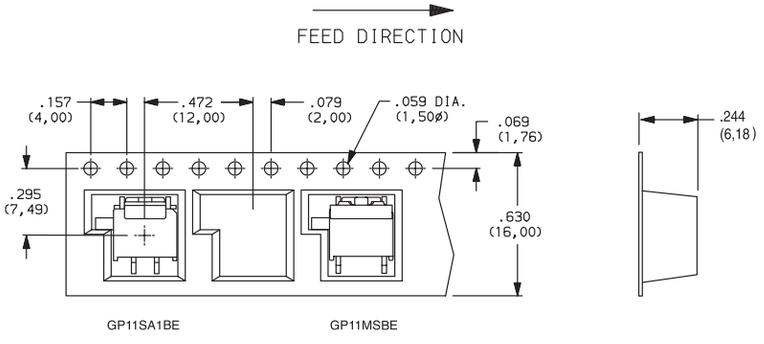
For part numbers GP11MSV1BE, GP12MSV1BE

REEL INFORMATION	
OUTSIDE DIAMETER	13.00 (330,0)
PILOT HOLE	.512 (13,0)
QUANTITY PER REEL	600



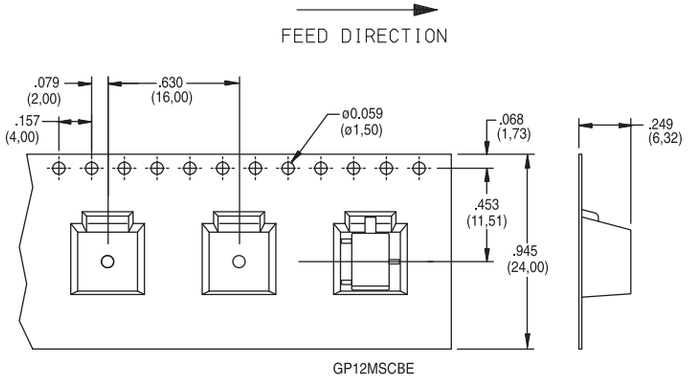
For part numbers GPXXSA1BE, GPXXMSABE

REEL INFORMATION	
OUTSIDE DIAMETER	13.00 (330,0)
PILOT HOLE	.512 (13,0)
QUANTITY PER REEL	600



For part numbers GP12MSCBE

REEL INFORMATION	
OUTSIDE DIAMETER	13.00 (330,0)
PILOT HOLE	.512 (13,0)
QUANTITY PER REEL	600



Third Angle Projection

Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

PN Series
Alternate & Momentary Action Pushbutton Switches

Features/Benefits

- ***Momentary or locking action***
- ***Different actuation forces for customized feel***
- ***Low cost, reliable contact design***
- ***Single and double pole options***
- ***RoHS compliant***

Typical Applications

- ***Computers and peripherals***
- ***Instrumentation and measurement equipment***
- ***Non-power, on-off switch applications***

Specifications

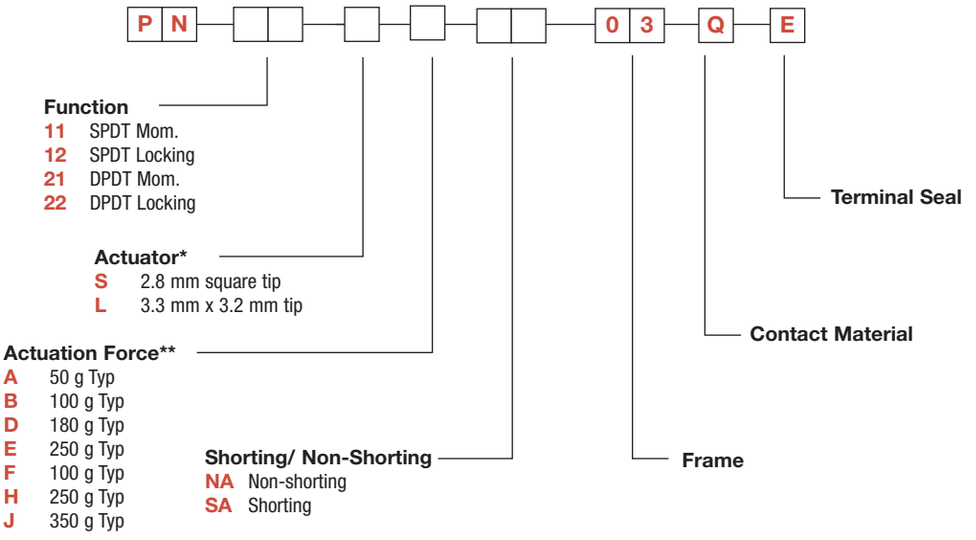
CONTACT RATING: 0.2 AMP @ 30 V DC max.
ELECTRICAL LIFE: 10,000 make-and-break cycles at full load.
MECHANICAL LIFE: 10,000 on/off cycles.
CONTACT RESISTANCE: 30 mΩ max. initial
INSULATION RESISTANCE: 100 MΩ min.
DIELECTRIC STRENGTH: 500 V AC min.
OPERATING/STORAGE TEMPERATURES: –10°C to 60°C.
PACKAGING: Switches are supplied in anti-static trays.

Materials

FRAME: Tin plated steel.
ACTUATOR: PA 66 black.
BASE: Phenolic resin.
TERMINALS: Silver plated brass.
MOVABLE CONTACTS: Silver plated phosphor bronze.
RETURN SPRING: SWC
DETENT SPRING: Phosphor bronze.
DETENT SPRING PLATE: Phosphor bronze.
RETURN SPRING RETAINER RING: Nickel plated steel.
TERMINAL SEAL: Epoxy.

Build-A-Switch

To order, simply select desired option from each category and place in the appropriate box. For additional options not shown in catalog, consult Customer Service Center.



* Note - The switch body style dimenions differ for each of these 3 groupings

“S” actuator available for PN 11 & PN 12 options

“S” actuator available for PN 21 & PN 22 options

“L” actuator available for PN 21 & PN 22 options

** Actuation Force "A" only available with PN11 with "S" actuator

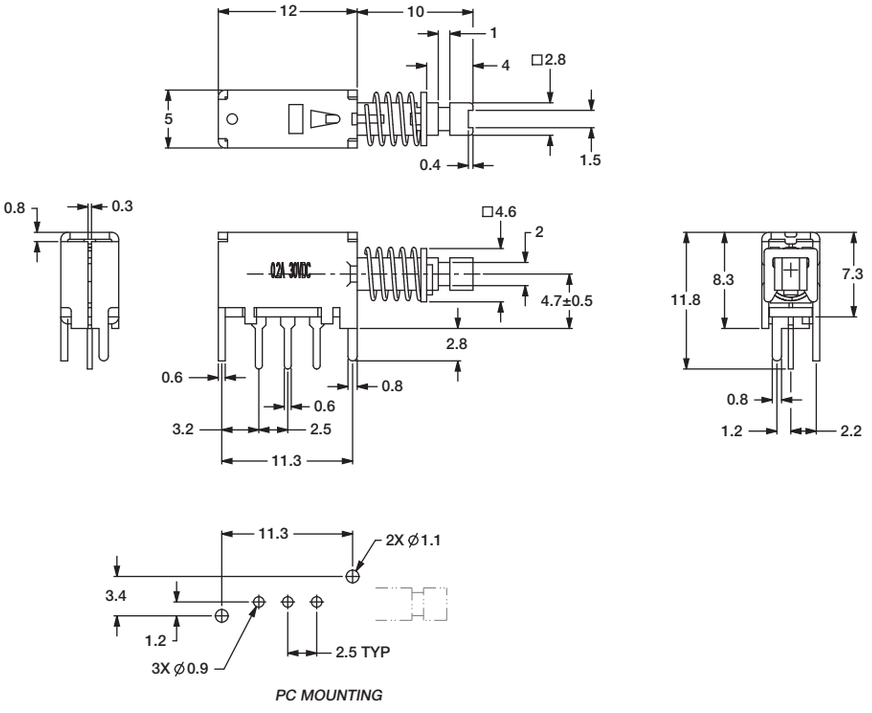
PN 11 & PN 21 available with Acuation Force “B”, “D”, “E”, “F”, “H”, “J”

PN 12 & PN 22 available with Actuation Force “D”, “E”, “H”, “J”

Full travel

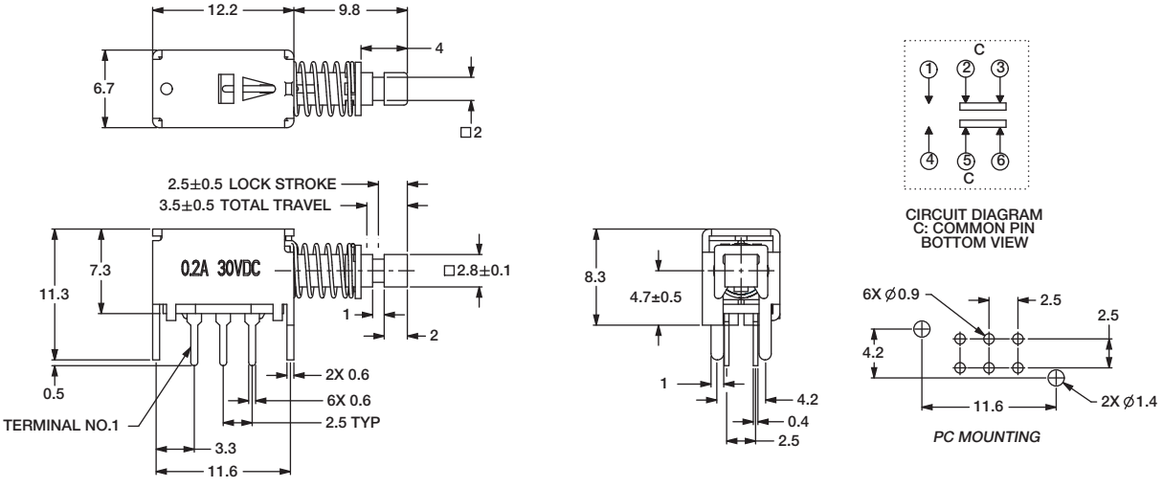
PN Series
Alternate & Momentary Action Pushbutton Switches

PN 11 SPDT Mom.
PN 12 SPDT Locking



PC MOUNTING

PN 21 DPDT Mom. with "S" Actuator
PN 22 DPDT Locking with "S" Actuator

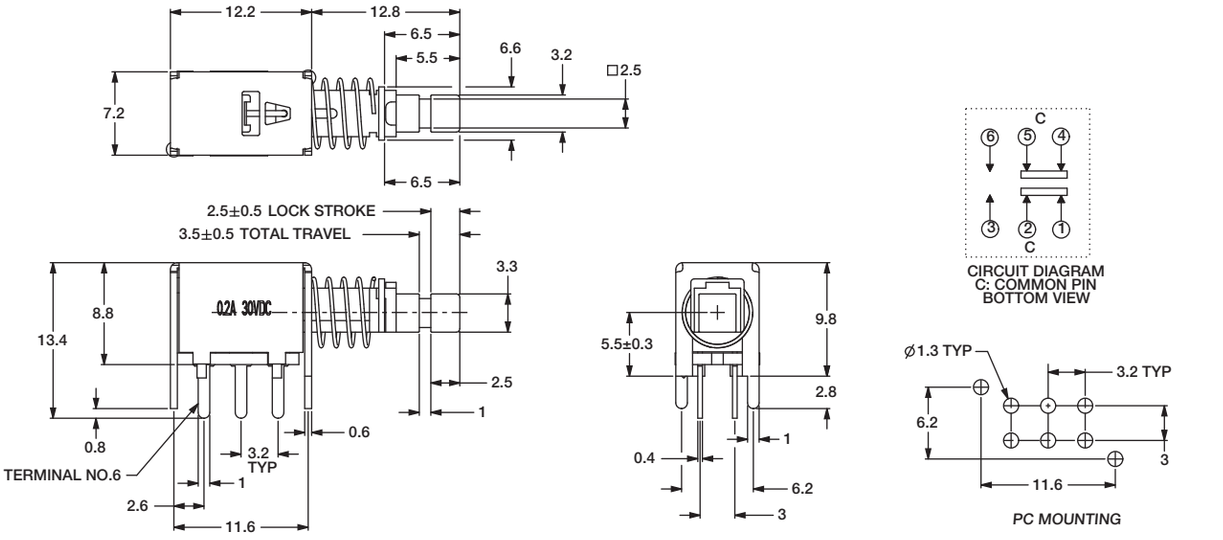


PC MOUNTING

Third Angle Projection

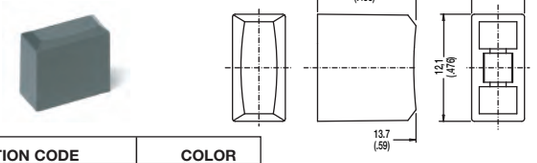
Dimensions are shown: mm
Specifications and dimensions subject to change

PN 21 DPDT Mom. with "L" Actuator
PN 22 DPDT Locking with "L" Actuator



BUTTONS MUST BE ORDERED SEPARATELY. SHIPPED IN BULK.

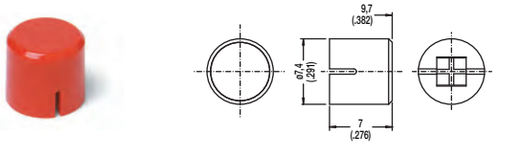
PE



OPTION CODE	COLOR
RD	Red
GY	Gray
BK	Black
WH	White

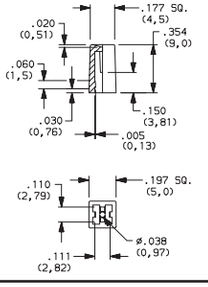
PE and PV buttons fit "L" actuators

PV



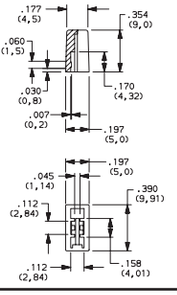
Indexed

G001A Black
G001G Gray
G001I Ivory
G001R Red



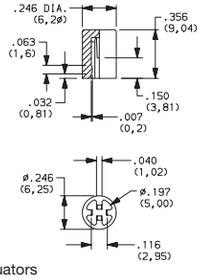
Rectangular

G002A Black
G002G Gray
G002I Ivory
G002R Red



Round

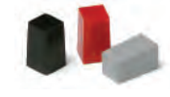
G003A Black
G003G Gray
G003I Ivory
G003R Red

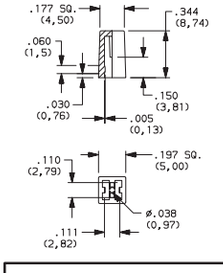


G001, G002, G003 and G004 buttons fit "S" actuators

Square

G004A Black
G004G Gray
G004I Ivory
G004R Red





Third Angle Projection

Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

PHB Series
Short Stroke Pushbutton Switches

Features/Benefits

- *Momentary or latching action*
- *Low cost, reliable contact design*
- *2 & 4 pole configurations*
- *Sealed contacts*
- *Optional buttons*
- *RoHS compliant*

Typical Applications

- *Computers and peripherals*
- *Instrumentation and measurement equipment*
- *Non-power, on-off switch applications*

Specifications

RATING: 1 A @ 15 V DC

DIELECTRIC STRENGTH (50 Hz/1 min.): 500 V DC between terminals or between terminals and frame for 1 minute

OPERATING LIFE: 10,000 cycles at rated load

CONTACT RESISTANCE: 20 m Ωohms initial

INSULATION RESISTANCE: 100 M Ωohms

TOTAL TRAVEL/LATCHING TRAVEL: 2.5mm (± 0.5 mm) / 1.5mm (± 0.5 mm) to latch EE option (push-push)

OPERATING FORCE:
2U option: 170 grams ± 100 grams (1.67 ± 0.98N)
4U option: 230 grams ± 100 grams (2.26 ± 0.98N)

OPERATING TEMPERATURE: -10˚C to 60˚C

BOUNCE TIME: ≤10 ms

SEALING: Sealed contacts.

PACKAGING: Switches; PHB2 models: 84 pcs per tray; PHB4 models 72 pcs per tray
Optional Caps; Bulk bag - 100 caps per bag

Materials

FIXED TERMINAL: Brass, silver plated

MOVABLE CONTACT: Phosphor bronze, silver plated

COVER: PA 66 Black

COVER TO BASE RETAINING CLIP: POM

ACTUATOR: POM

RETURN SPRING: Stainless steel

SPRING RETAINING RING: Steel, nickel plate

BASE: Phenolic resin

TERMINAL SEAL: Epoxy.

NOTE: Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.

Build-A-Switch

To order, simply select desired option from each category and place in the appropriate box. For additional options not shown in catalog, consult Customer Service Center.

Switch

P H B | | | | | | 1 A

Contact Arrangement
2U 2 Changeovers
4U 4 Changeovers

Mechanical Function
OA Momentary
EE Push-push

Termination
TS Straight
SN Kinked (plug in)

Electrical Rating
1A 1 Amp / 15 VDC

Caps (order separately)

INDEXED	COLOR
G001A	BLACK
G001G	GRAY
G0011	IVORY
G001R	RED

RECTANGULAR	COLOR
G002A	BLACK
G002G	GRAY
G0021	IVORY
G002R	RED

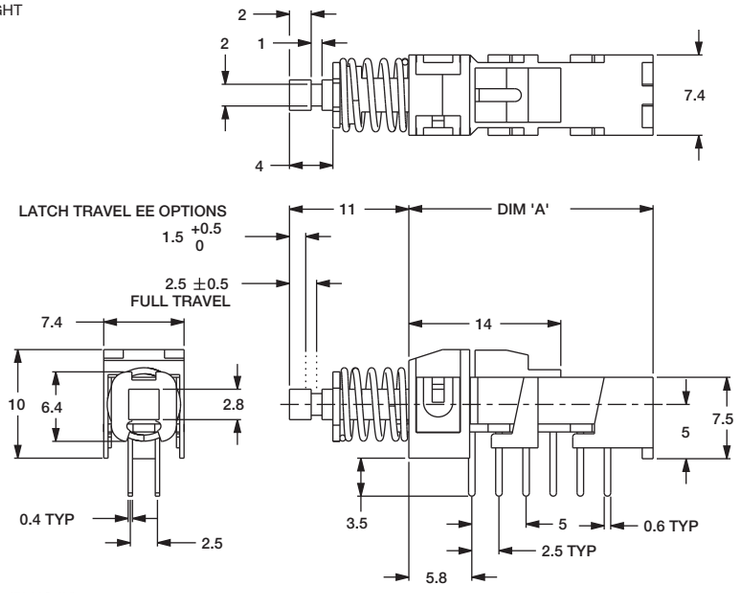
ROUND	COLOR
G003A	BLACK
G003G	GRAY
G0031	IVORY
G003R	RED

SQUARE	COLOR
G004A	BLACK
G004G	GRAY
G0041	IVORY
G004R	RED

Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

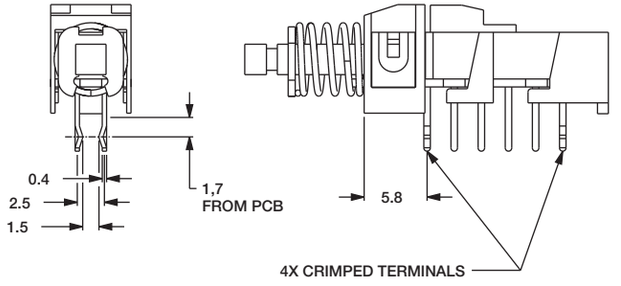
TERMINATION

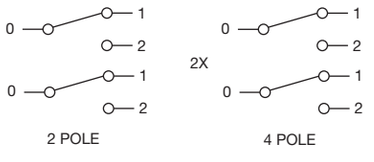
TS STRAIGHT

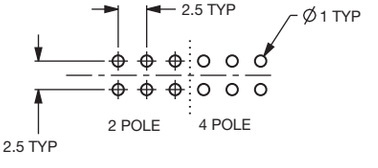


POLES	MODEL NO.	DIM 'A'	ACTION
4	PHB4UEE1A	22,5	PUSH/PUSH
	PHB4U0A1A	22,5	MOMENTARY
2	PHB2UEE1A	15,0	PUSH/PUSH
	PHB2U0A1A	15,0	MOMENTARY

SN KINKED (PLUG IN)







Third Angle Projection

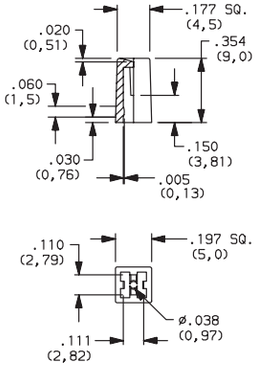
Dimensions are shown: mm
Specifications and dimensions subject to change

PHB Series
Short Stroke Pushbutton Switches

CAPS

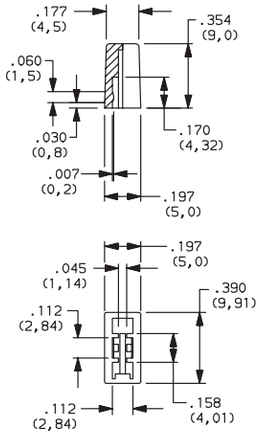
Indexed

G001A Black
G001G Gray
G001I Ivory
G001R Red



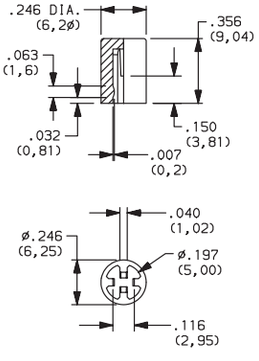
Rectangular

G002A Black
G002G Gray
G002I Ivory
G002R Red



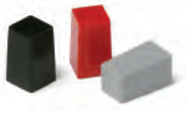
Round

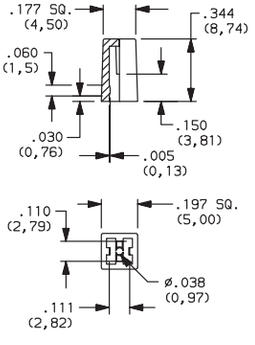
G003A Black
G003G Gray
G003I Ivory
G003R Red



Square

G004A Black
G004G Gray
G004I Ivory
G004R Red





Third Angle Projection

Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

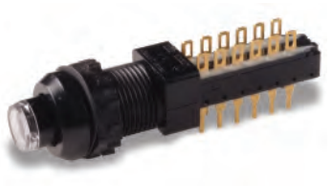
F Series
Pushbutton Switches

Features/Benefits

- ***Up to 10 poles per module***
- ***Various contact terminals***
- ***Various mounting & switch ganging configurations***
- ***Mechanical indicator buttons***
- ***RoHS compliant***

Typical Applications

- ***Audio selection***
- ***Digital equipment interface***
- ***Medical equipment interface***



Specifications

SWITCHING POWER: F module max. AC/DC: Silver: 50 VA/15W, Gold: 1 VA/300 mW.

SWITCHING VOLTAGE: F module max. AC/DC: Silver: 125/30V, Gold: 50/30 V.

SWITCHING CURRENT: F module max. AC/DC: Silver: 0.5A/0.5A, Gold: 0.04A/0.01A.

CARRYING CURRENT: Max at du = 20C: Silver: < 2A, Gold: <0.5A.

DIELECTRIC STRENGTH (50 Hz, 1 min.): Chassis/contact: ^1500V Between contacts: ^1500V.

OPERATING LIFE "OA/EE" (24V/200mA): $>10^5$ operations "GR": >3.5 x 104 operations.

CONTACT RESISTANCE: Initial: Typical %10 mΩ, max. 20 mΩ After operating life: %100 mΩ

INSULATION RESISTANCE: $\wedge 10^9$ Ω between open contacts, $\wedge 10^9$ Ω between chassis and contacts.

CAPACITANCE (at f = 10 kHz): %0.7 pF between 2 contacts.

TOTAL TRAVEL/LATCHING TRAVEL: 4.7mm/3.3mm (.185 inch/ .130 inch).

All models and options are RoHS compliant and compatible.

NOTE: All models and options are RoHS compliant and compatible.

NOTE: Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.

TYPICAL F OPERATING FORCE: 2U: 6.5N (650 grams); 4U: 6.5N (650 grams); 6U: 7.5N (750 grams); 8U: 9.0N (900 grams); 10U: 9.0N (900 grams).

EUROPEAN TYPICAL SF OPERATING FORCE: 2U: 3.5N±0.5N (350 grams±100 grams); 4U: 5N±1N (500 grams±100 grams); 6U: 6.5N±1N (650 grams±100 grams); 8U: 9.0N±1N (900 grams±100 grams).

OPERATING TEMPERATURE RANGE: -40°C to 70°C.

Materials

HOUSING: Polycarbonate UL 94V-0 or polyester UL 94V-0.

ACTUATOR: Polyester UL 94V-0.

MOVABLE CONTACTS: Bimetal brass, silver plated, gold plate over nickel.

STATIONARY CONTACTS & TERMINALS: Brass, silver plated, gold plated.

TERMINAL BOARD: Polyester UL 94V-0.

RETURN SPRING: Music wire.

TERMINAL SEAL: RTV adhesive sealant.

CHASSIS: Steel.

LOCKOUT PIN: Steel.

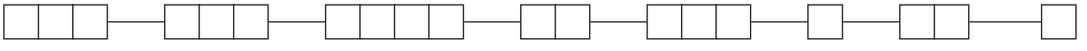
BLOCKERS: Steel.

Build-A-Switch

To order, simply select desired option from each category and place in the appropriate box. Available options are shown and described on pages A-88 thru A-95. For additional options not shown in catalog, consult Customer Service Center.

If requesting only a switch, select either a North American or European switch as noted below. Chassis and buttons are sold separately. If multiple stations are selected, we will assume all switches are the same unless noted otherwise.

North American Order Code - Switch Only



Designation
- **F** F Series
- **FLT** Light touch F series
- **ZF** Central mounted F series

Contact Arrangement
- **2U** 2PDT
- **4U** 4PDT
- **6U** 6PDT
- **8U** SPDT
- **10U** 10PDT

Mechanical Function
- **OA** Momentary
- **EE** Alternate (push-push)
- **GR** Interlock
- **AOR** Central release
- **OASP** Momentary with lockout
- **GRSP** Interlock with lockout

Terminal Sealing
- **(NONE)** None
- **TB** Top/bottom

Terminal Style
- **(NONE)** Solder lugs & PC pins
- **01A** Cut solder lugs
- **01B** Cut PC pins, for other configurations, consult factory

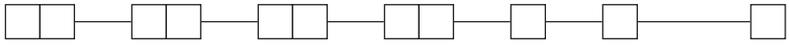
Electrical Function
- **(NONE)** BBM Break-Before-Make
- **M** MBB (special) Make-Before-Break

Contact Material
- **(NONE)** Silver, AG
- **AU** Gold

Dress nut*
*Central mounted F series only
- **(NONE)** No dress nut
- **B** Black
- **C** Chrome

F Series
Pushbutton Switches

European Order Code - Switch Only



Designation
SF F Series
ZF Central mounted F series

Contact Arrangement
2U 2PDT
4U 4PDT
6U 6PDT
8U SPDT

Mechanical Function
OA Momentary
EE Alternate (push-push)
GR Interlock

Terminal Style
(NONE) Solder lugs & PC pins
LB Cut solder lugs
PB Cut PC pins, for other configurations, consult factory

Electrical Function
(NONE) BBM

Contact Material
(NONE) Silver, AG
P Gold

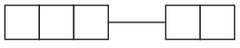
Dress nut*
*Central mounted F series only

(NONE) No dress nut
B Black
C Chrome

*Minimum order quantities apply.

Order Code - Buttons

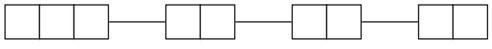
Solid Buttons



Style
F01 FMR
F02 FG*
F12 FSC
F13 FSD
F14 FU12
F15 FSB
F16 FE
F19 FA
F21 F001

Button Color
01 Black
02 White
03 Red
04 Light gray

Mechanical Indicator Buttons



Style
F01 FA100
F02 FA101
F07 FA120
F08 FA201
F11 FA200*

Shell Color
01 Black

Out Position Color
01 Black

In Position Color
02 White
06 Yellow
07 Blue
08 Green
12 Orange

*Button options for central mounting configurations, use 'FG' for central mount with chrome dress nut, use 'FA200' for central mount with black dress nut.

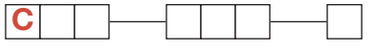
BUTTON REMOVAL

A button of a push-push switch should only be removed in the "OFF" non-latching position.

Order Code - Chassis

To order a switch with chassis, create the switch part number listed above and add the Chassis part number configurator information at the end of the part number.

Note: We do not guarantee or recommend interlocking beyond 10 stations.



No. of Stations
01 thru 23 Comes with standard .094 (2,4mm) mounting holes
Note: Single station chassis available with special mounting configurations, consult factory.

Spacing between Stations
00 Single station
10 10mm
12.5 12.5mm
15 15mm
17.5 17.5mm
20 20mm

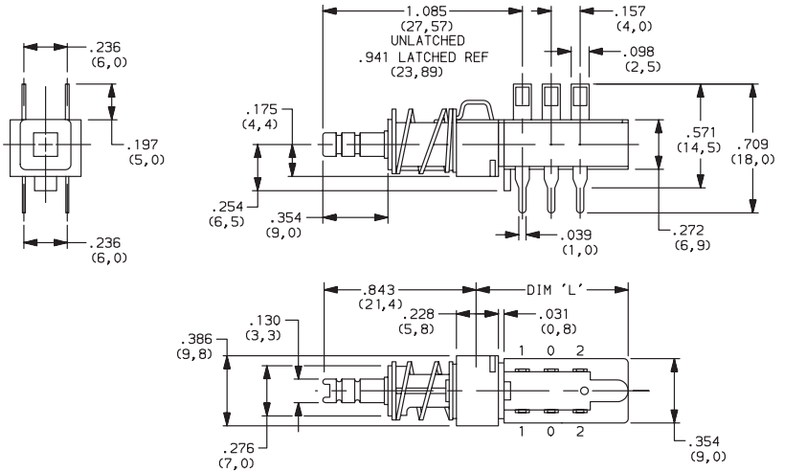
Special Acknowledgements
See note

*Minimum order quantities apply.

SWITCHES WITH STANDARD OPTIONS

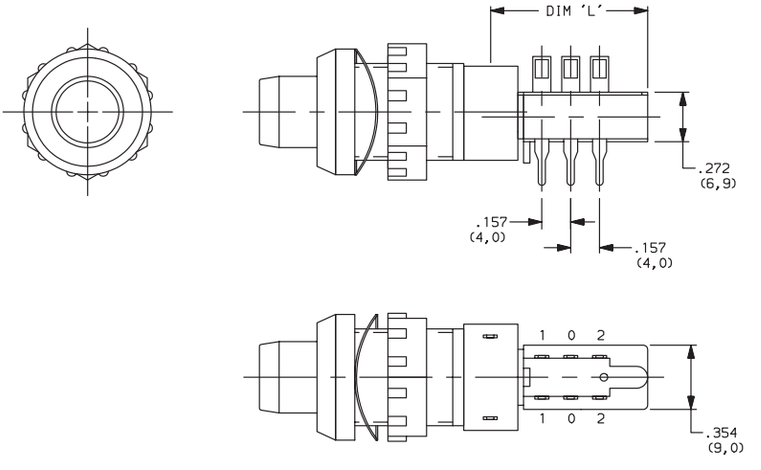
F2UEE

CONTACT ARRANGEMENT	LENGTH DIM 'L'
2U	0.827 (21,00)
4U	1.300 (33,00)
6U	1.770 (45,00)
8U	2.240 (57,00)
10U	2.720 (69,00)



ZF2UEEBF11010108

CONTACT ARRANGEMENT	LENGTH DIM 'L'
2U	0.827 (21,00)
4U	1.300 (33,00)
6U	1.770 (45,00)
8U	2.240 (57,00)
10U	2.720 (69,00)



DESIGNATION

Designation, North America

F F Series
FLT Light touch F series
ZF Central mounted F series

Designation, Europe

SF F Series
ZF Central mounted F series

Third Angle Projection

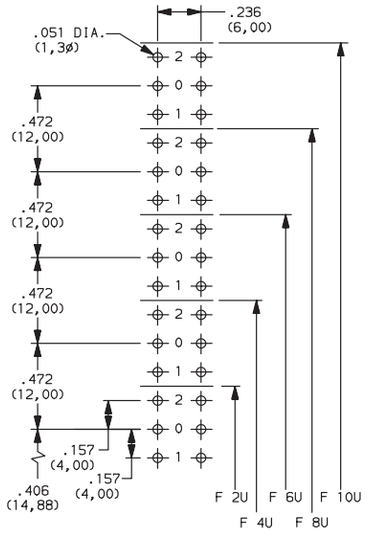
Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

F Series
Pushbutton Switches

CONTACT ARRANGEMENT

OPTION CODE	NO. OF POLES	SCHEMATIC
2U	2PDT	
4U	4PDT	2X
6U	6PDT	3X
8U	8PDT	4X
10U	10PDT	5X

PC MOUNTING



MECHANICAL FUNCTION

North America

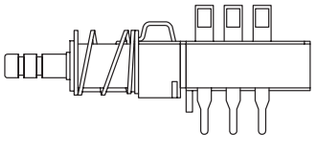
OPTION CODE	FUNCTION
OA	Momentary
EE	Alternate (push-push)
GR	Interlock
AOR	Central release
OASP	Momentary with lockout
GRSP	Interlock with lockout

Europe

OPTION CODE	FUNCTION
OA	Momentary
EE	Alternate (push-push)
GR	Interlock

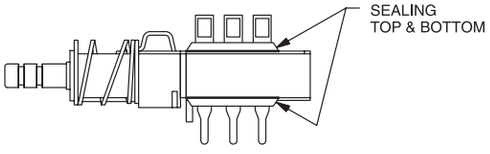
TERMINAL SEALING

(NONE) NO SEAL



F2UEE shown in example above.

TB TOP & BOTTOM



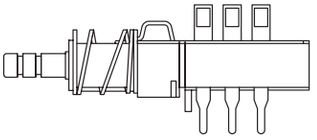
NOTE: Available for North America only

Third Angle Projection

Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

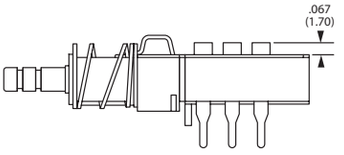
TERMINAL STYLE

(NONE) SOLDER LUGS & PC PINS



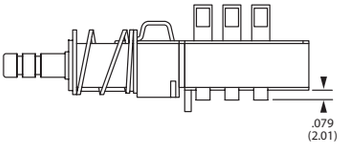
01A CUT SOLDER LUGS (North America)

LB CUT SOLDER LUGS (Europe)



01B CUT PC PINS (North America)

PB CUT PC PINS (Europe)



ELECTRICAL FUNCTION

OPTION CODE	FUNCTION
(NONE)	BBM Non-shorting
M	MBB Shorting (North America only)

CONTACT MATERIAL

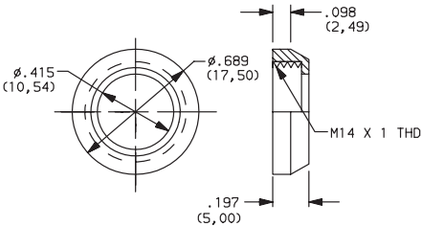
NORTH AMERICA OPTION CODE	EUROPE OPTION CODE	RoHS COMPLIANT *	RoHS COMPATIBLE *	MATERIAL	RATING
(NONE)	(NONE)	YES	YES	SILVER, AG	50 VA/15 W; 125/30 V; 0.5/0.5 A
AU	P	YES	YES	GOLD	1 VA/300mW; 50/30 V; 0.04 A/0.01 A

* Note: See Technical Data section of this catalog for RoHS compliant and compatible definitions and specifications.

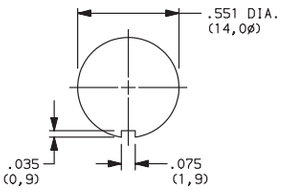
DRESS NUT

(NONE) NO DRESS NUT FOR F & F/LT DESIGNATIONS

B BLACK

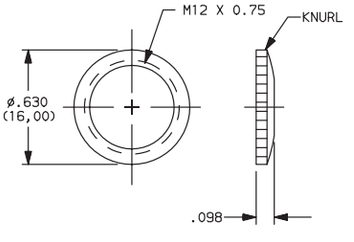


PANEL CUTOUT

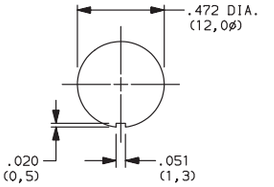


NOTE: Available with ZF designation and FA200 buttons.

C CHROME



PANEL CUTOUT



NOTE: Available with ZF designation and FG button.

Third Angle Projection

Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

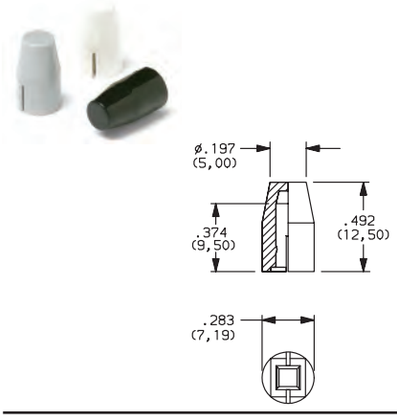
F Series
Pushbutton Switches

SOLID BUTTON

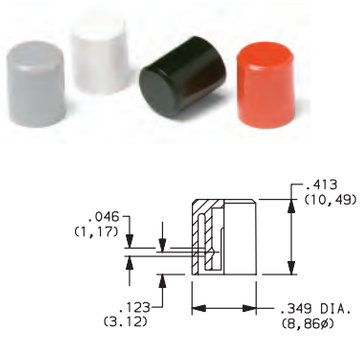
COLOR
STYLE

STYLE

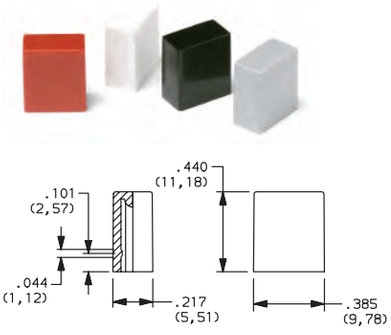
F01 FMR



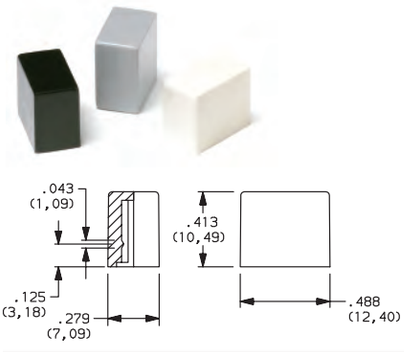
F02 FG



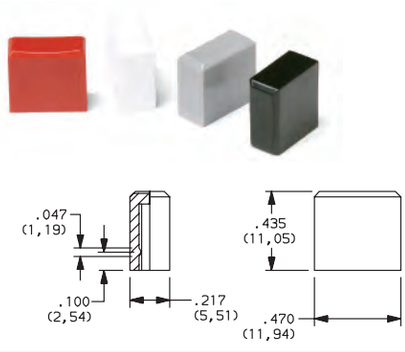
F12 FSC



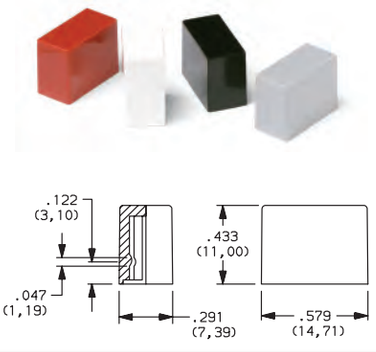
F13 FSD



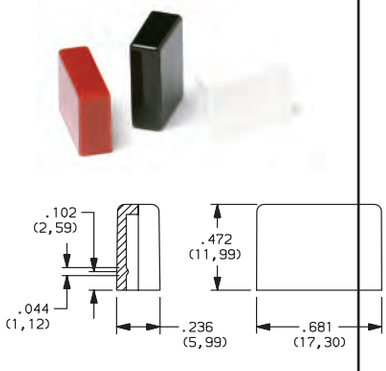
F14 FU12



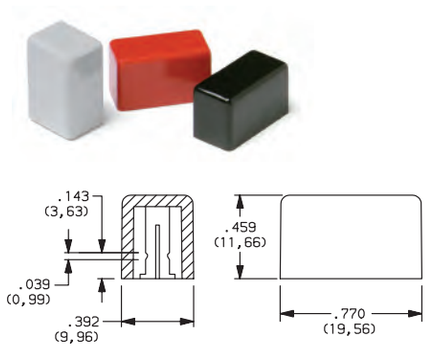
F15 FSB



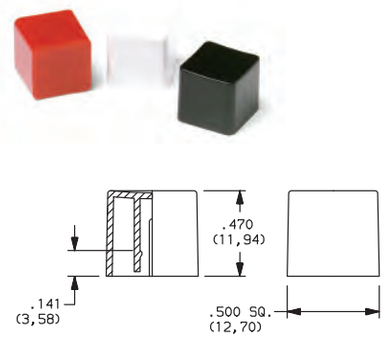
F16 FE



F19 FA



F21 F001



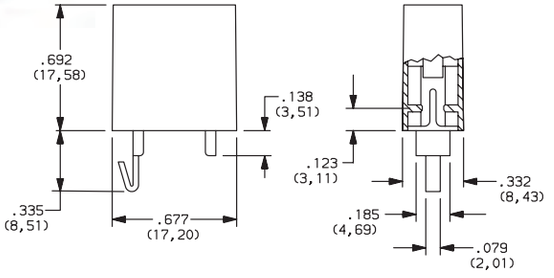
OPTION CODE	COLOR
01	BLACK
02	WHITE
03	RED
04	LT. GRAY

MECHANICAL BUTTON

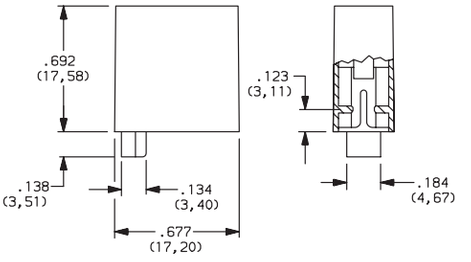
SHELL COLOR | IN POSITION COLOR
STYLE | OUT POSITION COLOR

STYLE

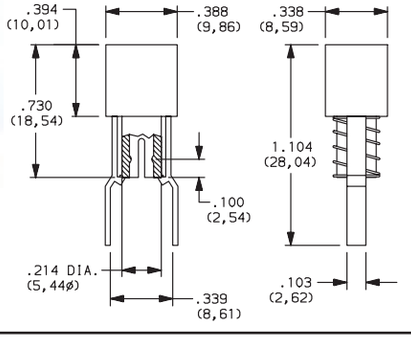
F01 FA100



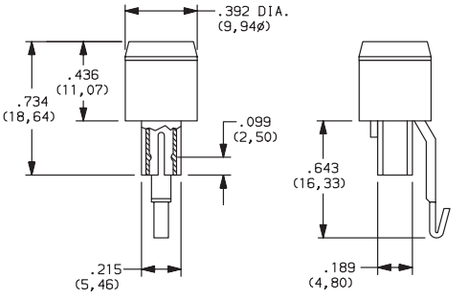
F02 FA101



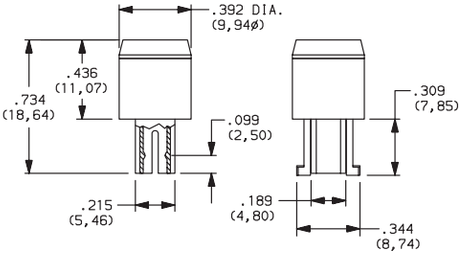
F07 FA120



F08 FA201



F11 FA200



SHELL COLOR

01 BLACK

OUT POSITION COLOR

01 BLACK

IN POSITION COLOR

OPTION CODE	COLOR
02	WHITE
06	YELLOW
07	BLUE
08	GREEN
12	ORANGE

F Series
Pushbutton Switches

CHASSIS

SPACING
NO. OF STATIONS

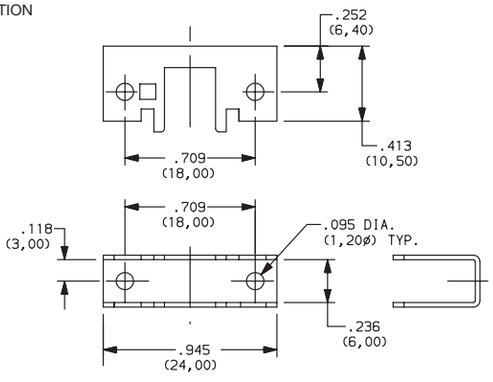
NUMBER OF STATIONS

C00 Thru C10 Comes with standard 0.094 (2,44mm) mounting holes

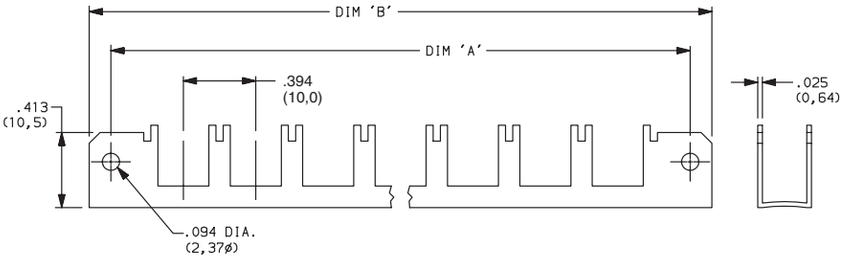
NOTE: Single station chassis available with mounting configurations, consult factory.

SPACING

00 SINGLE STATION

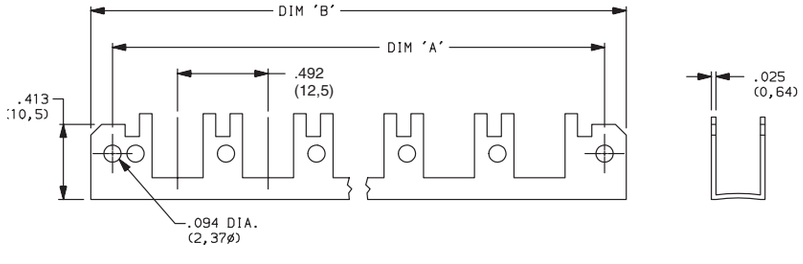


10 10mm



No. of Stations	Dim. 'A'	Dim. 'B'	Tolerance
2	1.182 (30,02)	1.418 (36,02)	0.005
3	1.575 (40,01)	1.811 (46,00)	0.010
4	1.969 (50,01)	2.205 (56,01)	0.010
5	2.363 (60,02)	2.599 (66,01)	0.010
6	2.757 (70,03)	2.993 (76,02)	0.015
7	3.150 (80,01)	3.386 (86,00)	0.015
8	3.544 (90,02)	3.780 (96,01)	0.015
9	3.938 (100,03)	4.174 (106,02)	0.015
10	4.331 (110,01)	4.567 (116,00)	0.015

12.5 12.5mm



No. of Stations	Dim. 'A'	Dim. 'B'	Tolerance
2	1.200 (30,48)	1.436 (36,47)	0.005
3	1.692 (42,98)	1.928 (48,97)	0.010
4	2.184 (55,47)	2.420 (61,47)	0.010
5	2.676 (67,97)	2.912 (73,96)	0.010
6	3.169 (80,49)	3.405 (86,49)	0.015
7	3.661 (92,99)	3.897 (98,98)	0.015
8	4.153 (105,49)	4.389 (111,48)	0.015
9	4.645 (117,98)	4.881 (123,98)	0.015
10	5.137 (130,48)	5.373 (136,47)	0.015

Third Angle Projection

Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

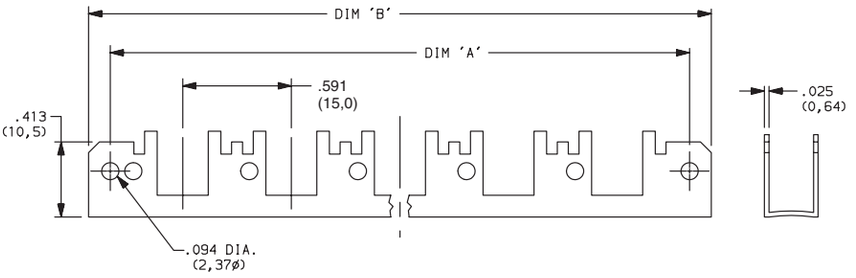
CHASSIS

SPACING
NO. OF STATIONS

SPACING

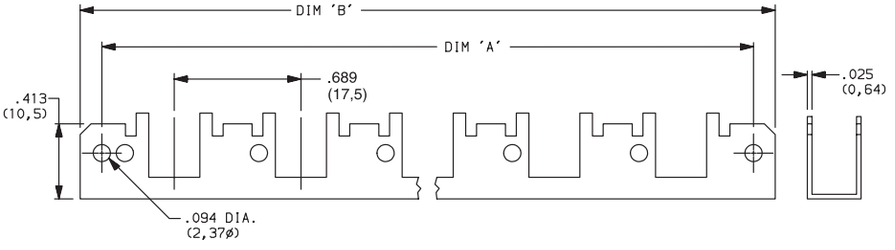
15 15mm

No. of Stations	Dim. 'A'	Dim. 'B'	Tolerance
2	1.374 (34,90)	1.615 (41,02)	0.005
3	1.969 (50,01)	2.205 (56,01)	0.010
4	2.560 (65,02)	2.796 (71,02)	0.010
5	3.150 (80,01)	3.386 (86,00)	0.010
6	3.741 (95,02)	3.977 (101,02)	0.015
7	4.332 (110,03)	4.568 (116,03)	0.015
8	4.922 (125,02)	5.158 (131,01)	0.015
9	5.513 (140,03)	5.749 (146,02)	0.015
10	6.103 (155,02)	6.339 (161,01)	0.015



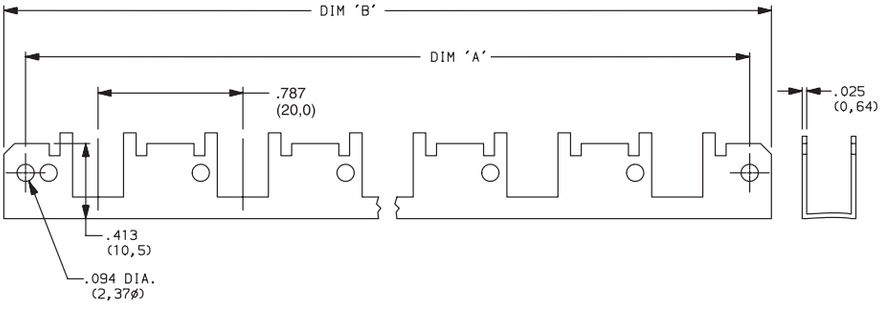
17.5 17.5mm

No. of Stations	Dim. 'A'	Dim. 'B'	Tolerance
2	1.477 (37,52)	1.713 (43,51)	0.005
3	2.166 (55,02)	2.402 (61,01)	0.010
4	2.855 (75,52)	3.091 (78.51)	0.010
5	3.544 (90,02)	3.780 (96,01)	0.010
6	4.233 (107,52)	4.469 (113,51)	0.015
7	4.922 (125,02)	5.158 (131,01)	0.015
8	5.611 (142,52)	5.847 (148.51)	0.015
9	6.300 (160,02)	6.536 (166,01)	0.015
10	6.989 (177,52)	7.225 (183,52)	0.015



20 20mm

No. of Stations	Dim. 'A'	Dim. 'B'	Tolerance
2	1.575 (40,01)	1.811 (46,00)	0.005
3	2.363 (60,02)	2.599 (66,01)	0.010
4	3.150 (80,01)	3.386 (86,00)	0.010
5	3.938 (100,03)	4.174 (106,02)	0.010
6	4.725 (120,02)	4.961 (126,01)	0.015
7	5.512 (140,00)	5.748 (146,00)	0.015
8	6.300 (160,02)	6.536 (166,01)	0.015
9	7.087 (180,01)	7.323 (186,00)	0.015
10	7.875 (200,03)	8.111 (206,02)	0.015



Third Angle Projection

Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

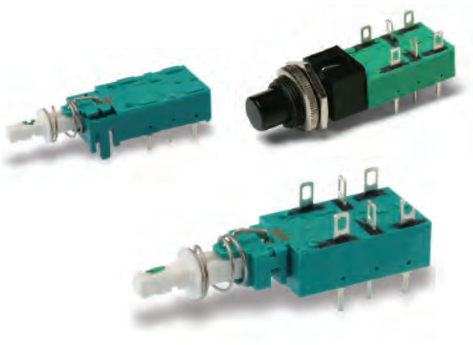
NE-18 Series
Mains / Power Switches

Features/Benefits

- *Chassis or panel mount*
- *Various buttons*
- *Various contact configurations*
- *RoHS compliant*

Typical Applications

- *Mains/power switching*
- *Consumer electronics*
- *Audio equipment*
- *Digital products*



UL61058-1

Specifications

ELECTRICAL RATING:

NE18 Series:

8A GP, 125 VAC, 50/60 Hz, 1E4, T70

6A GP, 250 VAC, 50/60 Hz, 1E4, T70

6(4)A RM, 250 VAC, 50/60 Hz, 1E4, T70

6/48A RC, 250 VAC, 50/60 Hz, 1E4, T70

1RA, 100 VDC, 1E4, T70

8RA, 30VDC, 1E4, T70

NE18CTII Series:

4A GP, 250 VAC, 50/60 Hz, 1E4, T70

4/48A RC, 250 VAC, 50/60 Hz, 1E4, T70

1RA, 100 VDC, 1E4, T70

4RA, 30VDC, 1E4, T70

DIELECTRIC STRENGTH (50 Hz, 1 min.): 2000 V

OPERATING LIFE AT MAX. LOAD AND AT MAX. INRUSH CURRENT: ^10^4 operations[5])

CONTACT RESISTANCE: Initial: 50mΩ; After 10^4 operations: 70mΩ.

INSULATION RESISTANCE: ^10^{12} Ωchassis – nearest contact; ^10^{12} Ωmains contact – mains contact; ^10^{12} Ωmains contact – mains contact after 10^4 operations.

LOW VOLTAGE CONTACT:

SWITCHING POWER MAX.: 12W

SWITCHING VOLTAGE MAX.: 24V

SWITCHING CURRENT MAX.: 0.5A

TOTAL TRAVEL: 4.7mm (.185 inch)

LATCHING TRAVEL: 3.3mm (.130 inch)

OPERATING FORCE: Without auxiliary low voltage contacts: NE18: 7N (700 grams); NE18CTII: 9.5N (950 grams).

With auxiliary low voltage contacts: NE18: 8N (800 grams); NE18CTII: 11N (1100 grams).

SEALING: Dust proof.

Materials

HOUSING, ACTUATOR & TERMINAL BOARD: Thermoplastic polyester (UL 94V-0).

MOVABLE CONTACT: Silver nickel alloy, silver plated.

FIXED CONTACTS: Silver nickel alloy, silver plated.

COMMON CONTACTS & TERMINALS: Copper alloy, silver plated.

RETURN SPRING: Music wire.

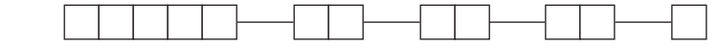
NOTE: All models arer RoHS compliant and compatible.

NOTE: Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.

Build-A-Switch

To order, simply select desired option from each category and place in the appropriate box. Available options are shown and described on pages A-97 thru A-104. For additional options not shown in catalog, consult Customer Service Center.

If requesting only a switch, select the switch as noted below. Buttons are sold separately.



Designation
NE18 NE1B
ZNE18 Cental mounted NE1B

Contact Arrangement
NE18 code # - see list

Mechanical Function
OA Momentary
EE Alternate (push-push)

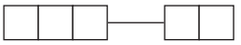
Single Station Chassis
01 With .094 mounting holes
(NONE) No chassis
02 With 4-40 tapped mounting holes
03 Special chassis (consult factory)

Dress nut*
*Central mounted ZNE18 series only
(NONE) No dress nut
B Black
C Chrome

Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

Order Code - Buttons

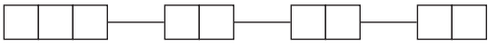
Solid Buttons



Style
- **F01** FMR
- **F02** FG*
- **F12** FSC
- **F13** FSD
- **F14** FU12
- **F15** FSB
- **F16** FE
- **F19** FA
- **F21** F001

Button Color
- **01** Black
- **02** White
- **03** Red
- **04** Light gray

Mechanical Indicator Buttons



Style
- **F01** FA100
- **F02** FA101
- **F07** FA120
- **F08** FA201
- **F11** FA200*

Shell Color
- **01** Black

Out Position Color
- **01** Black

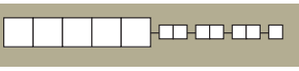
In Position Color
- **02** White
- **06** Yellow
- **07** Blue
- **08** Green
- **12** Orange

*Button options for central mounting configurations, use 'FG' for central mount with chrome dress nut, use 'FA200' for central mount with black dress nut.

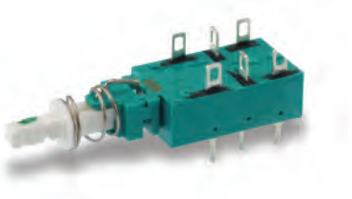
BUTTON REMOVAL

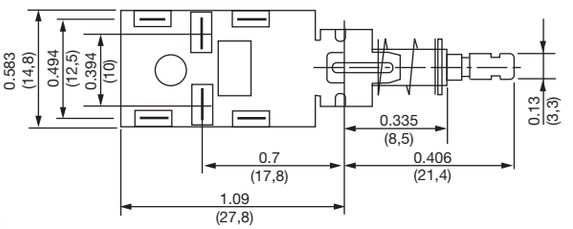
A button of a push-push switch should only be removed in the "OFF" non-latching position.

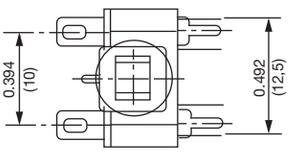
DESIGNATION & SWITCHES WITH STANDARD OPTIONS

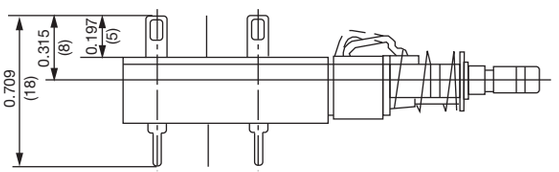


NE1838EE

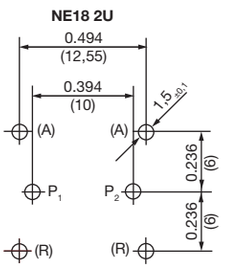








NE18 2U



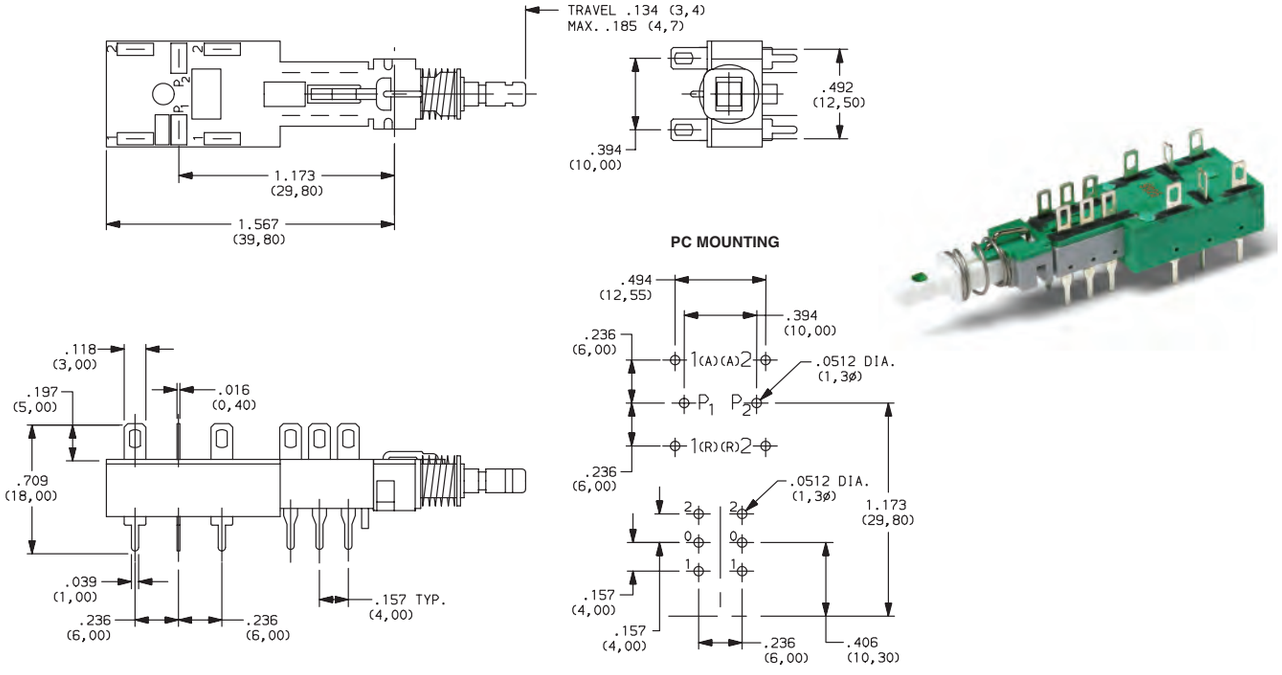
Third Angle Projection

Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

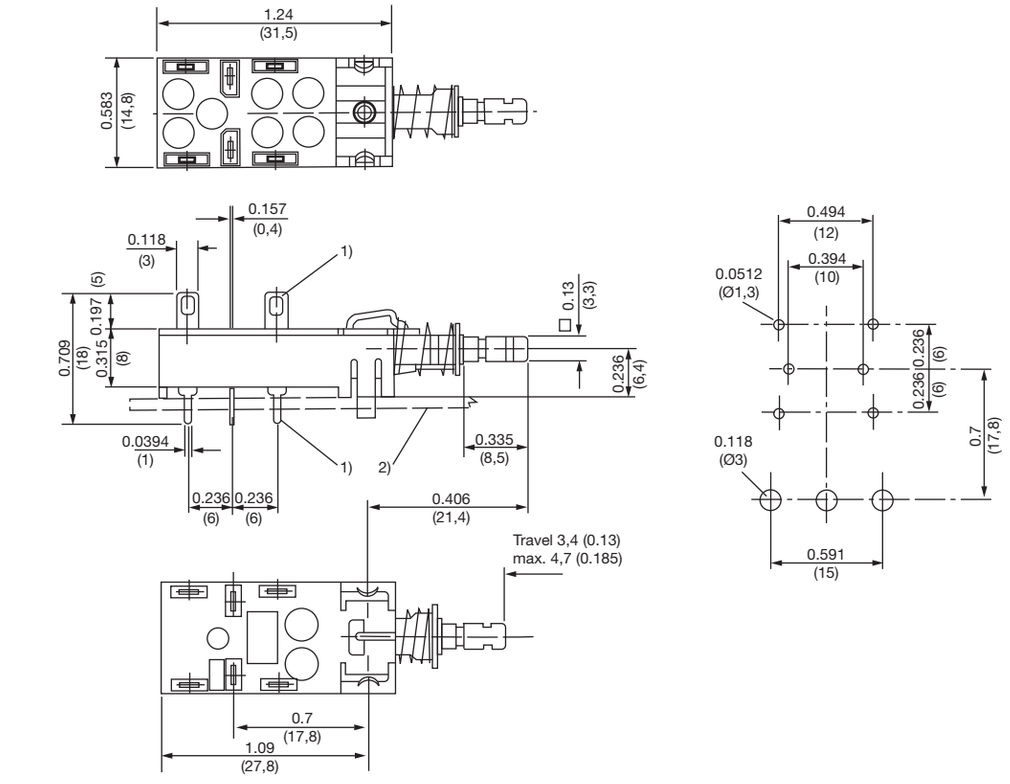
NE-18 Series
Mains / Power Switches

DESIGNATION & SWITCHES WITH STANDARD OPTIONS

NE1839EE



NE1846EE

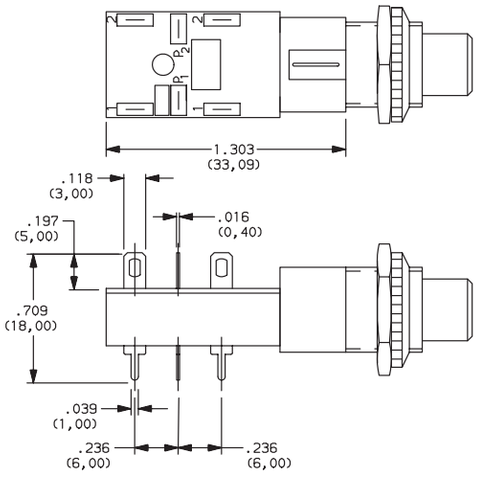


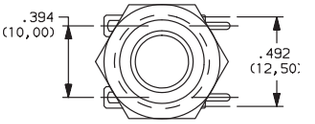
Third Angle Projection

Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

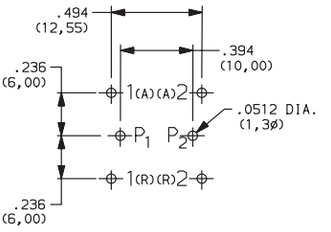
DESIGNATION & SWITCHES WITH STANDARD OPTIONS

ZNE1838EECF0201





PC MOUNTING



Third Angle Projection

Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

NE-18 Series
Mains / Power Switches

CONTACT ARRANGEMENT

OPTION CODE Contact capacity and availability	STYLE	ELECTRICAL CIRCUIT
37	NE18 — 2AX	DPST
38	NE18 — 2UX	DPDT
51	2U + NE18 — 2AX	DPST*
52 (4A/64)	NE18CTII — 2AX	DPST
39	2U + NE18 — 2UX	DPDT*
41	NE18 — 2AP	DPST
42	NE18 — 2UP	DPDT
43	NE18 — 2AW	DPST
44	NE18 — 2UW	DPDT
45	NE18 — 2ASX	DPST

OPTION CODE Contact capacity and availability	STYLE	ELECTRICAL CIRCUIT
46	NE18 — 2USX	DPDT
47	NE18 — 2ASP	DPST
48	NE18 — 2USP	DPDT
49	NE18 — 2ASW	DPST
50	NE18 — 2USW	DPDT
53 (4A/64)	2U + NE18CTII — 2AX	DPST
54	2U + NE18 — 2AW	DPST
55	2U + NE18 — 2AP	DPST
56	2U + NE18 — 2UW	DPDT
57	2U + NE18 — 2UP	DPDT

* 2U + Denotes auxiliary set of low current contacts DPDT
2A = DPST
2U = DPDT
S = Snap-in mounting
X = Solder lug/PC pins
W = Solder lugs only
P = PC pins only

NOTES
1. Contact plating is silver on all Power Switches.
2. The electrical function is Break Before Make (BBM) on all Power Switches.
3. The terminals will be epoxy sealed.

TYPE	POSSIBLE CONTACT ARRANGEMENT		CONTACT SPACING	PROTECTION CLASS (CEE 24)	APPROVALS
	POWER CONTACTS[1]	AUXILIARY CONTACTS			
NE18	2A[2]	2U	> 3mm (.118 inch)	II	UL61058-1
NE18	2A[2] 2U	2U	> 3mm (.118 inch)	I	UL61058-1
NE18CTII	2A[2]	2U	> 3mm (.118 inch)	II	UL61058-1

1) A = make contact, U = changeover contact
2) With 2A mains contacts: Mounting only by PC pins is not sufficient.

MECHANICAL FUNCTION

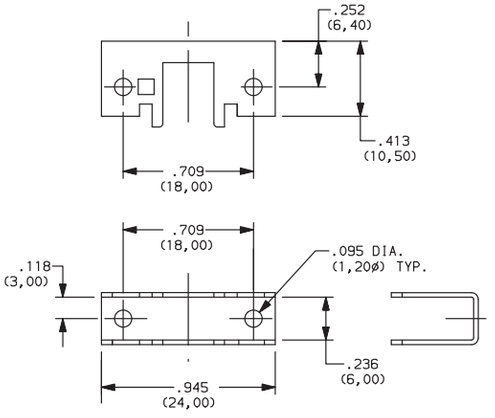
OPTION CODE	FUNCTION
OA	Momentary
EE	Alternate (push-push)

Third Angle Projection

Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

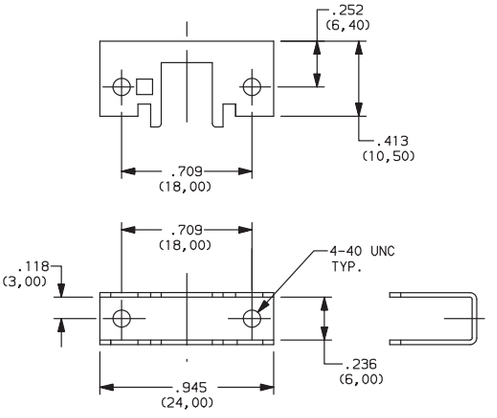
SINGLE STATION CHASSIS

01 WITH .094 MOUNTING HOLES



(NONE) NO CHASSIS

02 WITH 4-40 TAPPED MOUNTING HOLES

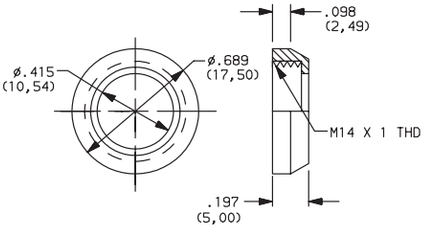


03 SPECIAL CHASSIS (CONSULT FACTORY)

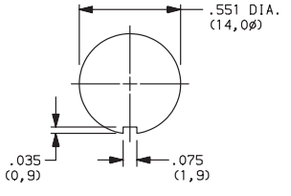
DRESS NUT

(NONE) NO DRESS NUT

B BLACK

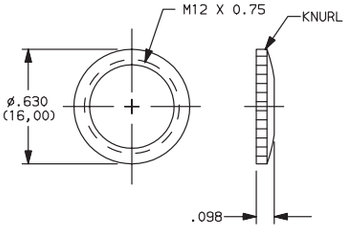


PANEL CUTOUT

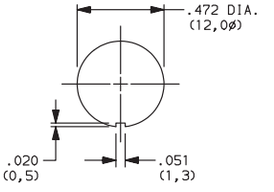


NOTE: Available with ZNE18 designation and FA200 buttons.

C CHROME



PANEL CUTOUT



NOTE: Available with ZNE18 designation and FG button.

Third Angle Projection

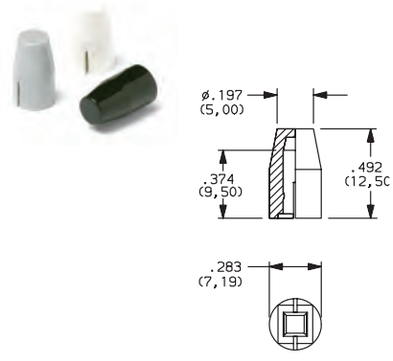
Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

NE-18 Series
Mains / Power Switches

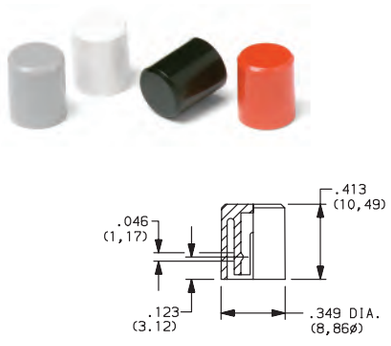
SOLID BUTTON

STYLE

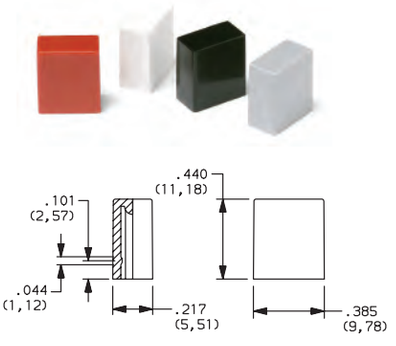
F01 FMR



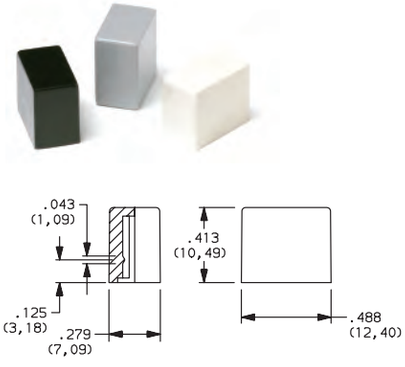
F02 FG



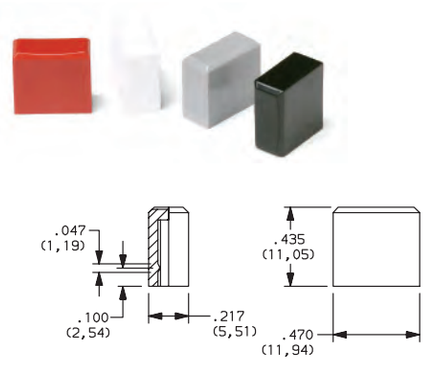
F12 FSC



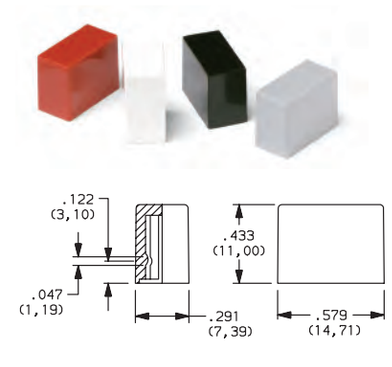
F13 FSD



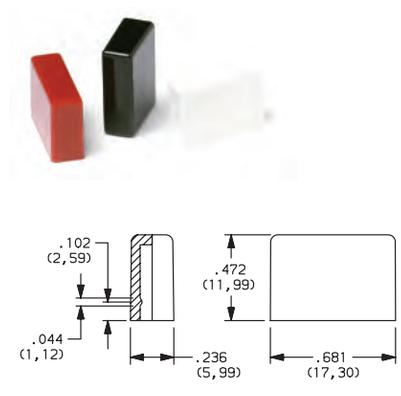
F14 FU12



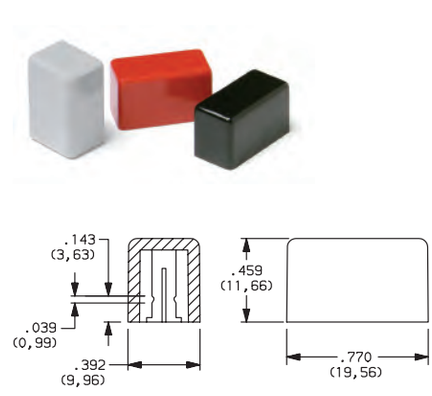
F15 FSB



F16 FE



F19 FA



OPTION CODE	COLOR
01	BLACK
02	WHITE
03	RED
04	LT. GRAY

Third Angle Projection

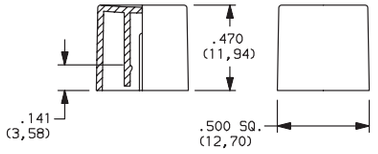
Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

SOLID BUTTON

COLOR
STYLE

STYLE

F21 F001



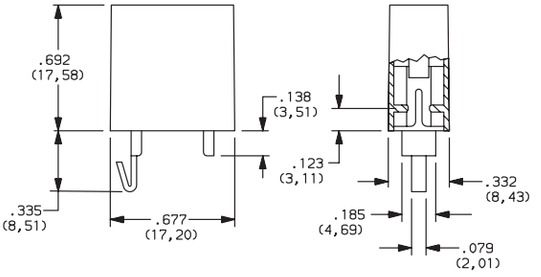
OPTION CODE	COLOR
01	BLACK
02	WHITE
03	RED
04	LT. GRAY
09	BLACK/CHROME (F03,F06 & F07 buttons only

MECHANICAL BUTTON

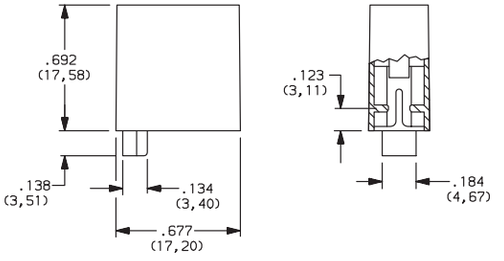
SHELL COLOR
IN POSITION COLOR
STYLE
OUT POSITION COLOR

STYLE

F01 FA100



F02 FA101



Third Angle Projection

Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

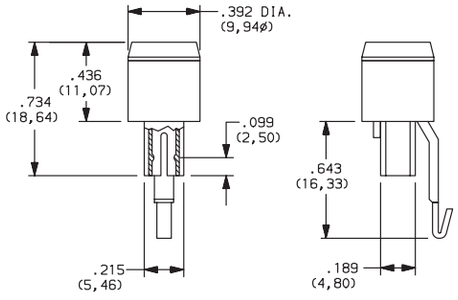
NE-18 Series
Mains / Power Switches

MECHANICAL BUTTON

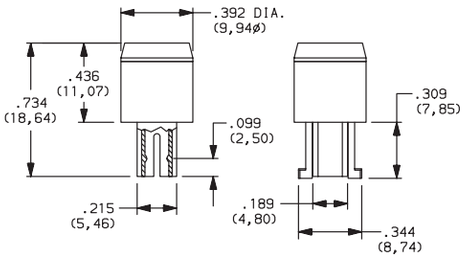
SHELL COLOR | IN POSITION COLOR
STYLE | OUT POSITION COLOR

STYLE

F08 FA201



F11 FA200



SHELL COLOR

01 BLACK

OUT POSITION COLOR

01 BLACK

IN POSITION COLOR

OPTION CODE	COLOR
02	WHITE
06	YELLOW
07	BLUE
08	GREEN
12	ORANGE

Third Angle Projection

Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

FP Series
Sealed Ultra Miniature Pushbutton Switches

Features/Benefits

- ***Vertical and right angle mount***
- ***Extended operating life 50,000 cycles***
- ***Optional caps***
- ***Sealed against soldering and cleaning processes***
- ***RoHS compliant***

Typical Applications

- ***Networking equipment***
- ***Modems***
- ***Reset functions***
- ***Instrumentation***

Specifications

CONTACT RATING: Max. 0.4 VA (28 V DC or V AC).
ELECTRICAL LIFE: 50,000 cycles.
CONTACT RESISTANCE: (10mA @ 2 V DC) 80 mΩ max. initial.
INSULATION RESISTANCE: 500MΩ min. @ 500 V DC - 1 minute.
OPERATING TEMPERATURE: –20°C to 80°C.
SOLDERABILITY: Per MIL-STD-202F method 208D, or
EIA RS-186E method 9.
PACKAGING:
Tray pack - 100 switches per tray.
Caps (optional) - Bulk bag; 100 caps per bag.

Materials

MOVABLE CONTACTS:
Base metal: Phosphor bronze
Plating: Gold over nickel plate
FIXED CONTACTS:
Base metal: Brass
Plating: Gold over nickel plate
COVER: PA66 - Black
ACTUATOR: PPS - Black
BASE: PPS - Black
SUPPORT BRACKET (A1 Terminal Style only): Steel with tin plate

NOTE: Specifications and materials listed above are for switches with standard options.
For information on specific and custom switches, consult Customer Service Center.

Build-A-Switch

To order, simply select desired option from each category and place in the appropriate box. Available options are shown and described on pages A-106 thru A-107. For additional options not shown in catalog, consult Customer Service Center.

F	P	1	1	S	P			B	1	T	P		

Designation
FP11 SPST N.O.

Actuator Length
SP Standard plunger 3.3mm

Terminal Style
C1 Vertical
A1 Right Angle

Contact Plating
B1 Gold over nickel plate

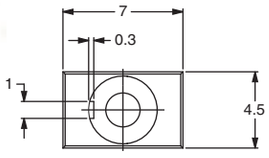
Packaging
TP Tray packaging

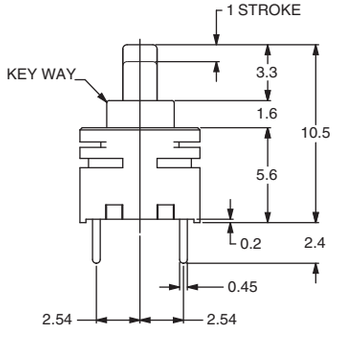
Cap
00 No cap
01 White cap - bulk bagged
02 Black cap - bulk bagged
03 Red cap - bulk bagged

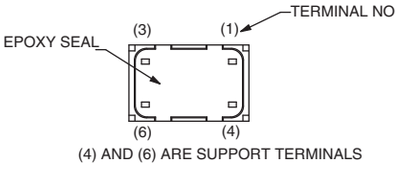
FP Series
Sealed Ultra Miniature Pushbutton Switches

SWITCH FUNCTION

C1 VERTICAL

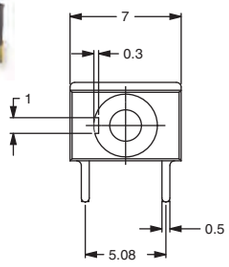


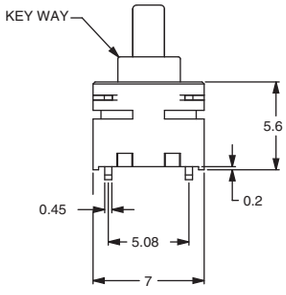


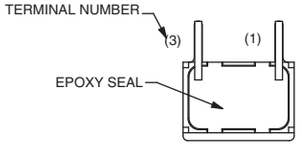


(4) AND (6) ARE SUPPORT TERMINALS

A1 RIGHT ANGLE





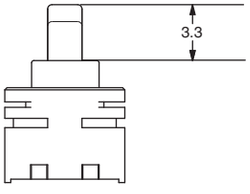


MODEL NO.	SWITCH FUNCTION	
	POS. 1	POS. 2
FP11	OFF	MOM
	CONNECTED TERMINALS	
	OPEN	1-3

SCHEMATIC SPST

ACTUATOR LENGTH

SP STANDARD PLUNGER 3.3MM

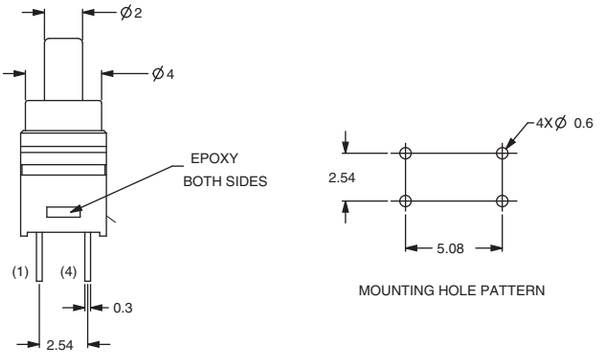


Third Angle Projection

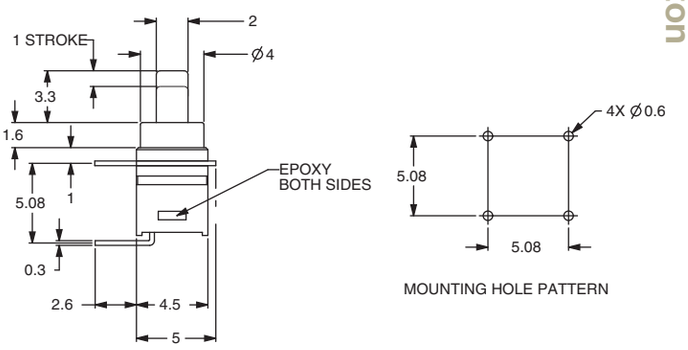
Dimensions are shown: mm
Specifications and dimensions subject to change

TERMINAL STYLE

C1 VERTICAL



A1 RIGHT ANGLE



CONTACT PLATING

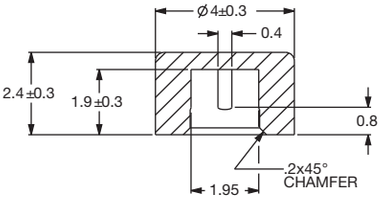
B1 GOLD OVER NICKEL PLATE

PACKAGING

TP TRAY PACKAGING

CAPS

OPTION CODE	DESCRIPTION
00	NO CAP
01	WHITE CAP, BULK BAGGED
02	BLACK CAP, BULK BAGGED
03	RED CAP, BULK BAGGED



To purchase Caps separately without switch, please use these part numbers

PART #	COLOR
798D01000	WHITE
798D02000	BLACK
798D03000	RED

Third Angle Projection

Dimensions are shown: mm
Specifications and dimensions subject to change

AP Series
Industrial Pushbutton Switch

Features/Benefits

- ***IP67 sealed***
- ***1,000,000 life cycle***
- ***Illumination / non-illumination***
- ***Multiple colored caps***
- ***Threaded or snap-in mounting***
- ***Caps available separately***
- ***RoHS compliant***

Typical Applications

- ***Harsh environments***
- ***Off-Road***
- ***Industrial***
- ***Medical***
- ***Transportation***
- ***Joystick control modules***
- ***Gaming***
- ***Military***

Specifications

FUNCTION: SPST Momentary
CONTACT ARRANGEMENT: N.O.
MOUNTING TYPE:
Snap-in (no panel seal)
Threaded body (hex nut, lock washer, and panel seal gasket provided)
Torque spec for threaded body: Do not exceed 8-9 in-lbs (0.9-1.0 N.m)

Mechanical

OPERATING LIFE: 1,000,000 cycles
TOTAL TRAVEL: 2.1 ± 0.2 mm
OPERATING POINT 1.55 ± 0.25 mm
OVER TRAVEL: 0.6 min.
OPERATING FORCE: 4N ± 1N standard configuration; other force option 2N ± 0.5N
VIBRATION: 10-500 Hz 10g Max
SHOCK: 60g 11ms sawtooth wave

Electrical

CONTACT RATING:
200mA @ 24 V DC resistive (500,000 cycles)
100mA @ 50 V DC resistive (500,000 cycles)
400mA @ 32 V AC resistive (500,000 cycles)
125mA @ 125 V AC resistive (1,000,000 cycles)
DIELECTRIC STRENGTH: 1000 V AC min.
INSULATION RESISTANCE: 1 G Ω @ 500 VDC
INITIAL CONTACT RESISTANCE 50 mΩ max (without wire leads)
BOUNCE TIME: <5 ms

Materials

HOUSING: PBT
BASE: PBT
CAP: PBT
ACTUATOR:
Illuminated: Clear polycarbonate
Non-illuminated: PBT
INTERNAL SEAL: Silicone rubber
TERMINALS: Copper alloy, gold over silver plating
MOVABLE CONTACT: Copper alloy, gold over silver plating
TERMINAL SEAL: Epoxy
WIRE LEADS: UL1569 Black 22 AWG

Operating Environment

OPERATING TEMPERATURE: -40˚C to 85˚C (+105˚C non-illuminated)
ESD PROTECTION: 20 KV min.

Process Environment

SEALING: IP67 for threaded body
IP65 for snap-in version (no panel seal)

NOTE: Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, please contact Customer Service.

Build-A-Switch

To order, simply select desired option from each category and place in the appropriate box.

A	P								B	E

Designation
AP AP Series

Operating Force
2 2 Newtons
4 4 Newtons

Actuator Style
D Dome / Convex
C Concave
E Extended Dome
N None

Actuator Color
0 No Cap
2 Black
3 Red
4 Orange
5 Yellow
6 Green
7 Blue
9 Gray

Please contact Customer Service for additional colors and paint / laser etched button options.

Illumination
00 No LED*
01 Super White
02 Bi-color; Red (Green)
03 Red
05 Amber
06 Green
07 Super Blue
08 Bi-color; Amber (Green)

* No LED available in short body only

Bushing Style**
S** Snap-in plastic
T Threaded plastic

** No panel seal option
*** PC terminals not available with illumination

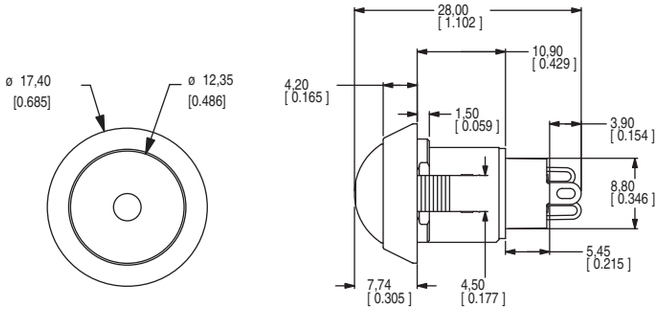
Termination
Z Solder Lug
W 12” Wire Leads 22 AWG
C*** PC Terminals

Contact Material
B Gold

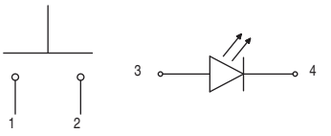
Terminal Seal
E Epoxy
All models are epoxy sealed

Contact Customer Service for additional hardware options.

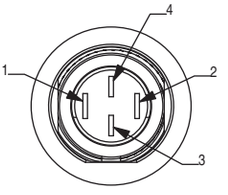
STANDARD VIEW



ELECTRICAL SCHEMATIC



SPST-NO



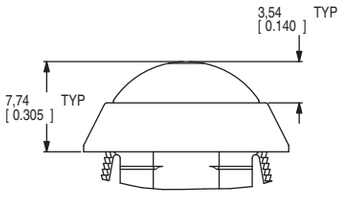
SEE SCHEMATIC

OPERATING FORCE

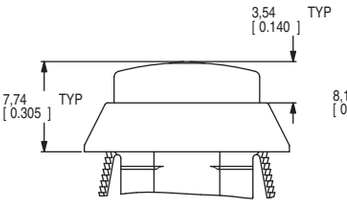
OPTION CODE	OPERATING FORCE
2	2 N, 200 g
4	4 N, 400 g

ACTUATOR STYLE

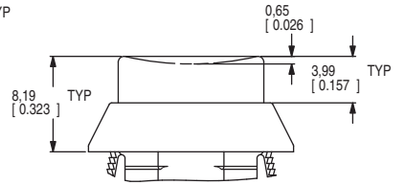
D DOME / CONVEX



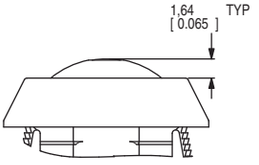
E EXTENDED DOME

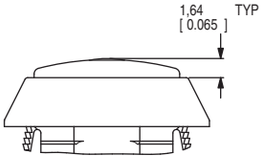


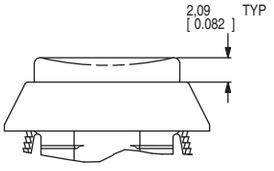
C CONCAVE



DOWN POSITION







ACTUATOR COLOR

OPTION CODE	ACTUATOR COLOR
0	No Cap
2	Black
3	Red
4	Orange
5	Yellow
6	Green
7	Blue
9	Gray

For additional colors please contact Customer Service.

Third Angle Projection

Dimensions are shown: mm (inches
Specifications and dimensions subject to change

AP Series
Industrial Pushbutton Switch

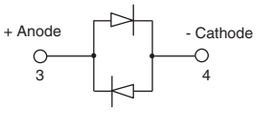
ILLUMINATION

OPTION CODE	ILLUMINATION TYPE	TYPICAL INTENSITY* MIN	MAX	PEAK WAVELENGTH	Vf Forward Voltage
		(mcd)		(nm)	
00	Model without illumination	N/A		N/A	
01	LED Super White	4,000	5,000	N/A	3.5
02	LED Bi-Color – Red (Green)	10	20	635/565	2.0
03	LED Red	4	8	700	2.0
05	LED Amber	35	50	610	2.0
06	LED Green	35	50	565	2.0
07	LED Super Blue	800	1,500	470	3.8
08	LED Bi-Color – Amber (Green)	10	10	585/565	2.0

*LED FORWARD CURRENT: 20 mA
LED FORWARD VOLTAGE: see chart above
LED REVERSE VOLTAGE: 5.0 V MAX

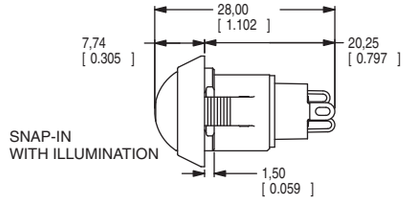
* For information on specific and custom LED, please contact Customer Service.

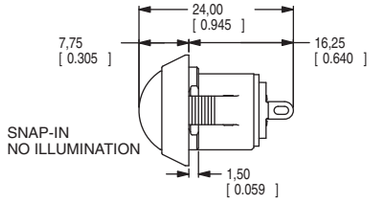
NOTE:
For bi-color LED's the polarity must be reversed to alternate the color



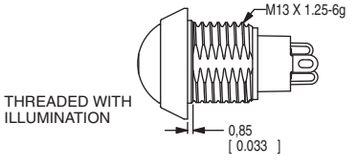
BUSHING STYLE

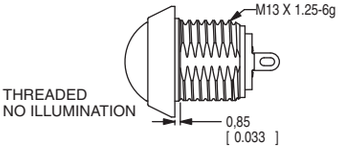
S SNAP-IN



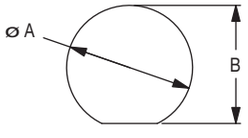


T THREADED PLASTIC





PANEL CUTOUT



PANEL THICKNESS	DIM A (± 0.05 mm)	DIM B (± 0.05 mm)
1 mm [0.039 in]	13.70 mm [0.539 in]	13.00 mm [0.512 in]
2 mm [0.079 in]	13.80 mm [0.539 in]	13.00 mm [0.512 in]
3 mm [0.118 in]	13.90 mm [0.547 in]	13.10 mm [0.516 in]
THREADED BODY MIN PANEL THICKNESS 1 mm	13.70 mm [0.539 in]	13.00 mm [0.512 in]

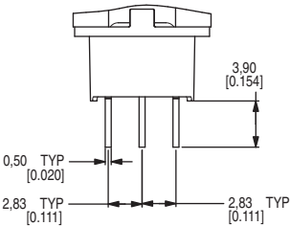
A 0.1mm min. chamfer on the leading edge of the mounting hole is recommended for snap-in version.

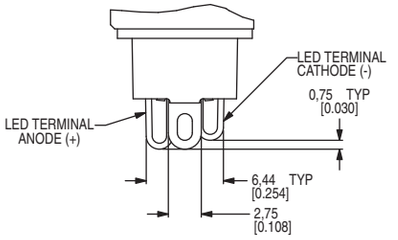
Third Angle Projection

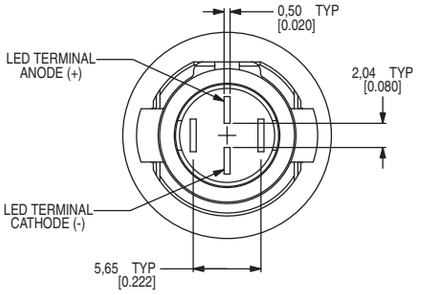
Dimensions are shown: mm (inches)
Specifications and dimensions subject to change

TERMINATION

Z SOLDER LUG



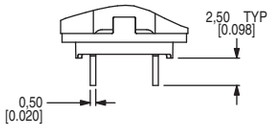


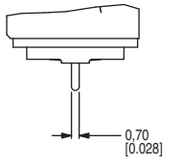


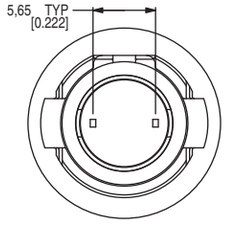
* Switching terminals are gold and LED terminals are silver

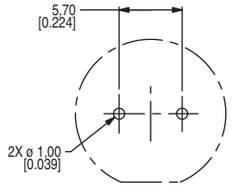
C PC TERMINALS

*** Illumination not available with PC Terminals



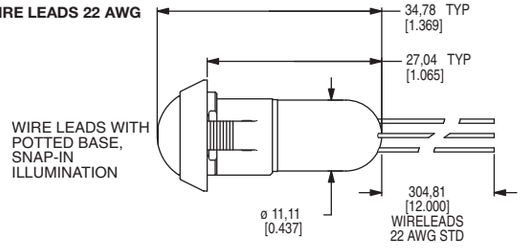


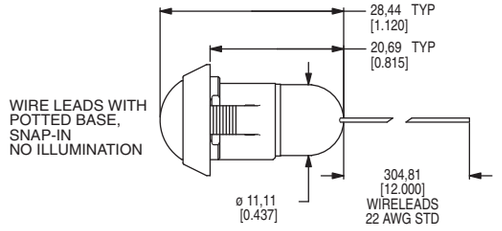


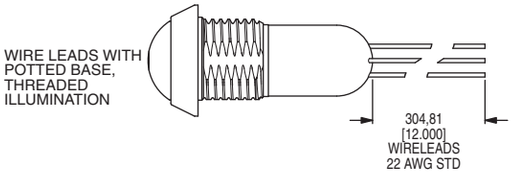


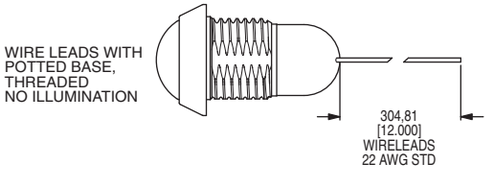
PCB HOLE PATTERN
BOARD VIEW

W 12" WIRE LEADS 22 AWG









Wires: Black wires - Terminals
Red wires - LED (+) Positive
White wire - LED (-) Negative

Third Angle
Projection

Dimensions are shown: mm (inches
Specifications and dimensions subject to change

AP Series
Industrial Pushbutton Switch

CONTACT MATERIAL

B GOLD

OPTION CODE	CONTACT MATERIAL
B	Gold

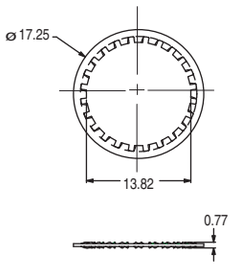
TERMINAL SEAL

E EPOXY

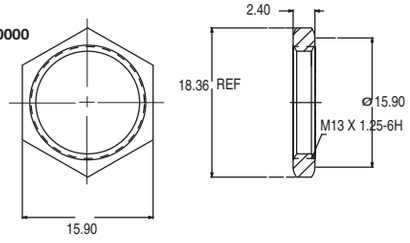
All models are epoxy sealed

HARDWARE

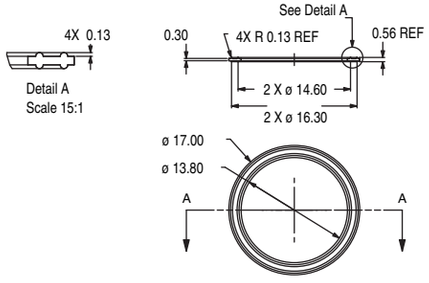
LOCK WASHER
Part Number 647D00000



HEX NUT
Part number 515D00000



PANEL SEAL
Part Number 655D00000



Caps available on next page

Third Angle Projection

Dimensions are shown: mm (inches)
Specifications and dimensions subject to change

AVAILABLE CAPS

481D XX XXX

Cap Color

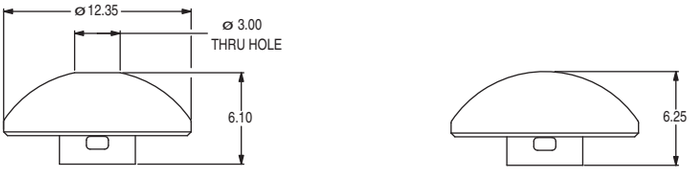
Style

OPTION	CAP COLOR
01	WHITE
02	BLACK
03	RED
04	ORANGE
05	YELLOW
06	GREEN
07	BLUE
08	BROWN
09	GRAY

PART NUMBER	HOLE	STYLE
481DXX000	NO	DOME
481DXX001	YES	DOME
481DXX002	NO	EXTENDED DOME
481DXX003	YES	EXTENDED DOME
481DXX004	NO	CONCAVE
481DXX005	YES	CONCAVE

DOME

481DXX000 = NO HOLE
481DXX001 = HOLE

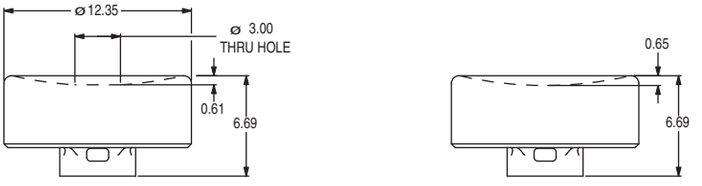


EXTENDED DOME

481DXX002 = NO HOLE
481DXX003 = HOLE

CONCAVE

481DXX004 = NO HOLE
481DXX005 = HOLE



Third Angle Projection

Dimensions are shown: mm (inches)
Specifications and dimensions subject to change

APB Series
Backlit Pushbutton Switch

Features/Benefits

- *IP67 sealed*
- *1,000,000 life cycle*
- *Illumination*
- *Threaded or snap-in mounting*
- *RoHS compliant*

Typical Applications

- *Harsh environments*
- *Off-Road*
- *Industrial*
- *Medical*
- *Transportation*
- *Joystick control modules*
- *Gaming*
- *Military*

Specifications

FUNCTION: SPST Momentary
CONTACT ARRANGEMENT: N.O.
MOUNTING TYPE:
Snap-in (no panel seal)
Threaded body (hex nut, lock washer, and panel seal gasket provided)
Torque spec for threaded body: Do not exceed 8-9 in-lbs (0.9-1.0 N.m)

Mechanical

OPERATING LIFE: 1,000,000 cycles
TOTAL TRAVEL: 2.1 ± 0.2 mm
OPERATING POINT 1.55 ± 0.25 mm
OVER TRAVEL: 0.6 min.
OPERATING FORCE: 4N ± 1N standard configuration; other force option 2N ± 0.5N
VIBRATION: 10-500 Hz 10g Max
SHOCK: 60g 11ms sawtooth wave

Electrical

CONTACT RATING:
200mA @ 24 V DC resistive (500,000 cycles)
100mA @ 50 V DC resistive (500,000 cycles)
400mA @ 32 V AC resistive (500,000 cycles)
125mA @ 125 V AC resistive (1,000,000 cycles)
DIELECTRIC STRENGTH: 1000 V AC min.
INSULATION RESISTANCE: 1 G Ω @ 500 VDC
INITIAL CONTACT RESISTANCE 50 mΩ max (without wire leads)
BOUNCE TIME: <5 ms

Materials

HOUSING: PBT
BASE: PBT
CAP: Painted polycarbonate
ACTUATOR:
Illuminated: Clear polycarbonate
INTERNAL SEAL: Silicone rubber
TERMINALS: Copper alloy, gold over silver plating
MOVABLE CONTACT: Copper alloy, gold over silver plating
TERMINAL SEAL: Epoxy
WIRE LEADS: UL1569 Black 22 AWG

Operating Environment

OPERATING TEMPERATURE: -40˚C to 85˚C
ESD PROTECTION: 20 KV min.

Process Environment

SEALING: IP67 for threaded body
IP65 for snap-in version (no panel seal)

NOTE: Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, please contact Customer Service.

Build-A-Switch

To order, simply select desired option from each category and place in the appropriate box.

A	P	B		E					B	E			

Designation
APB APB Series

Operating Force
2 2 Newtons
4 4 Newtons

Cap
E Extended Dome (600E)

Illumination
01 Super White
07 Super Blue

Bushing Style
S Snap-in plastic
T Threaded plastic

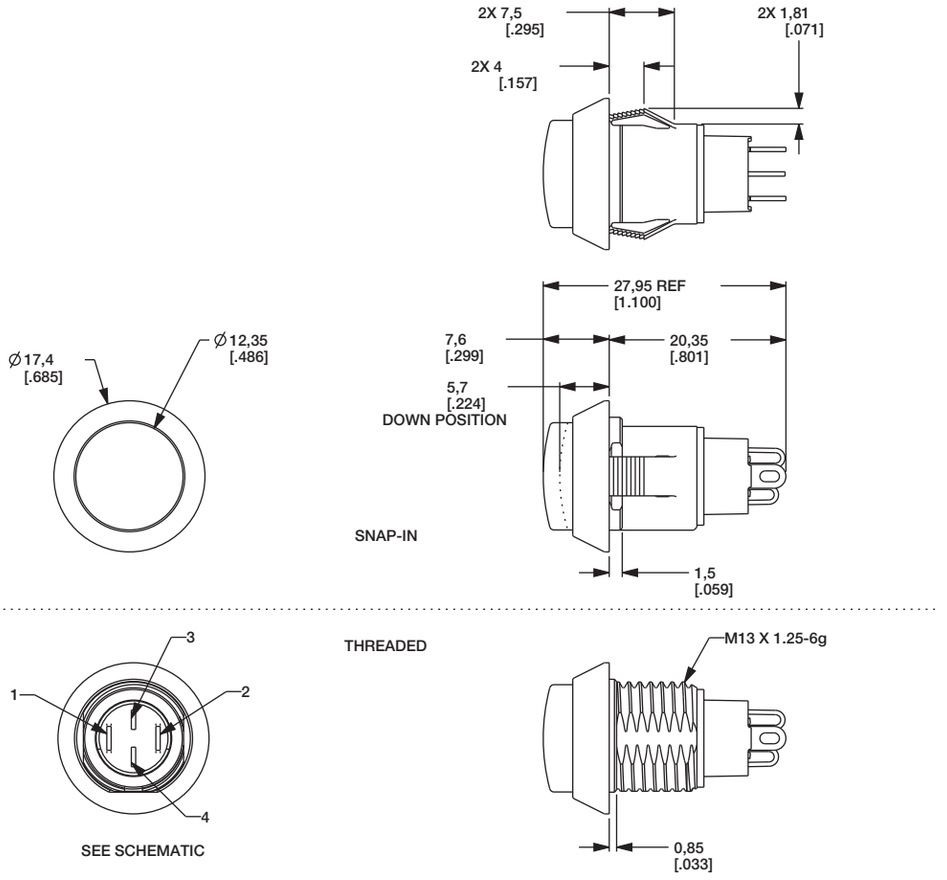
Termination
Z Solder Lug
W 12” Wire Leads 22 AWG

Contact Material
B Gold

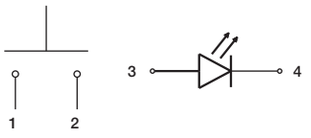
Terminal Seal
E Epoxy

Cap Symbol
000 Painted black over white without symbol*
001 Plus
002 Locked
003 Engine stop
004 Park brake release
005 Engine start
006 Fast
007 Slow
008 Unlocked
009 Rock shaft lower
010 Minus

* cap painted black over white to allow customer laser etching

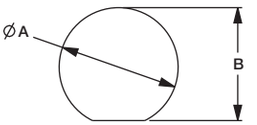


ELECTRICAL SCHEMATIC



SPST-NO-DB

PANEL CUTOUT



PANEL THICKNESS	DIM A (±0.05 MM)	DIM B (±0.05 MM)
1 MM [0.039 IN]	13.70 MM [0.539 IN]	13.00 MM [0.512 IN]
2 MM [0.079 IN]	13.80 MM [0.539 IN]	13.00 MM [0.512 IN]
3 MM [0.118 IN]	13.90 MM [0.547 IN]	13.10 MM [0.516 IN]
THREADED BODY MIN PANEL THICKNESS 1 MM	13.70 MM [0.539 IN]	13.00 MM [0.512 IN]

A 0.1 MM MIN CHAMFER ON THE LEADING EDGE OF MOUNTING HOLE IS RECOMMENDED FOR SNAP-IN VERSION.

Third Angle Projection

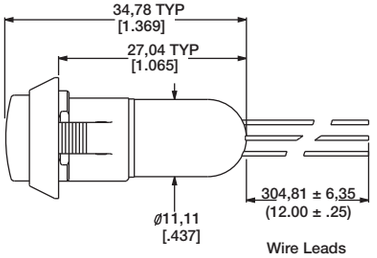
APB Series
Backlit Pushbutton Switch

TERMINATION

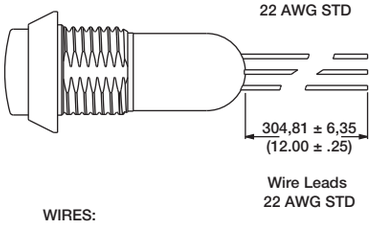
W 12" WIRE LEADS

Z SOLDER LUG

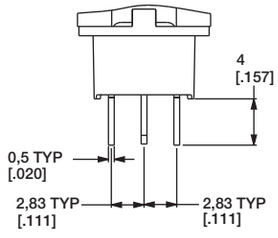
WIRE LEADS WITH POTTED BASE, SNAP-IN ILLUMINATION

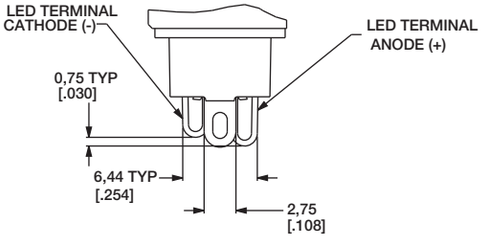


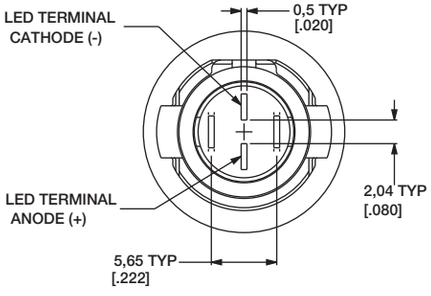
WIRE LEADS WITH POTTED BASE, THREADED ILLUMINATION



WIRES:
BLACK - TERMINALS
RED - LED (+) POSITIVE
WHITE - LED (-) NEGATIVE







CONTACT MATERIAL

B GOLD

OPTION CODE	CONTACT MATERIAL
B	Gold

TERMINAL SEAL

E EPOXY

All models are epoxy sealed

Third Angle Projection

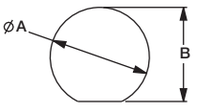
Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

CAP SYMBOLS

-000		NO SYMBOL
-001		PLUS
-002		LOCKED
-003	STOP	ENGINE STOP
-004		PARK BRAKE RELEASE
-005		ENGINE START
-006		FAST
-007		SLOW
-008		UNLOCKED
-009		ROCK SHAFT LOWER
-010		MINUS

NOTES:
1. ALL GRAPHICS MUST BE POSITIONED AS SHOWN, PERPENDICULAR TO ALIGNMENT FEATURE ON UNDERSIDE OF CAP.
2. GRAPHIC MARKING MUST BE ALIGNED WITH THE FLAT FEATURE ON THE UNDERSIDE OF THE CAP AS SHOWN, TOLERANCE ±3°

PANEL CUTOUT

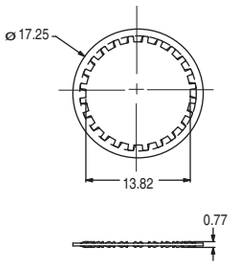


Panel Orientation
Flat indicates bottom

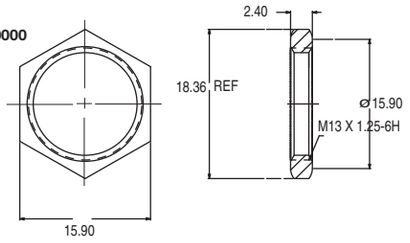
See chart on previous page for dimensions

HARDWARE

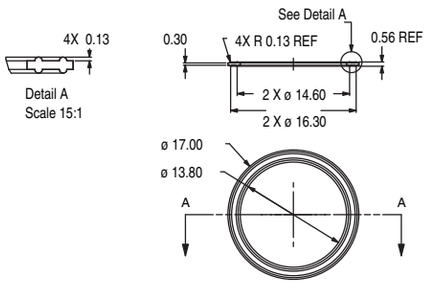
LOCK WASHER
Part Number 647D00000



HEX NUT
Part number 515D00000



PANEL SEAL
Part Number 655D00000



Third Angle Projection

Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

HP Series
Hall Effect Pushbutton Switch

Features/Benefits

- ***IP68 sealed***
- ***10,000,000 life cycle***
- ***Multiple colored caps***
- ***Redundant output available***

Typical Applications

- ***Harsh environments***
- ***Off-Road***
- ***Industrial***
- ***Medical***
- ***Transportation***
- ***Joystick control modules***
- ***Gaming***
- ***Military***

Specifications

FUNCTION: Linear output (See chart on next page)
MOUNTING TYPE: Front mount, Rear mount

Mechanical

MECHANICAL TRAVEL: 0.150 (3.81mm)
SHOCK: 60g 11ms sawtooth wave
VIBRATION: 10-500Hz 10g max.

Electrical

SUPPLY VOLTAGE: 5 ± 0.5 VDC
SUPPLY CURRENT: 10mA max.
OUTPUT CURRENT: 1mA max.
OUTPUT VOLTAGE: Programable from 0.5 -4.5V
ESD PROTECTION: 16kV per EIA-545

Materials

CASE / BUSHING: Anodized Aluminum
INSIDE HOUSING: PBT
CAP: PBT
ACTUATOR: PBT

Operating Environment

OPERATING TEMPERATURE: -40˚C to 85˚C
OPERATING LIFE: 10,000,000 cycles
SEALING: IP68S

NOTE: Specifications and materials listed above are for switches with standard options.
For information on specific and custom switches, please contact Customer Service.

Build-A-Switch

To order, simply select desired option from each category and place in the appropriate box.

H P

Designation
HP HP Series

Bushing / Mounting Style
1 Front mount, 5/8-24 thread
2 Rear mount, 5/8-24 thread
3 Rear mount, 15/32-32 thread

Cap Style
1 ø .625 Dome (front mount only)
2 ø .370 Flat

Sensor Configuration
S Single Output
D Dual Output,
Output 2 mirrors Output 1
(see figure 1)

Please contact Customer Service for additional options.

Output Voltage Code
1 V1= 1.0V, V2= 4.0V
2 V1= 4.0V, V2= 1.0V
3 V1= 0.5V, V2= 4.5V
4 V1= 4.5V, V2= 0.5V

Actuation Force
S 2.7lb (12N)

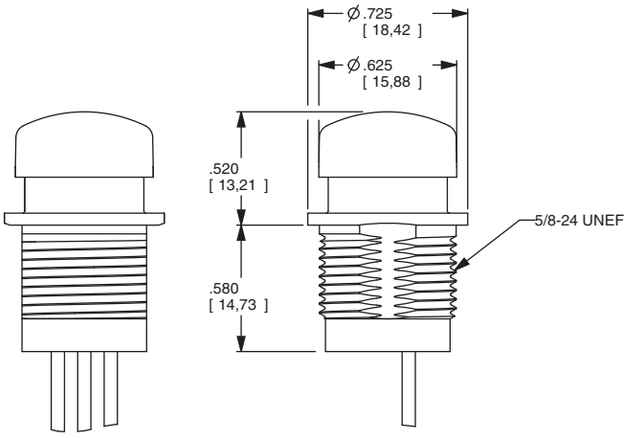
Termination Style
W 12” wire leads, 22 AWG XLPE (26 AWG for Dual Output)

Cap Color
1 White
2 Black (STD)
3 Red
4 Orange
5 Yellow

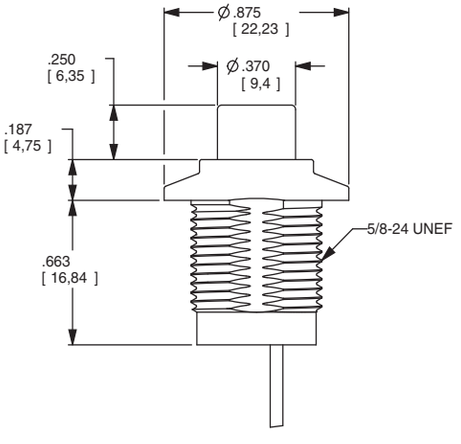
Bushing Finish
1 Clear anodize
2 Black anodize (STD)

Hardware
0 No hardware
1 Plated hardware (STD)
2 Stainless hardware

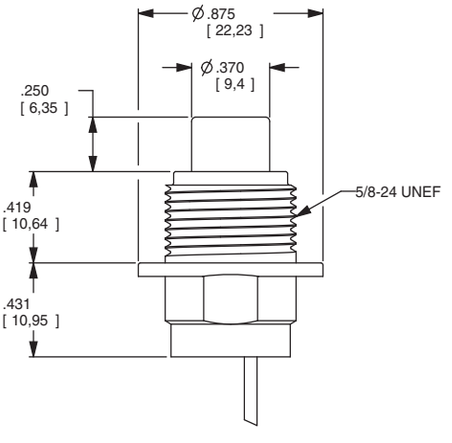
STANDARD VIEW



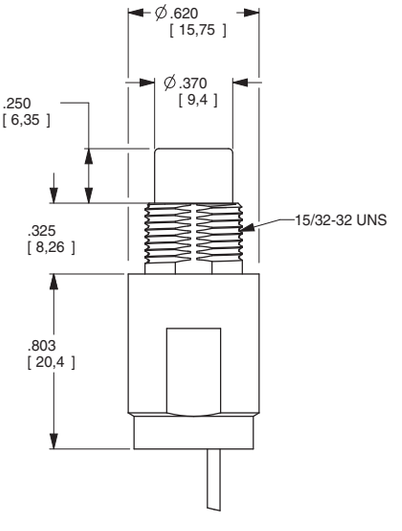
HP11



HP12



HP22



HP32

FIGURE 1: OUTPUT VOLTAGE

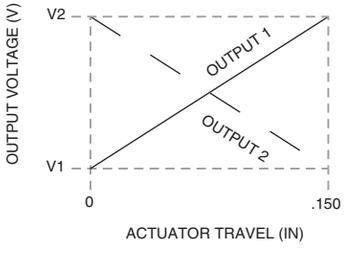
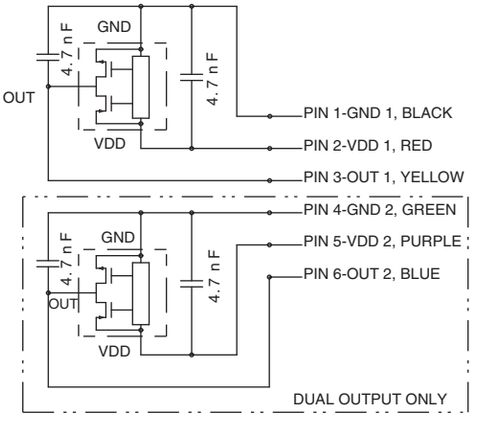


FIGURE 2- SCHEMATIC



Third Angle Projection

Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

NP Series
Sealed Industrial Pushbutton Switch

Features/Benefits

- ***IP68 sealed***
- ***1,000,000 life cycle***
- ***Multiple housing styles***
- ***Capable of up to 5A resistive load***
- ***Wirelead options available***
- ***RoHS compliant***

Typical Applications

- ***Harsh environments***
- ***Off-Road***
- ***Industrial***
- ***Transportation***
- ***Military***

Specifications

FUNCTION: SPDT Double Break (Form Z) Momentary
CONTACT ARRANGEMENT: N.O. and N.C.
MOUNTING TYPE: Threaded front or rear mount and slot mount
TORQUE SPEC FOR THREADED BODY: Do not exceed 50 in-lbs (5.65 N-m)

Mechanical

OPERATING LIFE: 1,000,000 cycles
TOTAL TRAVEL: 1.6 ± 0.15 mm
OPERATING POINT 0.9 ± 0.25 mm
OVER TRAVEL: 0.45 min.
OPERATING FORCE: 8N ± 1.5N
VIBRATION: 10-500 Hz 10g Max
SHOCK: 50g 11ms sawtooth wave

Electrical

CONTACT RATING:
Option G - Gold over Silver
10mA/5 VDC (1,000,000 cycles)
Option Q - Silver
1A/32 VDC resistive (100,000 cycles)
5A/32 VDC resistive (25,000 cycles)
3A/32 VDC resistive (25,000 cycles)

Electrical (cont.)

DIELECTRIC STRENGTH: 1000 V AC for 1 min.
INSULATION RESISTANCE: 1 G Ω @ 500 VDC
INITIAL CONTACT RESISTANCE 50 mΩ max (without wire leads)
BOUNCE TIME: <5 ms

Materials

HOUSING: 6061-T6 Aluminum, black or clear anodized
BASE: PBT
CAP: PBT
ACTUATOR: PBT
INTERNAL SEAL: Silicone rubber
TERMINALS: Copper with silver nickel inlay, silver plating
MOVABLE CONTACT: Copper alloy, gold over silver plating
TERMINAL SEAL: Epoxy

Operating Environment

OPERATING TEMPERATURE: -40˚C to +85˚C
ESD PROTECTION: 15KV min.

Process Environment

SEALING: IP68

NOTE: Specifications and materials listed above are for switches with standard options.
For information on specific and custom switches, please contact Customer Service.

Build-A-Switch

To order, simply select desired option from each category and place in the appropriate box.

N	P	8								E

Designation
NP NP Series

Operating Force
8 8 Newtons

Actuator Style
S Standard
E Extended (D housing style only)

Actuator Color*
2 Black (STD)
3 Red
4 Orange
5 Yellow
9 Gray

* Please contact Customer Service for additional colors.

Housing Style
T Standard threaded mount
L Long threaded mount
H Short threaded mount
S Slot mount
R Rear mount
D Dome bezel
P Tapered bezel

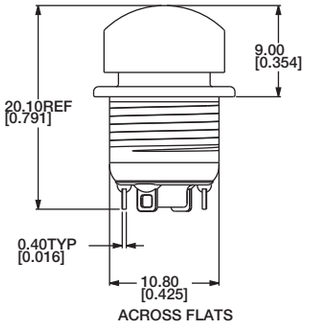
Housing Anodizing Color
1 Clear anodized
2 Black anodized (STD)

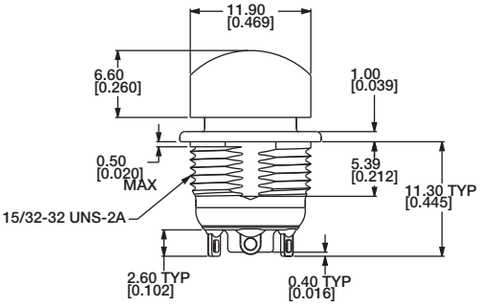
Termination
03 Solder Lug (STD)
02 PC Pin (G Contact Material)
W4 4x 12" 22 AWG UL1569 wire (overmolded)
W3 3x 12" 22 AWG UL1569 wire (overmolded)

Contact Material
Q Silver (STD)
G Gold over silver

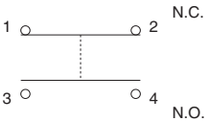
Terminal Seal
E Epoxy
All models are epoxy sealed

STANDARD VIEW





ELECTRICAL SCHEMATIC

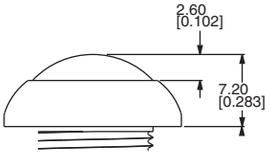


OPERATING FORCE

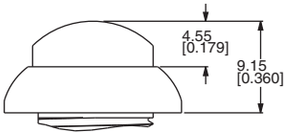
OPTION CODE	OPERATING FORCE
8	8 N

ACTUATOR STYLE

S STANDARD



E EXTENDED (D HOUSING STYLE ONLY)



ACTUATOR COLOR

OPTION CODE	ACTUATOR COLOR
2	Black
3	Red
4	Orange
5	Yellow
9	Gray

For additional colors please contact Customer Service.

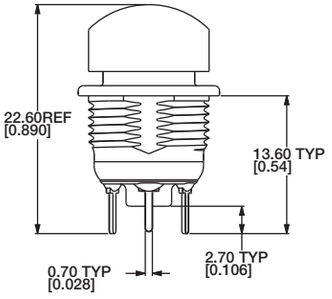
Third Angle Projection

Dimensions are shown: mm (inches)
Specifications and dimensions subject to change

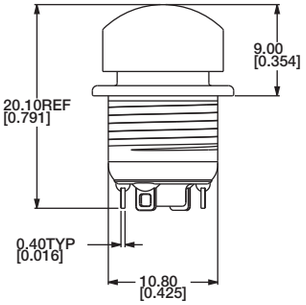
NP Series
Sealed Industrial Pushbutton Switch

HOUSING STYLE

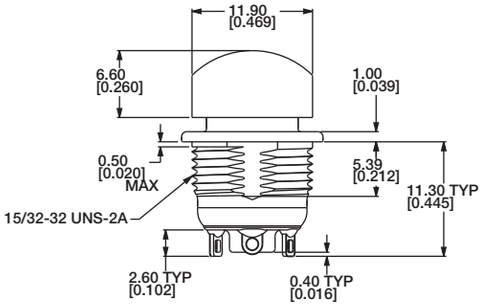
T STANDARD THREADED MOUNT

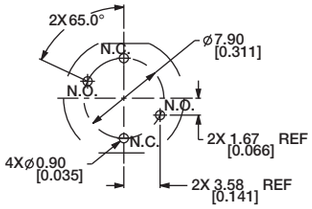


PC TERMINALS

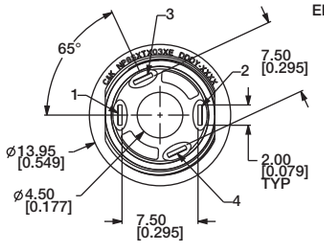


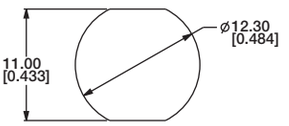
ACROSS FLATS





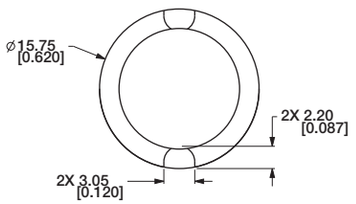
PC HOLE PATTERN
BOARD VIEW

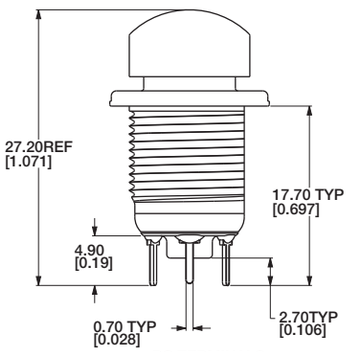




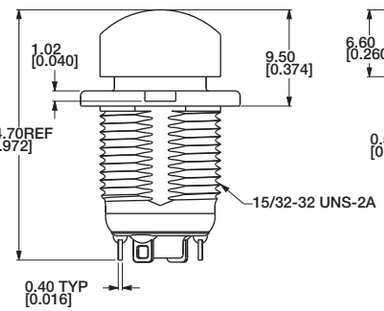
PANEL CUTOUT

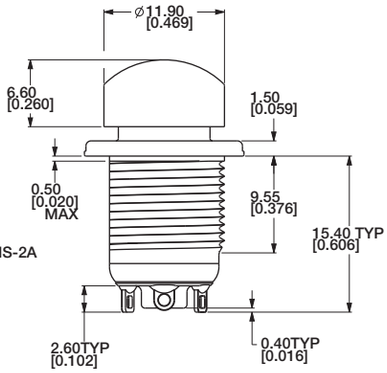
L LONG THREADED MOUNT

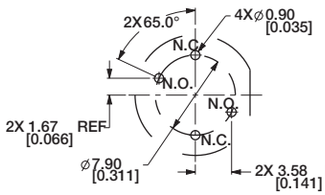




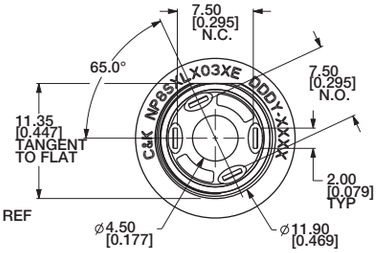
PC TERMINALS

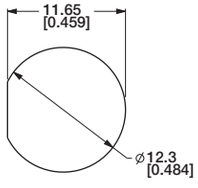






PC HOLE PATTERN
BOARD VIEW





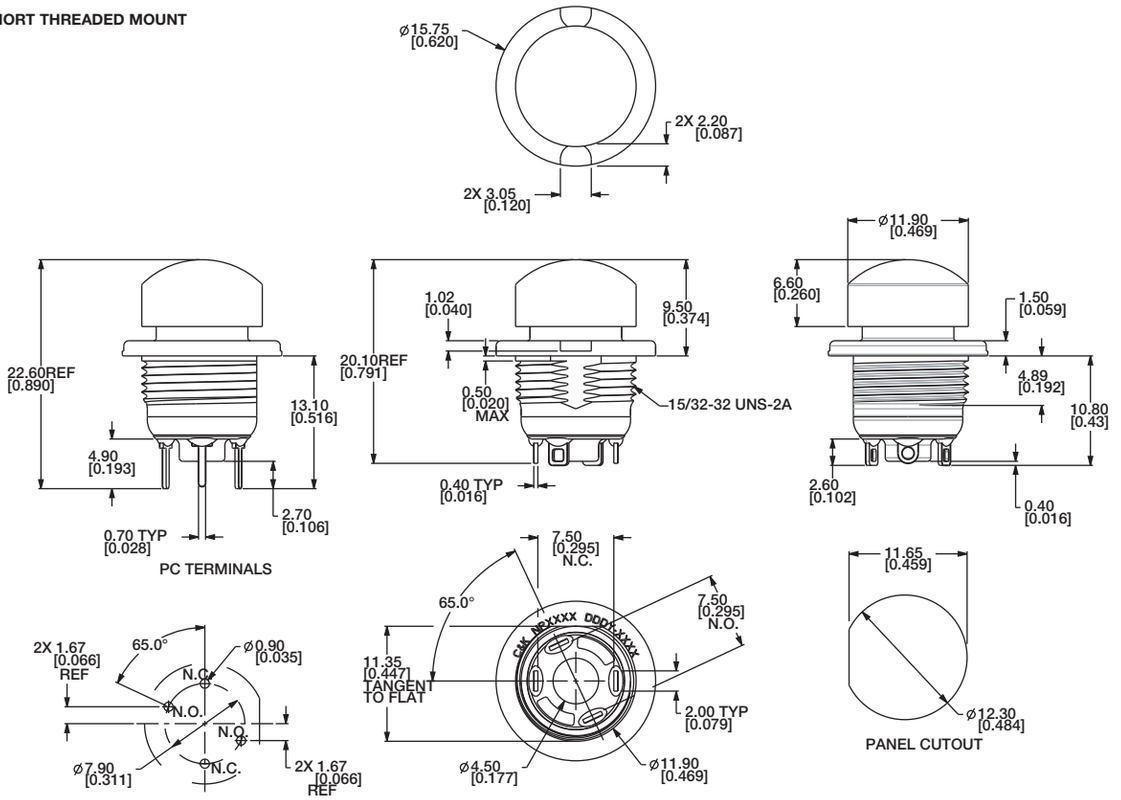
PANEL CUTOUT

Third Angle Projection

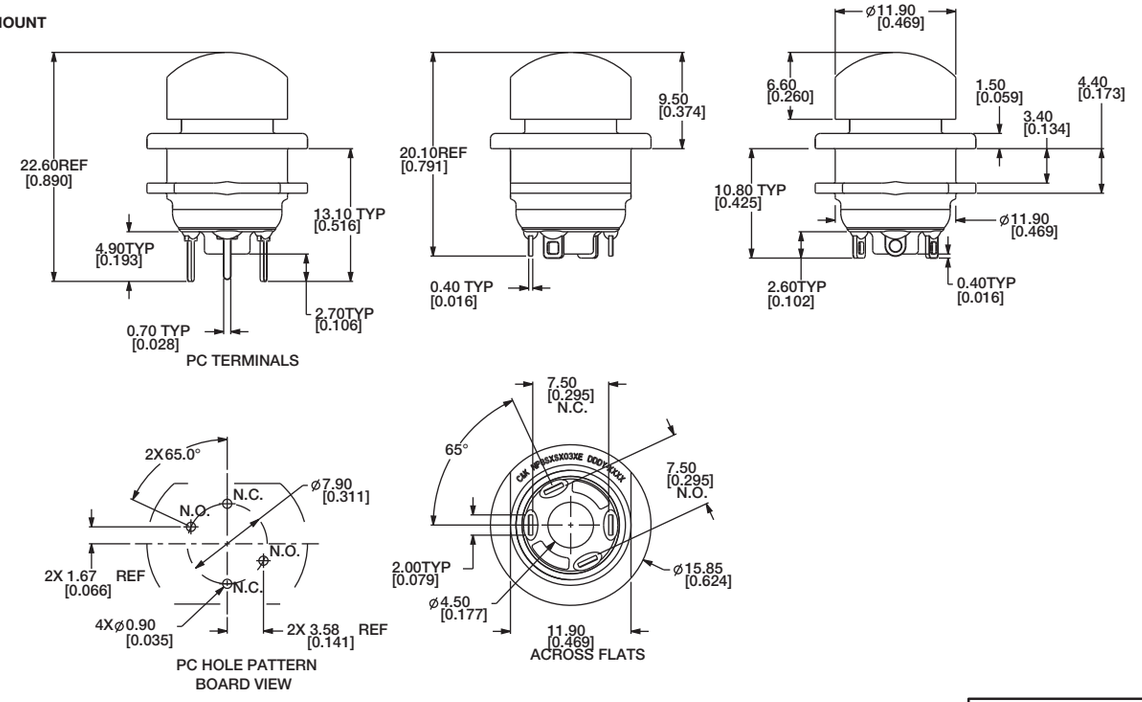
Dimensions are shown: mm (inches)
Specifications and dimensions subject to change

HOUSING STYLE

H SHORT THREADED MOUNT



S SLOT MOUNT



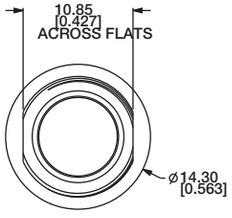
Third Angle Projection

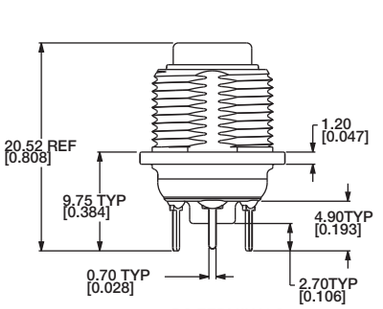
Dimensions are shown: mm (inches)
Specifications and dimensions subject to change

NP Series
Sealed Industrial Pushbutton Switch

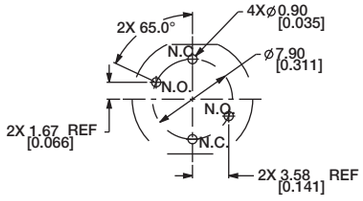
HOUSING STYLE

R REAR MOUNT

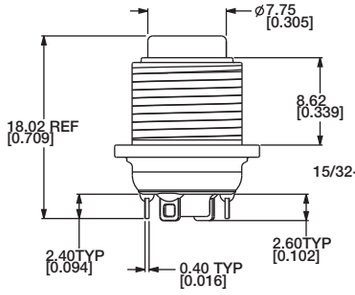


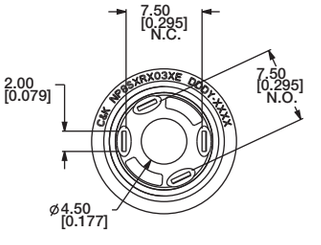


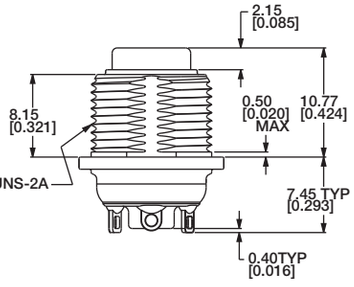
PC TERMINALS

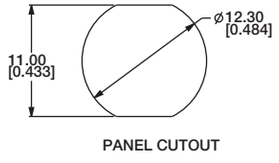


PC HOLE PATTERN
BOARD VIEW



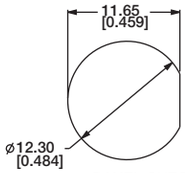




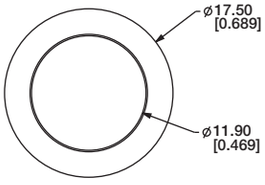


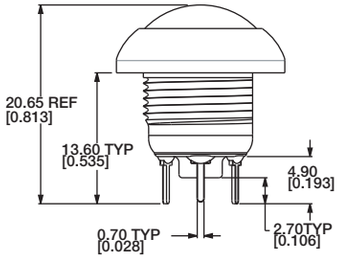
PANEL CUTOUT

D DOME BEZEL

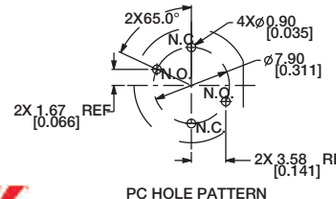


PANEL CUTOUT

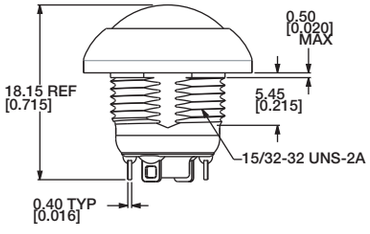


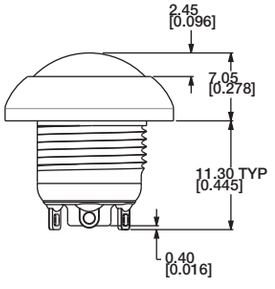


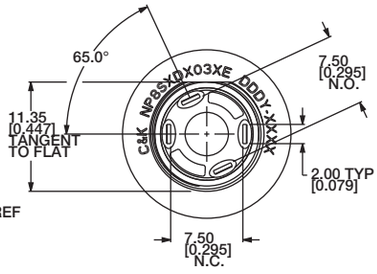
PC TERMINALS

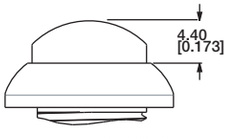


PC HOLE PATTERN
BOARD VIEW









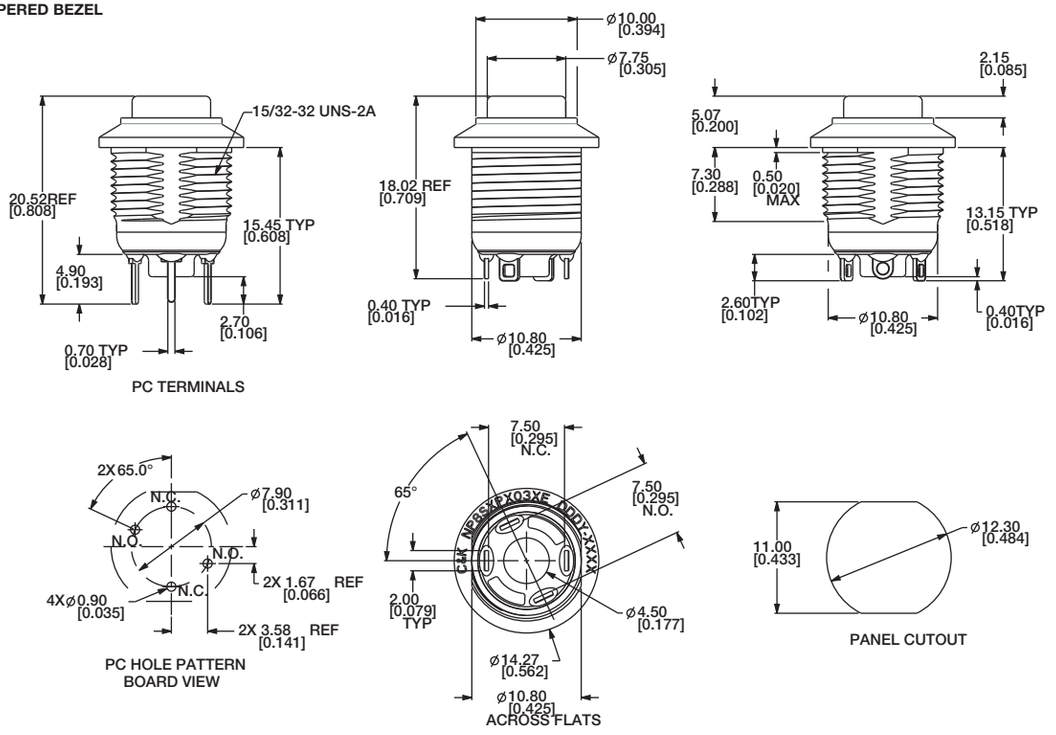
EXTENDED CAP

Third Angle
Projection

Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

HOUSING STYLE

P TAPERED BEZEL

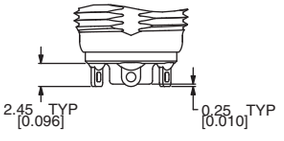


HOUSING ANODIZING COLOR

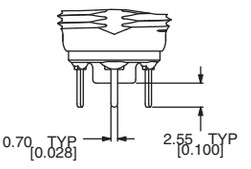
OPTION CODE	ANODIZING COLOR
1	Clear anodized
2	Black anodized (STD)

TERMINATION

03 SOLDER LUG (STD)



02 PC PIN (G CONTACT MATERIAL)

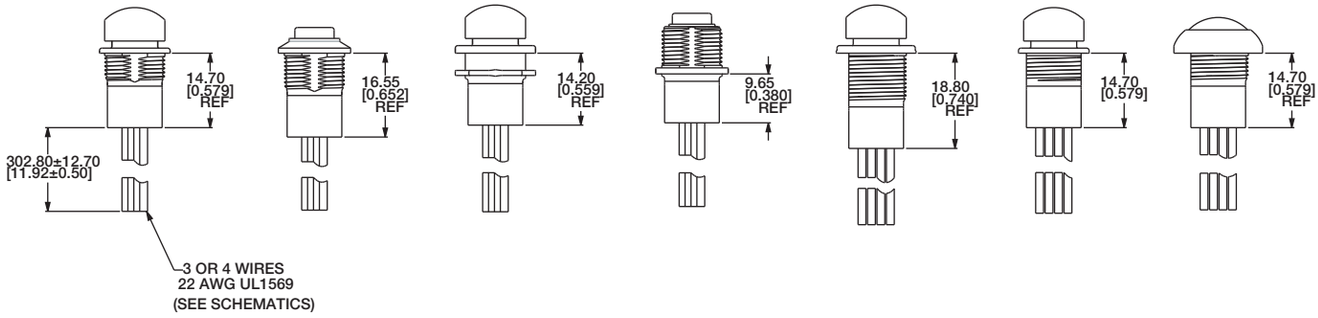


Third Angle Projection

Dimensions are shown: Inches (mm)
Specifications and dimensions subject to change

NP Series
Sealed Industrial Pushbutton Switch

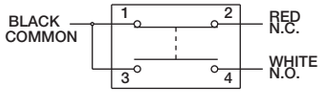
TERMINATION



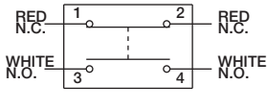
W3 3X 12" 22 AWG UL1569 WIRE (OVERMOLDED)

W4 4X 12" 22 AWG UL1569 WIRE (OVERMOLDED)

ELECTRICAL SCHEMATIC - 3 WIRES



ELECTRICAL SCHEMATIC - 4 WIRES



CONTACT MATERIAL

OPTION CODE	CONTACT MATERIAL
Q	Silver (STD)
G	Gold over Silver

TERMINAL SEAL

E EPOXY

All models are epoxy sealed

HARDWARE

HEX NUT

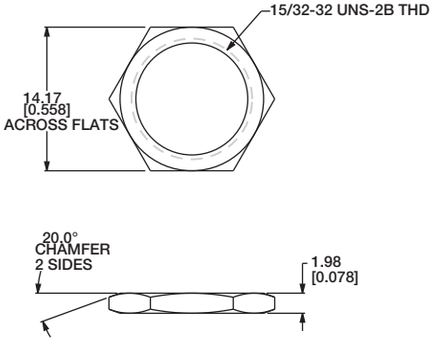
707100201 Nickel-plated

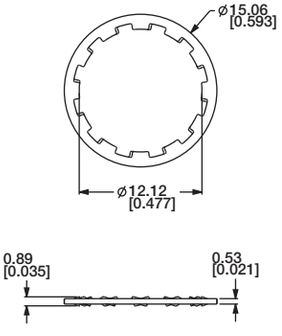
LOCKWASHER

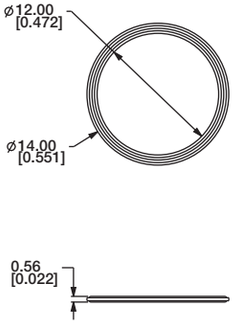
700302202

PANEL GASKET

851D02000







Third Angle Projection

Dimensions are shown: mm (inches)
Specifications and dimensions subject to change

PBA Series
Illuminated Pushbutton

Features/Benefits

- ***Illuminated display***
- ***Small size***
- ***Cold lighting***
- ***Tactile feed back***

Typical Applications

- ***Avionics***

Mechanical

ACTUATION FORCE: 5,5 N ± 0,5 N
MAXIMUM FORCE: 80 N
TRAVEL TO CONTACT: 1,2 ± 0,1 mm
OVERTRAVEL: >0,3 mm
TOTAL TRAVEL: 1,5 ± 0,1 mm
LIFE EXPECTANCY: 10^6 operations 28 V - 10 mA
WEIGHT: 2 grams
VIBRATION: ± 0,45mm from 33 Hz to 75 Hz
ACCELERATION: 10 g max

Electrical

CONTACTS: Gold plated
VOLTAGE: Max 100 V - Min 20 mV DC
CARRYING CURRENT: Max 250 mA - Min 50 µA
SWITCHING CURRENT: Max 50 mA - Min 50 µA
MAX SWITCHING POWER: 1 W
CONTACT RESISTANCE: < 50 Ω
DIELECTRIC STRENGTH: 500 V rms
INSULATION RESISTANCE (100 V): > 5000 M Ω
BOUNCE: < 3 ms
SWITCHING OF 2 POLES MATCHING: < 10 ms

Environmental Data

STORAGE TEMPERATURE: -55°C TO 85°C
OPERATING TEMPERATURE: -30°C TO 85°C
TEMPERATURE OF KEY TO CAP: < Ambiant +25°C
HUMIDITY TEST: 21 days (-40°C - 93% HR)
ALTITUDE PRESSURE: From 20 hPa to 1070 hPa

Soldering Data

WAVE SOLDERING: 260°C / 5s
MANUAL SOLDERING: 350°C / 2s
SEALING: According to IP64

Plastic Material

Housing and Cap: UL-94 V0

NOTE: Specifications and materials listed above are for switches with standard options.
For information on specific and custom switches, please contact Customer Service.

Build-A-Switch

To order, simply select desired option from each category and place in the appropriate box.

P B A [ ] [ ] [ ] [ ] [ ] Repeat sequence for 2nd Marking [ ] [ ]

Designation
PBA PBA Series

Size
1 9,5 x 14
2 11,5 x 14
3 14 x 14

Marking Location
H High
M Middle
L Low

Type of Marking
T Text / Legend
S Status Indicator

LED Color

0	White	λ
1	Green	λ 560 nm
2	Yellow Green	λ 568 nm
3	Amber	λ 590 nm
4	Red	λ 660 nm
5	Other	λ

Display Type

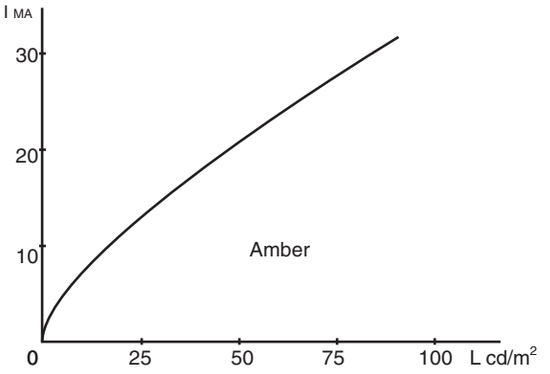
		LED Non-Illuminated	LED Illuminated
N	Text Marking	White	LED Color
	Background	Black	Black
S	Text Marking	Not visible	LED Color
	Background	Black	Black
R	Text Marking	White	LED Color
	Background	Red	Red
G	Text Marking	Green	Green
	Background	Black	Black

LED Supply or Type
AC Alternative
DC Direct
XX for each marking
1:6 LEDs in parallel
for direct current

PBA Series
Illuminated Pushbutton

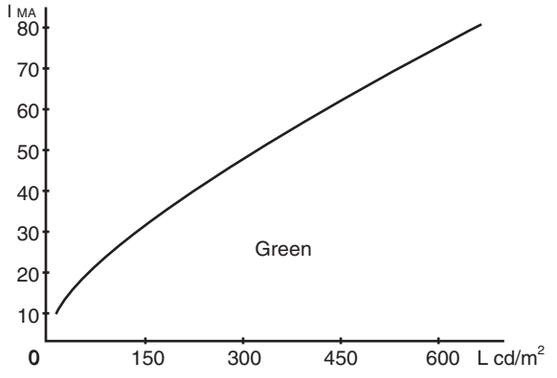
LIGHTING DATA

The legends of function and the status indicator can be illuminated separately.



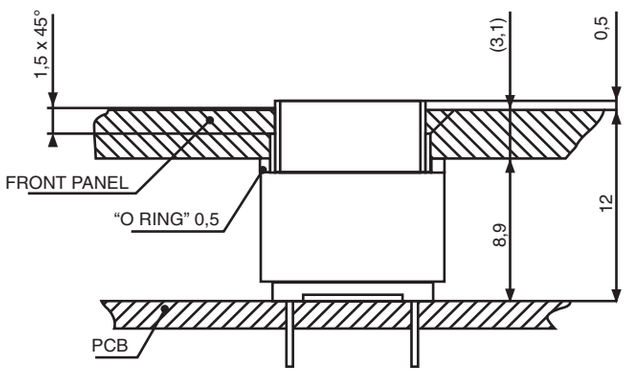
Color	Amber	Green
Wave Length	586 < λ < 592	555 < l < 560
Current Max	80 mA	80 mA
Chromaticity X Y	0,54 < X < 0,58 0,40 < Y < 0,44	0,30 < X < 0,40 0,6 < Y
Contrast Min.	1,2	0,85

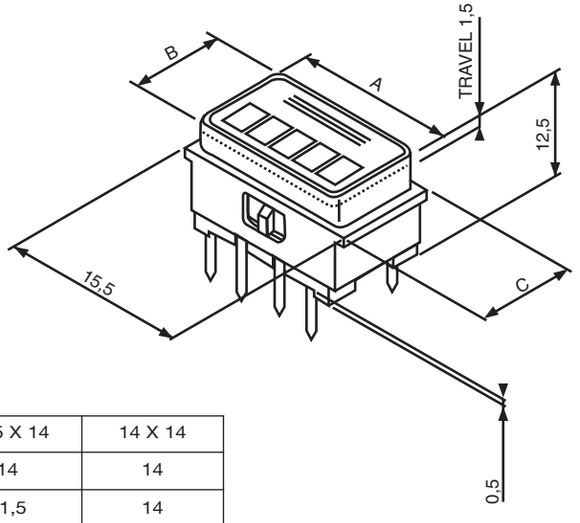
For other colors and displays, please contact Customer Service.



LIGHTING / CURRENT

DIMENSIONS (applicable for any size)

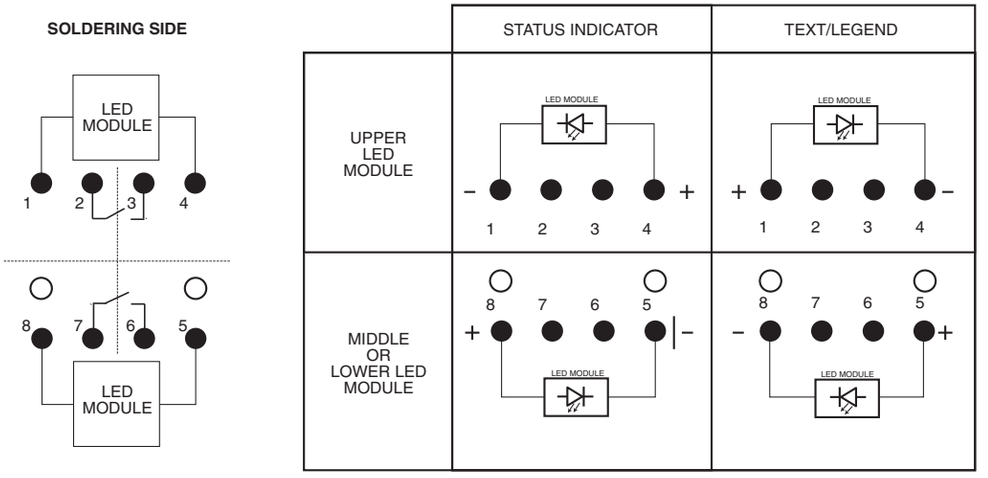




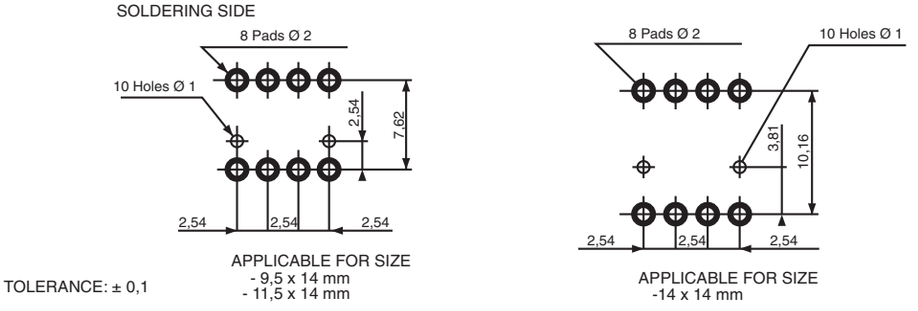
	9,5 X 14	11,5 X 14	14 X 14
A	14	14	14
B	9,5	11,5	14
C	11	11,5	15,5

Tolerance: ± 0,1 mm

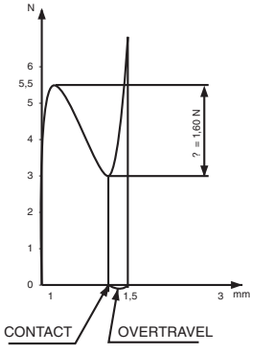
LED MODULE LAYOUT



PCB Layout



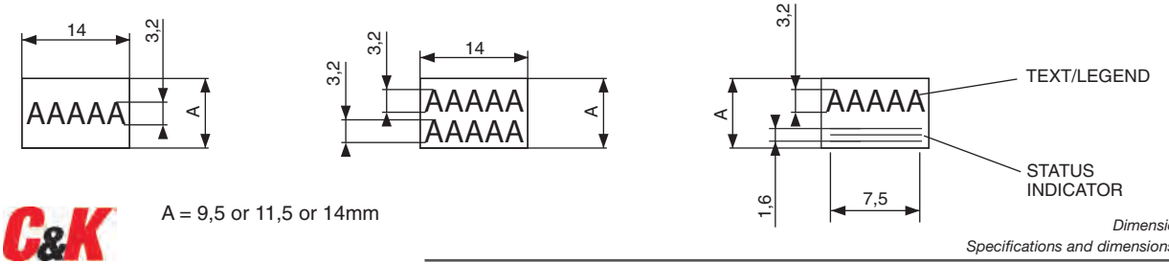
TACTILE EFFECT



TRAVEL
- TRAVEL TO CONTACT: 1,2 ± 0,1 mm
- OVERTRAVEL: > 0,3 mm
- TOTAL TRAVEL: 1,5 ± 0,1 mm

FORCE
- ACTUATOR FORCE: 5,5 N ± 0,5 N
- TACTILE FEELING: 1,6 N

1 or 2 markings are available in any combination of text / legend or status indicator.



A = 9,5 or 11,5 or 14mm

Dimensions are shown: mm
Specifications and dimensions subject to change

PB Series
Single Pole and Multi-Key Pushbutton Switches

Features/Benefits

- ***Momentary or latching options***
- ***Reliable contact design***
- ***2, 4, and 6 pole configurations***
- ***Long travel and extended life cycles***

Typical Applications

- ***Appliances***
- ***Audio and visual equipment***
- ***Consumer electronics***
- ***Industrial equipment***

Specifications

CONTACT RATING: 0.3A @ 30 VDC

INITIAL CONTACT RESISTANCE: 30 m ohms max.

INSULATION RESISTANCE: 100 M ohms min.

DIELECTRIC STRENGTH: 500 V AC (50-60 Hz) between open terminals and between the frame and terminal.

OPERATING LIFE: 10,000 cycles without load

OPERATING FORCE:
250 ± 100 gf (2.45 ± 0.98N)

LOCK TRAVEL: 2 ± 0.3 mm

TOTAL TRAVEL: 3 ± 0.3 mm

OPERATING TEMPERATURE: -20˚C to 70˚C

Materials

CASE: PC (UL 94HB)

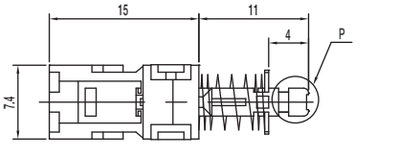
PLASTIC CLIP: POM (UL 94HB)

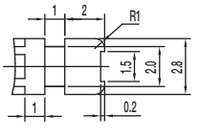
SPRING: SUS

KNOB: POM

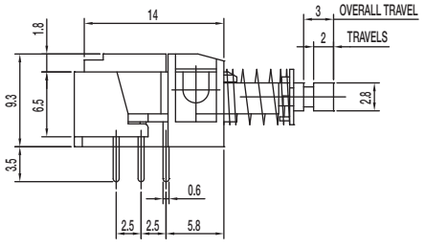
TERMINAL: Silver plated

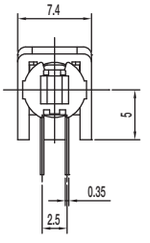
PB-22D01-L 2PDT LOCK / LATCHING



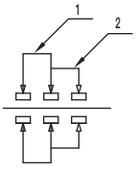


P DETAIL 2 : 1

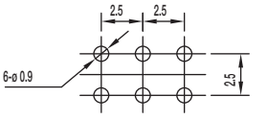




2P — 2T



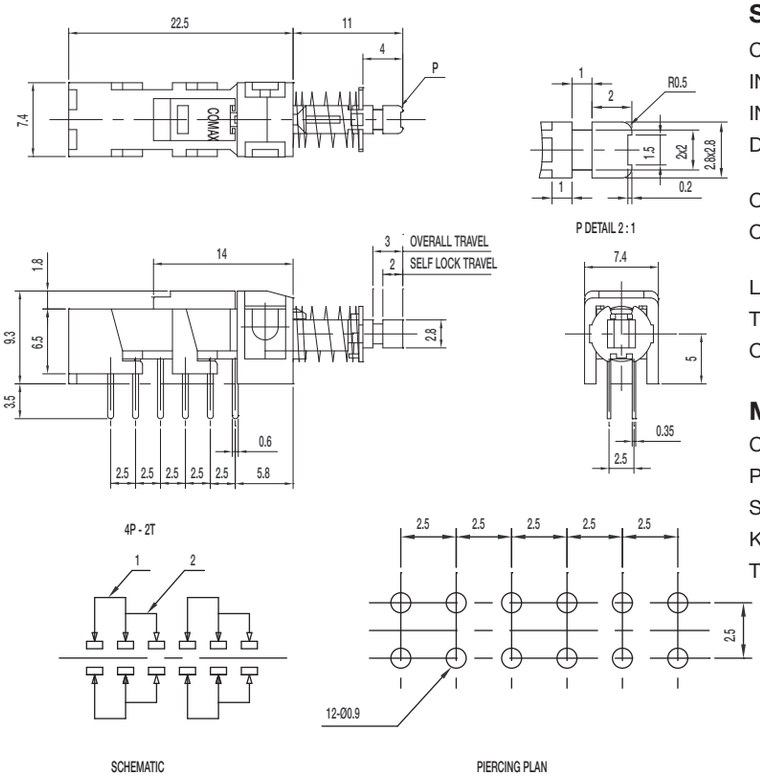
SCHEMATIC



PIERCING PLAN

PB Series
Single Pole and Multi-Key Pushbutton Switches

PB-42D01-L 4PDT LOCK / LATCHING



Specifications

CONTACT RATING: 0.3A @ 30 VDC

INITIAL CONTACT RESISTANCE: 30 m ohms max.

INSULATION RESISTANCE: 100 M ohms min.

DIELECTRIC STRENGTH: 500 V AC (50-60 Hz) between open terminals and between the frame and terminal.

OPERATING LIFE: 10,000 cycles without load

OPERATING FORCE:
280 ± 100 gf

LOCK TRAVEL: 2 ± 0.3 mm

TOTAL TRAVEL: 3 ± 0.3 mm

OPERATING TEMPERATURE: -20˚C to 70˚C

Materials

CASE: PC (UL 94HB)

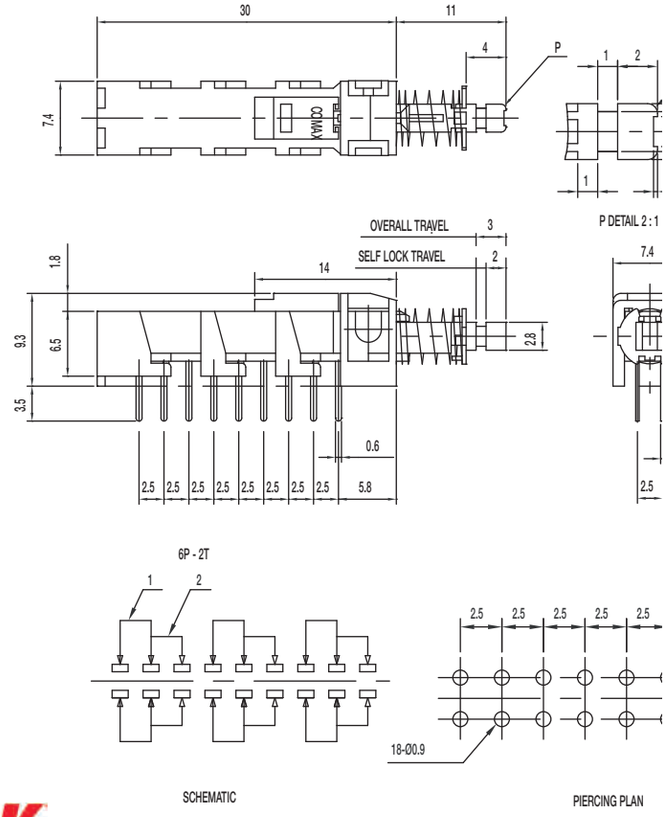
PLASTIC CLIP: POM (UL 94HB)

SPRING: SUS

KNOB: POM

TERMINAL: Silver plated

PB-62D01-L 6PDT LOCK / LATCHING



Specifications

CONTACT RATING: 0.3A @ 30 VDC

INITIAL CONTACT RESISTANCE: 30 m ohms max.

INSULATION RESISTANCE: 100 M ohms min.

DIELECTRIC STRENGTH: 500 V AC (50-60 Hz) between open terminals and between the frame and terminal.

OPERATING LIFE: 10,000 cycles without load

OPERATING FORCE:
300 ± 100 gf (2.94 ± 0.98N)

LOCK TRAVEL: 2 ± 0.3 mm

TOTAL TRAVEL: 3 ± 0.3 mm

OPERATING TEMPERATURE: -20˚C to 70˚C

Materials

CASE: PC (UL 94HB)

PLASTIC CLIP: POM (UL 94HB)

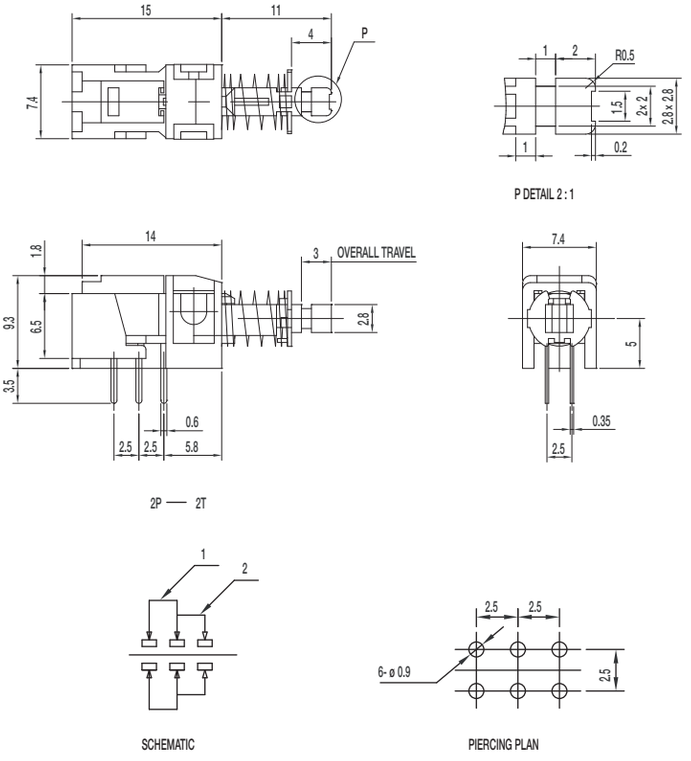
SPRING: SUS

KNOB: POM

TERMINAL: Silver plated

Dimensions are shown: mm
Specifications and dimensions subject to change

PB-22D01-F 2PDT NON-LOCK / MOMENTARY



Specifications

CONTACT RATING: 0.3A @ 30 VDC

INITIAL CONTACT RESISTANCE: 30 m ohms max.

INSULATION RESISTANCE: 100 M ohms min.

DIELECTRIC STRENGTH: 500 V AC (50-60 Hz) between open terminals and between the frame and terminal.

OPERATING LIFE: 10,000 cycles without load

OPERATING FORCE:
250 ± 100 gf (2.45 ± 0.98N)

TOTAL TRAVEL: 3 ± 0.3 mm

OPERATING TEMPERATURE: -20˚C to 70˚C

Materials

CASE: PC (UL 94HB)

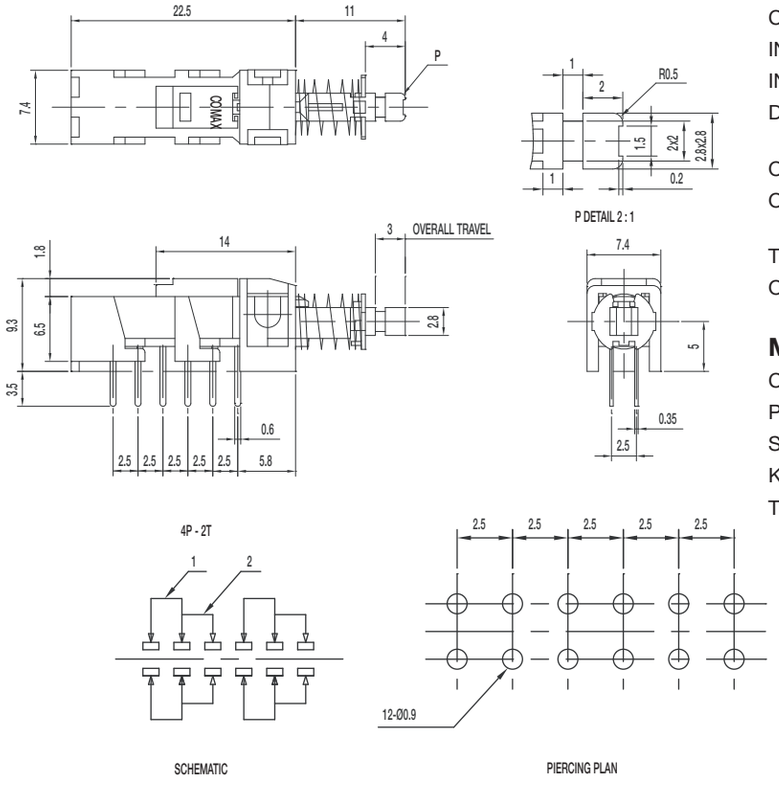
PLASTIC CLIP: POM (UL 94HB)

SPRING: SUS

KNOB: POM

TERMINAL: Silver plated

PB-42D01-F 4PDT NON-LOCK / MOMENTARY



Specifications

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INITIAL CONTACT RESISTANCE: 30 m ohms max.

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OPERATING LIFE: 10,000 cycles without load

OPERATING FORCE:
280 ± 100 gf (2.477 ± 0.98N)

TOTAL TRAVEL: 3 ± 0.3 mm

OPERATING TEMPERATURE: -20˚C to 70˚C

Materials

CASE: PC (UL 94HB)

PLASTIC CLIP: POM (UL 94HB)

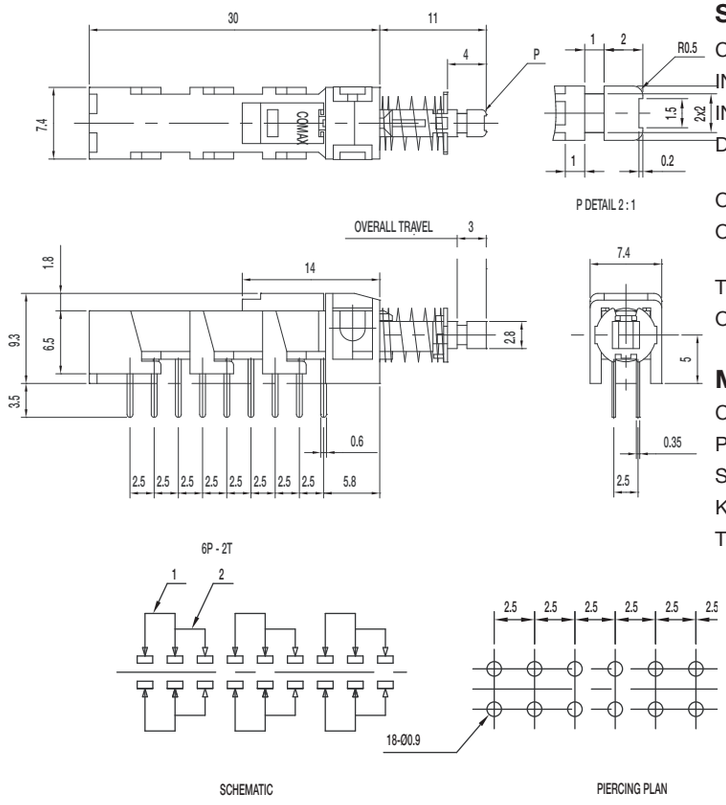
SPRING: SUS

KNOB: POM

TERMINAL: Silver plated

PB Series
Single Pole and Multi-Key Pushbutton Switches

PB-62D01-F 6PDT NON-LOCK / MOMENTARY



Specifications

CONTACT RATING: 0.3A @ 30 VDC

INITIAL CONTACT RESISTANCE: 30 m ohms max.

INSULATION RESISTANCE: 100 M ohms min.

DIELECTRIC STRENGTH: 500 V AC (50-60 Hz) between open terminals and between the frame and terminal.

OPERATING LIFE: 10,000 cycles without load

OPERATING FORCE:
300 ± 100 gf (2.94 ± 0.98N)

TOTAL TRAVEL: 3 ± 0.3 mm

OPERATING TEMPERATURE: -20˚C to 70˚C

Materials

CASE: PC (UL 94HB)

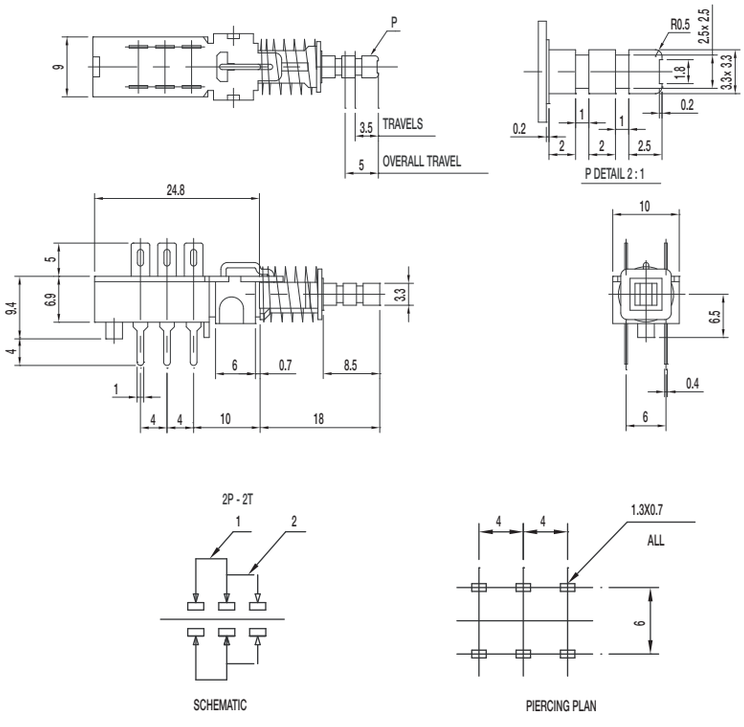
PLASTIC CLIP: POM (UL 94HB)

SPRING: SUS

KNOB: POM

TERMINAL: Silver plated

PB-22G02-L 2PDT LOCK / LATCHING



Specifications

CONTACT RATING: 1A @ 25 VDC

INITIAL CONTACT RESISTANCE: 30 m ohms max.

INSULATION RESISTANCE: 100 M ohms min.

DIELECTRIC STRENGTH: 500 V AC (50-60 Hz) between open terminals and between the frame and terminal.

OPERATING LIFE: 10,000 cycles without load

OPERATING FORCE:
350 ± 150 gf (3.43 ± 1.47N)

LOCK TRAVEL: 3.5 ± 0.3mm

TOTAL TRAVEL: 5 ± 0.3 mm

OPERATING TEMPERATURE: -20˚C to 70˚C

Materials

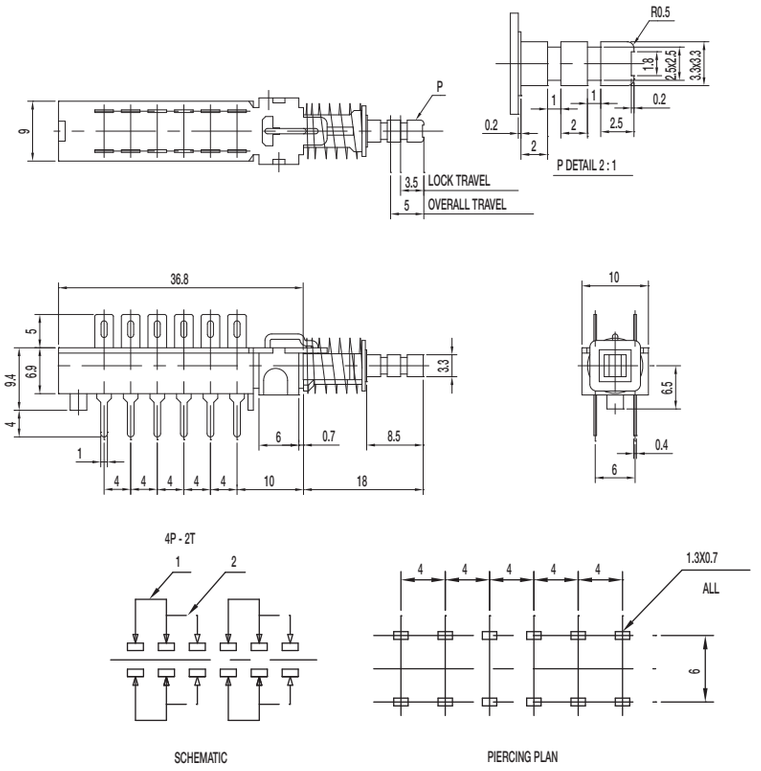
CASE: PC (UL 94HB)

SPRING: SUS

KNOB: POM

TERMINAL: Silver plated

PB-42G02-L 4PDT LOCK / LATCHING



Specifications

CONTACT RATING: 1A @ 25 VDC

INITIAL CONTACT RESISTANCE: 30 m ohms max.

INSULATION RESISTANCE: 100 M ohms min.

DIELECTRIC STRENGTH: 500 V AC (50-60 Hz) between open terminals and between the frame and terminal.

OPERATING LIFE: 10,000 cycles without load

OPERATING FORCE:
400 ± 150 gf (3.92 ± 1.47N)

LOCK TRAVEL: 3.5 ± 0.3mm

TOTAL TRAVEL: 5 ± 0.3 mm

OPERATING TEMPERATURE: -20˚C to 70˚C

Materials

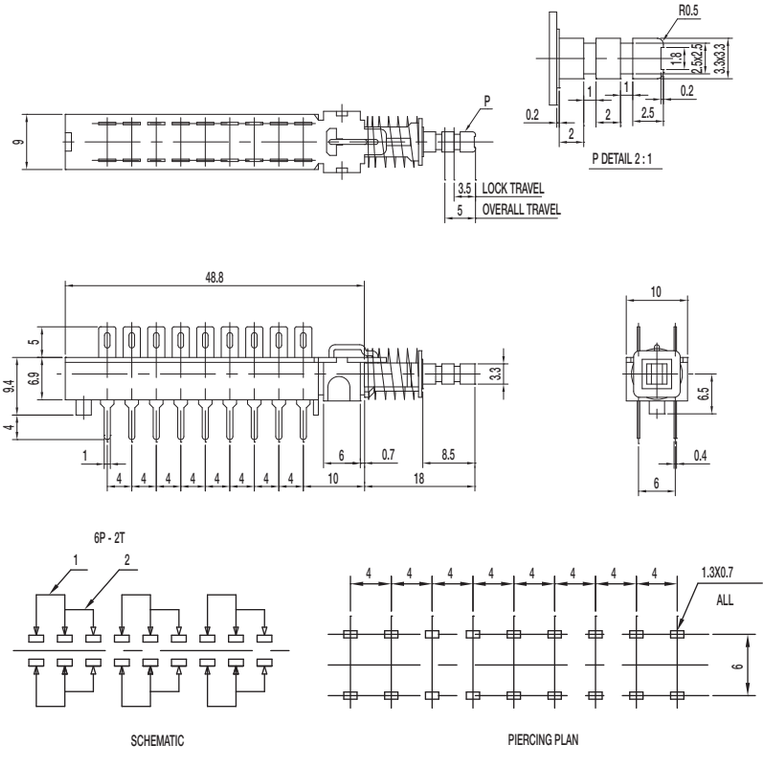
HOUSING: PC (UL 94HB)

SPRING: SUS

KNOB: POM

TERMINAL: Silver plated

PB-62G02-L DPDT LOCK / LATCHING



Specifications

CONTACT RATING: 1A @ 25 VDC

INITIAL CONTACT RESISTANCE: 30 m ohms max.

INSULATION RESISTANCE: 100 M ohms min.

DIELECTRIC STRENGTH: 500 V AC (50-60 Hz) between open terminals and between the frame and terminal.

OPERATING LIFE: 10,000 cycles without load

OPERATING FORCE:
450 ± 150 gf

LOCK TRAVEL: 3.5 ± 0.3mm

TOTAL TRAVEL: 5 ± 0.3 mm

OPERATING TEMPERATURE: -20˚C to 70˚C

Materials

HOUSING: PC (UL 94HB)

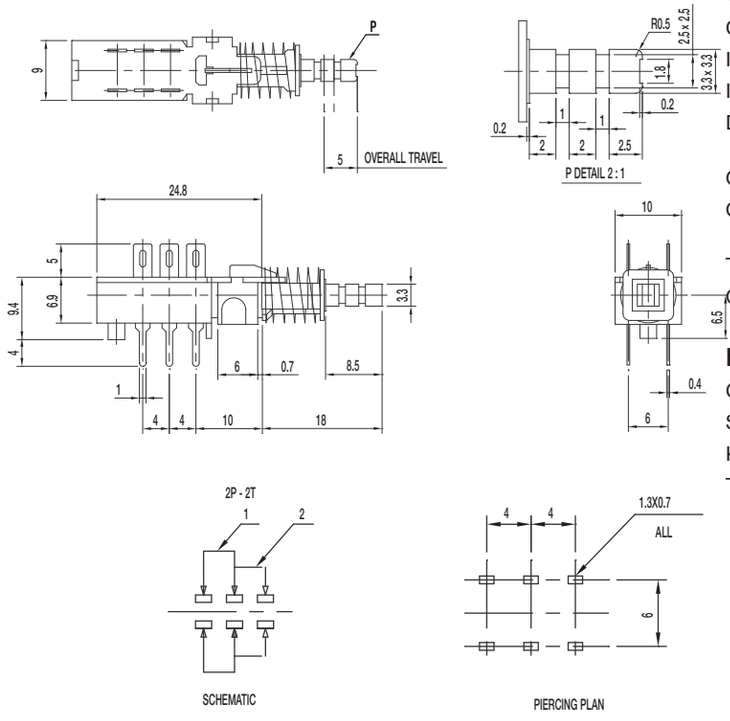
SPRING: SUS

KNOB: POM

TERMINAL: Silver plated

PB Series
Single Pole and Multi-Key Pushbutton Switches

PB-22G02-F DPDT NON-LOCK / MOMENTARY



Specifications

CONTACT RATING: 1A @ 25 VDC

INITIAL CONTACT RESISTANCE: 30 m ohms max.

INSULATION RESISTANCE: 100 M ohms min.

DIELECTRIC STRENGTH: 500 V AC (50-60 Hz) between open terminals and between the frame and terminal.

OPERATING LIFE: 10,000 cycles without load

OPERATING FORCE:
350 ± 150 gf (3.43 ± 1.47N)

TOTAL TRAVEL: 5 ± 0.3 mm

OPERATING TEMPERATURE: -20˚C to 70˚C

Materials

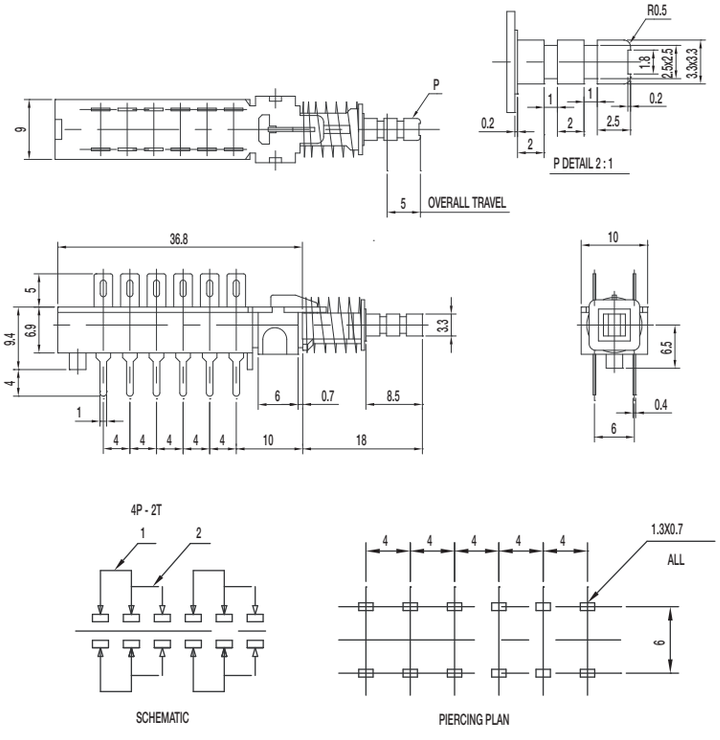
CASE: PC (UL 94HB)

SPRING: SUS

KNOB: POM

TERMINAL: Silver plated

PB-42G02-F 4PDT NON-LOCK / MOMENTARY



Specifications

CONTACT RATING: 1A @ 25 VDC

INITIAL CONTACT RESISTANCE: 30 m ohms max.

INSULATION RESISTANCE: 100 M ohms min.

DIELECTRIC STRENGTH: 500 V AC (50-60 Hz) between open terminals and between the frame and terminal.

OPERATING LIFE: 10,000 cycles without load

OPERATING FORCE:
400 ± 150 gf (3.92 ± 1.47N)

TOTAL TRAVEL: 5 ± 0.3 mm

OPERATING TEMPERATURE: -20˚C to 70˚C

Materials

HOUSING: PC (UL 94HB)

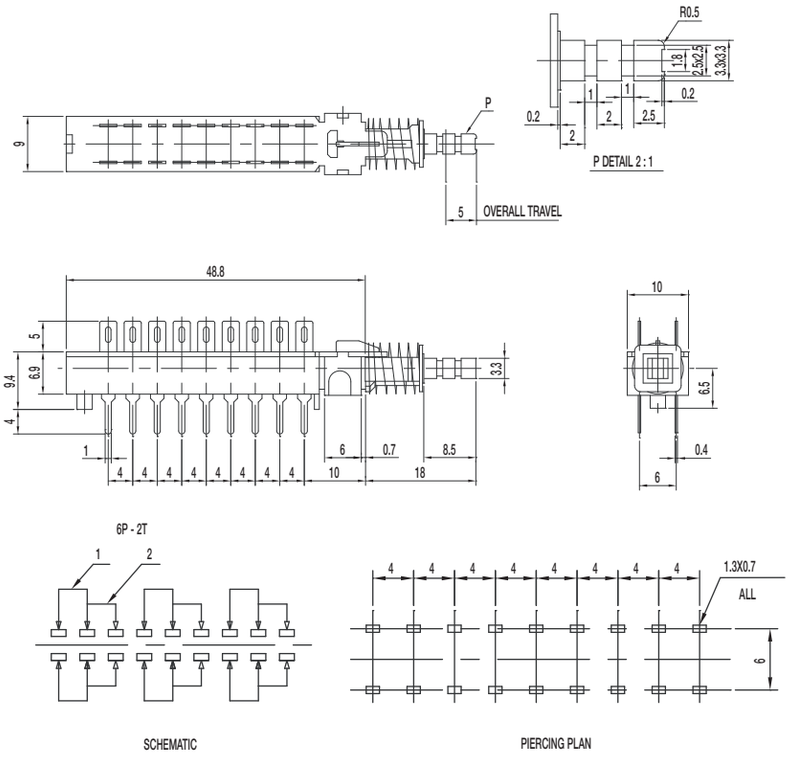
SPRING: SUS

KNOB: POM

TERMINAL: Silver plated

PB Series
Single Pole and Multi-Key Pushbutton Switches

PB-62G02-F 6PDT NON-LOCK / MOMENTARY



Specifications

CONTACT RATING: 1A @ 25 VDC

INITIAL CONTACT RESISTANCE: 30 m ohms max.

INSULATION RESISTANCE: 100 M ohms min.

DIELECTRIC STRENGTH: 500 V AC (50-60 Hz) between open terminals and between the frame and terminal.

OPERATING LIFE: 10,000 cycles without load

OPERATING FORCE:
450 ± 150 gf (4.41 ± 1.47N)

TOTAL TRAVEL: 5 ± 0.3 mm

OPERATING TEMPERATURE: -20˚C to 70˚C

Materials

HOUSING: PC (UL 94HB)

SPRING: SUS

KNOB: POM

TERMINAL: Silver plated

PB Multi-Key Series

P B _ K _ _ _ _ _ _ _ _ _

Key
- 1K 1K
- 2K 2K
- 3K 3K
- 4K 4K
- 5K 5K

Travel
- G 3.5 mm
- D 2 mm

Key Pitch
- 0 0
- 1 10
- 2 12.5
- 3 15
- 4 17.5
- 5 20
- 6 25
- 7 30

Mounting Hole
- A M3 x 0.5
- B 3.2
- C No mounting hole

Poles
- 2 2 poles
- 4 4 poles
- 6 6 poles

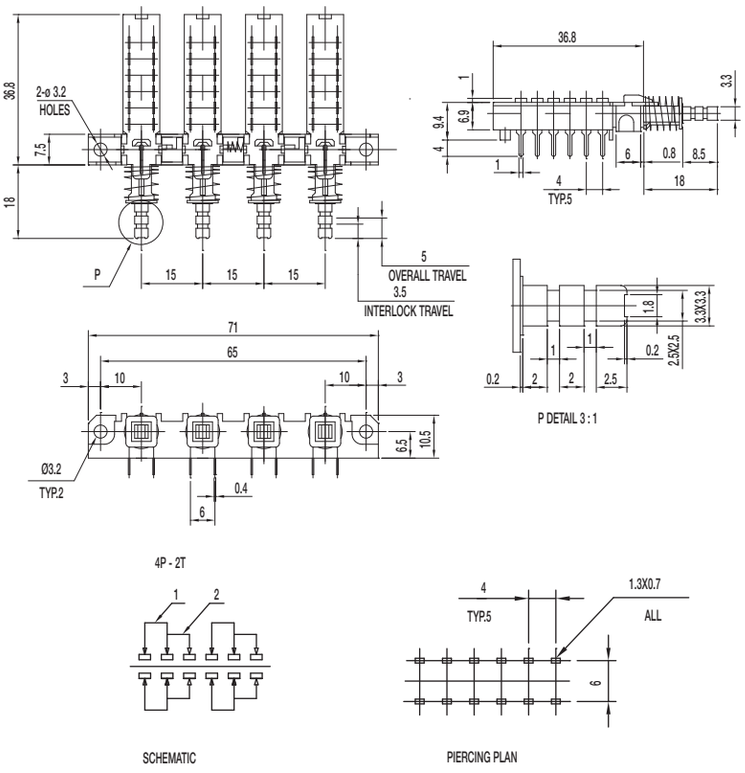
Operating Type
- E Release
- F Non-lock
- L Self-lock
- T Interlock
- XF All non-lock
- XT All self-lock
- XL All interlock

Terminal Shape
- P
- X
- N

Contact Function
- S Shorting
- NS Non-shorting

PB Series
Single Pole and Multi-Key Pushbutton Switches

PB Multi-Key Series



Specifications

CONTACT RATING: 0.3A @ 30 VDC

INITIAL CONTACT RESISTANCE: 30 m ohms max.

INSULATION RESISTANCE: 100 M ohms min.

DIELECTRIC STRENGTH: 500 V AC (50-60 Hz) between open terminals and between the frame and terminal.

OPERATING LIFE: 10,000 cycles without load

OPERATING FORCE:
250 ± 100 gf (2.45 ± 0.98N)

TOTAL TRAVEL: 3 ± 0.3 mm

OPERATING TEMPERATURE: -20˚C to 70˚C

Materials

CASE: PC (UL 94HB)

PLASTIC CLIP: POM (UL 94HB)

SPRING: SUS

KNOB: POM

TERMINAL: Silver plated

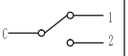
PS-12G Series
Pushbutton Switches

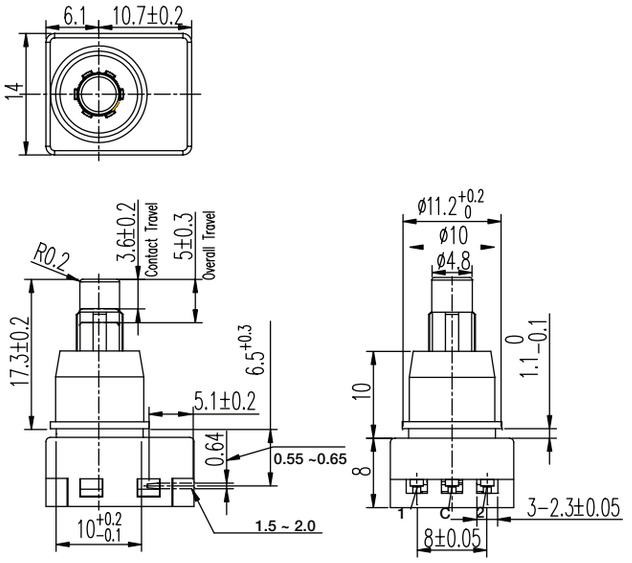
Features/Benefits

- *Latching pushbutton*
- *Non-shorting with lock*
- *5 mm travel*
- *SPDT*

Typical Applications

- *Automotive interior lighting*
- *Computer peripherals*
- *Appliances*

PART NUMBER	PACKAGING	SCHEMATIC
PS-12G01	200 pieces	



Dimensions

FOOTPRINT: 14 X 16.8 mm

HEIGHT: 18 mm

Specifications

CONTACT RATING: 1A @ 14 VDC

INITIAL CONTACT RESISTANCE: 100 m ohms max.

INSULATION RESISTANCE: 100 M ohms min.

DIELECTRIC STRENGTH: 500 V AC (50-60 Hz) between open terminals and between the frame and terminal.

OPERATING LIFE: 20,000 cycles with load

OPERATING FORCE: 400 ± 100 gf

OPERATING POSITION: 3.6 ± 0.2 mm

TOTAL TRAVEL: 5 ± 0.3 mm

OPERATING TEMPERATURE: -20˚C to 70˚C

Materials

KNOB: POM (UL 94HB)

HOUSING: PBT (UL 94V-0)

COVER: PBT (UL 94V-0)

ROTOR: PBT (UL 94V-0)

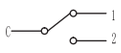
SLIDER: POM (UL 94HB)

TERMINAL: Phospher bronze, silver plated

SPRING: Stainless steel

CONTACT: Phospher bronze, silver plated

PS-12G Series
Pushbutton Switches

PART NUMBER	PACKAGING	SCHEMATIC
PS-12G03	200 pieces	

Dimensions

FOOTPRINT: 14 X 16.8 mm

HEIGHT: 18.3 mm

Specifications

CONTACT RATING: 2.2A @ 14.5 VDC

INITIAL CONTACT RESISTANCE: 50 m ohms max.

INSULATION RESISTANCE: 100 M ohms min.

DIELECTRIC STRENGTH: 500 V AC (50-60 Hz) between open terminals and between the frame and terminal.

OPERATING LIFE: 20,000 cycles with load

OPERATING FORCE: 650 ± 300 gf

OPERATING POSITION: 4.00 ± 0.2 mm

TOTAL TRAVEL: 4.5 ± 0.3 mm

OPERATING TEMPERATURE: -40˚C to 85˚C

Materials

KNOB: POM (UL 94HB)

HOUSING: PBT & PA (UL 94V-0)

COVER: PBT (UL 94V-0)

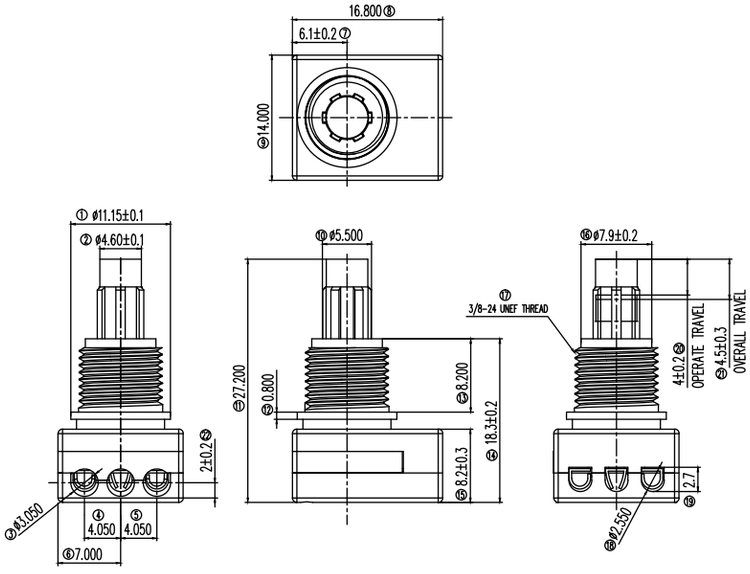
ROTOR: PBT (UL 94V-0)

SLIDER: POM (UL 94HB)

TERMINAL: Brass, silver plated

SPRING: Stainless steel

CONTACT: Phospher bronze, silver plated



TYCO .062 Commercial Pin and Socket Connector PT# 770983-1

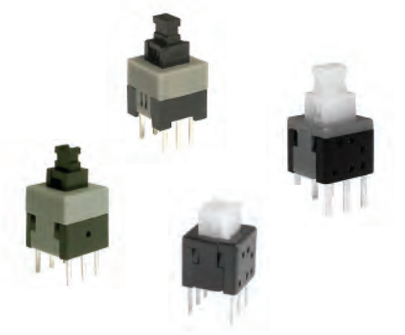
PS-22 Series
Subminiature Pushbutton Switches

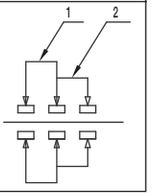
Features/Benefits

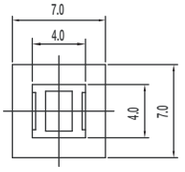
- ***Compact miniature push switch***
- ***Momentary or latching options***
- ***Shorting or non-shorting***
- ***DPDT***

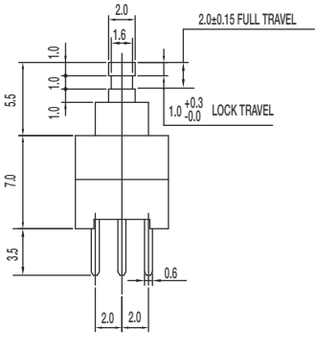
Typical Applications

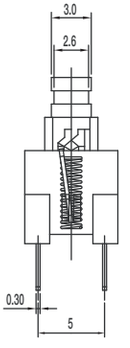
- ***Industrial***
- ***Automotive***
- ***Audio and visual equipment***

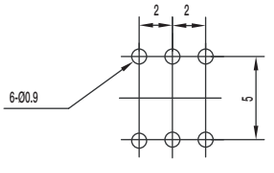


PART NUMBER	PACKAGING	SCHEMATIC
PS-2203-L NS PA	1,000 pieces	
PS-2203-F NS PA	1,000 pieces	









PIERCING PLAN

Dimensions

FOOTPRINT: 7.0 x 7.0 mm

HEIGHT: 12.5 mm

Specifications

CONTACT RATING: 0.1A @ 30 VDC

INITIAL CONTACT RESISTANCE: 30 m ohms max.

INSULATION RESISTANCE: 100 M ohms min.

DIELECTRIC STRENGTH: 500 V AC (50-60 Hz) between open terminals and between the frame and terminal.

OPERATING LIFE: 10,000 cycles with load

OPERATING FORCE:
200 ± 100 gf (1.96 ± 0.98N)

LOCK TRAVEL: 1 mm

TOTAL TRAVEL: 2 mm

OPERATING TEMPERATURE: -20˚C to 70˚C

Materials

KNOB: POM Black

HOUSING: PA Black

COVER: POM Grey (latch) / White (Mom)

TERMINAL: Brass, silver plated

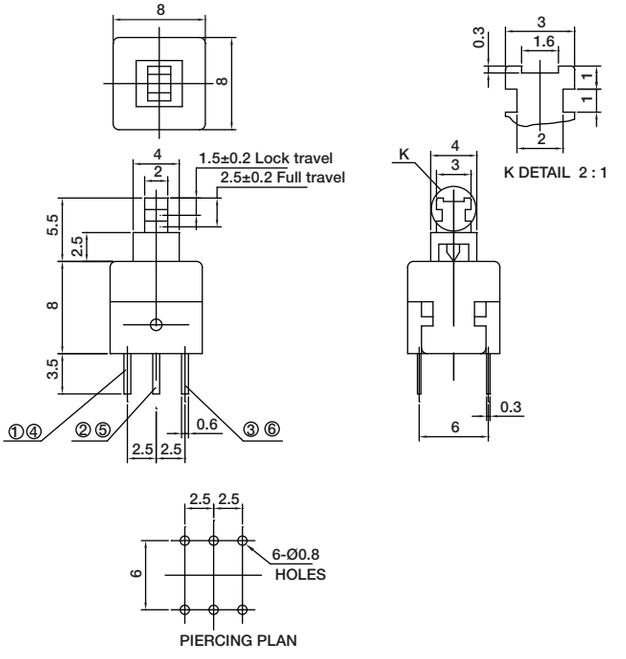
CONTACT CLIP: Phosphor bronze., silver plated

SPRING: Stainless steel

HOOK LOCK: Stainless steel (latch)

PS-22 Series
Subminiature Pushbutton Switches

PART NUMBER	PACKAGING	SCHEMATIC
PS-2206-L NS PA	1,000 pieces	2 P - 2 T
PS-2206-F NS PA	1,000 pieces	



Dimensions

FOOTPRINT: 8.0 x 8.0 mm

HEIGHT: 13.5 mm

Specifications

CONTACT RATING: 0.1A @ 30 VDC

INITIAL CONTACT RESISTANCE: 70 m ohms max.

INSULATION RESISTANCE: 100 M ohms min.

DIELECTRIC STRENGTH: 500 V AC (50-60 Hz) between open terminals and between the frame and terminal.

OPERATING LIFE: 10,000 cycles with load

OPERATING FORCE:
200 ± 100 gf (1.96 ± 0.98N)

LOCK TRAVEL: 1.5 mm

TOTAL TRAVEL: 2.5 mm

OPERATING TEMPERATURE: -20˚C to 70˚C

Materials

KNOB: POM Black

HOUSING: PA Black

COVER: POM Grey (latch) / White (Mom)

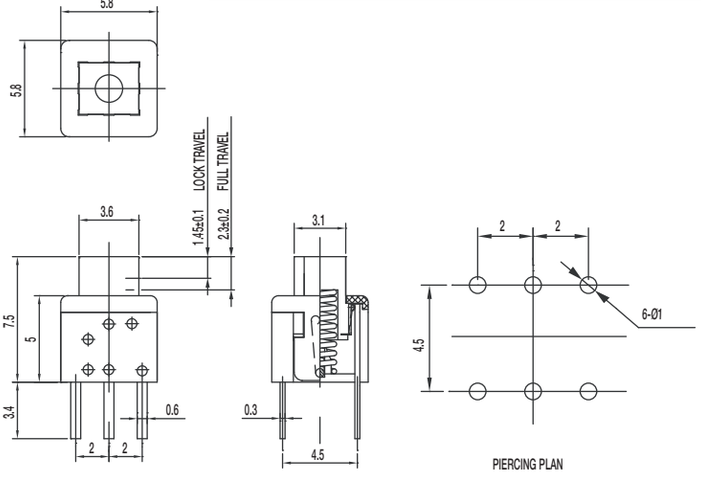
TERMINAL: Brass, silver plated

CONTACT CLIP: Phosphor bronze., silver plated

SPRING: Stainless steel

HOOK LOCK: Stainless steel (latch)

PART NUMBER	PACKAGING	SCHEMATIC
PS-2214-L NS PA	1,000 pieces	
PS-2214-F NS PA	1,000 pieces	



Dimensions

FOOTPRINT: 5.8 x 5.8 mm

HEIGHT: 7.5 mm

Specifications

CONTACT RATING: 0.1A @ 30 VDC

INITIAL CONTACT RESISTANCE: 80 m ohms max.

INSULATION RESISTANCE: 100 M ohms min.

DIELECTRIC STRENGTH: 500 V AC (50-60 Hz) between open terminals and between the frame and terminal.

OPERATING LIFE: 10,000 cycles with load

OPERATING FORCE:
150 ± 50 gf (1.47 ± 0.49N)

LOCK TRAVEL: 1.45 mm

TOTAL TRAVEL: 2.3 mm

OPERATING TEMPERATURE: -20˚C to 70˚C

Materials

KNOB: POM Natural (latch) / PA black

HOUSING: PA Black

COVER: PA Black

TERMINAL: Brass, silver plated

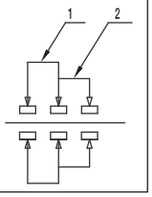
CONTACT CLIP: Phosphor bronze, silver clad

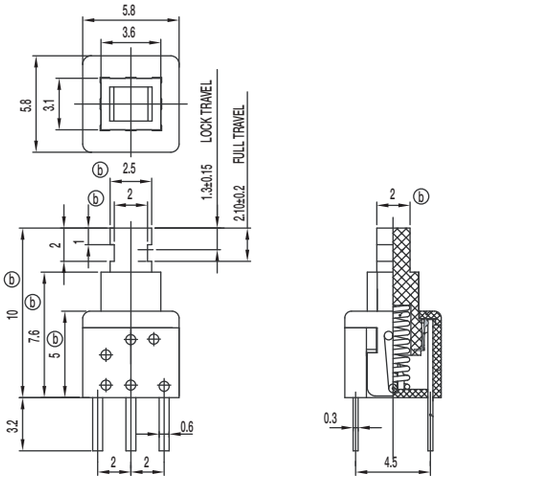
SPRING: Stainless steel

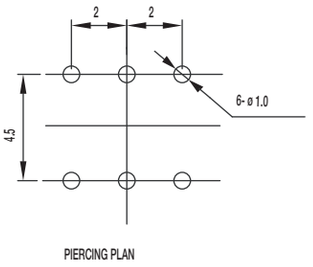
HOOK LOCK: Stainless steel (latch)

Dimensions are shown: mm
Specifications and dimensions subject to change

PS-22 Series
Subminiature Pushbutton Switches

PART NUMBER	PACKAGING	SCHEMATIC
PS-221605-L NS	1,000 pieces	
PS-221605-F NS	1,000 pieces	





PIERCING PLAN

Dimensions

FOOTPRINT: 5.8 x 5.8 mm

HEIGHT: 10 mm

Specifications

CONTACT RATING: 0.1A @ 30 VDC / 2A @ 2 VDC

INITIAL CONTACT RESISTANCE: 80 m ohms max.

INSULATION RESISTANCE: 100 M ohms min.

DIELECTRIC STRENGTH: 500 V AC (50-60 Hz) between open terminals and between the frame and terminal.

OPERATING LIFE: 10,000 cycles with load

OPERATING FORCE:
150 ± 50 gf (1.47 ± 0.49N)

LOCK TRAVEL: 1.3 mm

TOTAL TRAVEL: 2.1 mm

OPERATING TEMPERATURE: -20˚C to 70˚C

Materials

KNOB: POM Natural

HOUSING: PA Black

COVER: PC Grey

TERMINAL: Bras, silver plated

CONTACT CLIP: Phosphor bronze, silver clad

SPRING: Stainless steel

HOOK LOCK: Stainless steel (latch)

PS Series
Miniature Pushbutton Switches

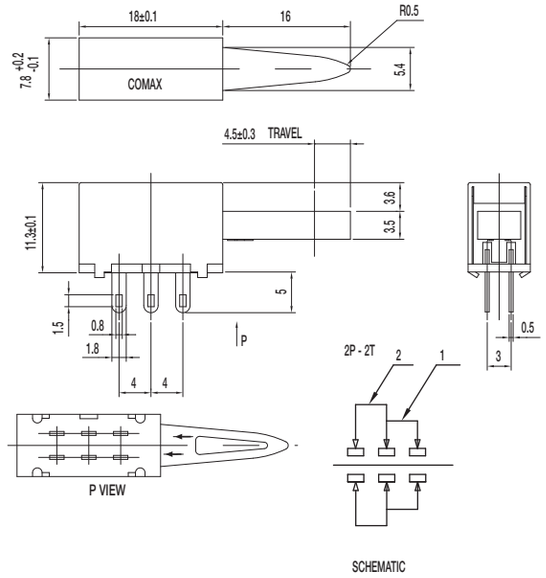
Features/Benefits

- *Miniature size*
- *Momentary or latching options*
- *Broad range of products*

Typical Applications

- *Industrial*
- *Automotive*
- *Audio and visual equipment*
- *Telecommunications*

PS-22I05 DPDT NON-SHORTING



Specifications

CONTACT RATING: 0.3A @ 30 VDC

INITIAL CONTACT RESISTANCE: 30 m ohms max.

INSULATION RESISTANCE: 100 M ohms min.

DIELECTRIC STRENGTH: 500 V AC (50-60 Hz) between open terminals and between the frame and terminal.

OPERATING LIFE: 10,000 cycles with load

OPERATING FORCE: 400 ± 150 gf (3.92 ± 1.47N)

TOTAL TRAVEL: 4.5 ± 0.3 mm

OPERATING TEMPERATURE: -20˚C to 70˚C

Materials

FRAME: SECC

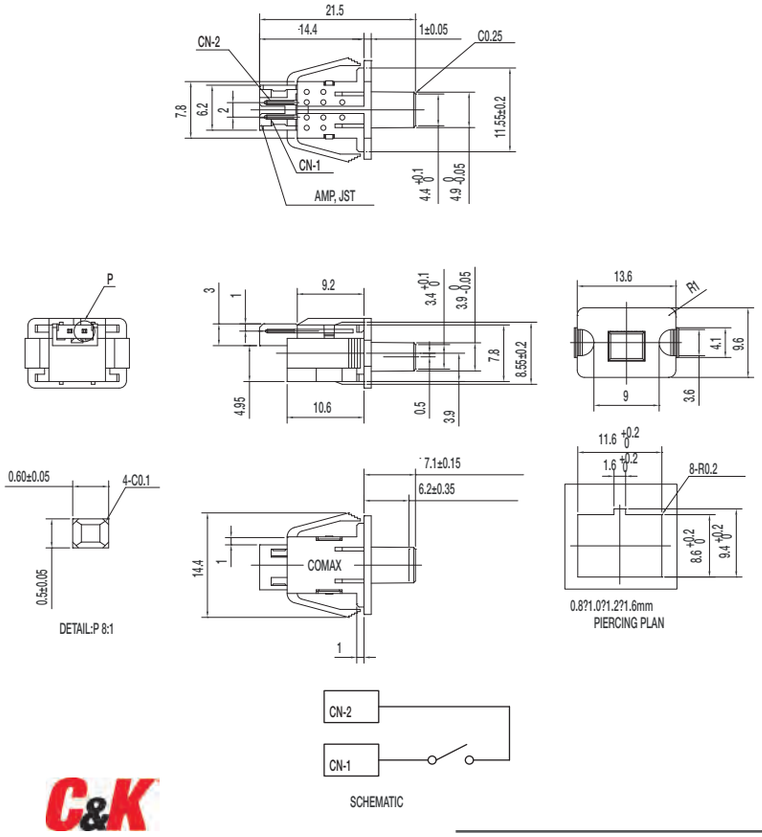
KNOB: POM (UL 94HB)

CONTACT PLATE: Silver clad

SPRING: SUS

TERMINAL: Silver plated

PS-12C02-F NS SPST NON-SHORTING



Specifications

CONTACT RATING: 100 µ A @ 3 VDC min. / 10mA @ 5 VDC max

INITIAL CONTACT RESISTANCE: 100 m ohms max.

INSULATION RESISTANCE: 100 M ohms min.

DIELECTRIC STRENGTH: 250 V AC (50-60 Hz) between open terminals and between the frame and terminal.

OPERATING LIFE: 100,000 cycles with load

OPERATING FORCE: 50 ± 15 gf (0.49 ± 0.147N)

PRE-TRAVEL: 6.20 ± 0.35 mm

OPERATING TEMPERATURE: -40˚C to 85˚C

Materials

KNOB: POM (UL 94HB)

COVER: PA (UL 94V-0)

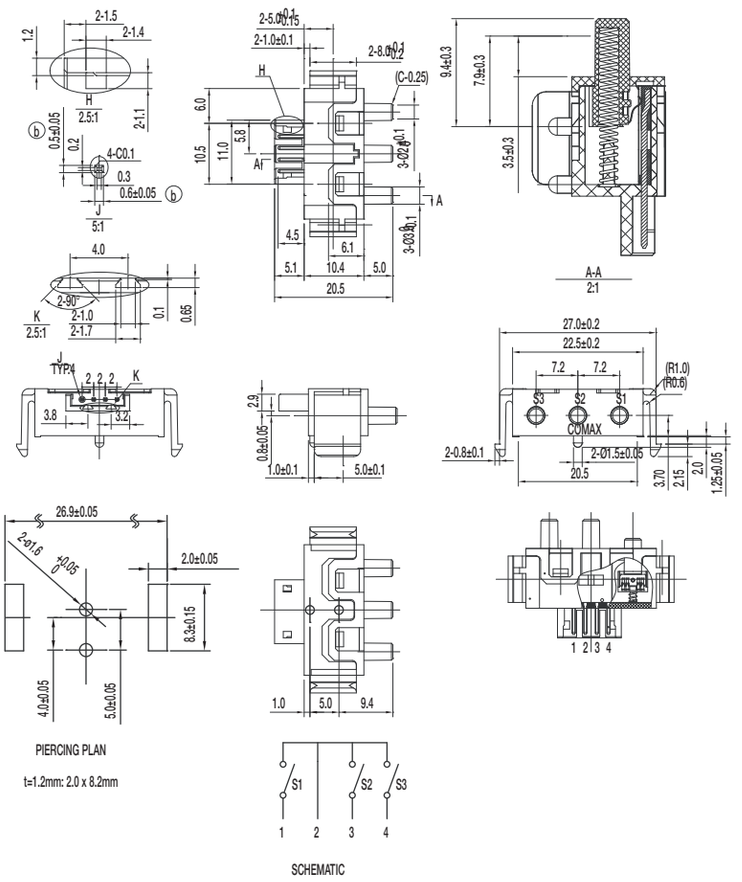
HOUSING: PA (UL 94V-0)

SPRING: SUS

TERMINAL: Silver plated

Dimensions are shown: mm
Specifications and dimensions subject to change

PS-32C02-F NS 1P3T NON-SHORTING



Specifications

CONTACT RATING: 100 µ A @ 3 VDC min. / 10mA @ 5 VDC max

INITIAL CONTACT RESISTANCE: 100 m ohms max.

INSULATION RESISTANCE: 100 M ohms min.

DIELECTRIC STRENGTH: 250 V AC (50-60 Hz) between open terminals and between the frame and terminal.

OPERATING LIFE: 100,000 cycles with load

OPERATING FORCE: 80 ± 20 gf (0.784 ± 0.196N)

PRE-TRAVEL: 1.5 ± 0.3 mm

OVER-TRAVEL: 3.5 ± 0.3 mm

TOTAL TRAVEL: 5 ± 0.3 mm

OPERATING TEMPERATURE: -20˚C to 65˚C

Materials

KNOB: POM (UL 94HB)

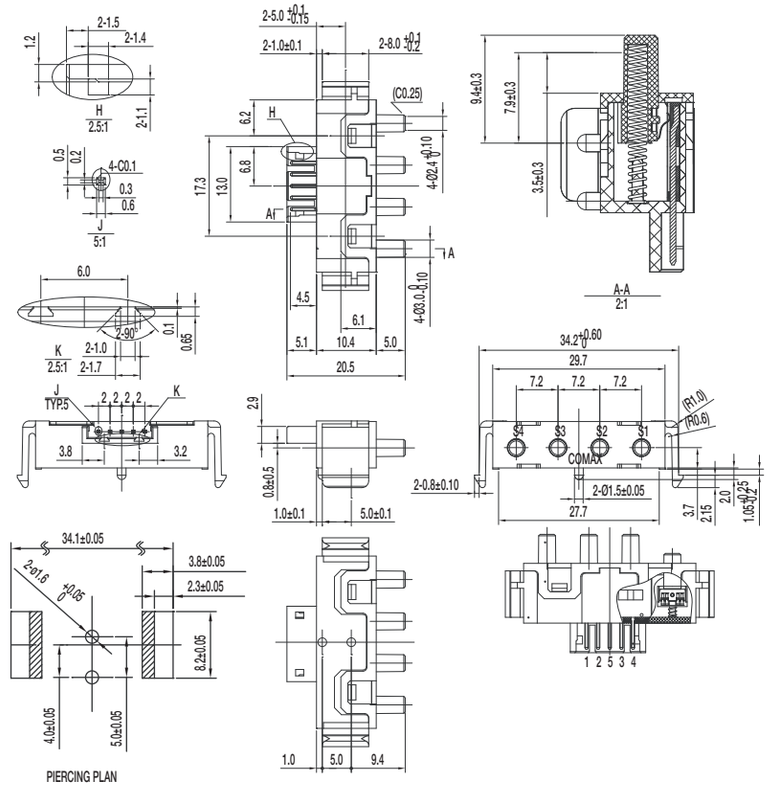
COVER: PA (UL 94V-0)

HOUSING: PA (UL 94V-0)

SPRING: SUS

TERMINAL: Silver plated

PS-42C02-F NS 1P4T NON-SHORTING



Specifications

CONTACT RATING: 100 µ A @ 3 VDC min. / 10mA @ 5 VDC max

INITIAL CONTACT RESISTANCE: 100 m ohms max.

INSULATION RESISTANCE: 100 M ohms min.

DIELECTRIC STRENGTH: 250 V AC (50-60 Hz) between open terminals and between the frame and terminal.

OPERATING LIFE: 100,000 cycles with load

OPERATING FORCE: 80 ± 20 gf (0.784 ± 0.196N)

PRE-TRAVEL: 1.5 ± 0.3 mm

OVER-TRAVEL: 3.5 ± 0.3 mm

TOTAL TRAVEL: 5 ± 0.3 mm

OPERATING TEMPERATURE: -20˚C to 65˚C

Materials

KNOB: POM (UL 94HB)

COVER: PA (UL 94V-0)

HOUSING: PA (UL 94V-0)

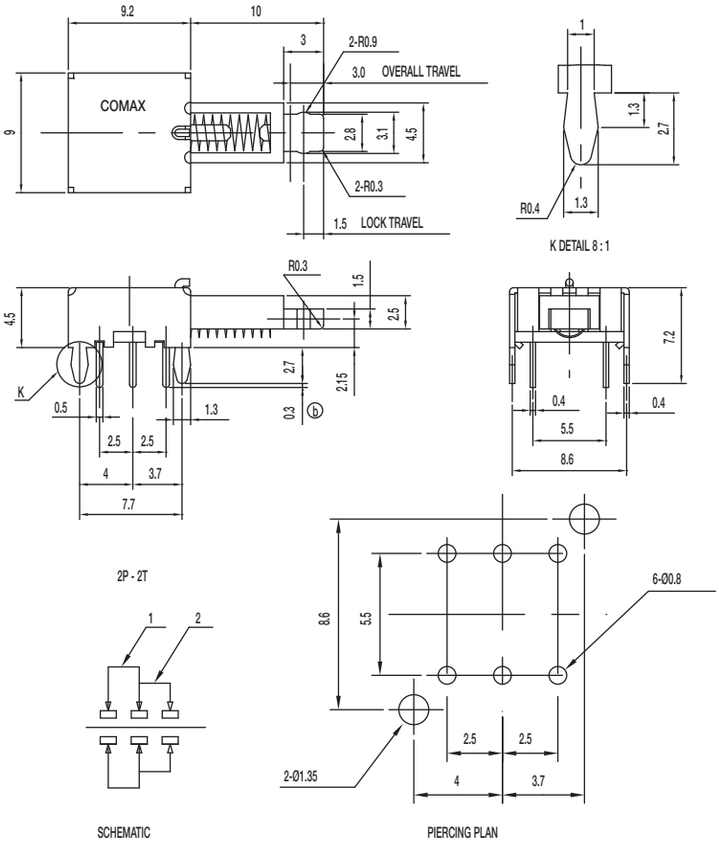
SPRING: SUS

TERMINAL: Silver plated

Dimensions are shown: mm
Specifications and dimensions subject to change

PS Series
Miniature Pushbutton Switches

PS-22C08-G10 NS DPDT NON-SHORTING



Specifications

CONTACT RATING: 0.3A @ 30 VDC

INITIAL CONTACT RESISTANCE: 30 m ohms max.

INSULATION RESISTANCE: 100 M ohms min.

DIELECTRIC STRENGTH: 500 V AC (50-60 Hz) between open terminals and between the frame and terminal.

OPERATING LIFE: 10,000 cycles without load

OPERATING FORCE: 200 ± 100 gf (1.96 ± 0.98N)

LOCK TRAVEL: 1.5 ± 0.3 mm

OVER-TRAVEL: 3 ± 0.3 mm

OPERATING TEMPERATURE: -20˚C to 70˚C

Materials

FRAME: SPCC

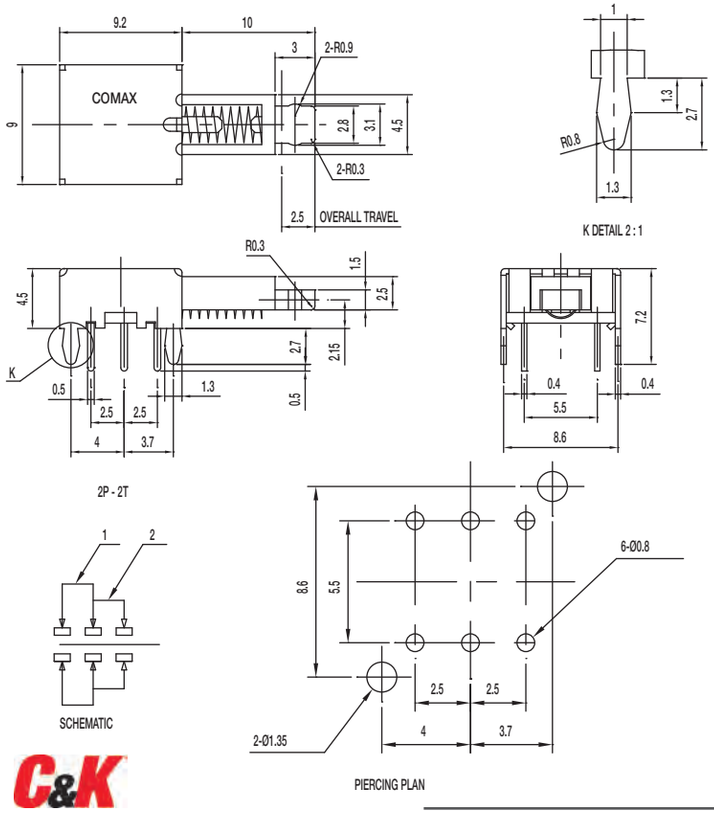
KNOB: POM (UL 94HB)

CONTACT: Silver plated

SPRING: SUS

TERMINAL: Silver plated

PS-22E08-G10 NS DPDT NON-SHORTING



Specifications

CONTACT RATING: 0.3A @ 30 VDC

INITIAL CONTACT RESISTANCE: 30 m ohms max.

INSULATION RESISTANCE: 100 M ohms min.

DIELECTRIC STRENGTH: 500 V AC (50-60 Hz) between open terminals and between the frame and terminal.

OPERATING LIFE: 10,000 cycles without load

OPERATING FORCE: 200 ± 100 gf (1.96 ± 0.98N)

TOTAL TRAVEL: 2.5 ± 0.3 mm

OPERATING TEMPERATURE: -20˚C to 70˚C

Materials

FRAME: SPCC

KNOB: POM (UL 94HB)

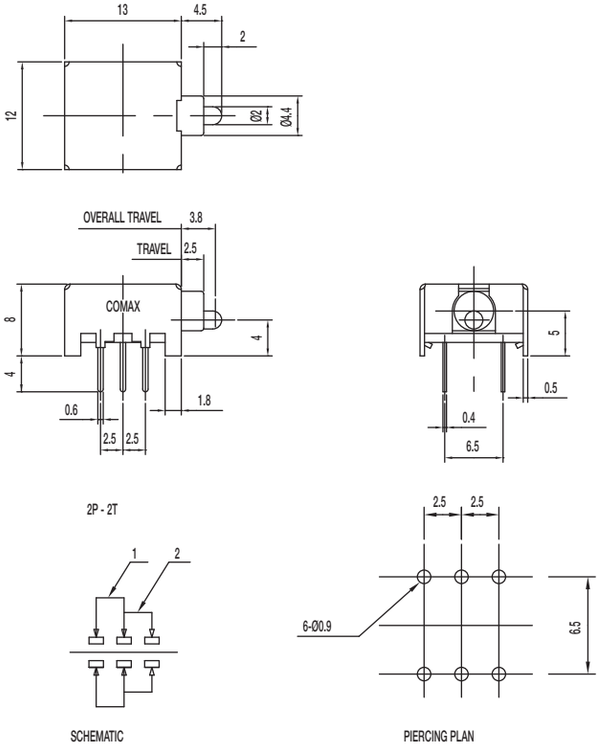
CONTACT: Silver plated

SPRING: SUS

TERMINAL: Silver plated

Dimensions are shown: mm
Specifications and dimensions subject to change

PS-22E09-G 4.5 NS DPDT NON-SHORTING



Specifications

CONTACT RATING: 0.3A @ 30 VDC

INITIAL CONTACT RESISTANCE: 30 m ohms max.

INSULATION RESISTANCE: 100 M ohms min.

DIELECTRIC STRENGTH: 500 V AC (50-60 Hz) between open terminals and between the frame and terminal.

OPERATING LIFE: 10,000 cycles with load

OPERATING FORCE: 70 ± 20 gf (0.686 ± 0.196N)

TRAVEL: 2.5 ± 0.3 mm

TOTAL TRAVEL: 3.8 ± 0.3 mm

OPERATING TEMPERATURE: -20˚C to 70˚C

Materials

FRAME: SPCC

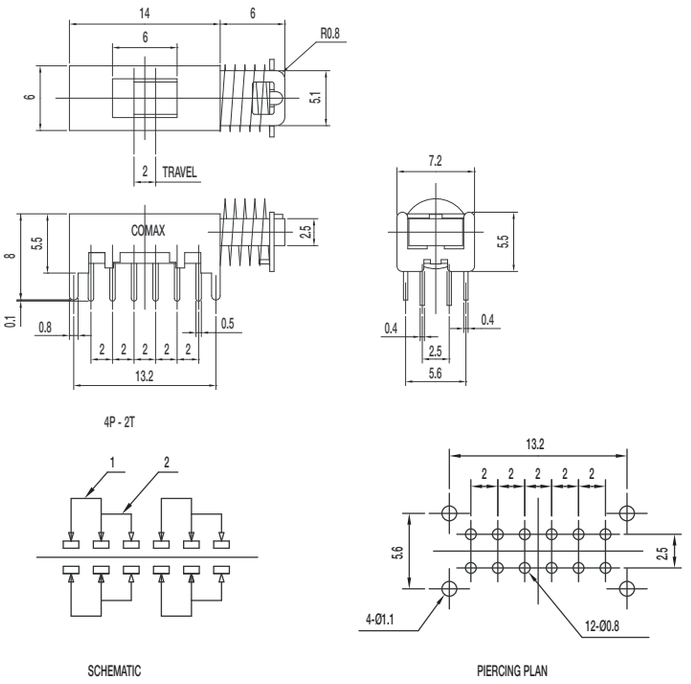
KNOB: POM (UL 94HB)

CONTACT: Silver plated

SPRING: SUS

TERMINAL: Silver plated

PS-42D09-NS 4P2T NON-SHORTING



Specifications

CONTACT RATING: 0.3A @ 30 VDC

INITIAL CONTACT RESISTANCE: 30 m ohms max.

INSULATION RESISTANCE: 100 M ohms min.

DIELECTRIC STRENGTH: 500 V AC (50-60 Hz) between open terminals and between the frame and terminal.

OPERATING LIFE: 10,000 cycles with load

OPERATING FORCE: 250 ± 100 gf (2.45 ± 0.98N)

TRAVEL: 2 ± 0.3 mm

OPERATING TEMPERATURE: -20˚C to 70˚C

Materials

FRAME: SPCC

KNOB: POM (UL 94HB)

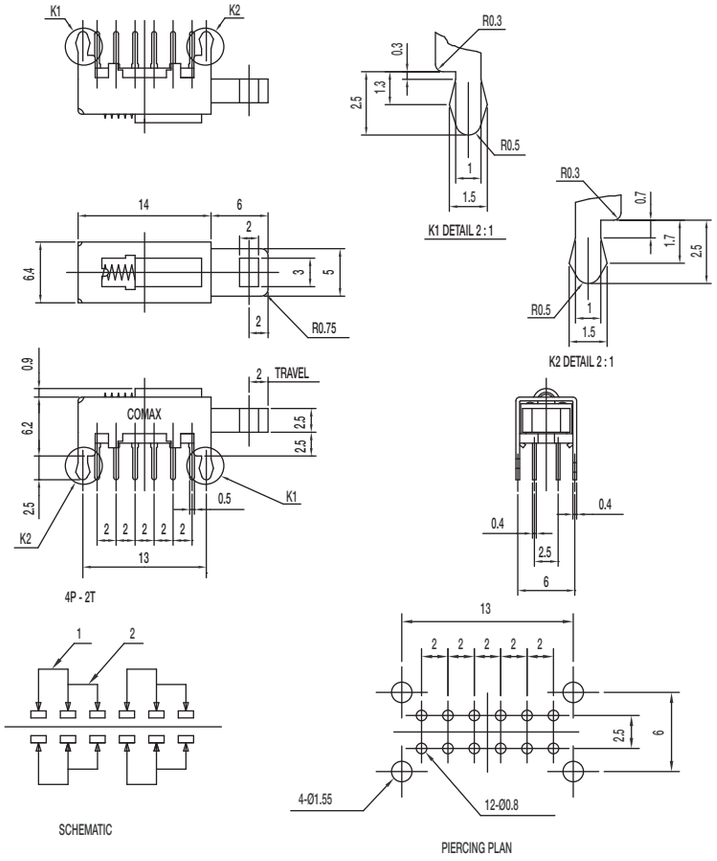
CONTACT PLATE: Silver plated

SPRING: Steel

TERMINAL: Silver plated

PS Series
Miniature Pushbutton Switches

PS-42D13-NS 4P2T NON-SHORTING



Specifications

CONTACT RATING: 0.3A @ 30 VDC

INITIAL CONTACT RESISTANCE: 30 m ohms max.

INSULATION RESISTANCE: 100 M ohms min.

DIELECTRIC STRENGTH: 500 V AC (50-60 Hz) between open terminals and between the frame and terminal.

OPERATING LIFE: 10,000 cycles with load

OPERATING FORCE: 250 ± 100 gf (2.45 ± 0.98N)

TRAVEL: 2 ± 0.3 mm

OPERATING TEMPERATURE: -20˚C to 70˚C

Materials

FRAME: SPCC

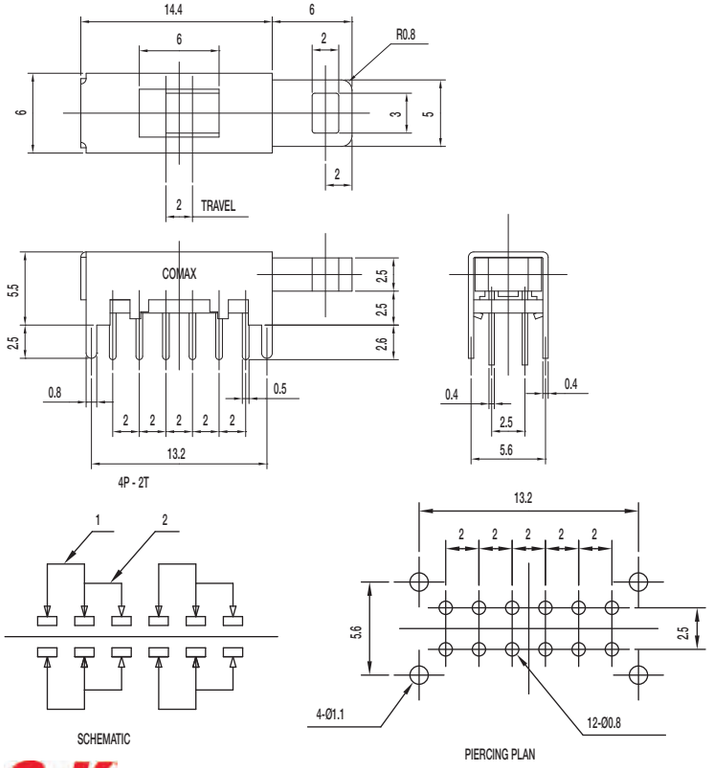
KNOB: POM (UL 94HB)

CONTACT: Silver plated

SPRING: Steel

TERMINAL: Silver plated

PS-42D16-S 4P2T SHORTING



Specifications

CONTACT RATING: 0.3A @ 30 VDC

INITIAL CONTACT RESISTANCE: 30 m ohms max.

INSULATION RESISTANCE: 100 M ohms min.

DIELECTRIC STRENGTH: 500 V AC (50-60 Hz) between open terminals and between the frame and terminal.

OPERATING LIFE: 10,000 cycles with load

OPERATING FORCE: 60 ± 30 gf (0.59 ± 0.29N)

TRAVEL: 2 ± 0.3 mm

OPERATING TEMPERATURE: -20˚C to 70˚C

Materials

FRAME: SPCC

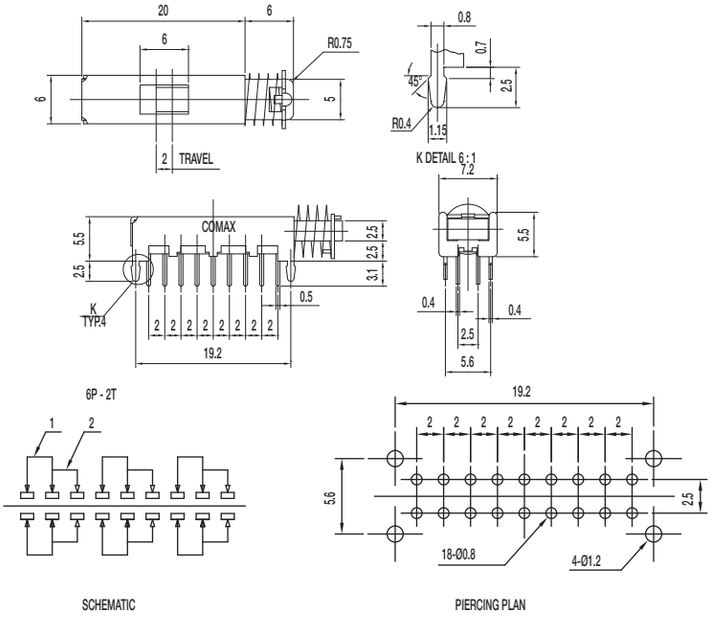
KNOB: POM (UL 94HB)

CONTACT: Silver plated

TERMINAL: Silver plated

Dimensions are shown: mm
Specifications and dimensions subject to change

PS-62D10-S 6P2T SHORTING



Specifications

CONTACT RATING: 0.3A @ 30 VDC

INITIAL CONTACT RESISTANCE: 30 m ohms max.

INSULATION RESISTANCE: 100 M ohms min.

DIELECTRIC STRENGTH: 500 V AC (50-60 Hz) between open terminals and between the frame and terminal.

OPERATING LIFE: 10,000 cycles with load

OPERATING FORCE: 250 ± 100 gf (2.45 ± 0.98N)

TRAVEL: 2 ± 0.3 mm

OPERATING TEMPERATURE: -20˚C to 70˚C

Materials

FRAME: SPCC

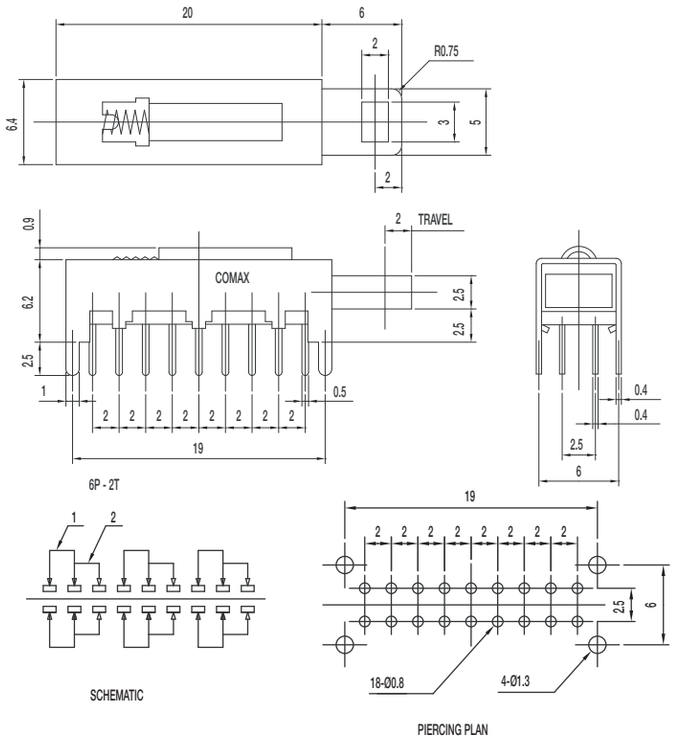
KNOB: POM (UL 94HB)

CONTACT: Silver plated

SPRING: Steel

TERMINAL: Silver plated

PS-62D13-S 6P2T SHORTING



Specifications

CONTACT RATING: 0.3A @ 30 VDC

INITIAL CONTACT RESISTANCE: 30 m ohms max.

INSULATION RESISTANCE: 100 M ohms min.

DIELECTRIC STRENGTH: 500 V AC (50-60 Hz) between open terminals and between the frame and terminal.

OPERATING LIFE: 10,000 cycles with load

OPERATING FORCE: 300 ± 100 gf (2.94 ± 0.98N)

TRAVEL: 2 ± 0.3 mm

OPERATING TEMPERATURE: -20˚C to 70˚C

Materials

FRAME: SPCC

KNOB: POM (UL 94HB)

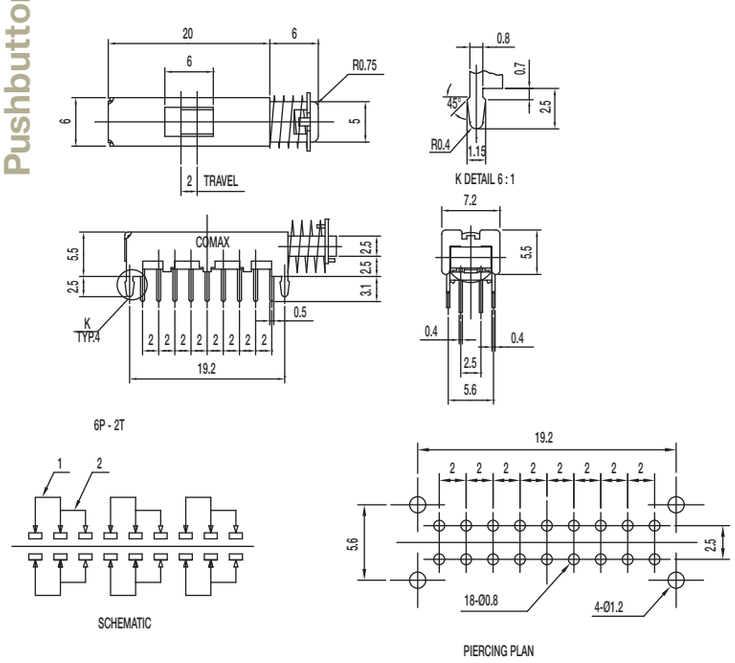
CONTACT PLATE: Silver plated

SPRING: Steel

TERMINAL: SUS

PS Series
Miniature Pushbutton Switches

PS-62D15-S 6P2T SHORTING



Specifications

CONTACT RATING: 0.3A @ 30 VDC

INITIAL CONTACT RESISTANCE: 30 m ohms max.

INSULATION RESISTANCE: 100 M ohms min.

DIELECTRIC STRENGTH: 500 V AC (50-60 Hz) between open terminals and between the frame and terminal.

OPERATING LIFE: 10,000 cycles with load

OPERATING FORCE: 250 ± 100 gf (2.45 ± 0.98N)

TRAVEL: 2 ± 0.3 mm

OPERATING TEMPERATURE: -20˚C to 70˚C

Materials

FRAME: SPCC

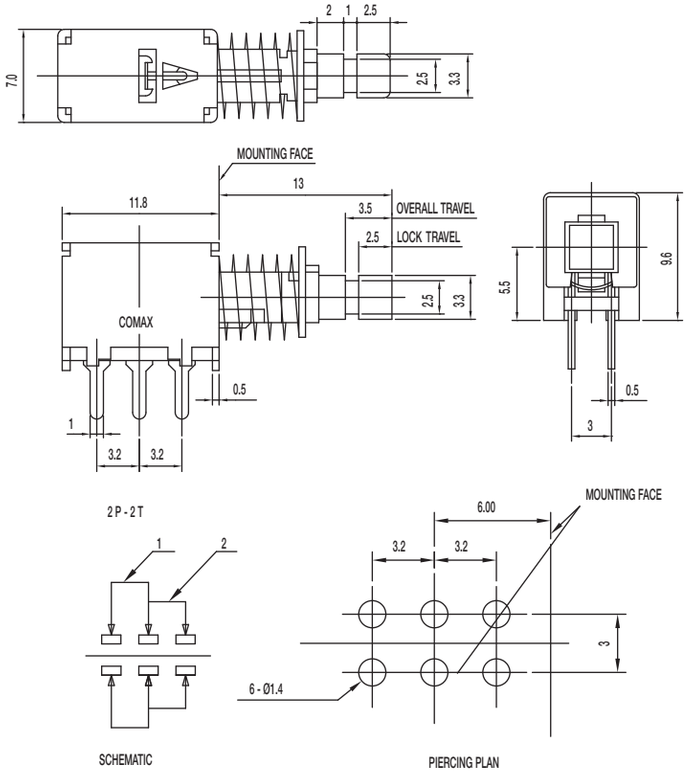
KNOB: POM (UL 94HB)

CONTACT: Silver plated

SPRING: Steel

TERMINAL: Silver plated

PS-22E02-G13 S DPDT SHORTING WITH LOCK



Specifications

CONTACT RATING: 0.3A @ 30 VDC

INITIAL CONTACT RESISTANCE: 30 m ohms max.

INSULATION RESISTANCE: 100 M ohms min.

DIELECTRIC STRENGTH: 500 V AC (50-60 Hz) between open terminals and between the frame and terminal.

OPERATING LIFE: 10,000 cycles with load

OPERATING FORCE: 300 ± 100 gf (2.94 ± 0.98N)

LOCK TRAVEL: 2.5 ± 0.3 mm

TOTAL TRAVEL: 3.5 ± 0.3 mm

OPERATING TEMPERATURE: -20˚C to 70˚C

Materials

FRAME: SPCC

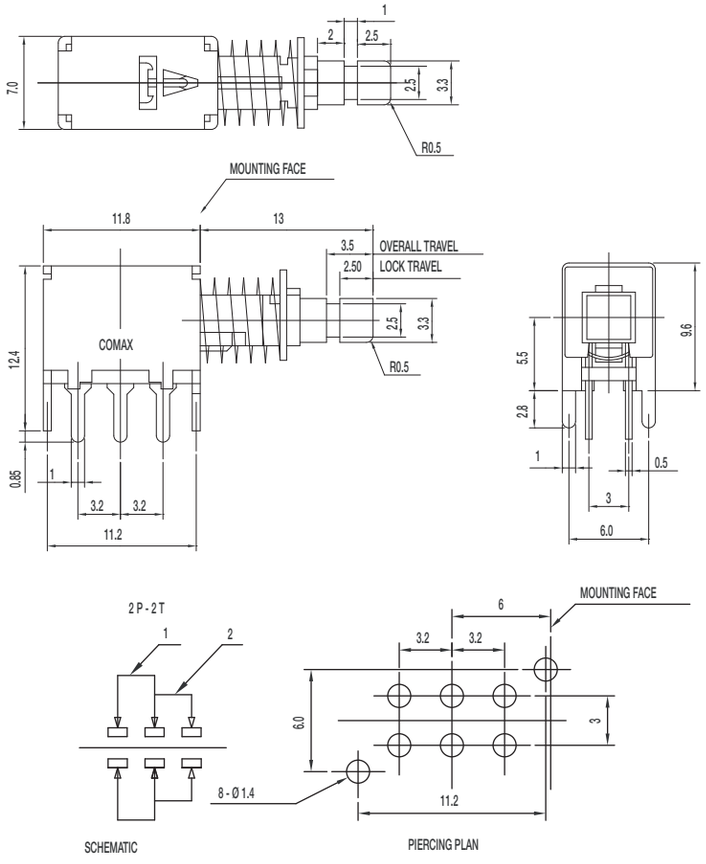
KNOB: POM (UL 94HB)

CONTACT: Silver plated

SPRING: Steel

TERMINAL: Silver plated

PS-22E04-G13 NS DPDT NON-SHORTING WITH LOCK



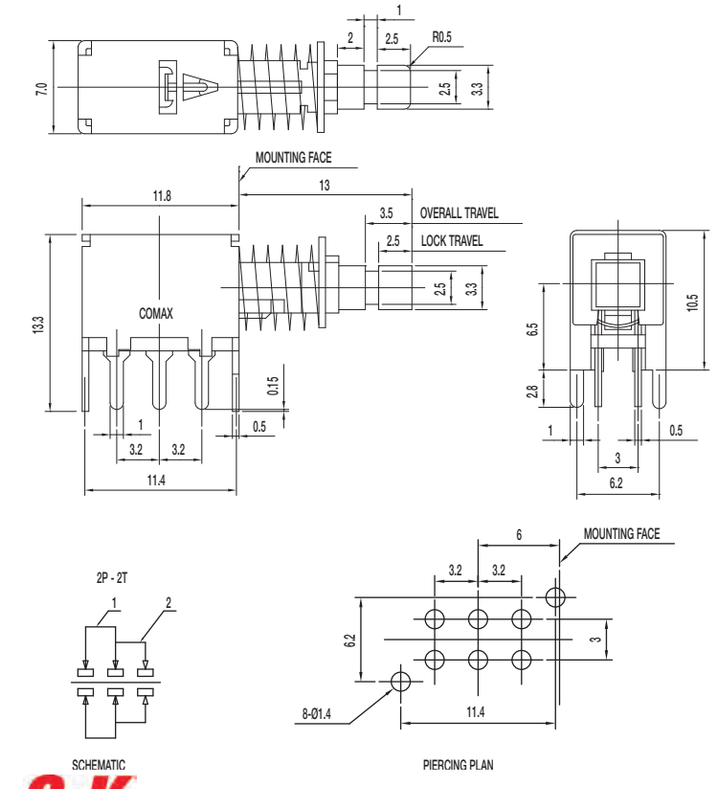
Specifications

CONTACT RATING: 0.3A @ 30 VDC
INITIAL CONTACT RESISTANCE: 30 m ohms max.
INSULATION RESISTANCE: 100 M ohms min.
DIELECTRIC STRENGTH: 500 V AC (50-60 Hz) between open terminals and between the frame and terminal.
OPERATING LIFE: 10,000 cycles with load
OPERATING FORCE: 300 ± 100 gf (2.94 ± 0.98N)
LOCK TRAVEL: 2.5 ± 0.3 mm
TOTAL TRAVEL: 3.5 ± 0.3 mm
OPERATING TEMPERATURE: -20˚C to 70˚C

Materials

FRAME: SPCC
KNOB: POM (UL 94HB)
CONTACT: Silver plated
SPRING: Steel
TERMINAL: Silver plated

PS-22E44-G13 NS DPDT NON-SHORTING WITH LOCK



Specifications

CONTACT RATING: 0.3A @ 30 VDC
INITIAL CONTACT RESISTANCE: 30 m ohms max.
INSULATION RESISTANCE: 100 M ohms min.
DIELECTRIC STRENGTH: 500 V AC (50-60 Hz) between open terminals and between the frame and terminal.
OPERATING LIFE: 10,000 cycles with load
OPERATING FORCE: 300 ± 100 gf (2.94 ± 0.98N)
LOCK TRAVEL: 2.5 ± 0.3 mm
TOTAL TRAVEL: 3.5 ± 0.3 mm
OPERATING TEMPERATURE: -20˚C to 70˚C

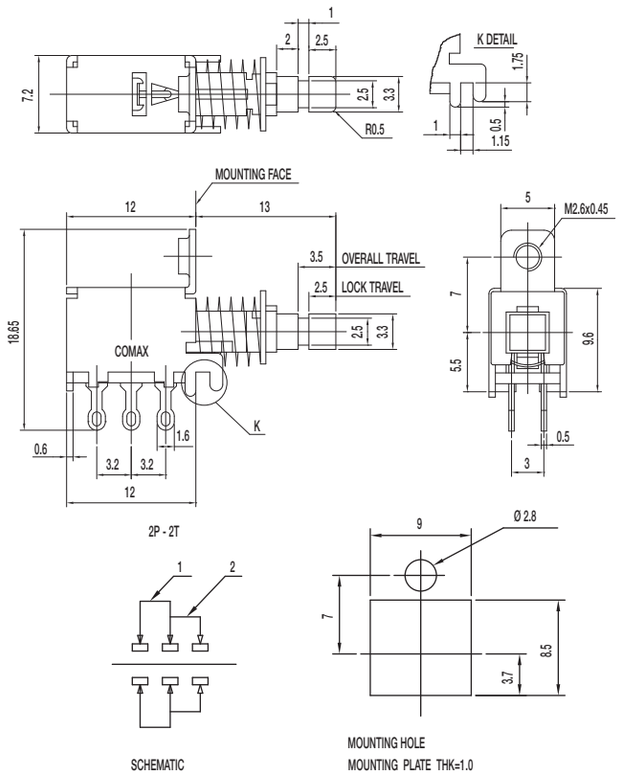
Materials

FRAME: SPCC
KNOB: POM (UL 94HB)
CONTACT: Silver plated
SPRING: Steel
TERMINAL: Silver plated

Dimensions are shown: mm
Specifications and dimensions subject to change

PS Series
Miniature Pushbutton Switches

PS-22E75-G13 NS DPDT NON-SHORTING WITH LOCK



Specifications

CONTACT RATING: 0.3A @ 30 VDC

INITIAL CONTACT RESISTANCE: 30 m ohms max.

INSULATION RESISTANCE: 100 M ohms min.

DIELECTRIC STRENGTH: 500 V AC (50-60 Hz) between open terminals and between the frame and terminal.

OPERATING LIFE: 10,000 cycles with load

OPERATING FORCE: 300 ± 100 gf (2.94 ± 0.98N)

LOCK TRAVEL: 2.5 ± 0.3 mm

TOTAL TRAVEL: 3.5 ± 0.3 mm

OPERATING TEMPERATURE: -20˚C to 70˚C

Materials

FRAME: SPCC

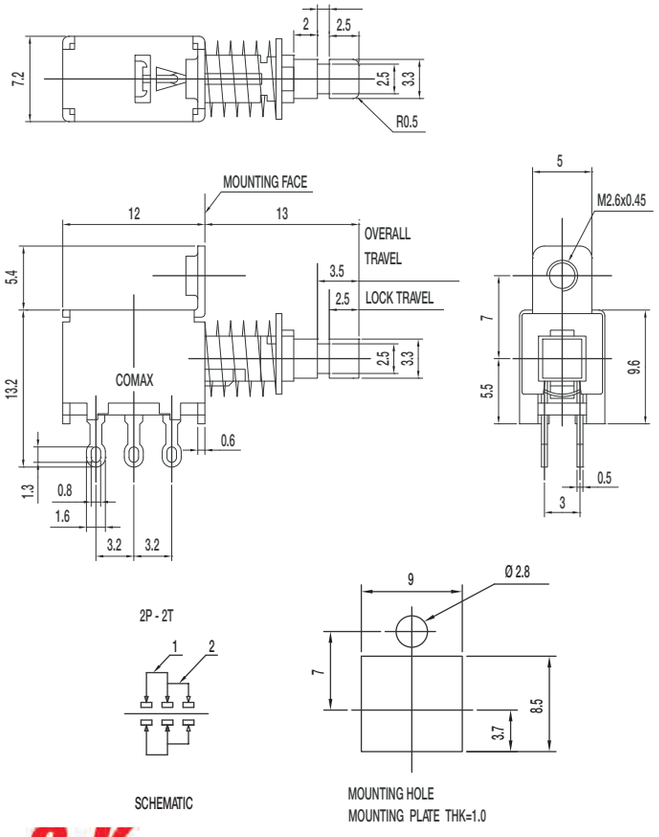
KNOB: POM (UL 94HB)

CONTACT: Silver plated

SPRING: Steel

TERMINAL: Silver plated

PS-22E95-G13 NS DPDT NON-SHORTING WITH LOCK



Specifications

CONTACT RATING: 0.3A @ 30 VDC

INITIAL CONTACT RESISTANCE: 30 m ohms max.

INSULATION RESISTANCE: 100 M ohms min.

DIELECTRIC STRENGTH: 500 V AC (50-60 Hz) between open terminals and between the frame and terminal.

OPERATING LIFE: 10,000 cycles with load

OPERATING FORCE: 300 ± 100 gf (2.94 ± 0.98N)

LOCK TRAVEL: 2.5 ± 0.3 mm

TOTAL TRAVEL: 3.5 ± 0.3 mm

OPERATING TEMPERATURE: -20˚C to 70˚C

Materials

FRAME: SPCC

KNOB: POM (UL 94HB)

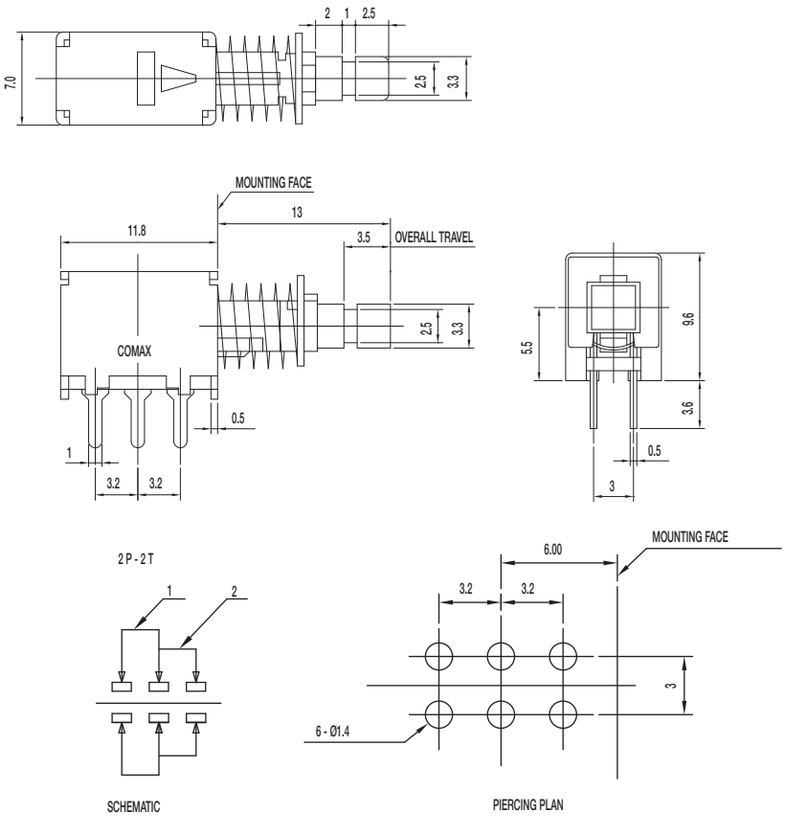
CONTACT: Silver plated

SPRING: Steel

TERMINAL: Silver plated

Dimensions are shown: mm
Specifications and dimensions subject to change

PS-22F02-G13 S DPDT SHORTING



Specifications

CONTACT RATING: 0.3A @ 30 VDC

INITIAL CONTACT RESISTANCE: 30 m ohms max.

INSULATION RESISTANCE: 100 M ohms min.

DIELECTRIC STRENGTH: 500 V AC (50-60 Hz) between openterminals and between the frame and terminal.

OPERATING LIFE: 10,000 cycles with load

OPERATING FORCE: 300 ± 100 gf (2.94 ± 0.98N)

TOTAL TRAVEL: 3.5 ± 0.3 mm

OPERATING TEMPERATURE: -20˚C to 70˚C

Materials

FRAME: SPCC

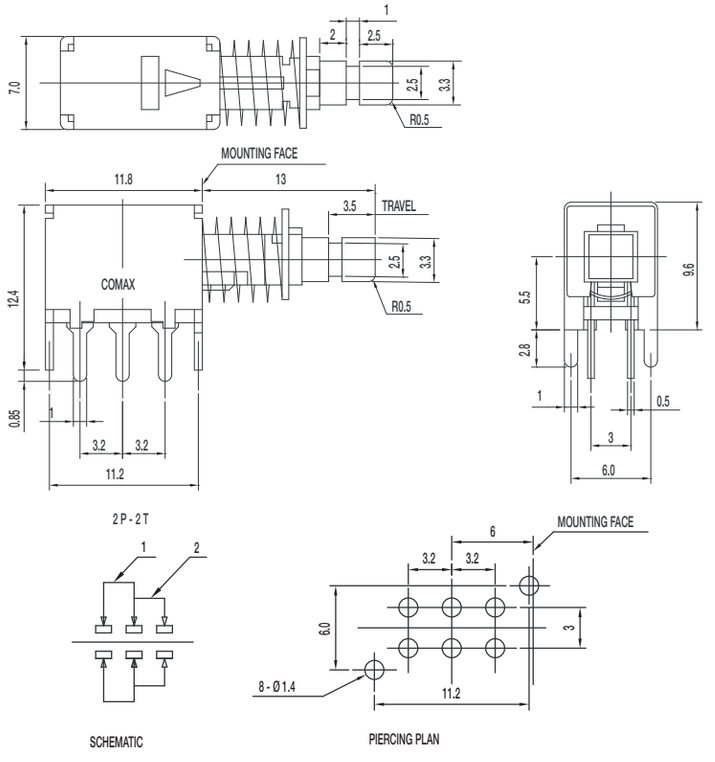
KNOB: POM (UL 94HB)

CONTACT: Silver plated

SPRING: Steel

TERMINAL: Silver plated

PS-22F04-G13 NS DPDT NON_SHORTING



Specifications

CONTACT RATING: 0.3A @ 30 VDC

INITIAL CONTACT RESISTANCE: 30 m ohms max.

INSULATION RESISTANCE: 100 M ohms min.

DIELECTRIC STRENGTH: 500 V AC (50-60 Hz) between open terminals and between the frame and terminal.

OPERATING LIFE: 10,000 cycles with load

OPERATING FORCE: 300 ± 100 gf (2.94 ± 0.98N)

TOTAL TRAVEL: 3.5 ± 0.3 mm

OPERATING TEMPERATURE: -20˚C to 70˚C

Materials

FRAME: SPCC

KNOB: POM (UL 94HB)

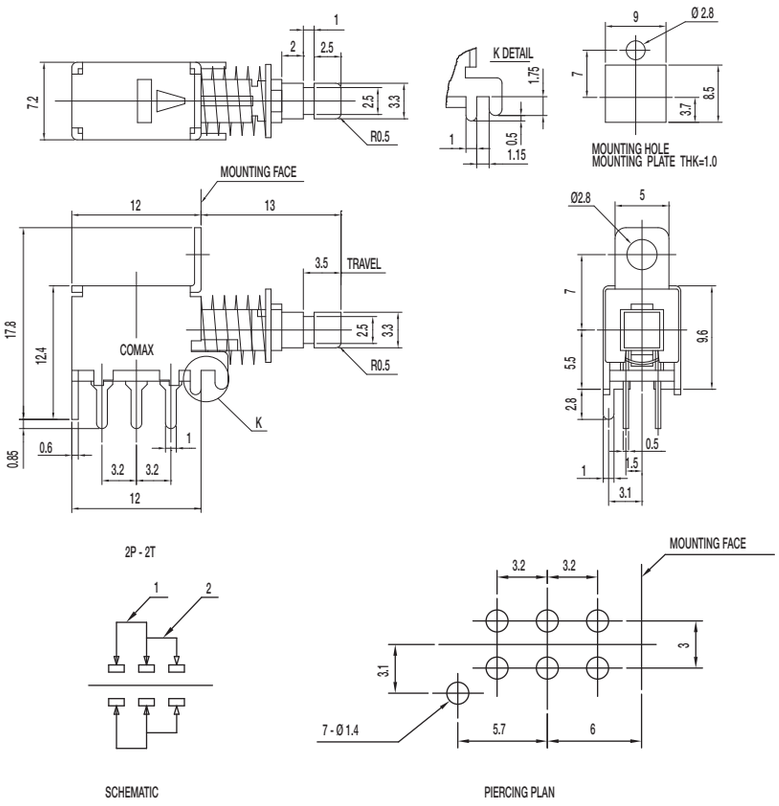
CONTACT: Silver plated

SPRING: Steel

TERMINAL: Silver plated

PS Series
Miniature Pushbutton Switches

PS-22F24-G13 NS DPDT NON_SHORTING



Specifications

CONTACT RATING: 0.3A @ 30 VDC

INITIAL CONTACT RESISTANCE: 30 m ohms max.

INSULATION RESISTANCE: 100 M ohms min.

DIELECTRIC STRENGTH: 500 V AC (50-60 Hz) between open terminals and between the frame and terminal.

OPERATING LIFE: 10,000 cycles with load

OPERATING FORCE: 300 ± 100 gf (2.94 ± 0.98N)

TOTAL TRAVEL: 3.5 ± 0.3 mm

OPERATING TEMPERATURE: -20˚C to 70˚C

Materials

FRAME: SPCC

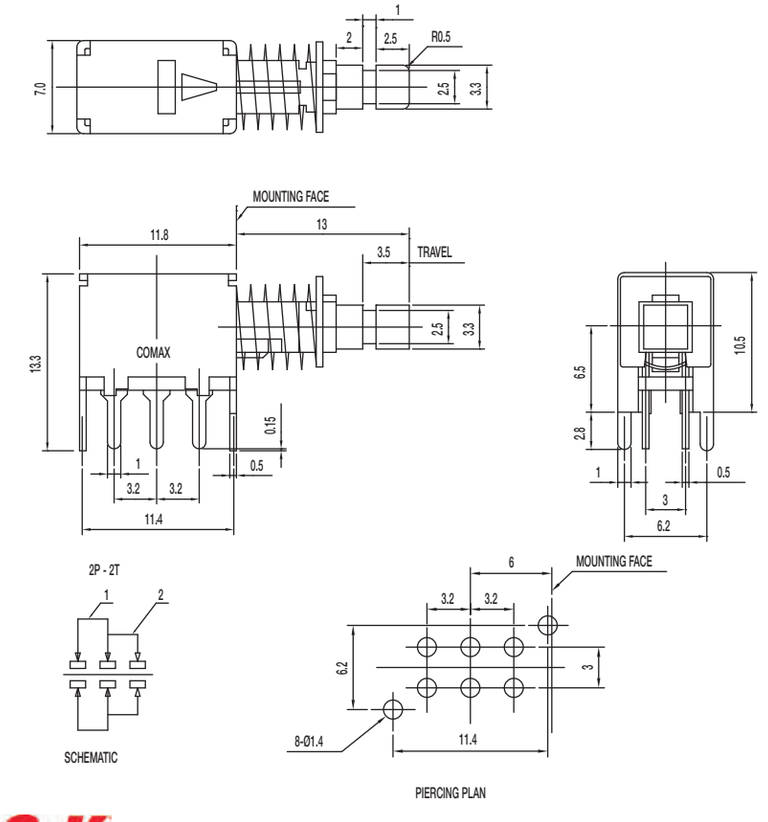
KNOB: POM (UL 94HB)

CONTACT: Silver plated

SPRING: Steel

TERMINAL: Silver plated

PS-22F44-G13 NS DPDT NON_SHORTING



Specifications

CONTACT RATING: 0.3A @ 30 VDC

INITIAL CONTACT RESISTANCE: 30 m ohms max.

INSULATION RESISTANCE: 100 M ohms min.

DIELECTRIC STRENGTH: 500 V AC (50-60 Hz) between open terminals and between the frame and terminal.

OPERATING LIFE: 10,000 cycles with load

OPERATING FORCE: 300 ± 100 gf (2.94 ± 0.98N)

TOTAL TRAVEL: 3.5 ± 0.3 mm

OPERATING TEMPERATURE: -20˚C to 70˚C

Materials

FRAME: SPCC

KNOB: POM (UL 94HB)

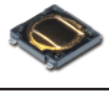
CONTACT: Silver plated

SPRING: Steel

TERMINAL: Silver plated

Dimensions are shown: mm
Specifications and dimensions subject to change

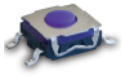
Tactile Switches
Product Selection Guide

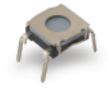
Surface Mount							
Series	**KXT2**	**KXT3**	**KMT2**	**KMT0**	**KMR 2-8**	**KMS**	**PTS525**
Size on PCB L x W (mm)	3,9 x 3	3 x 2	3 x 2,6	3 x 2,6	4,2 x 2,8	4,2 x 3,55	5,2 x 5,2
Total Height (mm)	1,05	0,6	0,65	0,65	1,9 2,5	1,42	0,8 and 1,5
Travel (mm)	0,1	0,13	0,15	0,15	0,2 to 0,35	0,25 to 0,3	0,3
Actuation Force (N)	100 gf 200 gf	100 gf 160gf 240 gf 330 gf	1,0 1,6	1,0; 1,6 2,3; 3,4	1,2; 2,0 3,0; 4,0	2,0 3,0	1,6 2,6
Contact Type	Silver	Silver	Silver	Silver	Silver / Gold	Silver / Gold	Silver
Max. Voltage (V)	12	15	32	32	32	32	32
Max. Switching Power (VA)	0,5	0,5	0,5	0,5	1 / 0,2	1 / 0,2	1
Life Cycles	100,000	300,000 500,000	150,000	300,000/600,000 1,000,000	100,000 300,000	100,000	100,000
IP Rating	IP64	IP64	IP54	IP68	IP40	IP40	IP40
Page Number	B-5	B-7	B-9	B-11	B-13	B-23	B-25
Surface Mount							
Series	**PTS530**	**PTS540**	**PTS810**	**PTS820**	**PTS830**	**PTS840**	**KSR**
Size on PCB L x W (mm)	4,5 x 4,5	3,7 x 3,7	4,2 x 3,2	3,9 x 2,9	3,5 x 2,6	3,5 x 3,55	7,15 x 3,8 7,3 x 3,8
Total Height (mm)	0,55 and 0,65	0,55 / 0,65	2,5	1,5/2,0/2,5	1,4	1,35	2,5
Travel (mm)	0,2	0,15	0,15/0,2	0,2	0,15	0,2	0,3 to 0,5
Actuation Force (N)	1,0; 1,6; 2,0; 2,6; 4,0; 6,0	160 gf 230 gf	1,6; 2,6; 4,0; 6,0	1,6 2,5	160 gf 450 gf	1,6 2,2	1,2; 2,0; 3,0; 4,5
Contact Type	Silver	Silver	Silver	Silver	Silver	Silver	Silver / Gold
Max. Voltage (V)	12	12	16	12	12	12	32
Max. Switching Power (VA)	–	–	–	-	-	-	1 / 0,2
Life Cycles	150,000 to 1,000,000	300,000 500,000	50,000 to 150,000	100,000 200,000	200,000 500,000	100,000	100,000 200,000
IP Rating	-	IP40	IP40	IP40	IP40	IP40	IP50
Page Number	B-29	B-31	B-33	B-35	B-38	B-42	B-45

* Other options available by request

Dimensions are shown: mm
Specifications and dimensions subject to change

Tactile Switches
Product Selection Guide

Surface Mount Thru-Hole Options					
Series	**KSS**	**KSC4V2**	**KSC 1 - 10**	**KSE**	**KT**
Footprint	5,5 x 4,4	2 holes ø 1,1 2 pads 1,5 x 0,8	J 6,8 x 6,2 G 10 x 6,2	6,8 x 6,2	SA 7,5x5 SA2 7,5x7
Total Height (mm)	1,7	5,0*		3,1 / 4,3	6,6 7,11 with tab
Travel (mm)	0,3	0,7*	0,20 to 0,75 *	0,3	0,3 to 0,5
Actuation Force (N)	2 2,5 4	3.5*	1,1 to 5,5 *	1.5 2.25	3
Contact Type	Silver / Gold	Silver / Gold	Silver / Gold	Silver	Silver / Gold
Max. Voltage (V)	32	32	32	32	50
Max. Switching Power (VA)	1 / 0,2	1 / 0,2	1 / 0.2	1	1 / 0.2
Life Cycles	100,000	300,000	100,000 to 1,000,000	300,000	100,000
IP Rating	IP40	IP67	IP67	IP67	
Page Number	B-49	B-63	B-51	B-65	B-68

Surface Mount Thru-Hole Options							
Series	**K5AT**	**K8**	**K5V**	**KSF/KSI**	**KSA**	**KSA-V**	**KSA MKII**
Footprint	G 8,4 x 10,8	G 8,4 x 10,8	8 x 9 x 17 / 9 x 13	7,62 x 5,08	7,62 x 5,08	7,62 x 2,54	7,62 x 5,08
Total Height (mm)	6,1	6	9 / 13	2,6	4,7 button option	8	4,7
Travel (mm)	0,5	0,45	1,2	0,3 to 0,5	0,3 to 0,5	0,3 to 0,5	0,3 to 0,5
Actuation Force (N)	4.0	4.0	4.0	1.3 3.0 1.6 5.0	1.3 3.0 5.0	1.3 3.0 5.0	1.3 3.0 5.0
Contact Type	Gold	Silver	Gold	Silver / Gold	Silver / Gold	Silver / Gold	Silver / Gold
Max. Voltage (V)	32	32	32	32	32	32	32
Max. Switching Power (VA)	1	1	1	1 / 0.2	1 / 0.2	1 / 0.2	1 / 0.2
Life Cycles	100,000	300,000	25,000	100,000	100,000	100,000	100,000 1,000,000
IP Rating	IP40	IP40	IP40	IP60	IP60	IP60	IP67
Page Number	B-73	B-75	B-78	B-82	B-84	B-84	B-89

* Other options available by request

Tactile Switches
Product Selection Guide

Surface Mount Thru-Hole Options					
Series	**KSJ**	**KSJ-V**	**KSJ**	**KSJ-V**	**PTS635**
Footprint	7,62 x 5,08	7,62 x 2,54	7,62 x 5,08	7,62 x 2,54	6 x 3,5
Total Height (mm)	9,9	8	6,65	8	2,5 4,3 5,0
Travel (mm)	0,3 to 0,5	0,3 to 0,5	0,55 to 0,7	0,55 to 0,7	0,25
Actuation Force (N)	1,3 3,0	1,3 3,0	2,0 3,0	2,0 3,0	1,3 2,0 2,6
Contact Type	Silver / Gold	Silver / Gold	Silver / Gold	Silver / Gold	Silver
Max. Voltage (V)	32	32	32	32	12
Life Cycles	100,000	100,000	100,000 30,000	100,000 30,000	20,000
IP Rating	IP60	IP60	IP60	IP60	IP40
Page Number	B-84	B-84	B-91	B-91	B-93

Surface Mount Thru-Hole Options						
Series	**PTS641**	**PTS645**	**PTS645-V**	**PTS125**	**ITS**	
Footprint	6,3 x 6,4	6 x 6	7,0 x 2,5	12 x 12	variety of sizes available	
Total Height (mm)	2,5 3,1 3,4	4,3; 5,0; 7,0; 9,5;	7,1	4,3 7,3 Sq. 8,5 12,0		
Travel (mm)	0,20 / 0,30	0,25	0,25	0,30	0,25	
Actuation Force (N)	160 gf 250 gf 320 gf	1,3; 1,6 2,0; 2,6	1,3; 1,6 2,0; 2,6	1,6 2,6	160 gf	
Contact Type	Silver	Silver	Silver	Silver	Silver	
Max. Voltage (V)	12	12	12	12	12	
Life Cycles	100,000	100,000	100,000	200,000	50,000	
IP Rating	IP40	IP40	IP40	IP40	IP40	
Page Number	B-96	B-98	B-103	B-105	B-109	

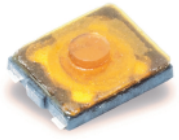
KXT2 Series
Double Action Ultra Low Profile Top Actuated

Features

- *3.9 x 3.0 mm footprint*
- *1.05 mm thickness*
- *Dual action*

Typical Applications

- *Wearable electronics*
- *Mobile Phones*
- *Portable Electronics*



Specification

FUNCTION: momentary action
CONTACT ARRANGEMENT: Dual action = SPDT, N.O.
TERMINALS: G type for SMT
TRAVEL: 0.1 mm ± 0.05 mm
TRAVEL: 0.2 mm + 0.1 / - 0.05 mm

Mechanical

	Operating force gf		Operating Life
KXT 211 LHS	Push force 1 Push force 2	100 ± 40 200 ± 50	100,000

Electrical

MAXIMUM VOLTAGE:	12 VDC
MAXIMUM CURRENT DC:	50 mA
DIELECTRIC STRENGTH:	250 V (50 Hz, 1 min.)
CONTACT RESISTANCE:	≤ 500 mΩ
INSULATION RESISTANCE:	100 MΩ
BOUNCE TIME:	≤ 10 ms

Environmental

OPERATING TEMPERATURE: -40˚C to 85˚C
STORAGE TEMPERATURE: -40˚C to 85˚C

Process

SOLDERING: This component is suited to the following methods:
Infrared Reflow Soldering in accordance with IEC61760-1

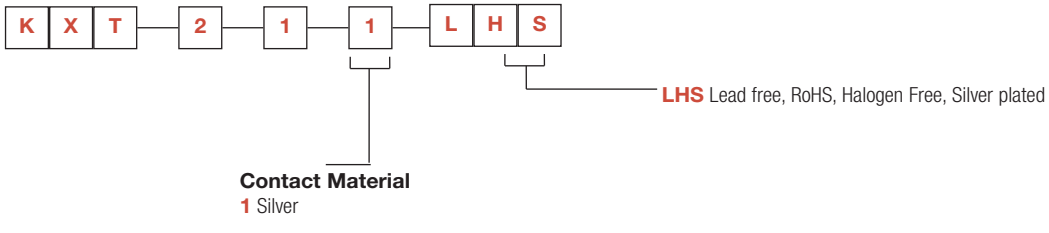
Packaging

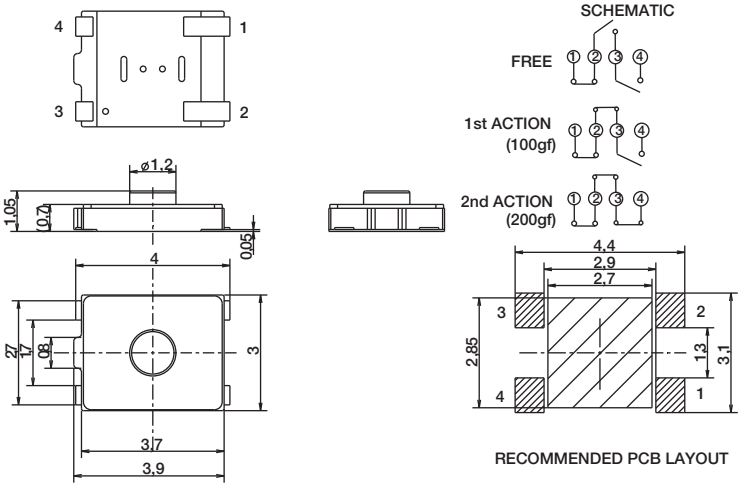
In reels of 6,000 pieces
Dimensions of reels according to EIA RS481 or IEC 2863
External diameter 178 mm ± 2mm

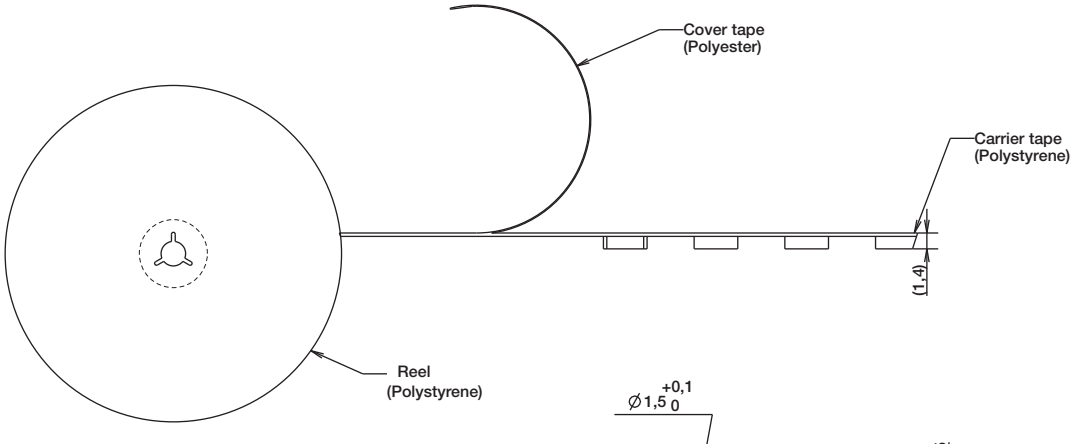
NOTE: Specifications listed above are for switches with standard options.
For information on specific and custom switches, consult Customer Service Center.

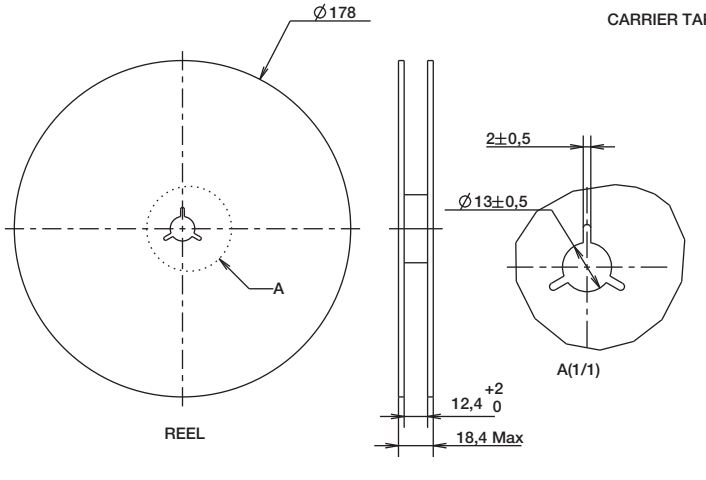
Part Number Description

For any part number different from those listed above, please consult your local representative.









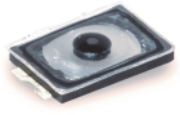
Dimensions are shown: mm
Specifications and dimensions subject to change

Features

- *3.0 x 2.0 mm footprint*
- *0.6 mm thickness*
- *High number of cycle*

Typical Applications

- *Wearable electronics*
- *In-Ear headphones, Earbuds*
- *Mobile Phones*
- *Portable Electronics*
- *Hearing Aids*



Specification

FUNCTION: momentary action
CONTACT ARRANGEMENT: 1 make contact = SPST, N.O.
TERMINALS: G type for SMT
TRAVEL: 0.13 mm ± 0.05 mm

Mechanical

	Operating force gf	Operating Life	Casing Color
KXT 311 LHS	100 ± 50	300,000	Black
KXT 321 LHS	160 ± 50	500,000	Black
KXT 331 LHS	240 ± 70	500,000	Black
KXT 341 LHS	330 ± 70	300,000	Black

Electrical

MAXIMUM VOLTAGE:	15 VDC
MAXIMUM CURRENT DC:	20 mA
DIELECTRIC STRENGTH:	(50/60 Hz, 1 min) 250 Vrms
CONTACT RESISTANCE:	≤ 500 mΩ
INSULATION RESISTANCE:	≥ 50 MΩ
BOUNCE TIME:	≤ 10 ms

Environmental

OPERATING TEMPERATURE: -40˚C to 85˚C
STORAGE TEMPERATURE: -40˚C to 85˚C

Process

SOLDERING: This component is suited to the following methods:
Infrared Reflow Soldering in accordance with IEC61760-1

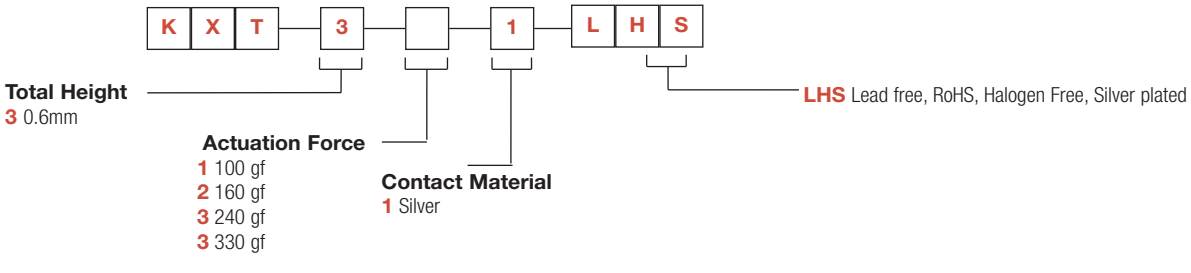
Packaging

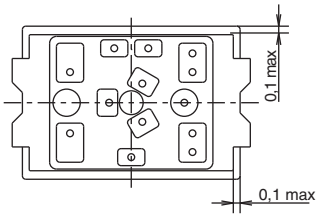
In reels of 8,500 pieces
Dimensions of reels according to EIA 481B
External diameter 330 mm

NOTE: Specifications listed above are for switches with standard options.
For information on specific and custom switches, consult Customer Service Center.

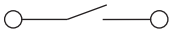
Part Number Description

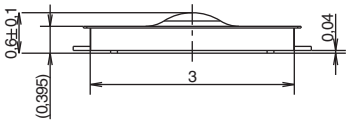
For any part number different from those listed above, please consult your local representative.

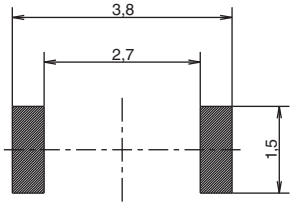




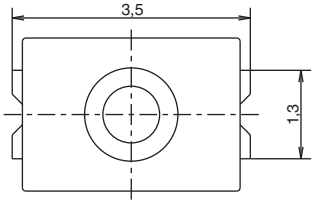
SCHEMATIC

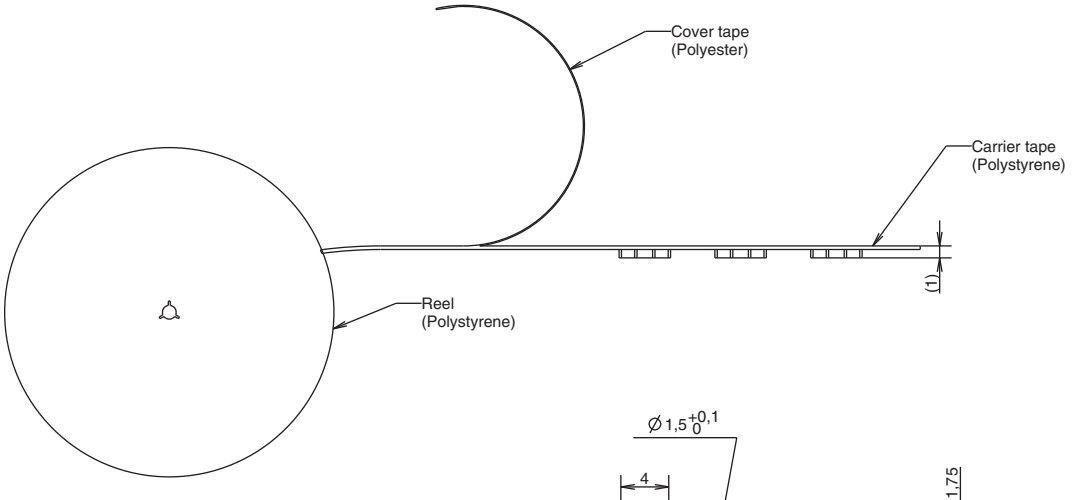


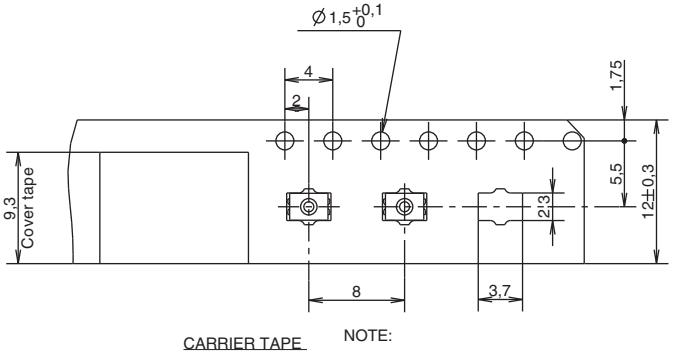




RECOMMENDED PCB LAYOUT

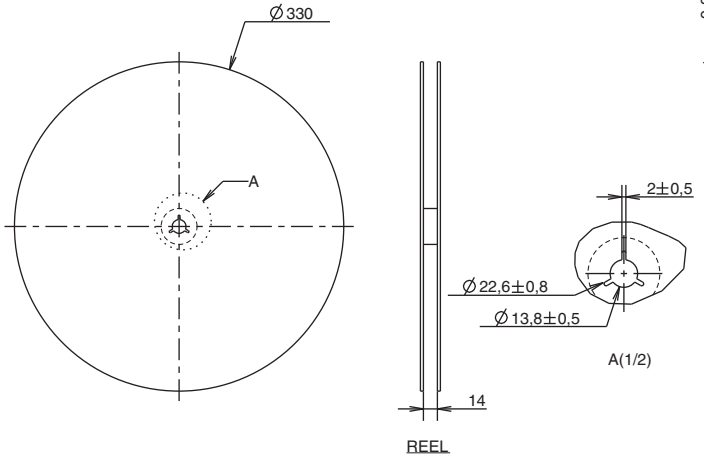






CARRIER TAPE

NOTE:



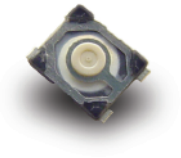
REEL

Features

- *Smallest footprint*
- *High number of cycles within the smallest packaging*
- *Smallest thickness with integrated actuator*
- *Ground pin option*
- *Halogen free*

Typical Applications

- *Mobile Phones*
- *Hearing Aids*
- *MP3 accessories*
- *Bluetooth Headset*



Specification

FUNCTION: momentary action
CONTACT ARRANGEMENT: 1 make contact = SPST, N.O.
TERMINALS: Gullwing type for SMT

Mechanical

Type G and NG	Operating force Newtons (grams)	Operating Life	Tactile Feeling	Travel mm
KMT 211 HF LFS	1.0 (100) ± 0.25	150,000	≥ 10%	0.15 ± 0.1
KMT 221 HF LFS	1.6 (160) ± 0.40	150,000	≥ 30%	0.15 ± 0.1

Electrical

	Silver
MAXIMUM POWER:	0.5 VA
MAXIMUM VOLTAGE:	32 VDC
MINIMUM VOLTAGE:	20 mV
MAXIMUM CURRENT DC:	50 mA
MINIMUM CURRENT DC:	1 mA
DIELECTRIC STRENGTH:	≥ 250 Vrms (1mn)
CONTACT RESISTANCE:	≤ 150 mΩ
INSULATION RESISTANCE:	≥ 50 MΩ
BOUNCE TIME:	≤ 6 ms

Environmental

	Silver
OPERATING TEMPERATURE:	-40˚C to 85˚C
STORAGE TEMPERATURE:	-55˚C (10 days) +85˚C (4 days)

Process

SOLDERING: This component is suited to the following methods:
– Infrared Reflow Soldering in accordance with IEC61760-1

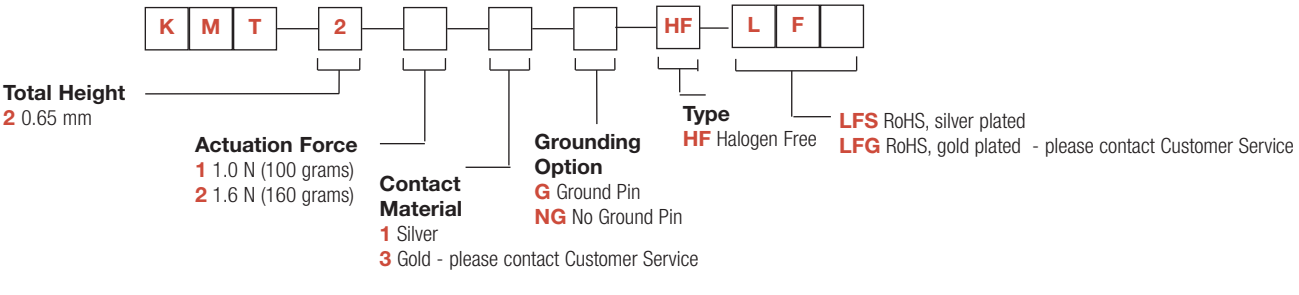
Packaging

In reels of 4,000 pieces.
Dimensions of reels according to EIA 481B
External diameter 180 mm

NOTE: Specifications listed above are for switches with standard options.
For information on specific and custom switches, consult Customer Service Center.

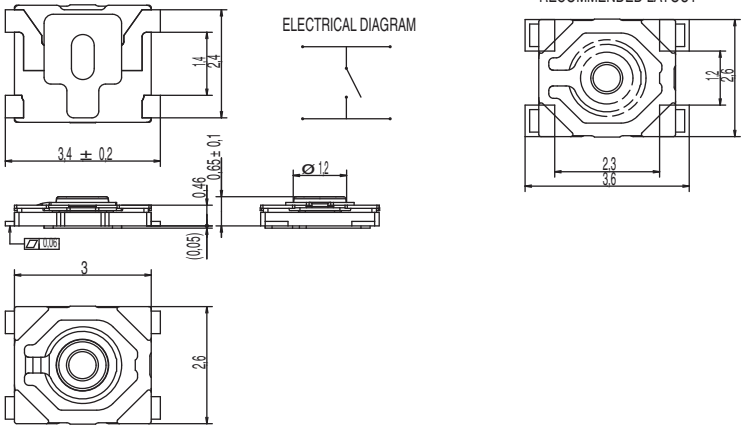
Part Number Description

For any part number different from those listed above, please consult your local representative.

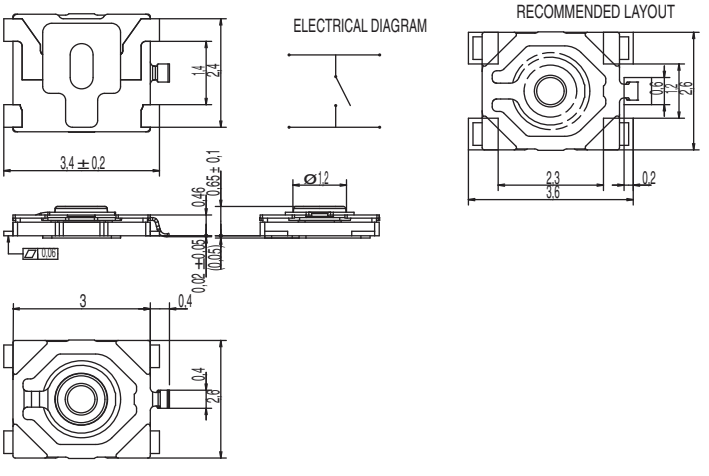


KMT2 Series
Nano-Miniature SMT Top Actuated

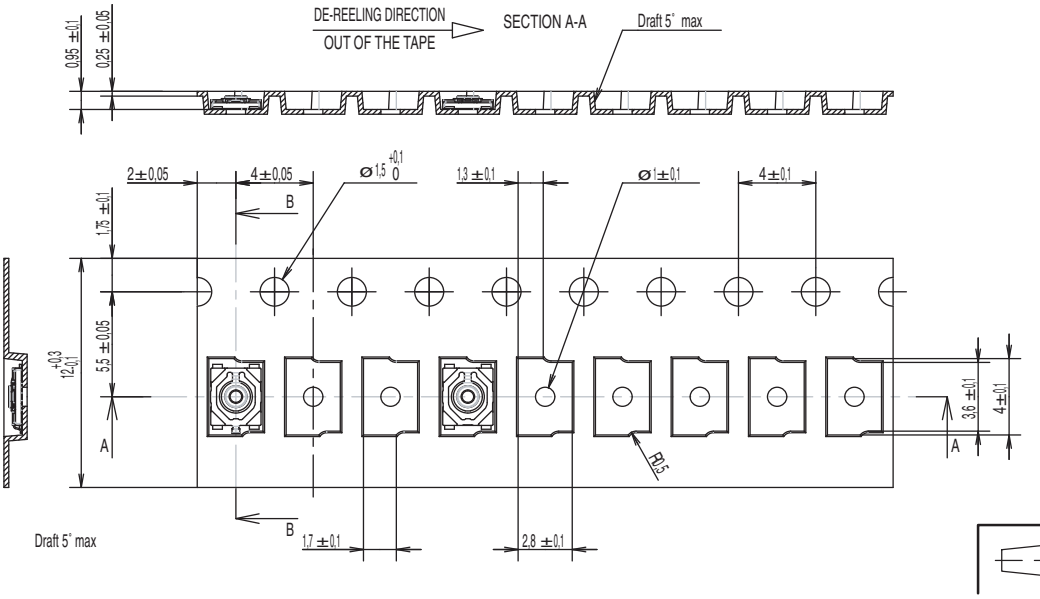
KMT Series – No Ground Pin



KMT Series – With Ground Pin



TAPE & REEL



First Angle Projection

Dimensions are shown: mm
Specifications and dimensions subject to change

Features

- *Smallest footprint*
- *Smallest thickness with integrated actuator*
- *Extended life cycles*
- *IP68*
- *Ultra low current capabilities*

Typical Applications

- *Mobile Phones*
- *Hearing Aids*
- *MP3 accessories*
- *Bluetooth Headset*
- *Automotive keyless entry system*
- *Smoke and CO detectors*
- *E-readers*
- *Home automation remote controls*

Specification

FUNCTION: momentary action, normally open
CONTACT ARRANGEMENT: 1 make contact = SPST, N.O.
TERMINALS: J lead type for SMT

Mechanical

TRAVEL (mm): 0.15 ± 0.1

	Operating force Newtons (grams)	Tactile Feeling	Operating Life
KMT011NGJLHS	1.0 (100) ± 25%	≥ 10%	300,000
KMT021NGJLHS	1.6 (160) ± 25%	≥ 30%	300,000
KMT071NGJLHS	2.3 (230) ± 25%	≥ 30%	300,000
KMT031NGJLHS	3.4 (340) ± 25%	≥ 30%	300,000

	Operating force Newtons (grams)	Tactile Feeling	Operating Life
KMT012NGJLHS	1.0 (100) ± 25%	≥ 10%	1,000,000
KMT022NGJLHS	1.6 (160) ± 25%	≥ 30%	600,000
KMT072NGJLHS	2.3 (230) ± 25%	≥ 30%	600,000

Electrical

MAXIMUM POWER:	0.5 VA
MAXIMUM VOLTAGE:	32 VDC
MINIMUM VOLTAGE:	20 mV
MAXIMUM CURRENT DC:	50 mA
MINIMUM CURRENT DC:	1 mA
DIELECTRIC STRENGTH:	≥ 250 Vrms (1mn)
CONTACT RESISTANCE:	≤ 150 mΩ
INSULATION RESISTANCE:	≥ 50 MΩ
BOUNCE TIME:	≤ 6 ms

Environmental

OPERATING TEMPERATURE: -40°C to 85°C
STORAGE TEMPERATURE: -55°C (10 days) +85°C (4 days)

Process

SOLDERING: This component is suited to the following methods:
– Infrared Reflow Soldering in accordance with IEC61760-1

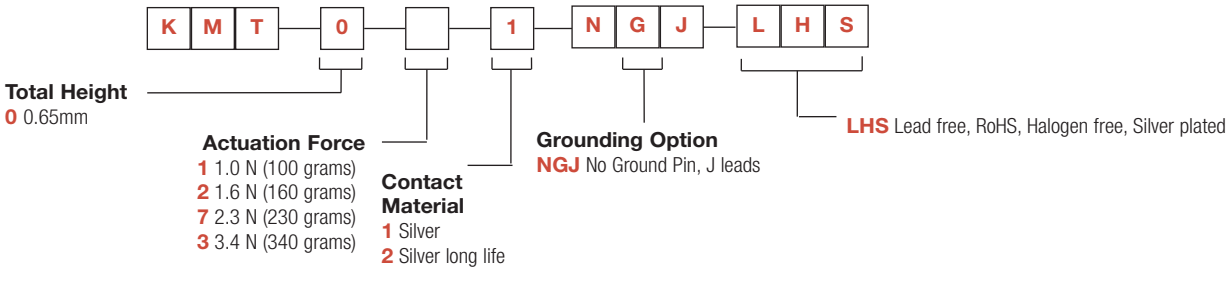
Packaging

In reels of 5,000 pieces.
Dimensions of reels according to EIA 481B
External diameter 180 mm

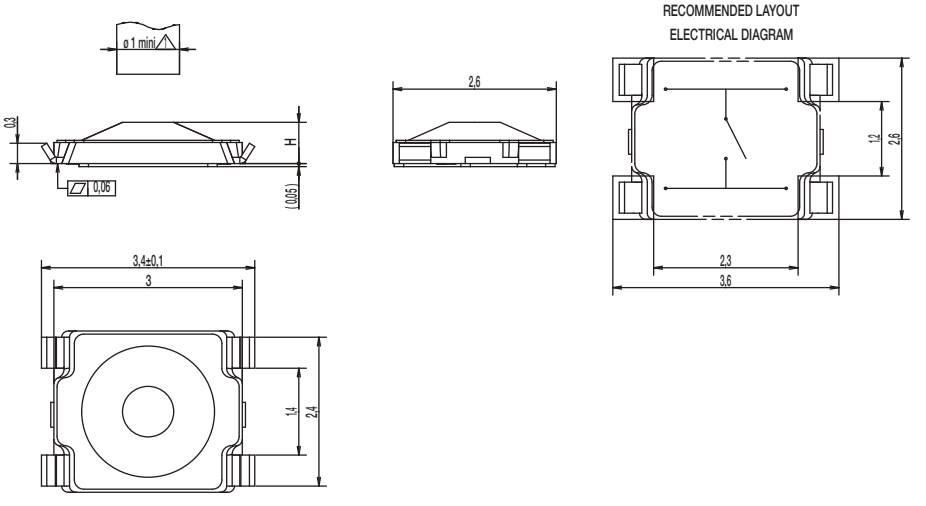
NOTE: Specifications listed above are for switches with standard options.
For information on specific and custom switches, consult Customer Service Center.

Part Number Description

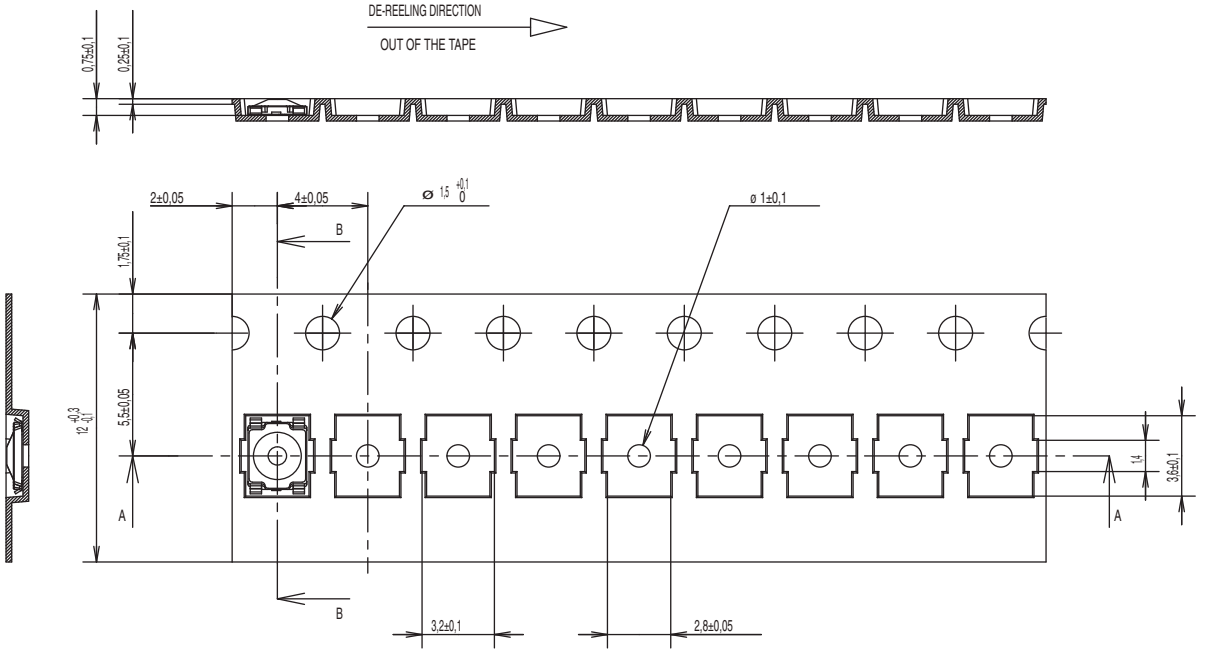
For any part number different from those listed above, please consult your local representative.



Minimum actuator diameter is 1.0 mm. It is recommended to enlarge this diameter to a full flat surface covering the switch.



TAPE & REEL



First Angle Projection

Dimensions are shown: mm
Specifications and dimensions subject to change

Features/Benefits

- *Small footprint*
- *4 actuation forces*
- *Excellent tactile feel*
- *Ultra low current capabilities*
- *IP40*

Typical Applications

- *Automotive*
- *Industrial electronics*
- *Medical equipment*

Specification

FUNCTION: momentary action
CONTACT ARRANGEMENT: 1 make contact = SPST, N.O.
TERMINALS: Gullwing type for SMT

Mechanical

Type G and NG See description below	Operating force N (grs)	Operating life (cycles)	Travel (mm)
KMR211 LFS	1.2 (120) ± 0.30	200,000	0.20 mm ± 0.1
KMR211 ULC LFS	1.2 (120) ± 0.30	200,000	0.20 mm ± 0.1
KMR213 LFG	1.2 (120) ± 0.30	200,000	0.20 mm ± 0.1
KMR213 ULC LFG	1.2 (120) ± 0.30	200,000	0.20 mm ± 0.1
KMR221 LFS	2.0 (200) ± 0.50	200,000	0.25 mm ± 0.1
KMR221 ULC LFS	2.0 (200) ± 0.50	200,000	0.25 mm ± 0.1
KMR223 LFG	2.0 (200) ± 0.50	200,000	0.25 mm ± 0.1
KMR223 ULC LFG	2.0 (200) ± 0.50	200,000	0.25 mm ± 0.1
KMR231 LFS	3.0 (300) ± 0.75	150,000	0.25 mm ± 0.1
KMR231 ULC LFS	3.0 (300) ± 0.75	150,000	0.25 mm ± 0.1
KMR232 LFS	3.0 (300) ± 0.75	300,000	0.25 mm ± 0.1
KMR232 ULC LFS	3.0 (300) ± 0.75	300,000	0.25 mm ± 0.1
KMR233 LFG	3.0 (300) ± 0.75	150,000	0.25 mm ± 0.1
KMR233 ULC LFG	3.0 (300) ± 0.75	150,000	0.25 mm ± 0.1
KMR241 LFS	4.0 (400) ± 1.00	100,000	0.30 mm ± 0.1
KMR241 ULC LFS	4.0 (400) ± 1.00	100,000	0.30 mm ± 0.1
KMR242 LFS	4.0 (400) ± 1.00	200,000	0.30 mm ± 0.1
KMR242 ULC LFS	4.0 (400) ± 1.00	200,000	0.30 mm ± 0.1
KMR243 LFG	4.0 (400) ± 1.00	100,000	0.30 mm ± 0.1
KMR243 ULC LFG	4.0 (400) ± 1.00	100,000	0.30 mm ± 0.1

Electrical

	Silver	Gold
MAXIMUM POWER:	1 VA	0.2 VA
MAXIMUM VOLTAGE:	32 VDC	32 VDC
MINIMUM VOLTAGE:	20 mVDC	20 mVDC
MAXIMUM CURRENT:	50 mA	10 mA
MINIMUM CURRENT:	1 mA*	1 mA*
DIELECTRIC STRENGTH:	≥ 250 Vrms	
CONTACT RESISTANCE:	≤ 100 mΩ	
INSULATION RESISTANCE:	≥ 1GΩ	
BOUNCE TIME:	≤ 3 ms	

*For ULC version minimum current is 1µA at 1.8 VDC

Environmental

	Silver	Gold
OPERATING TEMPERATURE:	-40˚C to 85˚C	-40˚C to 125˚C
STORAGE TEMPERATURE:	-55˚C to 85˚C	-55˚C to 125˚C

Process

Infrared Reflow Soldering in accordance with IEC61760-1

Packaging

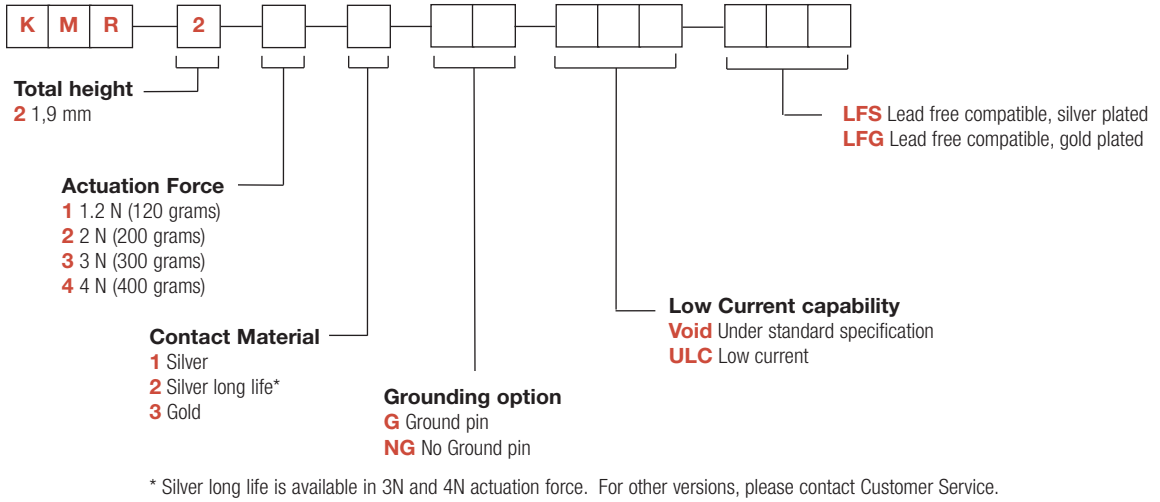
In reels of 7,000 pieces
External diameter 330 mm ± 2 mm

NOTE: Specifications listed above are for switches with standard options.
For information on specific and custom switches, consult Customer Service Center.

TACTILE FEELING: KMR 2 series with actuation force in 2N - 3N - 4N: ≥ 30%
KMR 2 series with actuation force in 1.2N: ≥ 20%

Part Number Description

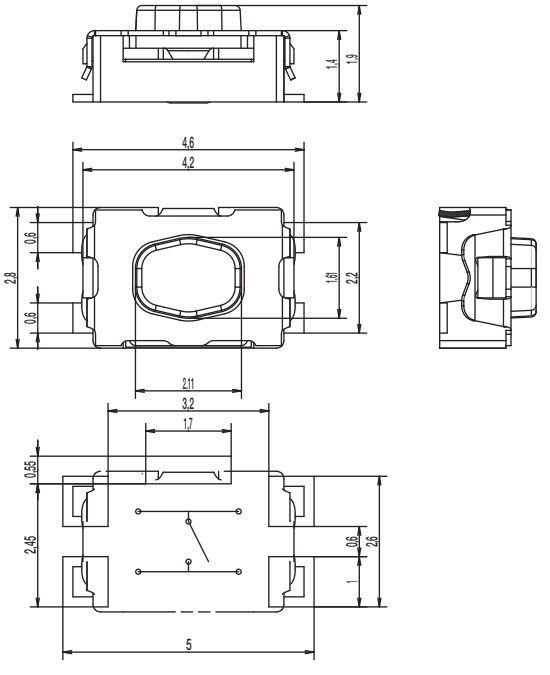
For any part number different from those listed above, please consult your local representative.



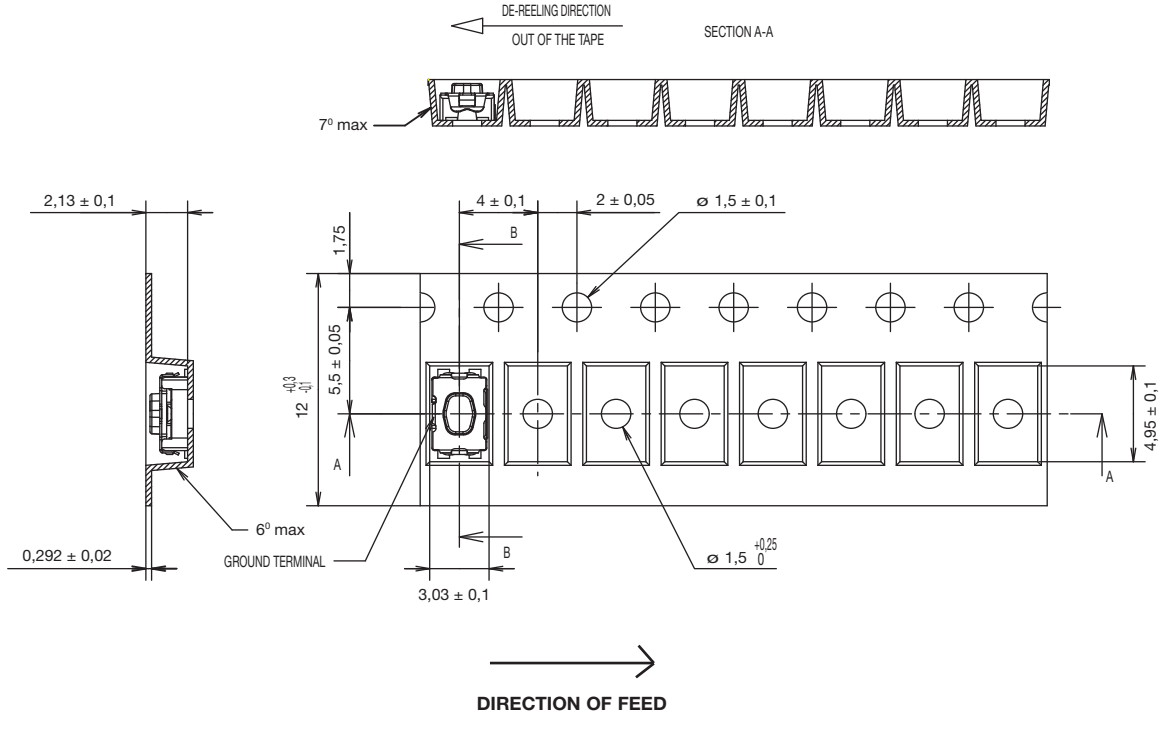
* Silver long life is available in 3N and 4N actuation force. For other versions, please contact Customer Service.

KMR 2 Series - 1.9 mm height

PCB layout shown with ground pin option



TAPE & REEL



First Angle Projection

Dimensions are shown: mm
Specifications and dimensions subject to change

KMR 4 Series
Microminiature SMT Top Actuated

Features/Benefits

- ***Small footprint***
- ***4 actuation forces***
- ***Excellent tactile feel***
- ***Ultra low current capabilities***
- ***IP40***

Typical Applications

- ***Automotive***
- ***Industrial electronics***
- ***Medical equipment***

Specification

FUNCTION: momentary action
CONTACT ARRANGEMENT: 1 make contact = SPST, N.O.
TERMINALS: Gullwing type for SMT

Mechanical

Type G and NG See description below	Operating force N (grs)	Operating life (cycles)	Travel (mm)
KMR411 LFS	1.2 (120) ± 0.30	100,000	0.20 mm ± 0.1
KMR411 ULC LFS	1.2 (120) ± 0.30	100,000	0.20 mm ± 0.1
KMR413 LFG	1.2 (120) ± 0.30	100,000	0.20 mm ± 0.1
KMR413 ULC LFG	1.2 (120) ± 0.30	100,000	0.20 mm ± 0.1
KMR421 LFS	2.0 (200) ± 0.50	100,000	0.25 mm ± 0.1
KMR421 ULC LFS	2.0 (200) ± 0.50	100,000	0.25 mm ± 0.1
KMR423 LFG	2.0 (200) ± 0.50	100,000	0.25 mm ± 0.1
KMR423 ULC LFG	2.0 (200) ± 0.50	100,000	0.25 mm ± 0.1
KMR431 LFS	3.0 (300) ± 0.75	100,000	0.25 mm ± 0.1
KMR431 ULC LFS	3.0 (300) ± 0.75	100,000	0.25 mm ± 0.1
KMR432 LFS	3.0 (300) ± 0.75	300,000	0.25 mm ± 0.1
KMR432ULC LFS	3.0 (300) ± 0.75	300,000	0.25 mm ± 0.1
KMR433 LFG	3.0 (300) ± 0.75	100,000	0.25 mm ± 0.1
KMR433ULC LFG	3.0 (300) ± 0.75	100,000	0.25 mm ± 0.1
KMR441 LFS	4.0 (400) ± 1.00	100,000	0.30 mm ± 0.1
KMR441 ULC LFS	4.0 (400) ± 1.00	100,000	0.30 mm ± 0.1
KMR442 LFS	4.0 (400) ± 1.00	200,000	0.30 mm ± 0.1
KMR442 ULC LFS	4.0 (400) ± 1.00	200,000	0.30 mm ± 0.1
KMR443 LFG	4.0 (400) ± 1.00	100,000	0.30 mm ± 0.1
KMR443 ULC LFG	4.0 (400) ± 1.00	100,000	0.30 mm ± 0.1

TACTILE FEELING: KMR 4 series with actuation force in 2N - 3N - 4N: ≥ 25%
KMR 4 series with actuation force in 1.2N: ≥ 20%

Electrical

	Silver	Gold
MAXIMUM POWER:	1 VA	0.2 VA
MAXIMUM VOLTAGE:	32 VDC	32 VDC
MINIMUM VOLTAGE:	20 mVDC	20 mVDC
MAXIMUM CURRENT:	50 mA	10 mA
MINIMUM CURRENT:	1 mA*	1 mA*
DIELECTRIC STRENGTH:	≥ 250 Vrms	
CONTACT RESISTANCE:	≤ 100 mΩ	
INSULATION RESISTANCE:	≥ 1GΩ	
BOUNCE TIME:	≤ 3 ms	

*For ULC version minimum current is 1µA at 1.8 VDC

Environmental

	Silver	Gold
OPERATING TEMPERATURE:	-40°C to 85°C	-40°C to 125°C
STORAGE TEMPERATURE:	-55°C to 85°C	-55°C to 125°C

Process

Infrared Reflow Soldering in accordance with IEC61760-1

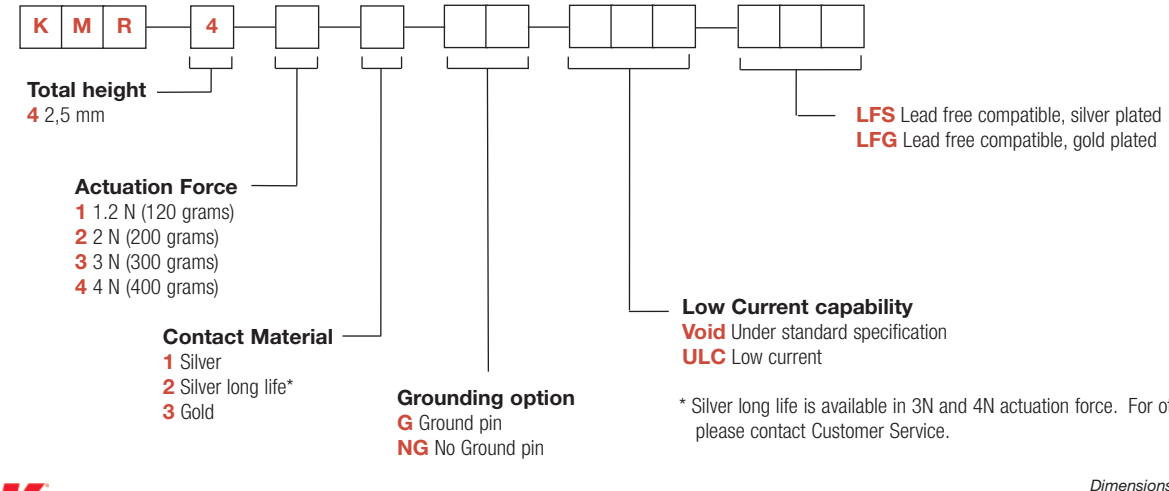
Packaging

In reels of 6,000 pieces
External diameter 330 mm ± 2 mm

NOTE: Specifications listed above are for switches with standard options.
For information on specific and custom switches, consult Customer Service Center.

Part Number Description

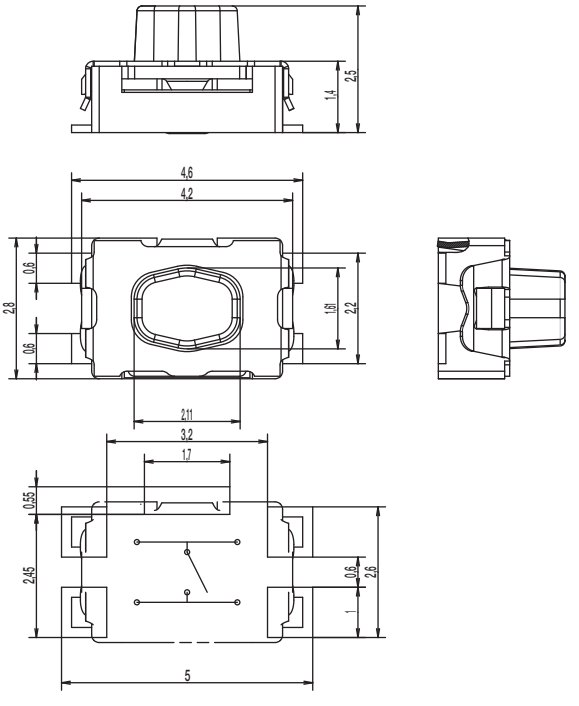
For any part number different from those listed above, please consult your local representative.



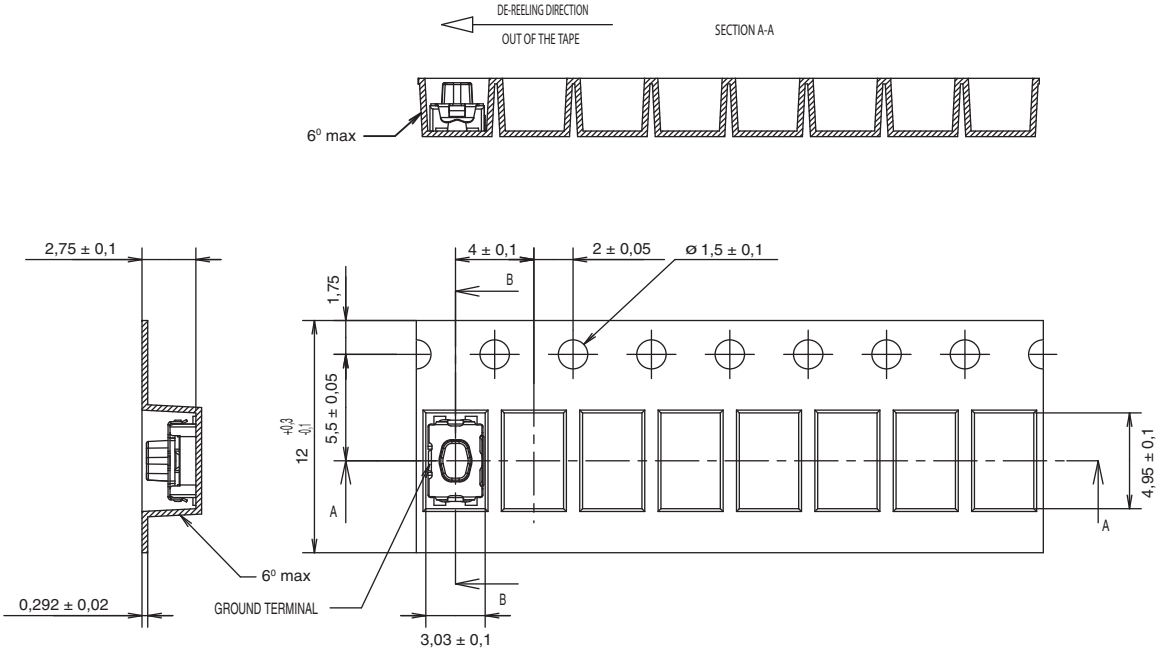
* Silver long life is available in 3N and 4N actuation force. For other versions, please contact Customer Service.

KMR 4 Series - 2.5 mm height

PCB layout shown with ground pin option



TAPE & REEL



First Angle Projection

Dimensions are shown: mm
Specifications and dimensions subject to change

Features/Benefits

- *Watertight IP67*
- *Standard and long life versions*
- *No ground pin*
- *Ultra low current capabilities*
- *Excellent tactile feel*

Typical Applications

- *Automotive*
- *Medical*
- *Consumer*
- *Industrial*

Specification

FUNCTION: momentary action
CONTACT ARRANGEMENT: 1 make contact = SPST, N.O.
TERMINALS: Gullwing type for SMT

Mechanical

Type NG See description below	Operating force N (grs)	Operating life (cycles)	Travel (mm)
KMR611NG LFS	1.2 (120) ± 0.30	200,000	0.20 mm ± 0.1
KMR611NG ULC LFS	1.2 (120) ± 0.30	200,000	0.20 mm ± 0.1
KMR613NG LFG	1.2 (120) ± 0.30	200,000	0.20 mm ± 0.1
KMR613NG ULC LFG	1.2 (120) ± 0.30	200,000	0.20 mm ± 0.1
KMR621NG LFS	2.0 (200) ± 0.50	200,000	0.25 mm ± 0.1
KMR621NG ULC LFS	2.0 (200) ± 0.50	200,000	0.25 mm ± 0.1
KMR623NG LFG	2.0 (200) ± 0.50	200,000	0.25 mm ± 0.1
KMR623NG ULC LFG	2.0 (200) ± 0.50	200,000	0.25 mm ± 0.1
KMR631NG LFS	3.0 (300) ± 0.75	150,000	0.25 mm ± 0.1
KMR631NG ULC LFS	3.0 (300) ± 0.75	150,000	0.25 mm ± 0.1
KMR632NG LFS	3.0 (300) ± 0.75	300,000	0.25 mm ± 0.1
KMR632NG ULC LFS	3.0 (300) ± 0.75	300,000	0.25 mm ± 0.1
KMR633NG LFG	3.0 (300) ± 0.75	150,000	0.25 mm ± 0.1
KMR633NG ULC LFG	3.0 (300) ± 0.75	150,000	0.25 mm ± 0.1
KMR641NG LFS	4.0 (400) ± 1.00	100,000	0.30 mm ± 0.1
KMR641NG ULC LFS	4.0 (400) ± 1.00	100,000	0.30 mm ± 0.1
KMR642NG LFS	4.0 (400) ± 1.00	200,000	0.30 mm ± 0.1
KMR642NG ULC LFS	4.0 (400) ± 1.00	200,000	0.30 mm ± 0.1
KMR643NG LFG	4.0 (400) ± 1.00	100,000	0.30 mm ± 0.1
KMR643NG ULC LFG	4.0 (400) ± 1.00	100,000	0.30 mm ± 0.1

Electrical

	Silver	Gold
MAXIMUM POWER:	1 VA	0.2 VA
MAXIMUM VOLTAGE:	32 VDC	32 VDC
MINIMUM VOLTAGE:	20 mVDC	20 mVDC
MAXIMUM CURRENT:	50 mA	10 mA
MINIMUM CURRENT:	1 mA*	1 mA*
DIELECTRIC STRENGTH:	≥ 250 Vrms	
CONTACT RESISTANCE:	≤ 100 mΩ	
INSULATION RESISTANCE:	≥ 1GΩ	
BOUNCE TIME:	≤ 3 ms	

*For ULC version minimum current is 1µA at 1.8 VDC

Environmental

	Silver	Gold
OPERATING TEMPERATURE:	-40˚C to 85˚C	-40˚C to 125˚C
STORAGE TEMPERATURE:	-55˚C to 85˚C	-55˚C to 125˚C

Process

Infrared Reflow Soldering in accordance with IEC61760-1

Packaging

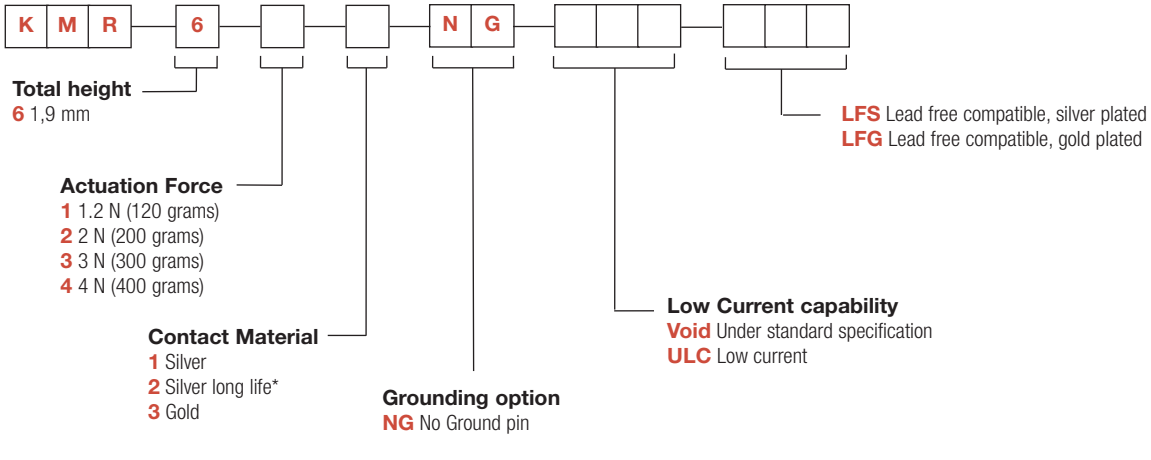
In reels of 7,000 pieces
External diameter 330 mm ± 2 mm

NOTE: Specifications listed above are for switches with standard options.
For information on specific and custom switches, consult Customer Service Center.

TACTILE FEELING: KMR 6 series with actuation force in 2N - 3N - 4N: ≥ 30%
KMR 6 series with actuation force in 1.2N: ≥ 20%

Part Number Description

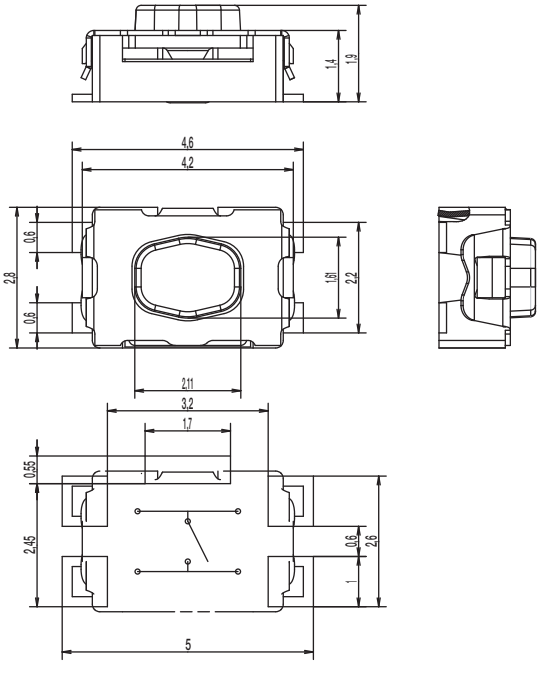
For any part number different from those listed above, please consult your local representative.



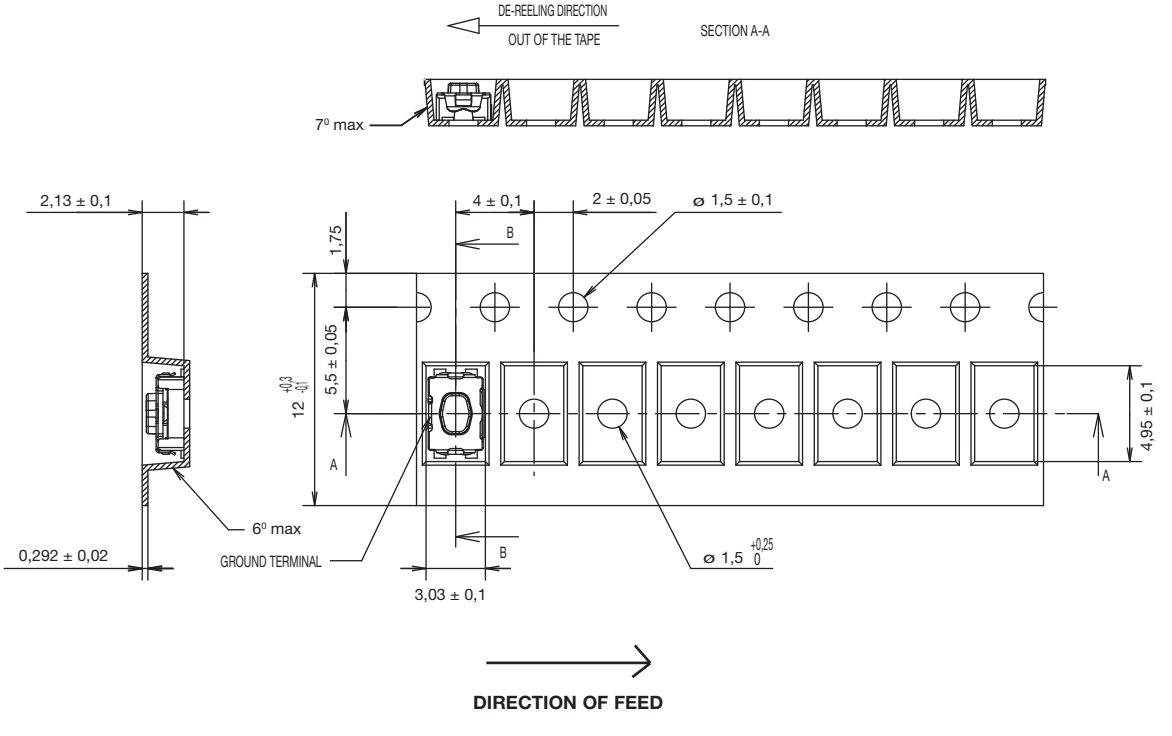
* Silver long life is available in 3N and 4N actuation force. For other versions, please contact Customer Service.

KMR 6 Series - 1.9 mm height

PCB layout shown with ground pin option



TAPE & REEL



Features/Benefits

- *Watertight IP67*
- *Standard and long life versions*
- *No ground pin*
- *Ultra low current capabilities*
- *Excellent tactile feel*

Typical Applications

- *Automotive*
- *Medical*
- *Consumer*
- *Industrial*

Specification

FUNCTION: momentary action
CONTACT ARRANGEMENT: 1 make contact = SPST, N.O.
TERMINALS: Gullwing type for SMT

Mechanical

Type NG See description below	Operating force N (grs)	Operating life (cycles)	Travel (mm)
KMR711NG LFS	1.2 (120) ± 0.30	100,000	0.20 mm ± 0.1
KMR711NG ULC LFS	1.2 (120) ± 0.30	100,000	0.20 mm ± 0.1
KMR713NG LFG	1.2 (120) ± 0.30	100,000	0.20 mm ± 0.1
KMR713NG ULC LFG	1.2 (120) ± 0.30	100,000	0.20 mm ± 0.1
KMR721NG LFS	2.0 (200) ± 0.50	100,000	0.25 mm ± 0.1
KMR721NG ULC LFS	2.0 (200) ± 0.50	100,000	0.25 mm ± 0.1
KMR723NG LFG	2.0 (200) ± 0.50	100,000	0.25 mm ± 0.1
KMR723NG ULC LFG	2.0 (200) ± 0.50	100,000	0.25 mm ± 0.1
KMR731NG LFS	3.0 (300) ± 0.75	100,000	0.25 mm ± 0.1
KMR731NG ULC LFS	3.0 (300) ± 0.75	100,000	0.25 mm ± 0.1
KMR732NG LFS	3.0 (300) ± 0.75	300,000	0.25 mm ± 0.1
KMR732NG ULC LFS	3.0 (300) ± 0.75	300,000	0.25 mm ± 0.1
KMR733NG LFG	3.0 (300) ± 0.75	100,000	0.25 mm ± 0.1
KMR733NG ULC LFG	3.0 (300) ± 0.75	100,000	0.25 mm ± 0.1
KMR741NG LFS	4.0 (400) ± 1.00	100,000	0.30 mm ± 0.1
KMR741NG ULC LFS	4.0 (400) ± 1.00	100,000	0.30 mm ± 0.1
KMR742NG LFS	4.0 (400) ± 1.00	200,000	0.30 mm ± 0.1
KMR742NG ULC LFS	4.0 (400) ± 1.00	200,000	0.30 mm ± 0.1
KMR743NG LFG	4.0 (400) ± 1.00	100,000	0.30 mm ± 0.1
KMR743NG ULC LFG	4.0 (400) ± 1.00	100,000	0.30 mm ± 0.1

Electrical

	Silver	Gold
MAXIMUM POWER:	1 VA	0.2 VA
MAXIMUM VOLTAGE:	32 VDC	32 VDC
MINIMUM VOLTAGE:	20 mVDC	20 mVDC
MAXIMUM CURRENT:	50 mA	10 mA
MINIMUM CURRENT:	1 mA*	1 mA*
DIELECTRIC STRENGTH:	≥ 250 Vrms	
CONTACT RESISTANCE:	≤ 100 mΩ	
INSULATION RESISTANCE:	≥ 1GΩ	
BOUNCE TIME:	≤ 3 ms	

*For ULC version minimum current is 1µA at 1.8 VDC

Environmental

	Silver	Gold
OPERATING TEMPERATURE:	-40°C to 85°C	-40°C to 125°C
STORAGE TEMPERATURE:	-55°C to 85°C	-55°C to 125°C

Process

Infrared Reflow Soldering in accordance with IEC61760-1

Packaging

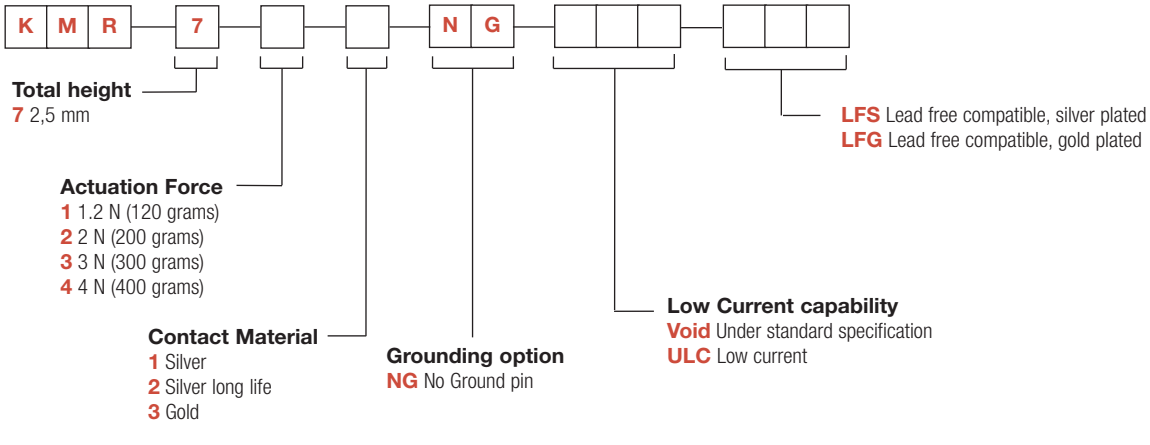
In reels of 6,000 pieces
External diameter 330 mm ± 2 mm

NOTE: Specifications listed above are for switches with standard options.
For information on specific and custom switches, consult Customer Service Center.

TACTILE FEELING: KMR 7 series with actuation force in 2N - 3N - 4N: ≥ 25%
KMR 7 series with actuation force in 1.2N: ≥ 20%

Part Number Description

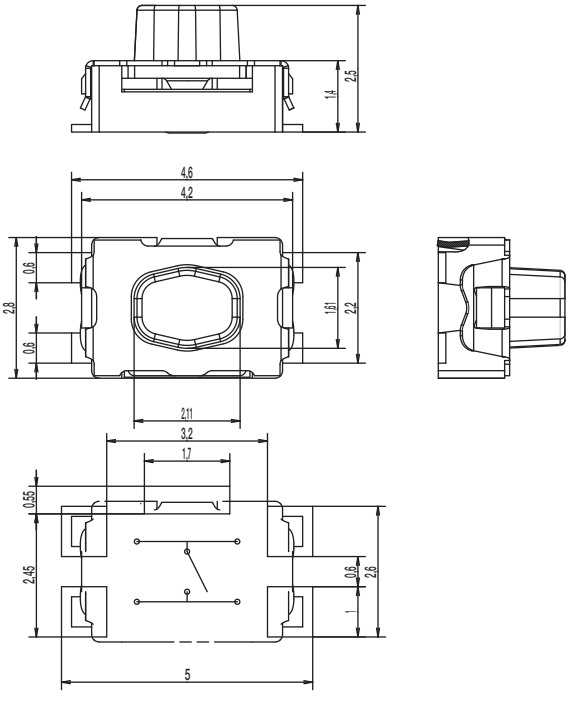
For any part number different from those listed above, please consult your local representative.



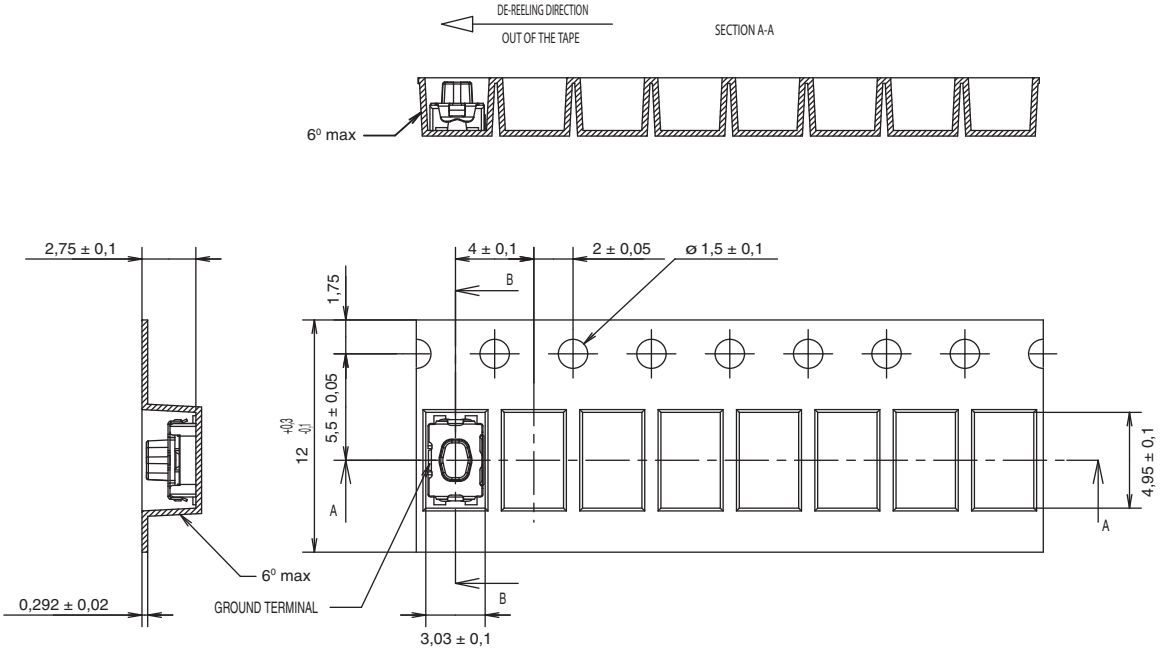
* Silver long life is available in 3N and 4N actuation force. For other versions, please contact Customer Service.

KMR 7 Series - 2.5 mm height

PCB layout shown with ground pin option



TAPE & REEL



Features/Benefits

- *Small footprint*
- *3 actuation forces*
- *Excellent tactile feel*
- *Hard actuator*
- *IP40*

Typical Applications

- *Automotive*
- *Mobile phones*
- *Industrial electronics*
- *Medical equipment*

Specification

FUNCTION: momentary action
CONTACT ARRANGEMENT: 1 make contact = SPST, N.O.
TERMINALS: Gullwing type for SMT

Mechanical

Type G and NG See description below	Operating force N (grs)	Operating life (cycles)	Travel (mm)
KMR811G LFS	1.2 (120) ± 0.30	200,000	0.20 mm ± 0.1
KMR821G LFS	2.0 (200) ± 0.50	200,000	0.25 mm ± 0.1
KMR831G LFS	3.0 (300) ± 0.75	150,000	0.25 mm ± 0.1
KMR831NG ULC LFS	3.0 (300) ± 0.75	150,000	0.25 mm ± 0.1

TACTILE FEELING:

KMR 8 series with actuation force in 2N - 3N - 4N: ≥ 30%
KMR 8 series with actuation force in 1.2N: ≥ 20%

Electrical

Silver

MAXIMUM POWER:	1 VA
MAXIMUM VOLTAGE:	32 VDC
MINIMUM VOLTAGE:	20 mVDC
MAXIMUM CURRENT:	50 mA
MINIMUM CURRENT:	1 mA*
DIELECTRIC STRENGTH:	≥ 250 Vrms
CONTACT RESISTANCE:	≤ 100 mΩ
INSULATION RESISTANCE:	≥ 1GΩ
BOUNCE TIME:	≤ 3 ms

*For ULC version minimum current is 1µA at 1.8 VDC

Environmental

Silver

OPERATING TEMPERATURE:	-40˚C to 85˚C
STORAGE TEMPERATURE:	-55˚C to 85˚C

Process

Infrared Reflow Soldering in accordance with IEC61760-1

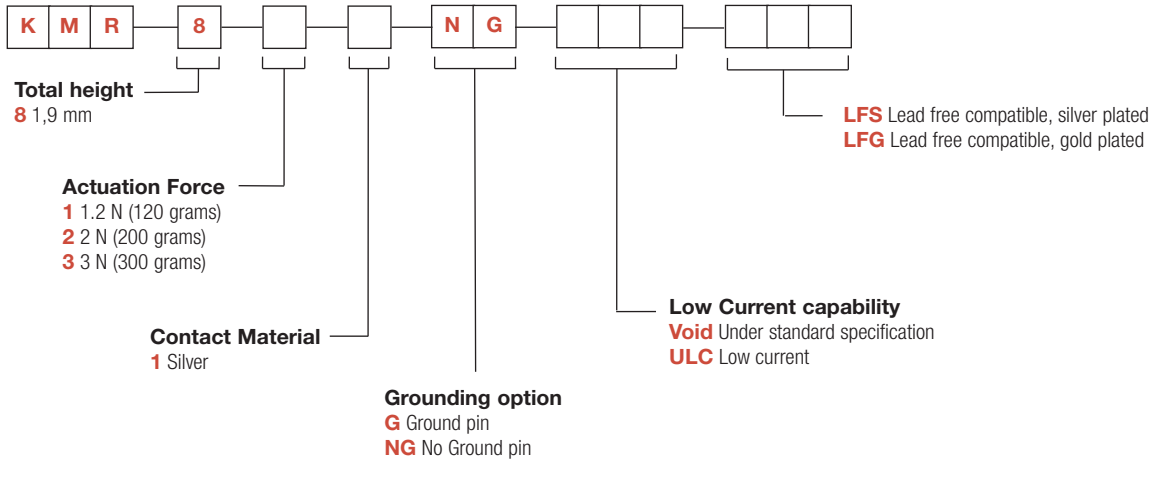
Packaging

In reels of 7,000 pieces
External diameter 330 mm ± 2 mm

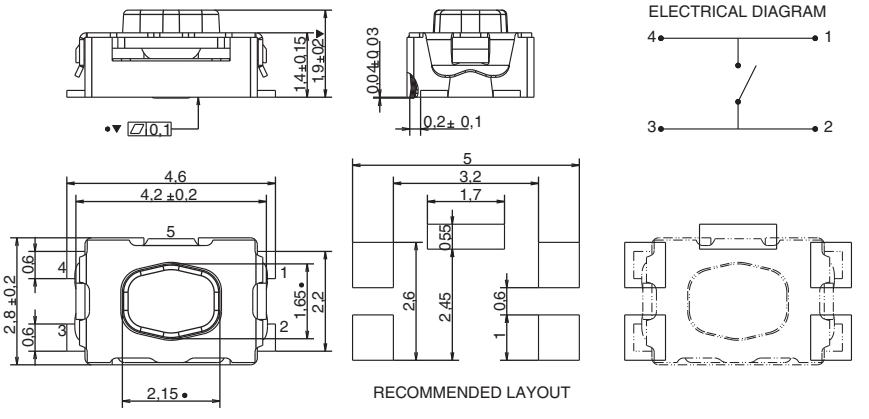
NOTE: Specifications listed above are for switches with standard options.
For information on specific and custom switches, consult Customer Service Center.

Part Number Description

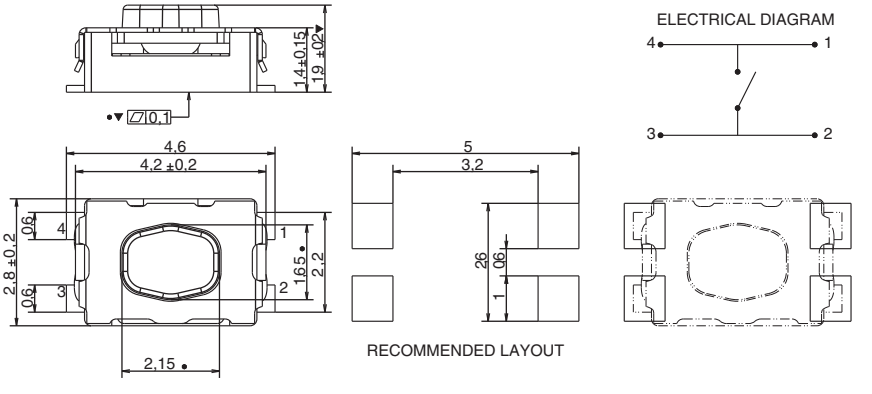
For any part number different from those listed above, please consult your local representative.



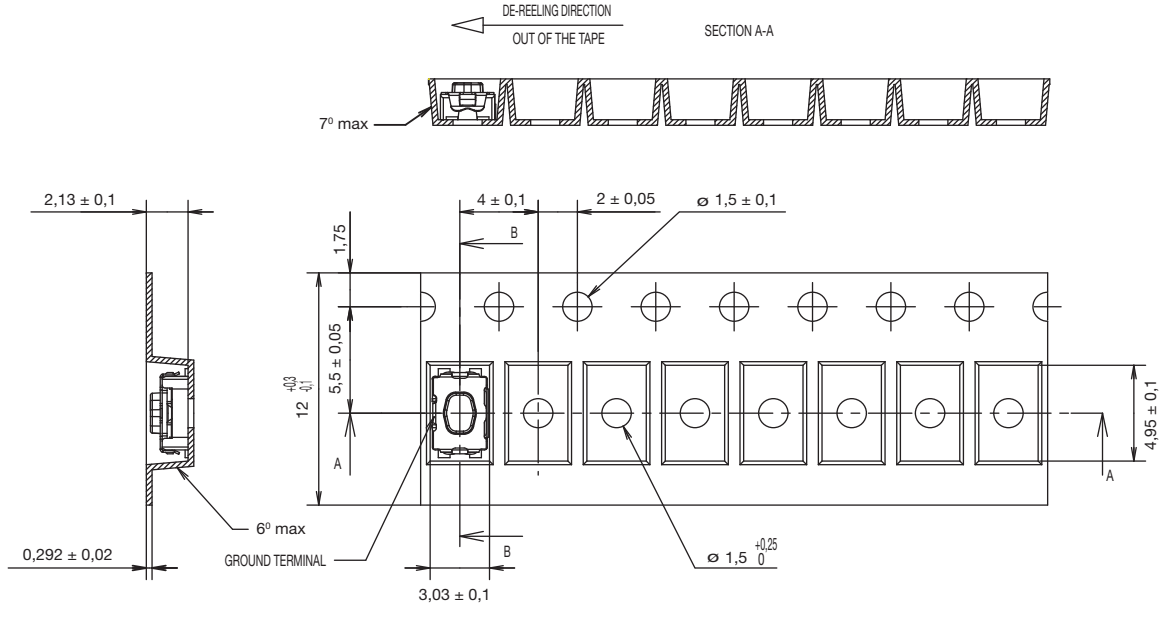
G - Ground Pin



NG - No Ground Pin



TAPE & REEL



Features/Benefits

- **Compact size**
- **Excellent tactile feel**
- **ESD protection**
- **Positioning pegs for stability**
- **RoHS compliant and compatible**

Typical Applications

- **Mobile phones**
- **Medical handheld monitors**
- **Consumer electronics**
- **Telecommunication networks**

Specification

FUNCTION: Momentary
CONTACT ARRANGEMENT: SPST, N.O.
TERMINALS: Gullwing type for SMT
IP40 Sealed

Mechanical

OVERLOAD: 20N
TACTILE FEELING: 15% min. for the 2N version
25% min for the 2.5N version

Type	Operating force Newtons (grams)	Operating life (operations)	Travel
KMS221G/GP	2N (200) ± 0.5	100 K cycles	0,25 ± 0,15
KMS223G/GP	2N (200) ± 0.5	100 K cycles	0,25 ± 0,15
KMS231G/GP	3N (300) ± 0.6	100 K cycles	0,3 ± 0,15
KMS233G/GP	3N (300) ± 0.6	100 K cycles	0,3 ± 0,15

Note: Specifications listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.

Packaging

Tape and reels in reels of 3,000 pieces.
External diameter 330mm ± 2mm.

Electrical

	Silver	Gold
MAXIMUM POWER:	1 VA	0.2 VA
MAXIMUM VOLTAGE:	32 VDC	32 VDC
MAXIMUM CURRENT DC:	50 mA	10 mA
MINIMUM CURRENT DC:	1 mA	1 mA

DIELECTRIC STRENGTH: 250 VDC
CONTACT RESISTANCE: ≤100 mΩ
INSULATION RESISTANCE: 10^9 Ω
BOUNCE TIME: ≤ 3 ms

Environmental

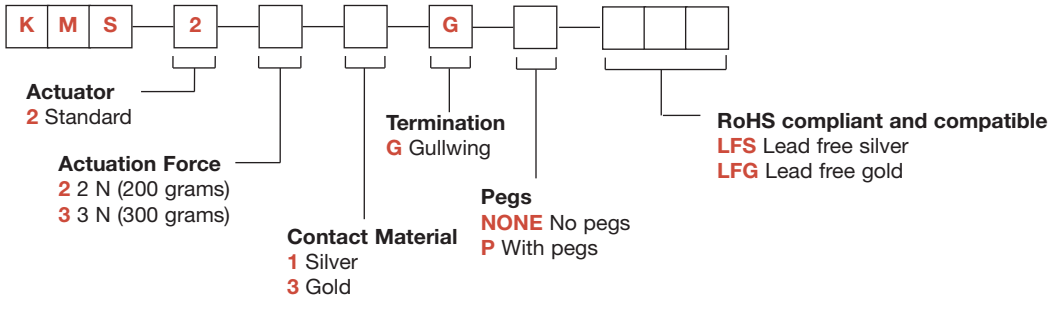
	Silver	Gold
OPERATING TEMPERATURE:	-40˚C to 85˚C	-40˚C to 125˚C
STORAGE TEMPERATURE:	-55˚C to 85˚C	-55˚C to 125˚C

Process

Infared reflow soldering in accordance with IEC 61760-1

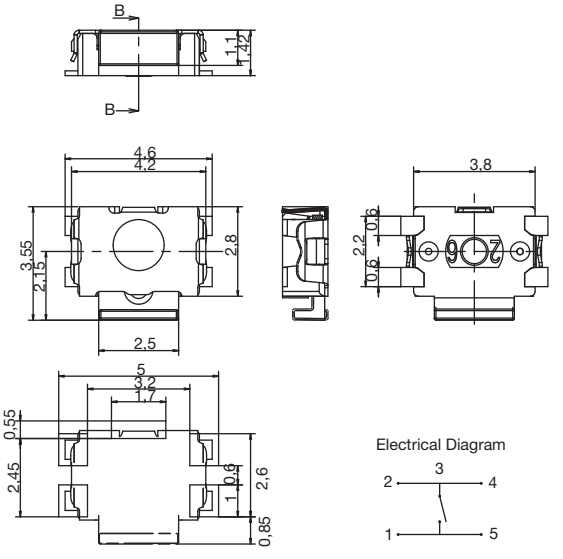
How To Order

Our easy build-a-switch concept allows you to mix and match options to create the switch you need. To order, select desired option from each category and place it in the appropriate box.

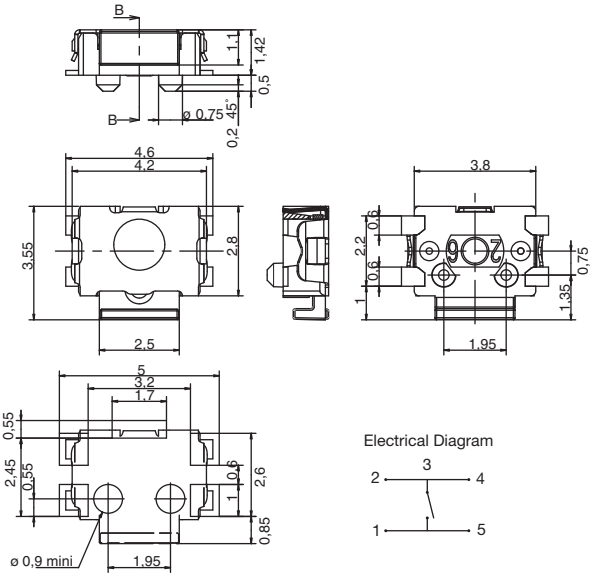


KMS Series
Microminiature SMT Side Actuated

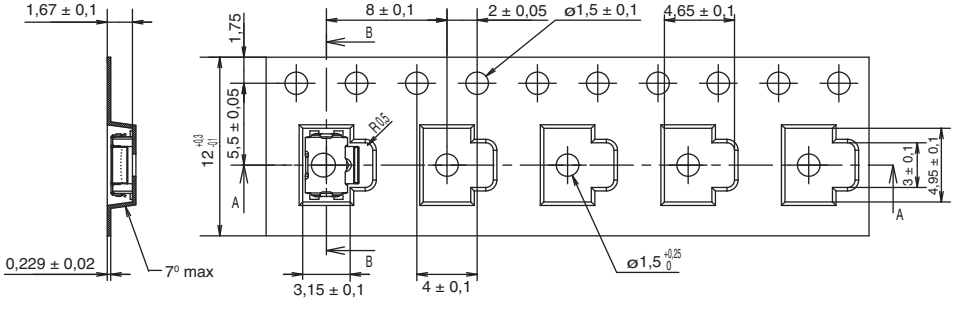
KMS



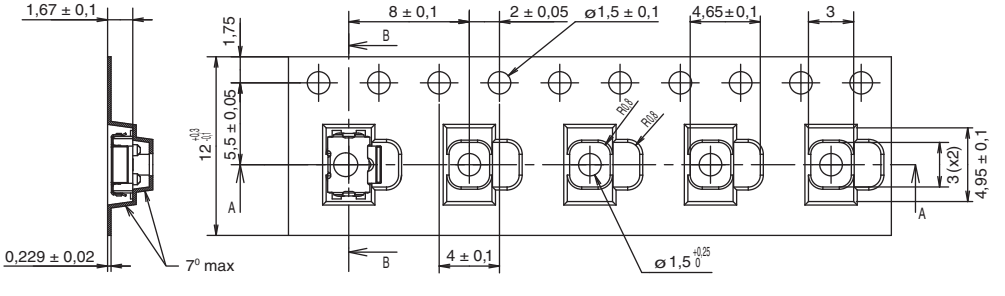
KMS WITH PEGS



TAPE & REEL



WITH PEGS



DIRECTION OF FEED

First Angle Projection

Dimensions are shown: mm
Specifications and dimensions subject to change

PTS 525 Series
Microminiature Tact Switch for SMT

Features/Benefits

- ***0.8 & 1.5 mm actuator height***
- ***Ruggedized package in a compact size***
- ***High number of cycles***

Typical Applications

- ***Consumer products***
- ***Instrumentation***
- ***Remote controls***

Specification

FUNCTION: Momentary action
CONTACT ARRANGEMENT: 1 make contact = SPST, N.O.

Electrical

MAXIMUM VOLTAGE:	15 VDC
MAXIMUM CURRENT DC:	20 mA
DIELECTRIC STRENGTH:	250 VA C (1mn)
CONTACT RESISTANCE:	≤ 100 mΩ
INSULATION RESISTANCE:	≥ 100 MΩ
BOUNCE TIME:	≤ 10 ms

Environmental

OPERATING TEMPERATURE: -20˚C to 70˚C

Process

SOLDERING: This component is suited to the following methods:
Infrared Reflow Soldering in accordance with IEC61760-1

Packaging

Switches in reels of:
5,000 pieces in 0.8 mm height
4,000 pieces in 1.5 mm height
Dimensions of reels according to EIA 481B
External diameter 330 mm

NOTE: Specifications listed above are for switches with standard options.
For information on specific and custom switches, consult Customer Service Center.

How To Order

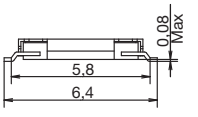
Please see chart below for full part numbers.

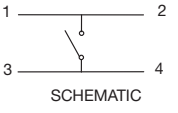
Part Number	Height (mm)	Leads Shape	Ground Pin	Force	Travel (mm)	Operating Life
PTS525 SM08 SMTR 2 LFS	0.8	G	No	160 gf ± 50 gf	0.25 ± 0.2	1,000,000
PTS525 SK08 SMTR 2 LFS	0.8	G	No	260 gf ± 50 gf	0.25 ± 0.2	200,000
PTS525 SM15 SMTR 2 LFS	1.5	G	No	160 gf ± 50 gf	0.25 ± 0.2	1,000,000
PTS525 SK15 SMTR 2 LFS	1.5	G	No	260 gf ± 50 gf	0.25 ± 0.2	500,000
PTS525 SMG15 SMTR 2 LFS	1.5	G	Yes	160 gf ± 50 gf	0.25 ± 0.2	1,000,000
PTS525 SKG15 SMTR 2 LFS	1.5	G	Yes	260 gf ± 50 gf	0.25 ± 0.2	500,000
PTS525 SMG15J SMTR 2 LFS	1.5	J	Yes	160 gf ± 50 gf	0.25 ± 0.2	1,000,000
PTS525 SKG15J SMTR 2 LFS	1.5	J	Yes	260 gf ± 50 gf	0.25 ± 0.2	500,000

First Angle Projection

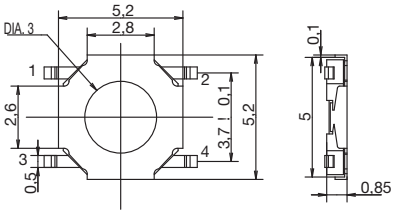
Dimensions are shown: mm
Specifications and dimensions subject to change

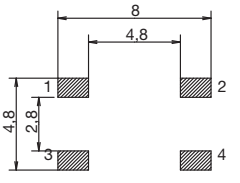
PTS 525 Series
Microminiature Tact Switch for SMT



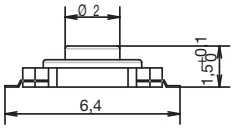


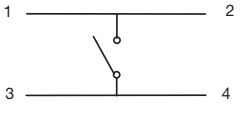
SCHEMATIC





RECOMMENDED PCB LAYOUT





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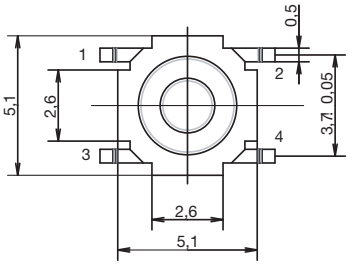
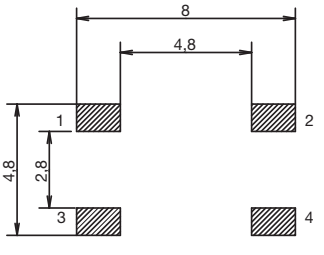
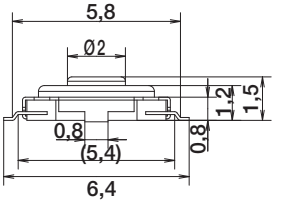
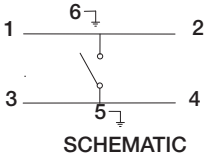




RECOMMENDED PCB LAYOUT





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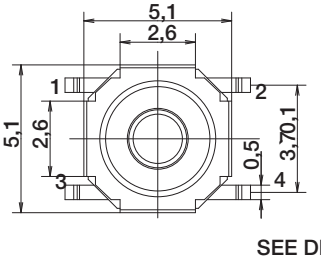
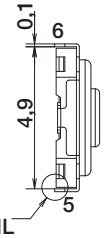
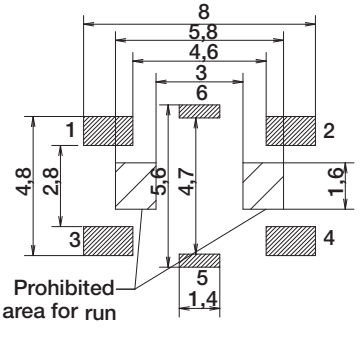




SEE DETAIL B

DETAIL B
SCALE
20



RECOMMENDED PCB LAYOUT