



Product specification

Revision
PS_M

Y16WP1500FP - K12PL GN 1 5N L866

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Date.: 23/08/2018

C&K Part Number	Designation	Drawing reference
Y16WP1500FP	K12PL GN 1 5N L866	CU16WP1500FP

VIEW

FEATURES

MAIN FEATURES



The K12PL GN 1 5N L866 is a high performance key switch with separated electrical and mechanical functions.

- Self cleaning contacts
- Tactile feeling & electrical function separated
- Excellent tactile feedback
- With snap point
- With central Led
- Actuator type: round, button
- Actuator color: Black
- With snap-in pegs
- Terminal plating: Pure Tin
- Compatible with lead free process (wave or hand soldering only)
- Marking: on product and on packaging box

Summary:

- 1 - General
- 2 - Led Characteristics
- 3 - Switch Rating (Switch activated position)
- 4 - Operating temperatures
- 5 - Test conditions
- 6 - Electrical performance (Switch activated position)
- 7 - Mechanical performance
- 8 - Physical data
- 9 - Environment performance
- 10 - Durability
- 11 - Solderability
- 12 - Packaging
- 13 - Material declarations
- 14 - Liabilities

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Revision record:

Revision	Date	Comments	Approved by
PS_M	4/25/2018	ECO-0017730-16	laurent.kubat



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<p>CONFIDENTIAL. This document and the information in it is the exclusive property of C&K and is not to be used or disclosed without the express written permission of C&K.</p>	1/GENERAL	<p>Product Definition This specification applies to a key switch. Description: see Features & Main Features page 1. Dimensions and shapes: according to the product drawing.</p> <p>Function: Normally open Contact type: Single pole single throw Terminals: THT Contact plating: Gold</p> <p>Terminals plating: Lead free tin Illuminated: YES Operating direction: Top actuated Activation type: Momentary action</p>	
	2/LED CHARACTERISTICS	<p>LED reference: L866 Led color: Green Forward Current (If): 20 mA Typical Forward Voltage: 2.2 V Maximum Forward Voltage: 2.5 V</p>	
	3/SWITCH RATING (Switch activated position)	<p>Minimum power: 0.02 VA Maximum power: 3 VA Minimum voltage: 2 V Maximum voltage: 30 V Minimum current: 10 mA Maximum current: 100 mA</p>	
	4/OPERATING TEMPERATURE	<p>Minimum operating temperature: -40 °C Maximum operating temperature: 85 °C Minimum storage temperature: -40 °C Maximum storage temperature: 95 °C</p>	
	5/TEST CONDITIONS	<p>Minimum ambient temperature: 15 °C Maximum ambient temperature: 35 °C Minimum relative humidity: 25 % Maximum relative humidity: 75 % Minimum air pressure: 86 kPa Maximum air pressure: 106 kPa Samples shall be soldered on the PCB according to their normal process.</p>	
	6/ELECTRICAL PERFORMANCE (Switch activated position)	Test Conditions / Information	Criteria
	Contact resistance (max RC)	The switch shall be manually actuated. Open circuit voltage: 20 mV max. Test current: 10 mA max.	0.05 Ohm
	Insulation resistance (min RI)	The insulation resistance shall be measured between contacts. Test voltage: 500 Vd.c. Duration of application: 60 s ± 5	10000 MOhm
	Dielectric strength	The dielectric strength test shall be performed between contacts. The applicable test voltage shall be applied for a minimum duration of 60 s.	500 Vrms

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	Bouncing (max duration)	The switch shall be manually actuated. Open circuit voltage: ~ 5 V. Test current: 10 mA.
		1 ms
Bouncing draw	 	
7/MECHANICAL PERFORMANCE	Test Conditions / Information	Criteria
Curve Operating Force		



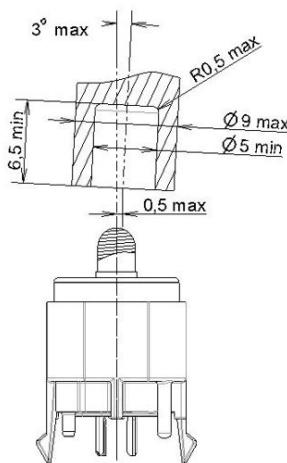
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Activation condition



Remarks: Angular and misalignment tolerances above
are applicable for each axis

Activation force (Fa)

Placing the switch such that the direction of switch operation is vertical and then gradually increasing the force applied to the button, the maximum force required before the activation of the electrical contact shall be measured = Fa

Please refer to the curve operating force.

Maximal force: 7 N
Minimal force: 5 N

Electrical height

Product height at electrical travel

Remarks:

- 1 - Electrical travel = travel distance required for the actuator to establish an electrical contact
- 2 - Switch height: 11 +0.15/-0.05 mm
- 3 - Height with PCB as displacement reference

Maximal value: 10.6 mm
Minimal value: 10.3 mm

End Travel height

Product height at max travel

Remarks:

- 1 - Switch height: 11 +0.15/-0.05 mm
- 2 - Height with PCB as displacement reference

Maximal value: 9.95 mm
Minimal value: 9.75 mm

Return force (Frr)

Same condition as activation force. On depression, the minimum force within the deactivation area of the electrical contact = Return force (Frr)

Minimum force: 0.8 N

Please refer to the curve operating force.

8/PHYSICAL DATA

Information

Dimensions layout

According to the product drawing

CU16WP1500FP

Weight

1 Grams



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9/ENVIRONMENT PERFORMANCE	Test Conditions / Information	Criteria
Overload	Samples shall be submitted to an overload without generating deviation of characteristics in item electrical and mechanical performances. One cycle only	30 N
Dry heat	Samples shall be tested in accordance with NF EN 60068-2-2, test Bb; Recovery time: 1 hour. Temperature: +85°C - Duration: 10 days	Item electrical and mechanical performances shall be satisfied
Cold	Samples shall be tested in accordance with NF EN 60068-2-1, test Ab; Recovery time: 1 hour. Temperature: -40°C - Duration: 10 days	Items electrical and mechanical performances shall be satisfied.
Vibration	Samples shall be tested in accordance with NF EN 60068-2-6. Vibrations shall be performed in the three mutually perpendicular axes of the samples. Duration: 23 min per direction; Sweep frequency: 10 to 500 Hz; Frequencies scanning : 1 octave/mn; Displacement or acceleration: 1.5mm or 10g; Number of cycles in each of the three axis: 2.	Items electrical and mechanical performances shall be satisfied.
Shocks	Samples shall be tested in accordance with NF EN 60068-2-27. Shocks shall be applied in each direction of the three major axis of the samples. Impulse: 1/2 sinusoidal. Acceleration: 500 m/sec. Impact duration : 11 ms. Number of shock in each direction of three axis: 3.	Items electrical and mechanical performances shall be satisfied.
Thermal shocks	Samples shall be tested in accordance with NF EN 60068-2-14, test Nb; Duration of exposure: 30mn per temperature; Changing time: 30sec max; Recovery time: 1 hour. Temperatures: -40°C / +85°C - Number of cycles: 20	Items electrical and mechanical performances shall be satisfied.
Damp heat	Samples shall be tested in accordance with NF EN 60068-2-30, test Cb; Temperature: 55°C+/-2°C; Relative Humidity: 90 to 96 %; Recovery time: 1 hour. Number of cycles: 6	Items electrical and mechanical performances shall be satisfied.
IP code	Samples shall be tested in accordance with NF EN 60529.	IP 40

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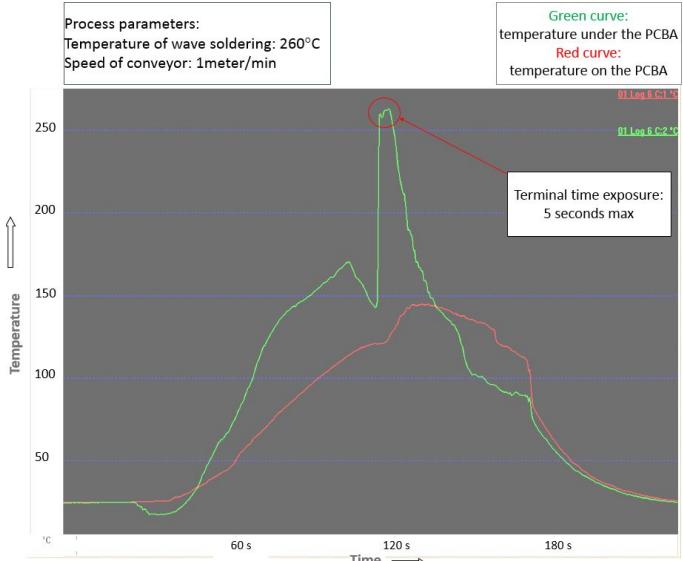


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CONFIDENTIAL. This document and the information in it is the exclusive property of C&K and is not to be used or disclosed without the express written permission of C&K.	Washing process	Not compatible
	Marking	According to the Product drawing.
	Chemical agent	Not compatible
	Shear test (max force)	Switch/PCB: the force shall be applied on the longest side of the switch, parallel to the PCB 50 N
	10/DURABILITY	Test Conditions / Information
	Life test	Operating speed: 60 cycles max per minute. Push force: maximum specified activation force of the switch. Number of cycles: 1000K Items electrical and mechanical performances shall be satisfied except Contact resistance which can reach 2 Ohms.
	11/ SOLDERABILITY	Test Conditions / Information
	Soldering profile	Wave soldering compatible with lead free soldering profile (according to C&K recommendation: following single wave soldering profile)
	Soldering profile draw	
Manual soldering	Hand soldering: 350°C / 3s	Item electrical and mechanical performances shall be satisfied.
MSL level	The Moisture Sensitive Level is defined according to the standard JEDEC J-STD-020.	1

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12/PACKAGING		Information		
Type	Box			
Transport conditions	According to specification NF H00-060.			
13/MATERIAL DECLARATIONS		Information		
Rohs compliance	YES This product is complying with the EU directive 2011/65/EU and with the EU directive 2015/863, without exemption.			
Low Halogen compliance	YES			
Reach compliance	YES Reach compliant, according to the C&K Declaration on Regulation (EC) N° 1907/2006.			
Declarations	Remarks: 1/ Low Halogen compliance, according to the JEDEC/ECA Standard JS709B. 2/ The C&K Reach declaration refers to the current Reach Candidate List of Substances of Very High Concern published by the European Chemicals Agency.			
14/LIABILITIES		Information		
Application limits	For applications requiring hight reliability and safety, or for which failure or malfunction of the product may directly threaten life or personal asset, please contact us. These applications are (not limited to): - Aircraft and aerospace - Anti disaster and anti crime equipment - Medical equipment - Transportation equipment (automotive, train, boat, etc.) - High public information processing devices Any other device similar to the above.			
Change	Please contact your local C&K representative to obtain the latest version before usage.			
Specification validity	This specification is a constituent document of contract for business concluded between your company and C&K Components. Any other information such as catalogue pages, brochures, leaflet, web pages does not constitute contracting information.			
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Recommendation prohibition

In order to obtain the best results and benefits from the product, and avoiding any accident or malfunction, we recommend reading and applying the following rules:
- Make sure the product is placed as parallel to the PCB as possible. In case the position needs to be corrected manually, do not push on the dome or actuator. Please use the body of the switch to do so.
- Safeguard the switch against flux penetration from the top side.
- This product is not compatible with washing process after reflow soldering.
- If heat is applied repeatedly, the tactile feeling may be affected. Do stay within the recommended limits and conditions.
- If soldering conditions allowed manual soldering, you need to respect the following precautions in order to avoid any unexpected malfunction of the switch:
- Maximum temperature: 350 degree C.
- Maximum time: 3 seconds, one time, for all terminals.
- Do not apply excessive force to the terminals of the switch while it is heated up by the soldering.
- Do not operate the switch whilst it is heated up.
- Do not put any object on the actuator of the protective film during soldering.
When the switch is mounted on an FPC board, it is necessary to strengthen the FPC board with a rigidizer on its reverse side to give mechanical support to the switch during operation and avoid any undulations of the PFC that may bring extra stress to the switch.
For thin switch, do not overstress the product when placed on the PCB.
Do not give too much bending radius to the PCB after soldering, this may damage the body or the terminals.
When handing the product after soldering, please do not overload the switch in the case the PCBs are stacked or packaged.
Be careful not to pollute or damage switch terminals during handing of PCB (piling up the PCBs).
Avoid side stress and shocks to the actuator during handing. This may result in switch malfunction or actuator being taken of its working position.
Avoid pressing the top sealing film or actuator with sharp object. Use of ultrasonic wave welding is not recommended. If you have chosen to use this technology, depending on vibration direction, frequency, and switch mounting conditions, ultrasonic wave welding may cause resonance phenomenon that can affect the switch integrity. It can deteriorate the switch performances, and lead to contact failure such as decrease of contact pressure or abnormal abrasion. Make sure that your testing confirms that ultrasonic wave welding does not affect the switch. If the product is not used immediately, please follow handling recommendations: store it as delivered (sealed bag and desiccant) without direct sunshine or corrosive gas at normal room temperature. However, it is recommended to use it as soon as possible.

Designing your system by C&K

Please follow the PCB layout recommended in the product drawing. Do not apply excessive amount of solder paste or enlarge the soldering pads too much as solder flux may penetrate inside the switch causing malfunction. Do follow the 'restriction in operation' part on the product drawing. This is related to actuator shape, maximum angle for actuation and off centring of actuation axis. These parameters are important to get obtain the best performance out of the switch specifications. Outside of the recommended values, tactility, travel, force and life time can be greatly affected up to non functioning. If a hinge motion must be designed to activate the switch, make sure the actuation point is not sliding or giving too much side actuation. Do not apply excessive load to the switch. It is always preferable to have the mechanical stop being integrated in the system actuator/button. The switch is designed to work under resistive load. For any other usage (inductive or capacitive) we strongly recommend you to test your configuration beforehand. The circuit shall be designed to avoid current and voltage surge. Power rating is the maximum value at which the switch can be continuously used at ambient temperature. Above this value, the switch can be damaged or cause fire. Bounce time at operation is defined in this specification and needs to be taken into account for circuit design (multiple information read, delay time, etc). If a dip solder component needs to be soldered on the back side of the PCB after processing this switch, precautions must be taken to avoid flux contamination by giving sufficient distance between the dip solder pads and the switch.