N - Channel 60V (D-S) MOSFET, ESD Protection

GENERAL DESCRIPTION

The ME2N7002E-Gis the N-Channel logic enhancement mode power field effect transistors are produced using high cell density, DMOS trench technology. This high density process is especially tailored to minimize on-state resistance. These devices are particularly suited for low voltage application such as cellular phone and notebook computer power management and other battery powered circuits , and low in-line power loss are needed in a very small outline surface mount package.

FEATURES

- $R_{DS(ON)} \leqq 4\Omega @ V_{GS}=10V$
- $R_{DS(ON)} \leqq 4\Omega @ V_{GS}=4.5V$
- Super high density cell design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- Capable doing Cu wire bonding
- ESD Rating = 1000V HBM
- MSL1

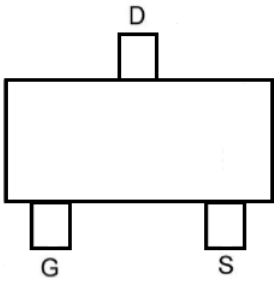
APPLICATIONS

- Power Management in Note book
- Portable Equipment
- Battery Powered System
- Load Switch

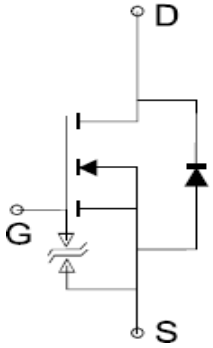
PIN CONFIGURATION

(SOT-23)

Top View



Ordering Information: ME2N7002E-G (Green product-Halogen free)



N-Channel MOSFET

Absolute Maximum Ratings (T_A=25℃ Unless Otherwise Noted)

Parameter		Symbol	Maximum Ratings	Unit
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain	T_A=25℃	I_D	0.24	A
	T_A=70℃	I_D	0.19	
Pulsed Drain Current		I_{DM}	0.9	A
Maximum Power Dissipation	T_A=25℃	P_D	0.36	W
	T_A=70℃	P_D	0.23	
Junction and Storage Temperature Range		T_J, T_{stg}	-55 to 150	℃
Thermal Resistance-Junction to Ambient*		$R_{\theta JA}$	350	℃/W

* The device mounted on 1in^2 FR4 board with 2 oz copper

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Electrical Characteristics (T_J=25℃ Unless Otherwise Specified)

Symbol	Parameter	Limit	Min	Typ	Max	Unit
STATIC						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	60			V
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250μA	1		2	V
I_{GSS}	Gate-Body Leakage	V_{DS}=0V, V_{GS}=±20V			±1	μA
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=60V, V_{GS}=0V			1	μA
$R_{DS(ON)}$	Drain-Source On-Resistance*	V_{GS}=10V, I_D=500mA		1.8	4	Ω
		V_{GS}=4.5V, I_D=200mA		2.1	4	
V_{SD}	Diode Forward Voltage *	I_{SD}=200mA, V_{GS}=0V		1	1.3	V
DYNAMIC						
Qg	Total Gate Charge	V_{DS}=25V, V_{GS}=10V, I_D=0.22A		4.7	6	nC
Qgs	Gate-Source Charge			2.3	3.5	
Qgd	Gate-Drain Charge			0.9	1.5	
Rg	Gate Resistance	f=1MHz			700	Ω
Ciss	Input Capacitance	V_{DS}=25V, V_{GS}=0V, f=1MHz		23.2	40	pF
Coss	Output Capacitance			2.6	5	
Crss	Reverse Transfer Capacitance			1.6	3	
$t_{d(on)}$	Turn-On Delay Time	V_{DD}=30V, R_L=103Ω, I_D=0.29A,V_{GS}=10V,R_{GEN}=6Ω		5.4	10	ns
t_r	Turn-On Rise Time			3.6	7	
$t_{d(off)}$	Turn-Off Delay Time			24.3	40	
t_f	Turn-Off Fall Time			14.5	30	

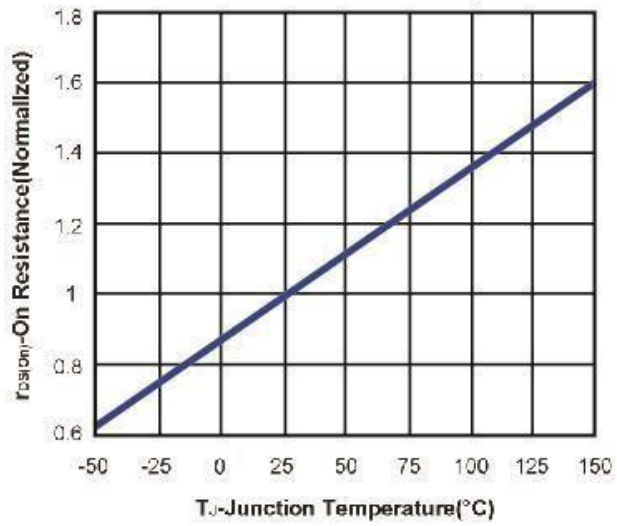
Notes: a, pulse test: pulse width≦ 300us, duty cycle≦ 2%, Guaranteed by design, not subject to production testing.

b. Matsuki Electric reserves the right to improve or change product design, functions, reliability, qualified manufacturer without notice notice.

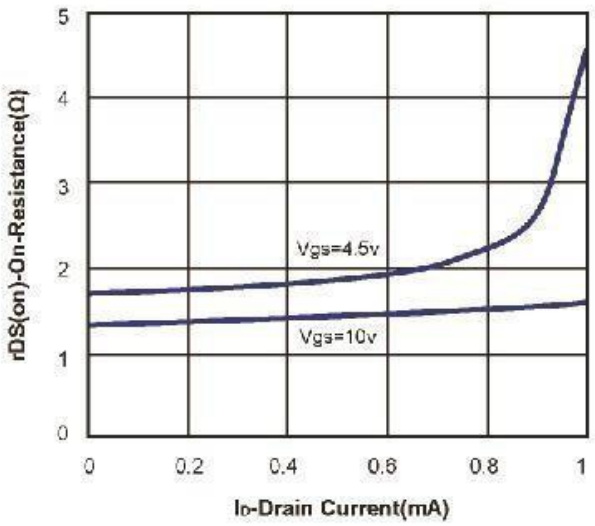
N - Channel 60V (D-S) MOSFET, ESD Protection

Typical Characteristics (T_J =25℃Noted)

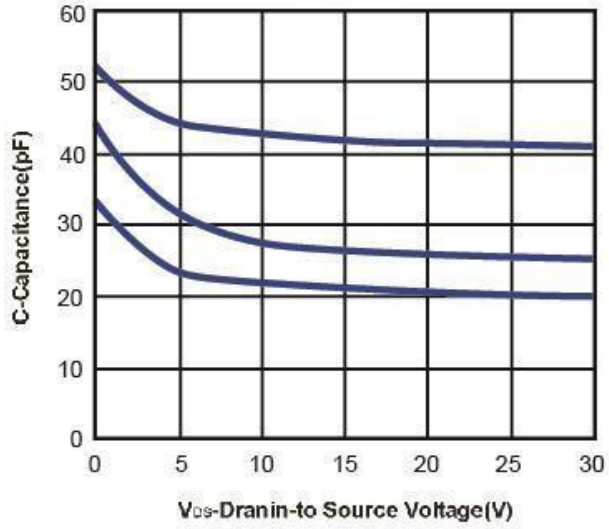
On Resistance vs. Junction Temperature



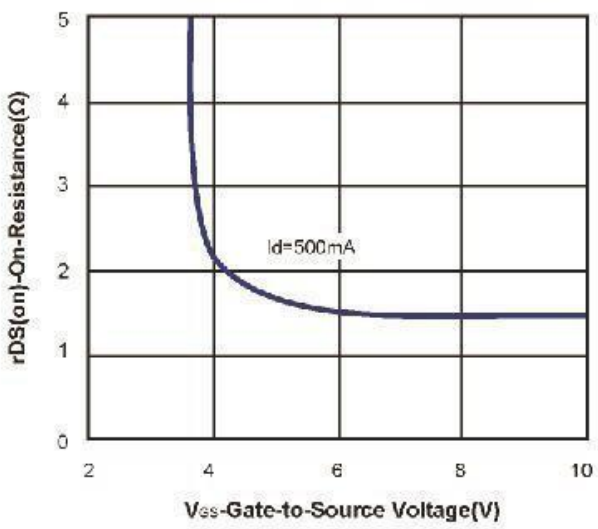
On Resistance vs. Drain Current



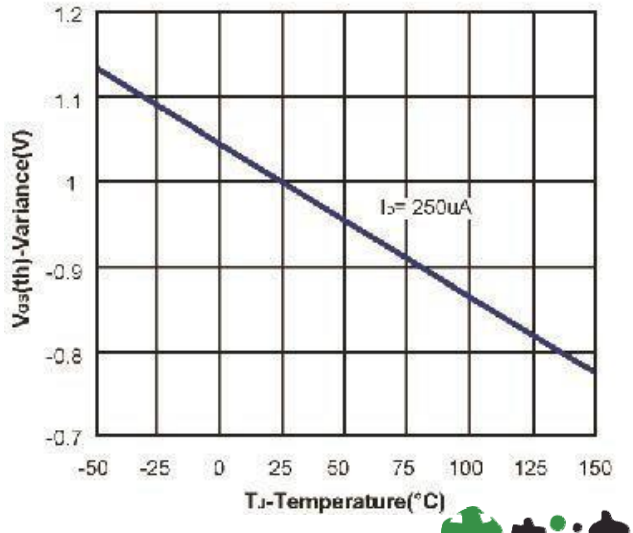
Capacitance



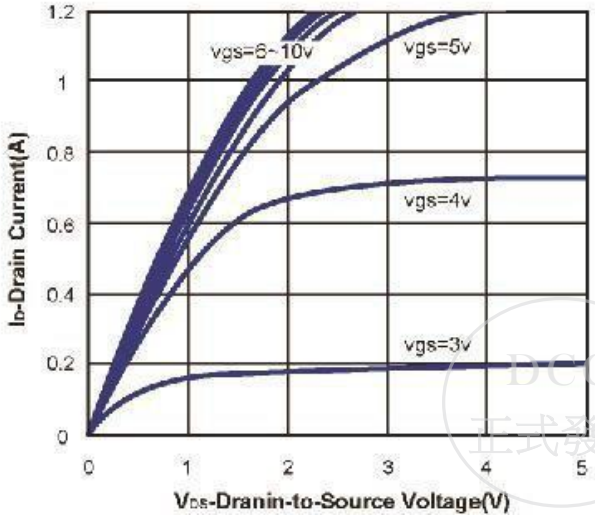
On Resistance vs. Gate-to-Source Voltage



Threshold Voltage



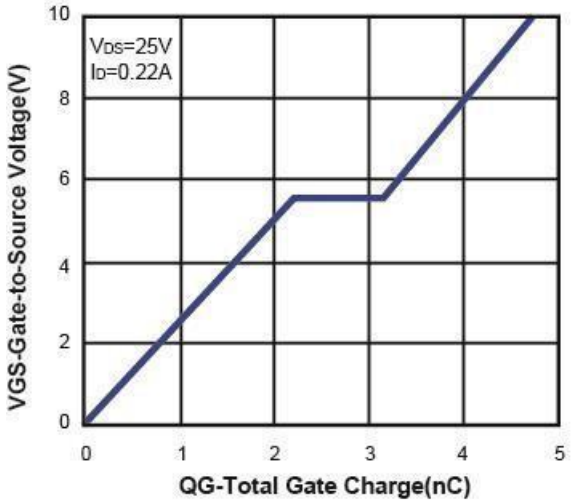
On-Region Characteristics



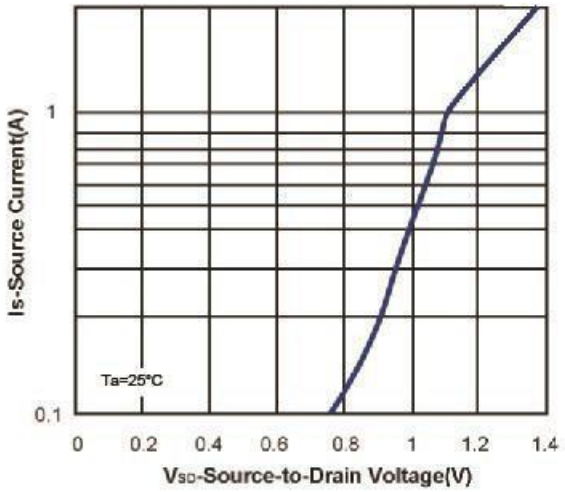
N - Channel 60V (D-S) MOSFET, ESD Protection

Typical Characteristics (T_J =25℃ Noted)

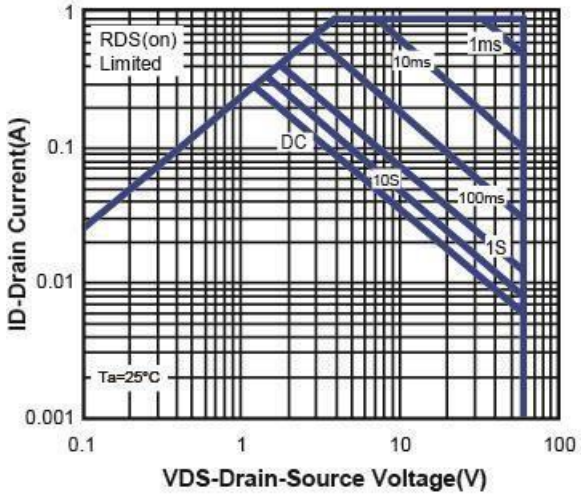
Gate Charge



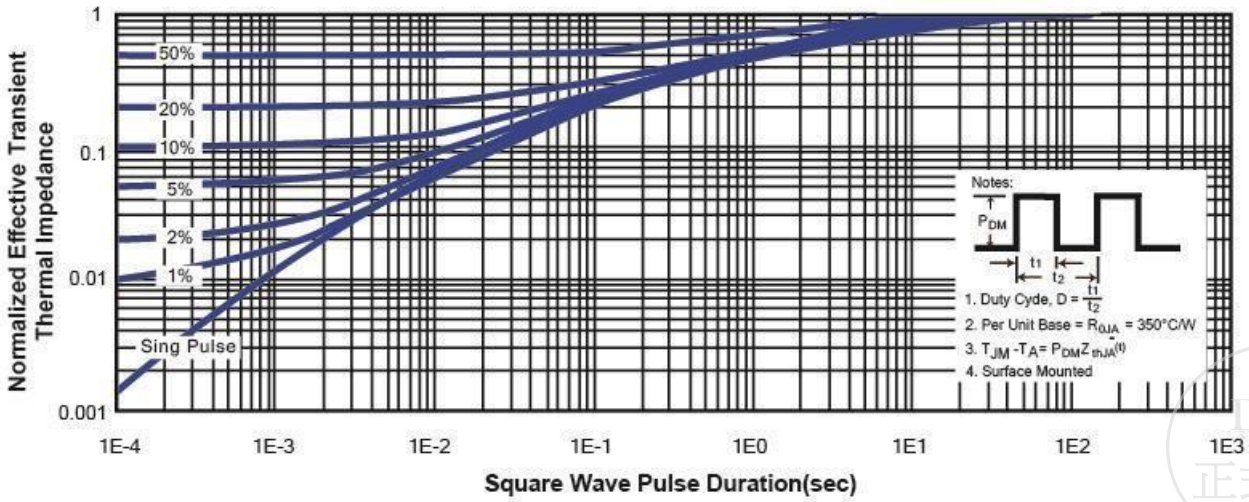
Body-diode characteristics



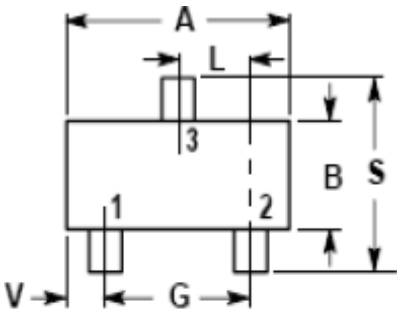
Maximum Forward Biased Safe Operating Area

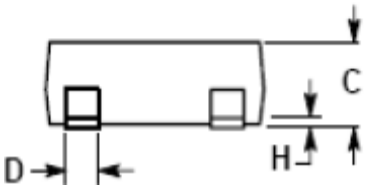


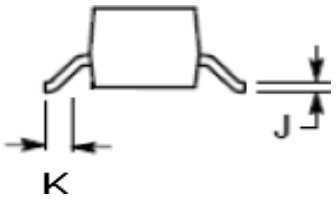
Normalized Thermal Transient Impedance, Junction-to-Ambient



SOT-23 Package Outline



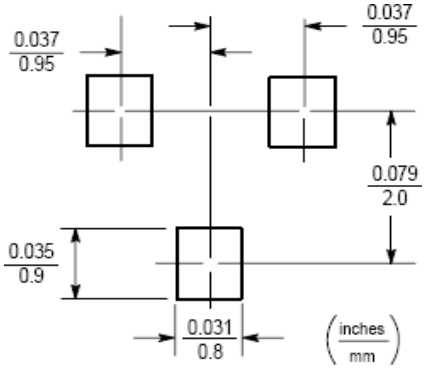




NOTS:
1. DIMENSIONING AND TOLERANCING PERANSI Y14.5M,1982
2. CONTROLLING DIMENSION:INCH

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.1102	0.1197	2.80	3.04
B	0.0472	0.0551	1.20	1.40
C	0.0350	0.0440	0.89	1.11
D	0.0150	0.0200	0.37	0.5
G	0.0701	0.0807	1.78	2.04
H	0.0005	0.0040	0.013	0.100
J	0.0034	0.0070	0.085	0.177
K	0.007	–	0.018	–
L	0.0350	0.0401	0.89	1.02
S	0.0830	0.1039	2.10	2.64
V	0.0177	0.0236	0.45	0.60

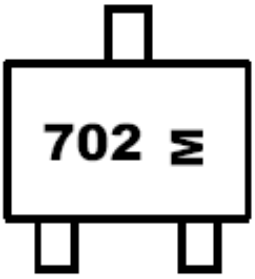
SOLDERING FOOTPRINT



Device name: ME2N7002E-G

Package: SOT-23

Marking Code :



702 : Device number

M : Date code

MONTH CODE

ODD YEARS(2007, 2009)

Jan	1
Feb	2
Mar	3
Apr	4
May	5
Jun	6
Jul	7
Aug	8
Sep	9
Oct	T
Nov	V
Dec	C

EVEN YEARS(2006,2008)

Jan	E
Feb	F
Mar	H
Apr	J
May	K
Jun	L
Jul	N
Aug	P
Sep	U
Oct	X
Nov	Y
Dec	Z

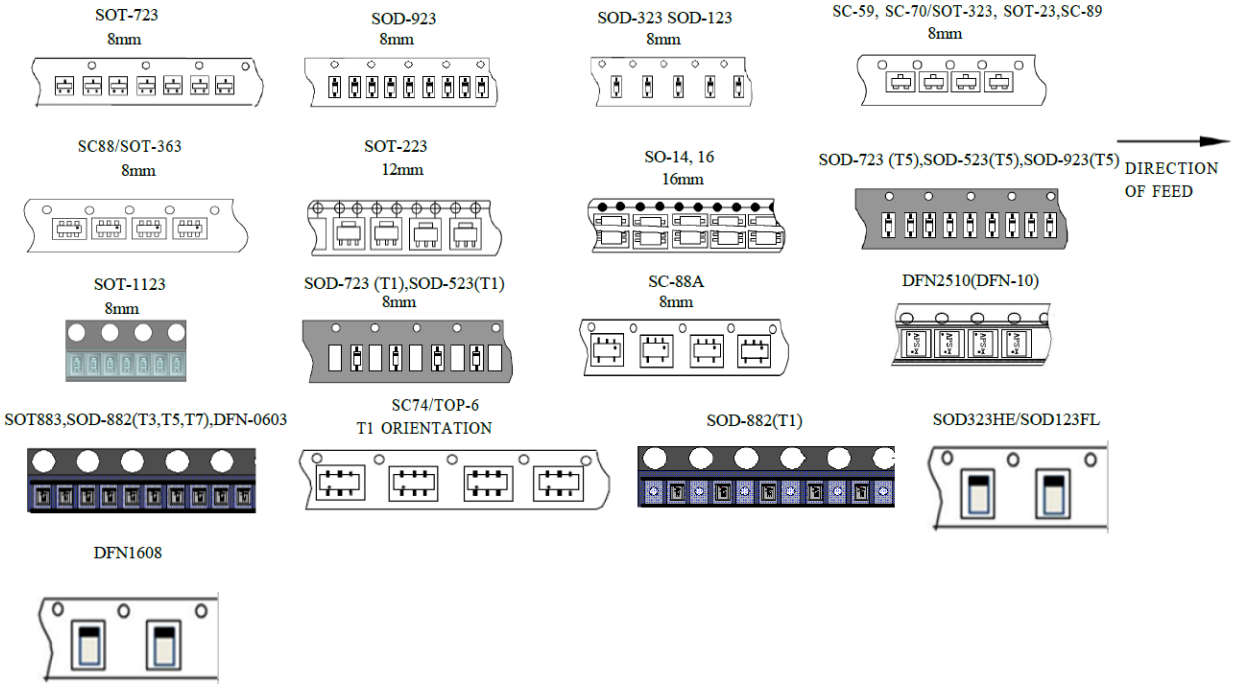
TAPE AND REEL SPECIFICATIONS AND PACKAGING SPECIFICATIONS

Embossed Tape and Reel is used to facilitate automatic pick and place equipment feed requirements. The tape is used as the shipping container for various products and requires a minimum of handling. The antistatic/conductive tape provides a secure cavity for the product when sealed with the “peel - back” cover tape.

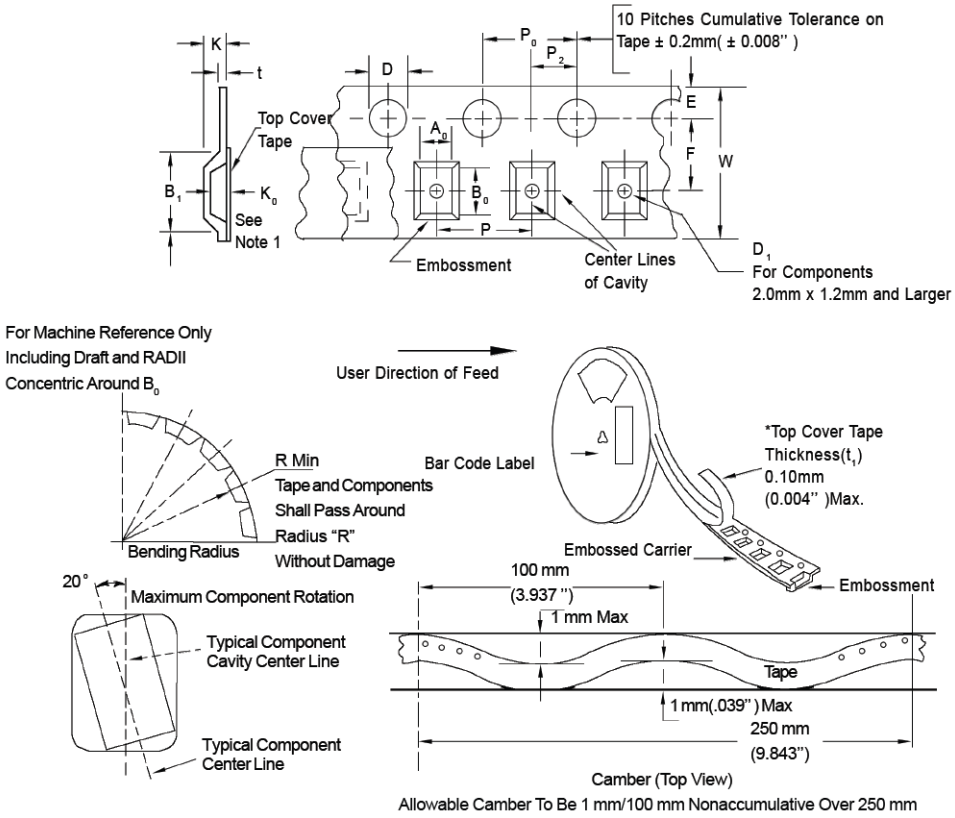
. Two Reel Sizes Available (7” and 13”)
. Used for Automatic Pick and Place Feed Systems
. Minimizes Product Handling
. EIA 481, -1, -2

. SOD - 123, SC - 59, SC - 70 / SOT - 323 , SC -70ML / SOT -363, SOT- 23, TSOP - 6, SOD - 323 SOD - 523 ,SOD-923,SOD-882 SOT- 723, SOT-883,SOD - 723 ,SC-89,SOT-1123,DFN0603 in 8 mm Tape
. SOT - 223 in 12 mm Tape
. SO - 14, SO -16 in 16 mm Tape

Use the standard device title and add the required suffix as listed in the option table on the following page. Note that the individual reels have a finite number of devices depending on the type of product contained in the tape. Also note the minimum lot size is one full reel for each line item, and orders are required to be in increments of the single reel quantity.



EMBOSSED TAPE AND REEL DATA FOR DISCRETES
CARRIER TAPE SPECIFICATIONS



DIMENSIONS

Tape Size	B_1 Max	D	D_1	E	F	K	P_0	P_2	RMin	TMax	WMax
8mm	4.55mm (.179")	1.5+0.1mm -0.0	1.0Min (.039")	1.75±0.1mm (.069±.004)	3.5±0.05mm (.138±.002")	2.4mmMax (.094")	4.0±0.1mm (.157±.004")	2.0±0.1mm (.079±.002")	25mm (.98")	0.6mm (.024")	8.3mm (.327")
12mm	8.2mm (.323")	(.059+.004" -0.0)	1.5mmMin (.060")		5.5±0.05mm (.217±.002")	6.4mmMax (.252")			30mm (1.18")		12±.30mm (.470±.012")
16mm	12.1mm (.476")				7.5±0.10mm (.295±.004")	7.9mmMax (.311")					16.3mm (.642")
24mm	20.1mm (.791")				11.5±0.1mm (.453±.004")	11.9mmMax (.468")					24.3mm (.957")

Metric dimensions govern - English are in parentheses for reference only.

NOTE 1: A_0, B_0, and K_0 are determined by component size. The clearance between the components and the cavity must be within .05 mm min. to.50 mm max.,

NOTE 2: the component cannot rotate more than 10 ° within the determined cavity.

NOTE 3: If B_1 exceeds 4.2 mm (.165") for 8 mm embossed tape, the tape may not feed through all tape feeders.

NOTE 4: Measure for 50+/-10 empty pockets at the tape leader using the ruler provided on the machine.

NOTE 5: At the end of counter units the handler will seal 110+/-10 empty pockets.