Small Signal MOSFET
115 mAmps, 60 Volts
N–Channel SOT–23

L2N7002LT1G

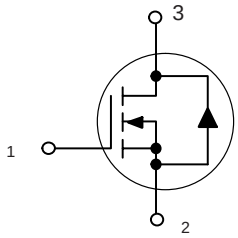
- Pb−Free Package is Available.



CASE 318, STYLE 21
SOT– 23 (TO–236AB)

115 mAMPS
60 VOLTS
$R_{DS(on)}$ = 7.5 Ω

N - Channel



MAXIMUM RATINGS

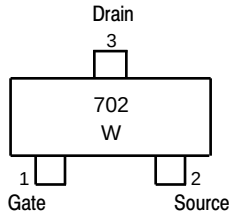
Rating	Symbol	Value	Unit
Drain–Source Voltage	V_{DSS}	60	Vdc
Drain–Gate Voltage (R_{GS} = 1.0 MΩ)	V_{DGR}	60	Vdc
Drain Current – Continuous T_C = 25°C (Note 1.) T_C = 100°C (Note 1.) – Pulsed (Note 2.)	I_D I_D I_{DM}	±115 ±75 ±800	mAdc
Gate–Source Voltage – Continuous – Non–repetitive ($t_p \leq 50$ µs)	V_{GS} V_{GSM}	±20 ±40	Vdc Vpk

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Total Device Dissipation FR–5 Board (Note 3.) T_A = 25°C Derate above 25°C	P_D	225 1.8	mW mW/°C
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	556	°C/W
Total Device Dissipation Alumina Substrate,(Note 4.) T_A = 25°C Derate above 25°C	P_D	300 2.4	mW mW/°C
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	417	°C/W
Junction and Storage Temperature	T_J, T_{stg}	–55 to +150	°C

1. The Power Dissipation of the package may result in a lower continuous drain current.
2. Pulse Test: Pulse Width ≤ 300 µs, Duty Cycle ≤ 2.0%.
3. FR–5 = 1.0 x 0.75 x 0.062 in.
4. Alumina = 0.4 x 0.3 x 0.025 in 99.5% alumina.

MARKING DIAGRAM & PIN ASSIGNMENT



702 = Device Code
W = Work Week

ORDERING INFORMATION

Device	Marking	Shipping
L2N7002LT1G	702	3000 Tape & Reel
L2N7002LT3G	702	10000 Tape & Reel

L2N7002LT1G

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Characteristic		Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain–Source Breakdown Voltage (V_{GS} = 0, I_D = 10 µAdc)		$V_{(BR)DSS}$	60	–	–	Vdc
Zero Gate Voltage Drain Current (V_{GS} = 0, V_{DS} = 60 Vdc)	T_J = 25°C T_J = 125°C	I_{DSS}	– –	– –	1.0 500	µAdc
Gate–Body Leakage Current, Forward (V_{GS} = 20 Vdc)		I_{GSSF}	–	–	100	nAdc
Gate–Body Leakage Current, Reverse (V_{GS} = –20 Vdc)		I_{GSSR}	–	–	–100	nAdc
ON CHARACTERISTICS (Note 2.)						
Gate Threshold Voltage (V_{DS} = V_{GS}, I_D = 250 µAdc)		$V_{GS(th)}$	1.0	1.6	2.5	Vdc
On–State Drain Current ($V_{DS} \geq 2.0\ V_{DS(on)}$, V_{GS} = 10 Vdc)		$I_{D(on)}$	500	–	–	mA
Static Drain–Source On–State Voltage (V_{GS} = 10 Vdc, I_D = 500 mAdc) (V_{GS} = 5.0 Vdc, I_D = 50 mAdc)		$V_{DS(on)}$	 – –	 – –	 3.75 0.375	Vdc
Static Drain–Source On–State Resistance (V_{GS} = 10 V, I_D = 500 mAdc) (V_{GS} = 5.0 Vdc, I_D = 50 mAdc) 	T_C = 25°C T_C = 125°C T_C = 25°C T_C = 125°C	$r_{DS(on)}$	 – – – –	 1.4 – 1.8 –	 7.5 13.5 7.5 13.5	Ohms
Forward Transconductance ($V_{DS} \geq 2.0\ V_{DS(on)}$, I_D = 200 mAdc)		g_{FS}	80	–	–	mmhos
DYNAMIC CHARACTERISTICS						
Input Capacitance (V_{DS} = 25 Vdc, V_{GS} = 0, f = 1.0 MHz)		C_{iss}	–	17	50	pF
Output Capacitance (V_{DS} = 25 Vdc, V_{GS} = 0, f = 1.0 MHz)		C_{oss}	–	10	25	pF
Reverse Transfer Capacitance (V_{DS} = 25 Vdc, V_{GS} = 0, f = 1.0 MHz)		C_{rss}	–	2.5	5.0	pF
SWITCHING CHARACTERISTICS (Note 2.)						
Turn–On Delay Time	(V_{DD} = 25 Vdc , $I_D \cong$ 500 mAdc, R_G = 25 Ω, R_L = 50 Ω, V_{gen} = 10 V)	$t_{d(on)}$	–	7	20	ns
Turn–Off Delay Time		$t_{d(off)}$	–	11	40	ns
BODY–DRAIN DIODE RATINGS						
Diode Forward On–Voltage (I_S = 115 mAdc, V_{GS} = 0 V)		V_{SD}	–	–	–1.5	Vdc
Source Current Continuous (Body Diode)		I_S	–	–	–115	mAdc
Source Current Pulsed		I_{SM}	–	–	–800	mAdc

2. Pulse Test: Pulse Width ≤ 300 µs, Duty Cycle ≤ 2.0%.

L2N7002LT1G

TYPICAL ELECTRICAL CHARACTERISTICS

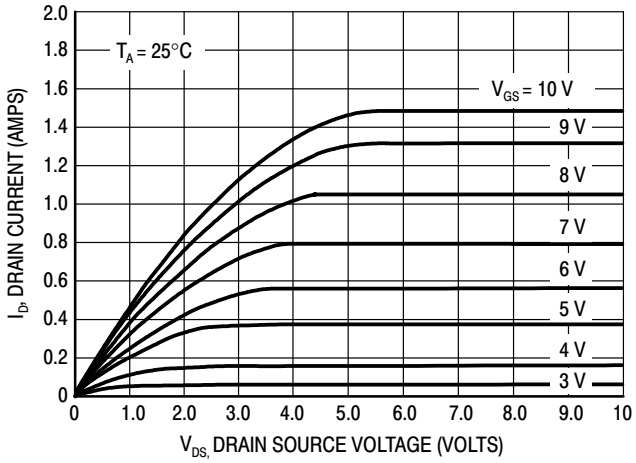


Figure 1. Ohmic Region

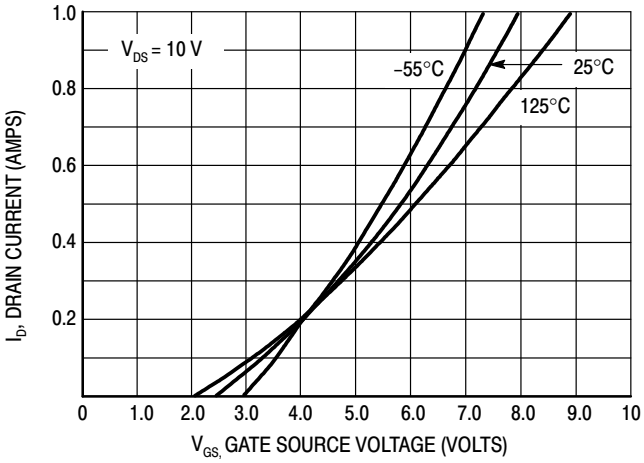


Figure 2. Transfer Characteristics

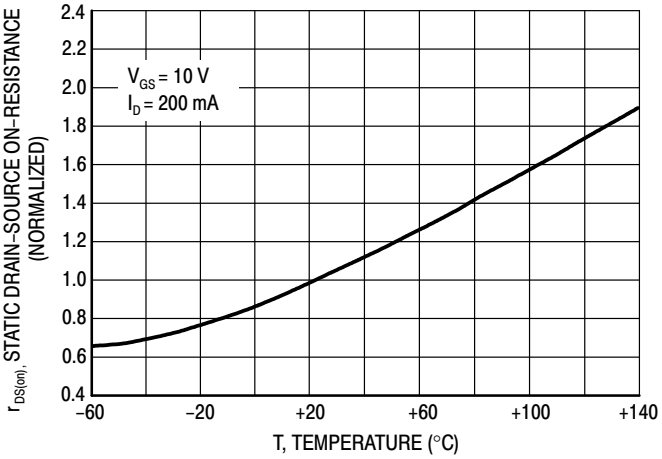


Figure 3. Temperature versus Static Drain–Source On–Resistance

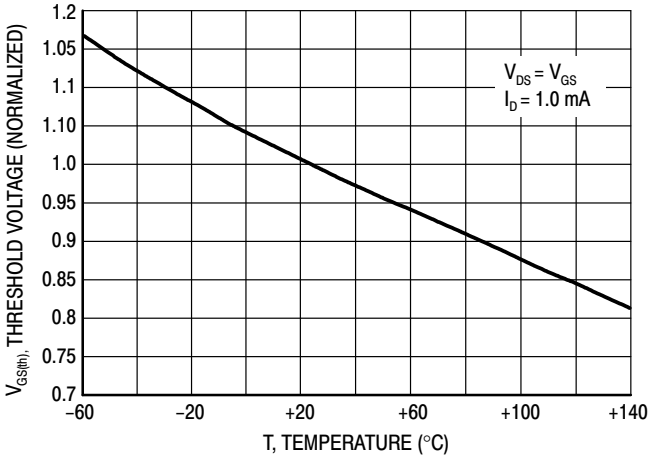
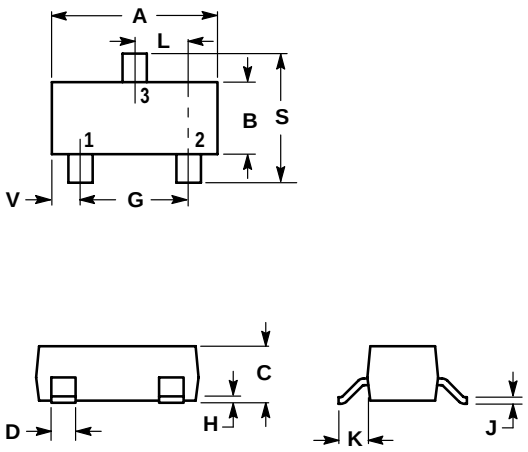


Figure 4. Temperature versus Gate Threshold Voltage

L2N7002LT1G

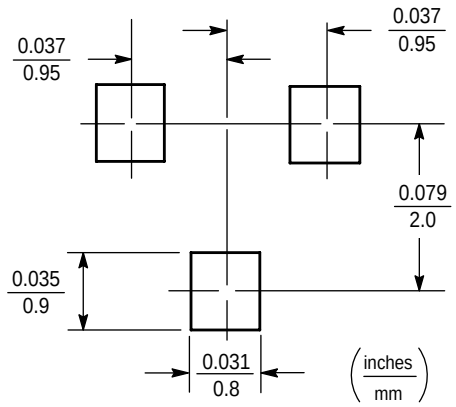
SOT–23



NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI 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	0.50
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	0.0140	0.0285	0.35	0.69
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

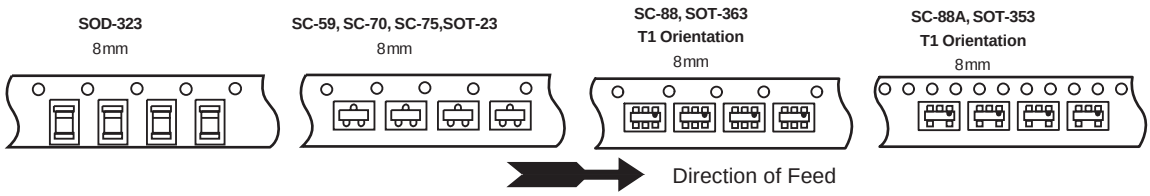


Tape & Reel and Packaging Specifications for Small-Signal Transistors, FETs and Diodes

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
- SOT–23, SC–70/SOT–323, SC–89, SC–88/SOT–363, SC–88A/SOT–353, SOD–323, SOD-523 in 8 mm Tape

Use the standard device title and add the required suffix as listed in the option table below (Table 1). 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.

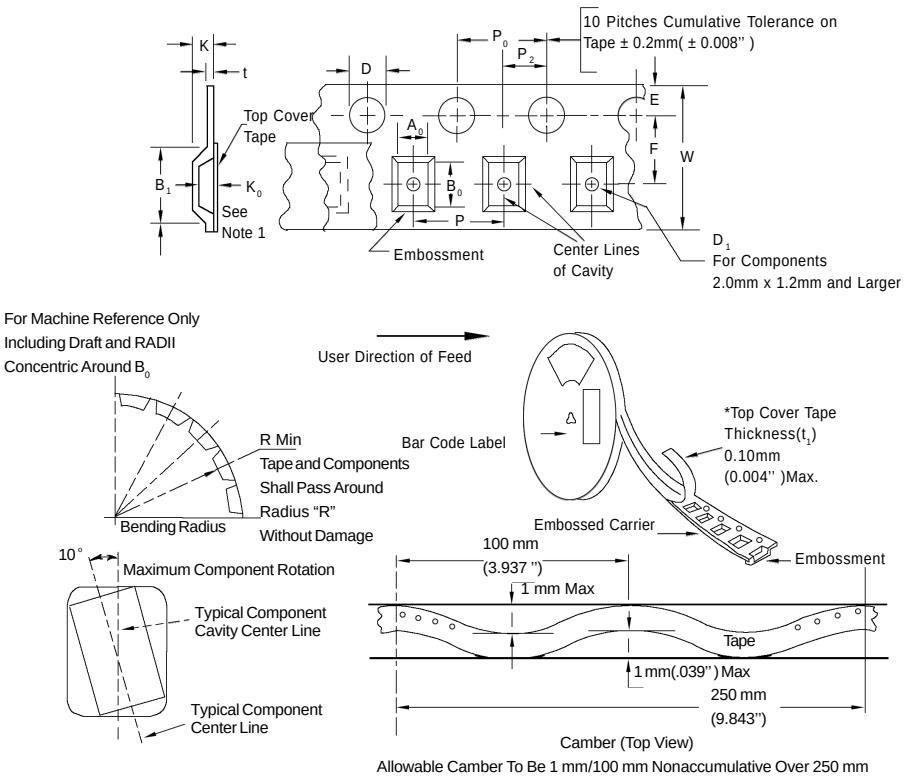


Typical Reel Orientations

Table 1. EMBOSSED TAPE AND REEL ORDERING INFORMATION

Package	Tape Width (mm)	Pitch mm	Reel Size mm(inch)	Devices Per Reel and Minimum Order Quantity	Device Suffix
SOT–23	8	4	178	(7)	3,000 T1
	8		330	(13)	10,000 T3
SC–70/SOT–323	8	4	178	(7)	3,000 T1
	8		330	(13)	10,000 T3
SC–89	8	4	178	(7)	3,000 T1
	8		330	(13)	10,000 T3
SC–88/SOT-363	8	4	178	(7)	3,000 T1
	8		330	(13)	10,000 T3
SC–88A/SOT-353	8	4	178	(7)	3,000 T1
	8		330	(13)	10,000 T3
SOD-323	8	4	178	(7)	3,000 T1
	8		330	(13)	10,000 T3
SOD-523	8	4	178	(7)	3,000 T1
	8		330	(13)	10,000 T3

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'')

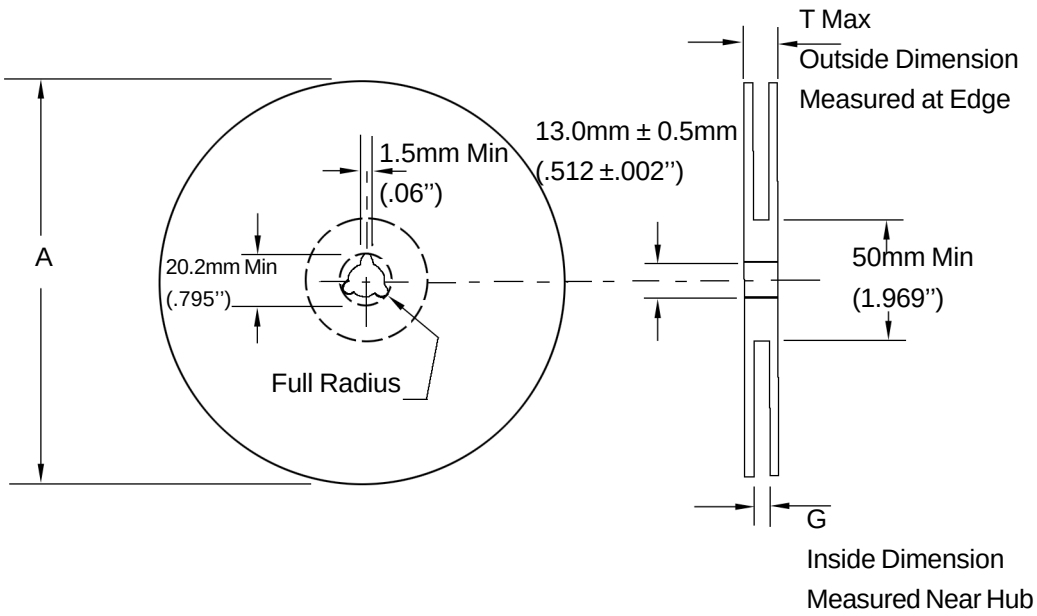
Metric dimensions govern - English are in parentheses for reference only.

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.

EMBOSSED TAPE AND REEL DATA
FOR DISCRETES



Size	A Max	G	T Max
8 mm	330mm (12.992")	8.4mm+1.5mm, -0.0 (.33"+.059", -0.00)	14.4mm (.56")
12mm	330mm (12.992")	12.4mm+2.0mm, -0.0 (.49 "+ .079", -0.00)	18.4mm (.72")
16mm	360mm (14.173")	16.4mm+2.0mm, -0.0 (.646"+.078", -0.00)	22.4mm (.882")
24 mm	360mm (14.173")	24.4mm+2.0mm, -0.0 (.961"+.070", -0.00)	30.4mm (1.197")

Reel Dimensions

Metric Dimensions Govern — English are in parentheses for reference only

Storage Conditions

Temperature: 5 to 40 Deg.C (20 to 30 Deg. C is preferred)
Humidity: 30 to 80 RH (40 to 60 is preferred)
Recommended Period: One year after manufacturing
(This recommended period is for the soldering condition only. The characteristics and reliabilities of the products are not restricted to this limitation)