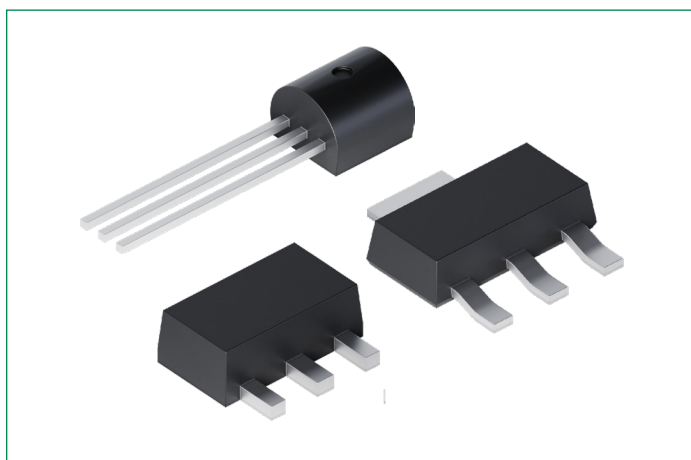


LX8 Series

EV Series 0.8 A Sensitive TRIACs



Description

The LX8 is a solid-state switch series offering direct interface to microprocessor drivers in an economical TO-92 and surface mount packages. The die voltage blocking junctions are glass-passivated to ensure long term reliability and parametric stability.

Features

- RoHS compliant and halogen-free
- Through-hole and surface mount packages
- Static $dv/dt > 10 \text{ V}/\mu\text{s}$
- Blocking voltage (V_{DRM}) capability up to 600 V
- Surge current capability $> 9.5 \text{ A}$

Applications

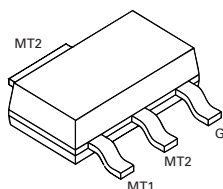
The LX8 EV Series is especially designed for low current applications such as heating controls in hair care products, as well as replacement of mechanical switch contacts where long life is required.

Product Summary

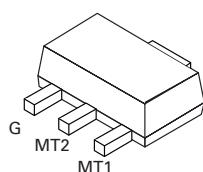
Characteristic	Value	Unit
$I_{\text{T(RMS)}}$	0.8	A
$V_{\text{DRM}}/V_{\text{RRM}}$	400 to 600	V
I_{GT}	3 to 10	mA

Pinout Diagram

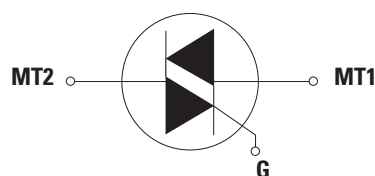
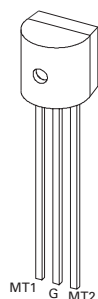
SOT-223



SOT-89



TO-92



MT1: Main Terminal 1; **MT2:** Main Terminal 2; **G:** Gate

Maximum Ratings

Symbol	Characteristics	Conditions			Value	Units
$I_{T(RMS)}$	On-state RMS Current	TO-92	$T_C = 50\text{ }^{\circ}\text{C}$	Full sine wave	0.8	A
		SOT-89	$T_C = 60\text{ }^{\circ}\text{C}$			
		SOT-223	$T_L = 90\text{ }^{\circ}\text{C}$			
I_{TSM}	Non-repetitive Surge Peak On-state Current	$f = 50\text{ Hz}$		T_{vj} initial = $25\text{ }^{\circ}\text{C}$, Single cycle	8	A
		$f = 60\text{ Hz}$			9.5	
I^2t	I^2t Value for Fusing	$t_p = 10\text{ ms}$			0.32	A^2s
		$t_p = 8.3\text{ ms}$			0.37	
$di/dt_{(cr)}$	Critical Rate of Rise of On-state Current	–			20	$\text{A}/\mu\text{s}$
I_{GM}	Peak Gate Current	$t_p = 10\text{ }\mu\text{s}$			1	A
$P_{G(AV)}$	Average Gate Power Dissipation	–			0.1	W
T_{stg}	Storage Temperature Range	–			–40 to 150	$^{\circ}\text{C}$
T_{vj}	Virtual Junction Temperature Range	–			–40 to 110	$^{\circ}\text{C}$

Electrical Characteristics – Static ($T_{vj} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)

Symbol	Characteristics	Conditions	Maximum Value	Units
V_{TM}	Peak On-state Voltage	$I_T = 1.13\text{ A}_{pk}$	1.6	V
I_{DRM}	Off-state Current, Peak Repetitive	$V_D = V_{DRM}$, $T_{vj} = 25\text{ }^{\circ}\text{C}$	5	μA
		$V_D = V_{DRM}$, $T_{vj} = 110\text{ }^{\circ}\text{C}$	100	

Electrical Characteristics – Dynamic ($T_{vj} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)

Symbol	Characteristics	Conditions	Quadrant	Limit	Value			Units
					LX803xy	LX807xy	LX809xy	
I_{GT}	Gate Trigger Current	$V_D = 12\text{ V}$, $R_L = 60\text{ }\Omega$	I – II – III	Max.	3	5	10	mA
			IV	Max.	5	7	10	
V_{GT}	Gate Trigger Voltage	$V_D = 12\text{ V}$, $R_L = 60\text{ }\Omega$	All quadrants	Max.	1.3			V
I_H	Holding Current	Gate Open		Max.	5		10	mA
$dv/dt_{(cr)}$	Critical rate of rise of Off-state Voltage	$T_{vj} = 110\text{ }^{\circ}\text{C}$, $V_D = V_{DRM}$, Exponential Waveform, Gate Open		Min.	10		50	$\text{V}/\mu\text{s}$
$dv/dt_{(com)}$	Critical rate of rise of Commutating Voltage	$(di/dt)_C = 0.43\text{ A/ms}$, $T_{vj} = 110\text{ }^{\circ}\text{C}$		Min.	1.5		2	$\text{V}/\mu\text{s}$
t_{gt}	Gate-controlled Turn-on Time	$I_G = 25\text{ mA}$, $P_W = 15\text{ }\mu\text{s}$, $I_T = 1.2\text{ A}_{pk}$		Max.	2.0		2.0	μs

Note: x = voltage, y = package

Thermal Characteristics

Symbol	Characteristics	Conditions		Value	Units
$R_{th(j-c)}$	Thermal Resistance, Junction to Case (AC)	$I_T = 0.8\text{ A}_{(RMS)}$	TO-92	60	K/W
			SOT-89	50	
			SOT-223	25	
$R_{th(j-a)}$	Thermal Resistance, Junction to Ambient	$I_T = 0.8\text{ A}_{(RMS)}$	TO-92	150	K/W
			SOT-89	90	
			SOT-223	60	

Note 1: 60 Hz AC resistive load condition, 100% conduction

Characteristic Curves

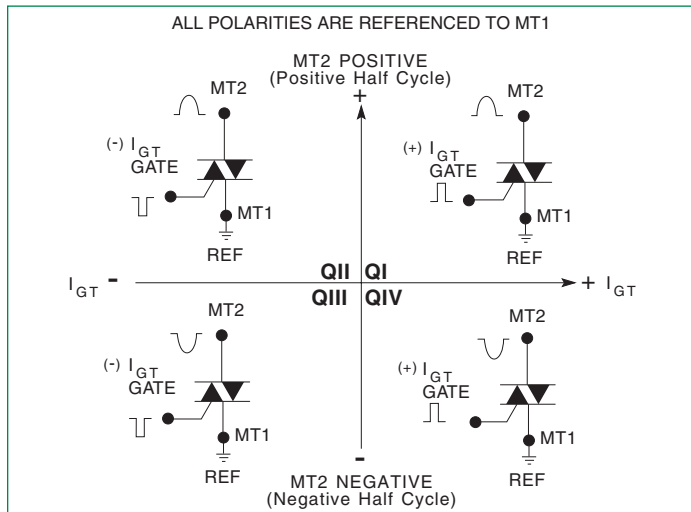


Fig. 2. Normalized DC Gate Trigger Current for all Quadrants vs. Junction Temperature

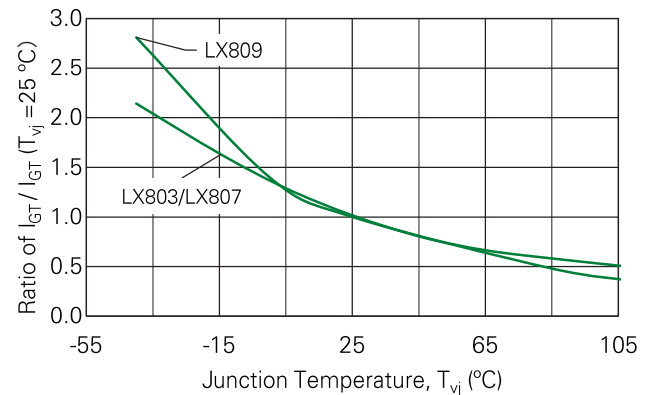


Fig. 3. Normalized DC Holding Current vs. Junction Temperature

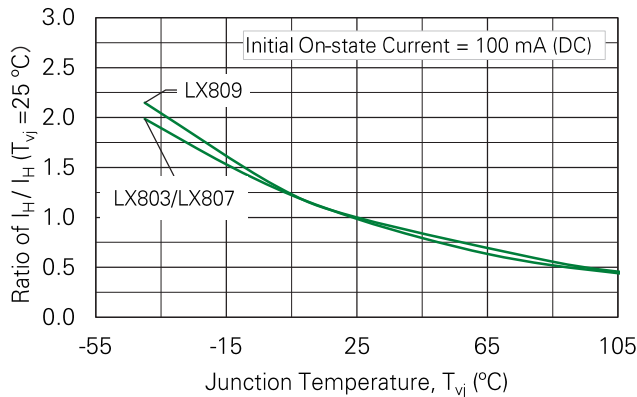


Fig. 4. Normalized DC Gate Trigger Voltage for all Quadrants vs. Junction Temperature

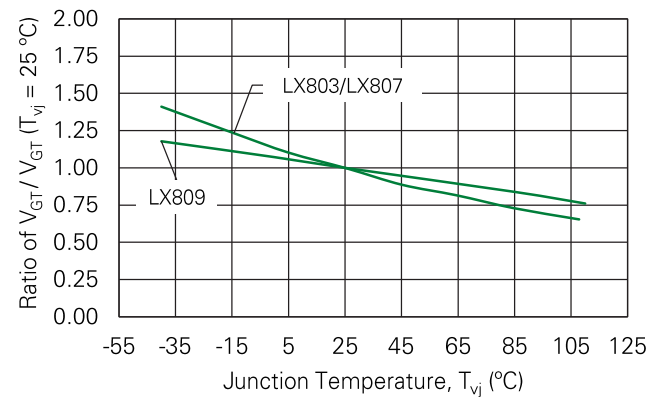


Fig. 5. Typical Power Dissipation vs. RMS On-state Current

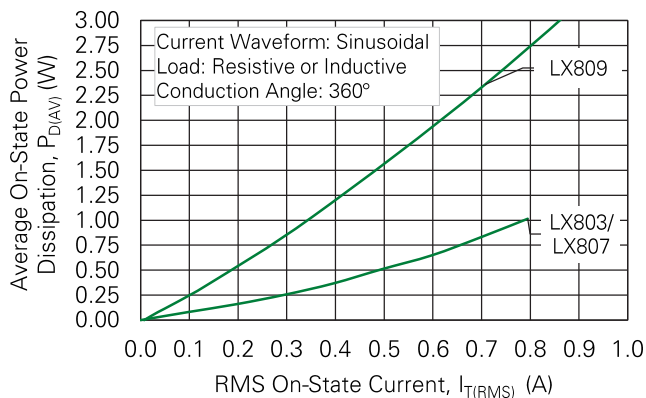


Fig. 6. Maximum Allowable Case Temperature vs. On-state Current

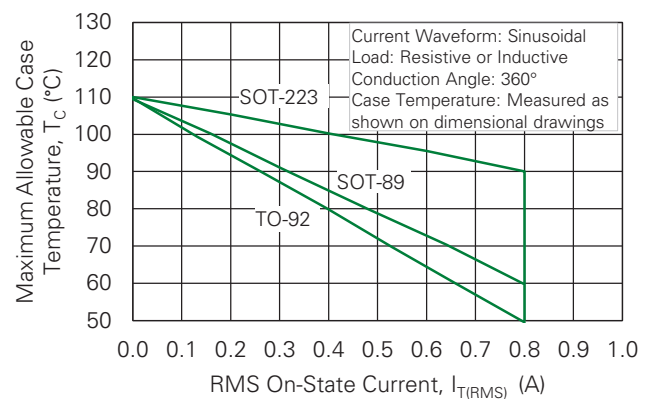
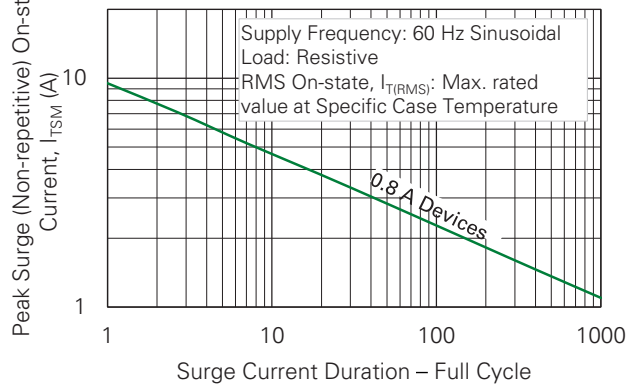


Fig. 7. Surge Peak On-state Current vs. Number of Cycles



Notes:

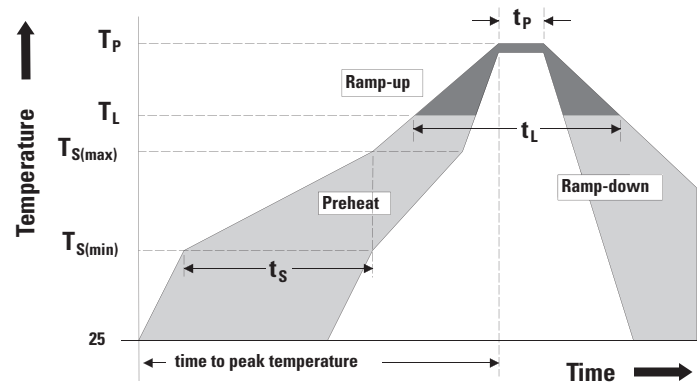
1. Gate control may be lost during and immediately following surge current interval.
2. Overload may not be repeated until junction temperature has returned to steady-state rated value.

Soldering Parameters

Characteristic		Value
Reflow Condition		Pb – Free assembly
Pre-heat	Temperature Min ($T_{s(min)}$)	150 °C
	Temperature Max ($T_{s(max)}$)	200 °C
	Time (min to max) (t_s)	60 – 180 secs
Average ramp up rate (Liquidus Temp)(T_L) to peak		5 °C/second max
$T_{s(max)}$ to T_L - Ramp-up Rate		5 °C/second max
Reflow	Temperature (T_L) (Liquidus)	217 °C
	Time (t_L)	60 – 150 seconds
Peak Temperature (T_P)		260 ^{+0/-5} °C
Time within 5 °C of actual peak Temperature (t_p)		20 – 40 seconds
Ramp-down Rate		5 °C/second max
Time 25 °C to peak Temperature (T_P)		8 minutes max
Do Not Exceed		280 °C

Physical Specifications

Characteristic	Value
Terminal Finish	100% Matte Tin-plated
Body Material	UL Recognized compound meeting flammability rating V-0
Lead Material	Copper Alloy



Environmental Specifications

Test	Specifications and Conditions
AC Blocking	MIL-STD-750, M-1040, Cond A Applied Peak AC voltage @ 110 °C for 1008 hours
Temperature/Humidity	EIA / JEDEC, JESD22-A101, 1008 hours; 320 V - DC: 85 °C; 85 % relative humidity
Temperature Cycling	MIL-STD-750, M-1051, 100 cycles; -40 °C to +150 °C; 15-min dwell-time
High-temperature Storage	MIL-STD-750, M-1031, 1008 hours; 150 °C
Low-temperature Storage	1008 hours; -40 °C
Resistance to Solder Heat	MIL-STD-750: Method 2031
Solderability	ANSI/J-STD-002: category 3, Test A
Lead Bend	MIL-STD-750, M-2036 Cond E

Product Selector

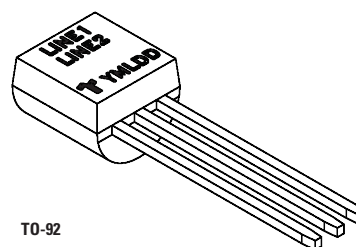
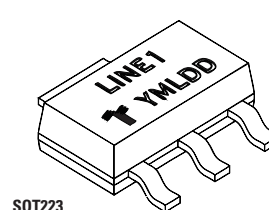
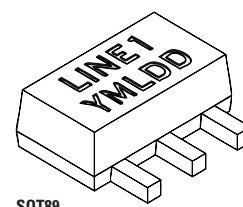
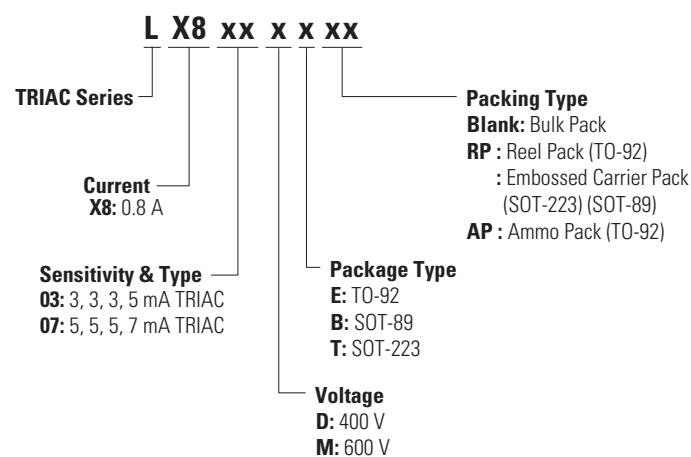
Part Number	Voltage		Gate Sensitivity Quadrants		Package
	400 V	600 V	I – II – III	IV	
LX803DE	X	–	3 mA	5 mA	TO-92
LX803ME	–	X	3 mA	5 mA	TO-92
LX803DT	X	–	3 mA	5 mA	SOT-223
LX803MT	–	X	3 mA	5 mA	SOT-223
LX807DE	X	–	5 mA	7 mA	TO-92
LX807ME	–	X	5 mA	7 mA	TO-92
LX807DT	X	–	5 mA	7 mA	SOT-223
LX807MT	–	X	5 mA	7 mA	SOT-223
LX807MB	–	X	5 mA	7 mA	SOT-89
LX809MB	–	X	10 mA	10 mA	SOT-89

Packing Options

Part Number	Marking	Weight	Packing Mode	Base Quantity
LX8xxyE	LX8xxyE	0.217 g	Bulk	2500
LX8xxyEAP	LX8xxyE	0.217 g	Ammo Pack	2000
LX8xxyERP	LX8xxyE	0.217 g	Tape & Reel	2000
LX8xxyTRP	LX8xxyT	0.120 g	Tape & Reel	1000
LX8xxyBRP	8xx	0.053 g	Tape & Reel	1000

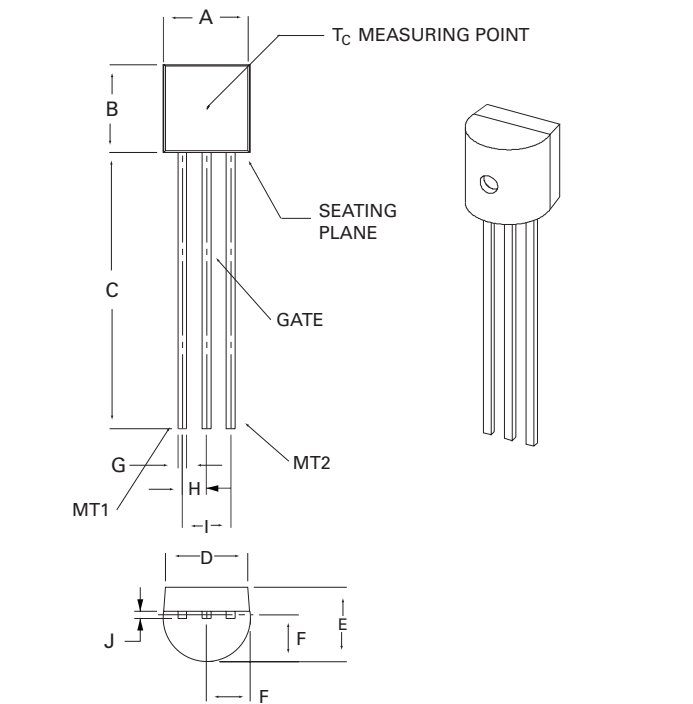
Note: xx = gate sensitivity, y = voltage

Part Numbering and Marking



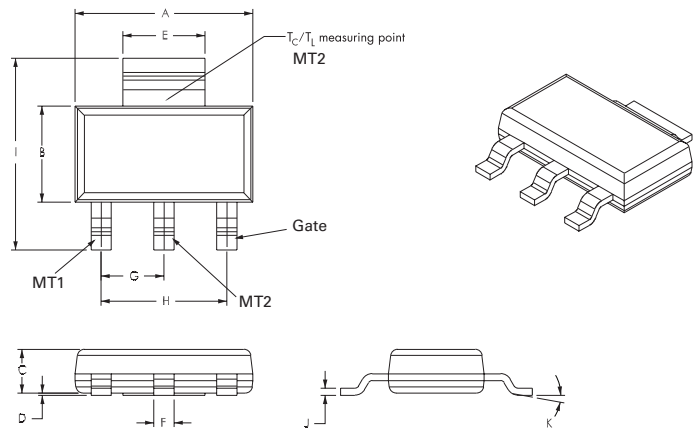
Line1 = Littelfuse Part Number
Line2 = continuation...Littelfuse Part Number
Y = Last Digit of Calendar Year
M = Letter Month Code (A-L for Jan-Dec)
L = Location Code
DD = Calendar Date

Package Dimensions TO-92



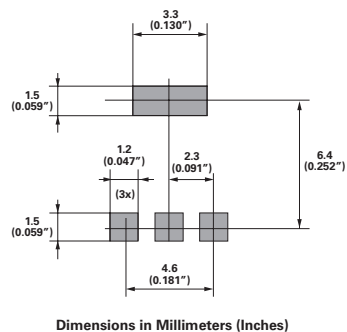
Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max
A	4.450	5.200	0.175	0.205
B	4.320	5.330	0.170	0.210
C	12.70	–	0.500	–
D	3.430	–	0.135	–
E	3.180	4.190	0.125	0.165
F	2.040	2.660	0.080	0.105
G	0.407	0.533	0.016	0.021
H	1.150	1.390	0.045	0.055
I	2.420	2.660	0.095	0.105
J	0.380	0.500	0.015	0.020

Package Dimensions SOT-223



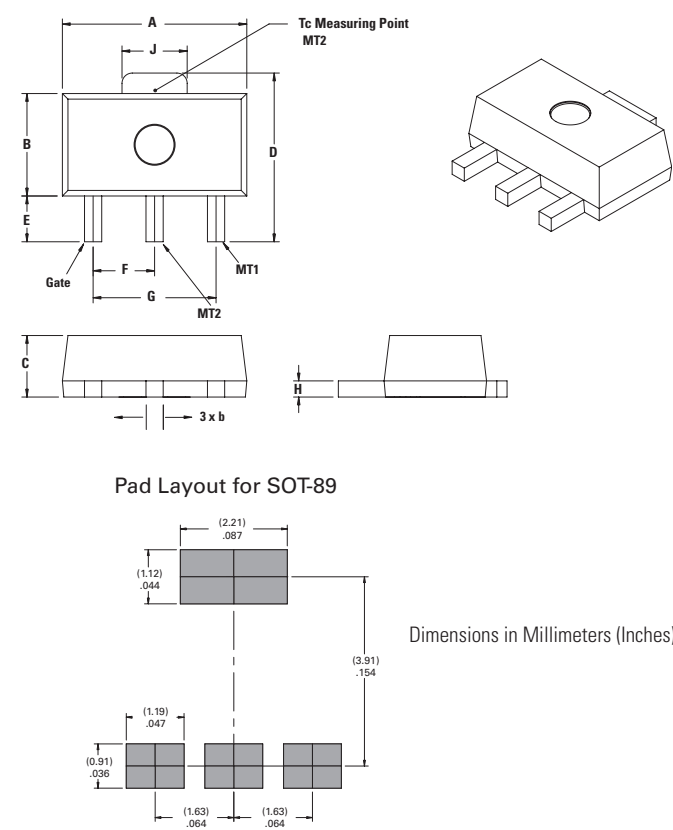
Symbol	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	6.30	6.50	6.70	0.248	0.256	0.264
B	3.30	3.50	3.70	0.130	0.138	0.146
C	–	–	1.80	–	–	0.071
D	0.02	–	0.10	0.001	–	0.004
E	2.90	3.00	3.15	0.114	0.118	0.124
F	0.60	0.70	0.85	0.024	0.027	0.034
G	–	2.30	–	–	0.090	–
H	–	4.60	–	–	0.181	–
I	6.70	7.00	7.30	0.264	0.276	0.287
J	0.24	0.26	0.35	0.009	0.010	0.014
K	10° MAX.					

Pad Layout for SOT-223



Dimensions in Millimeters (Inches)

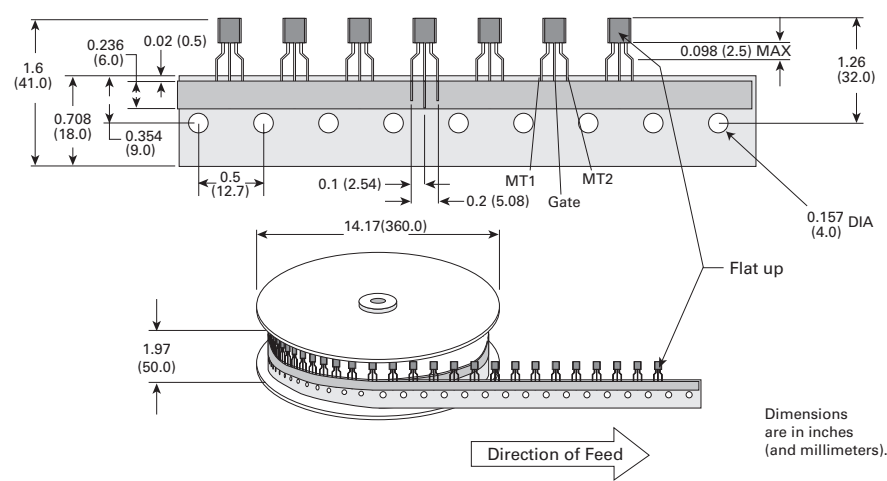
Package Dimensions SOT-89



Symbol	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max
A	4.40	–	4.60	0.173	–	0.181
b	0.66	–	0.84	0.026	–	0.033
B	2.29	–	2.60	0.090	–	0.102
C	1.40	–	1.60	0.055	–	0.063
D	3.94	–	4.25	0.155	–	0.167
E	0.81	–	1.20	0.032	–	0.047
F	–	1.5	–	–	0.059	–
G	–	3	–	–	0.118	–
H	0.35	–	0.44	0.014	–	0.017
I	0.36	–	0.48	0.014	–	0.019
J	–	1.65	–	–	0.065	–

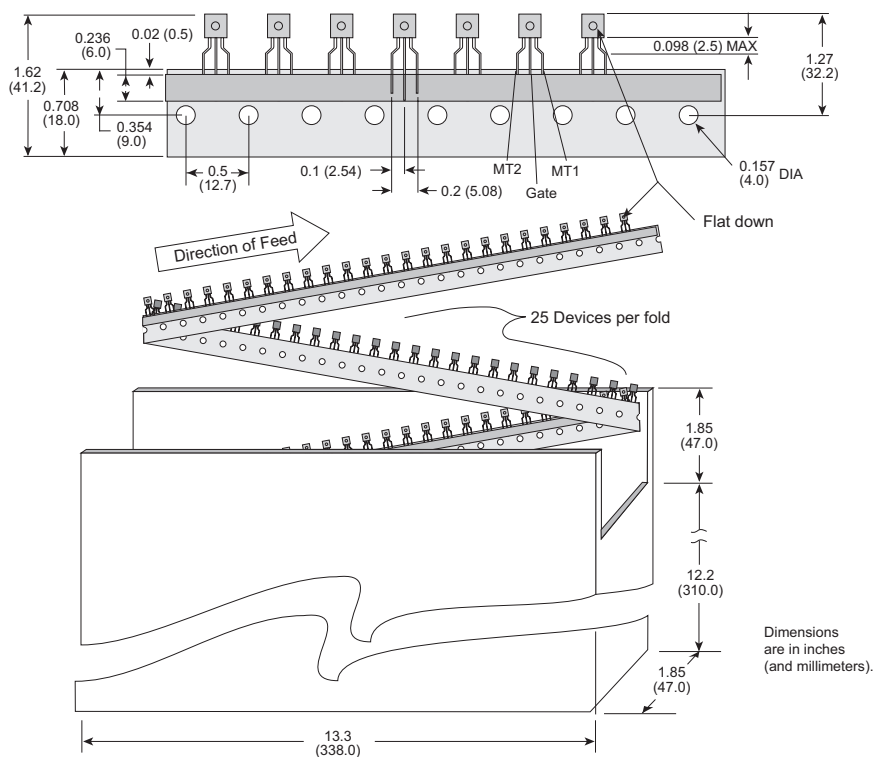
TO-92 (3-lead) Reel Pack (RP) Radial Leaded Specifications

Meets all EIA-468-C Standards

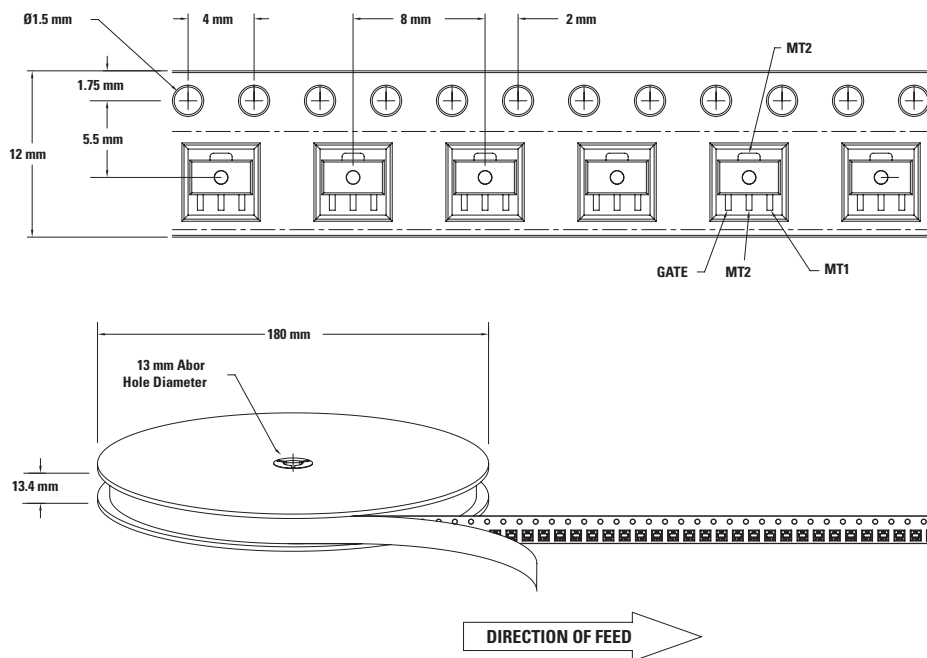


TO-92 (3-lead) Ammo Pack (AP) Radial Leaded Specifications

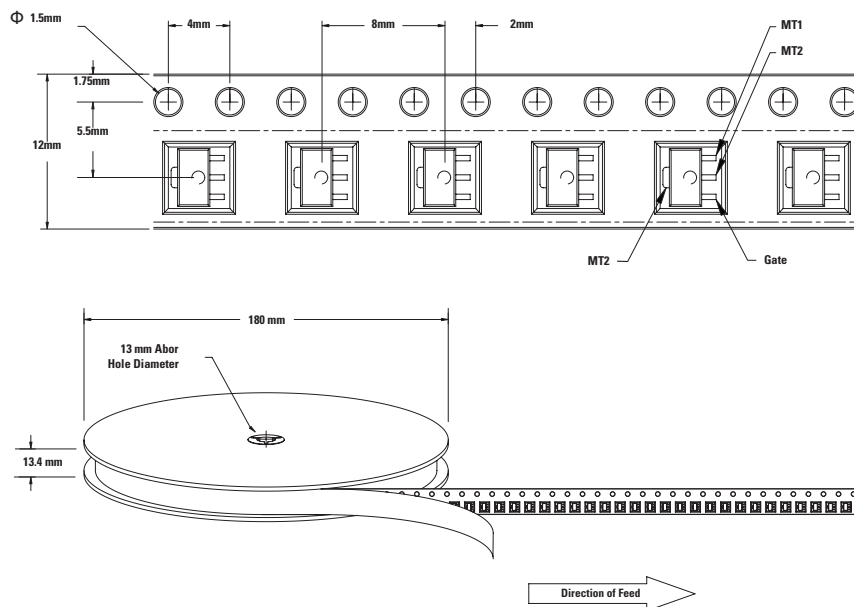
Meets all EIA-468-C Standards



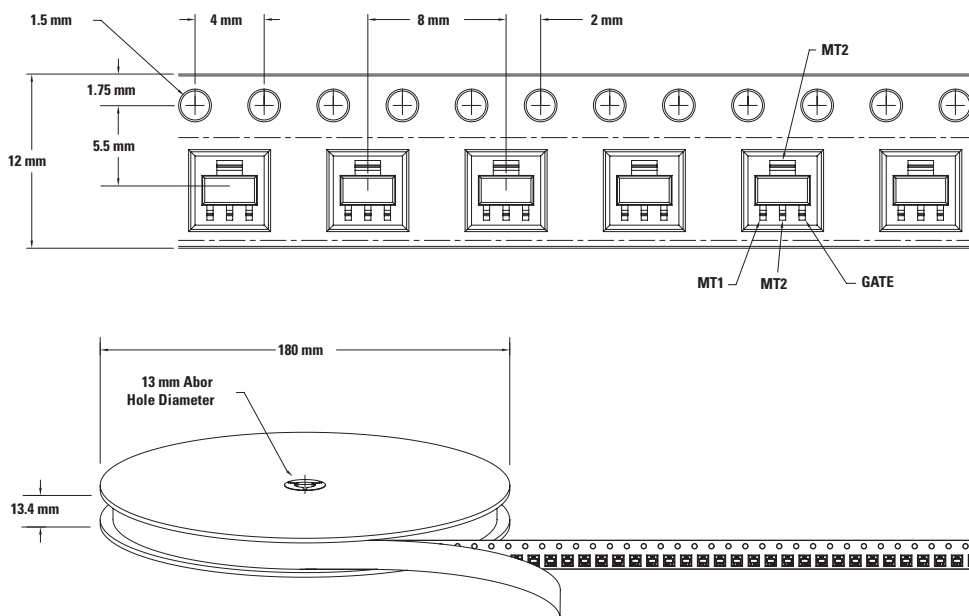
SOT-89 Reel Pack (RP) Specifications



SOT-89 Reel Pack (RP1) Specifications



SOT-223 Reel Pack (RP) Specifications



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