

## Features

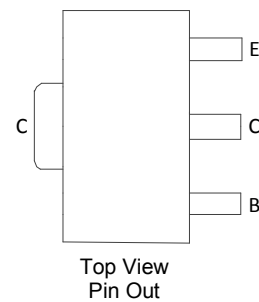
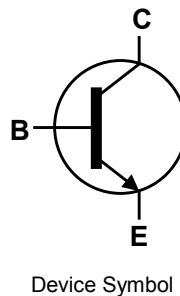
- $BV_{CEO} > 40V$
- $I_C = 5.0A$  Continuous Current
- Low Saturation Voltage  $V_{CE(sat)} < 60mV @ 1A$
- $R_{sat} = 38m\Omega$  for a Low Equivalent On-Resistance
- $P_D = 2.4W$  Power Dissipation
- Complementary part number ZXTP25040DZ
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen- and Antimony-Free. "Green" Device (Note 3)**
- **For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please [contact us](mailto:contact@diodes.com) or your local Diodes representative. <https://www.diodes.com/quality/product-definitions/>**

## Mechanical Data

- Case: SOT89
- Case Material: Molded Plastic. "Green" Molding Compound. UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 ③
- Weight: 0.05 grams (Approximate)

## Application

- Emergency lighting circuits
- Motor driving (including DC fans)
- Solenoid, relay and actuator drivers
- DC-DC modules
- Backlight inverters
- Power switches
- MOSFET gate drivers

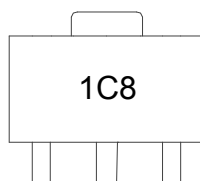


## Ordering Information (Note 4)

Part Number	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity Per Reel
ZXTN25040DZTA	Standard	1C8	7	12	1,000

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
  2. See <https://www.diodes.com/quality/lead-free/> for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
  3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
  4. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

## Marking Information



1C8 = Product Type Marking Code

**Absolute Maximum Ratings** (@  $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

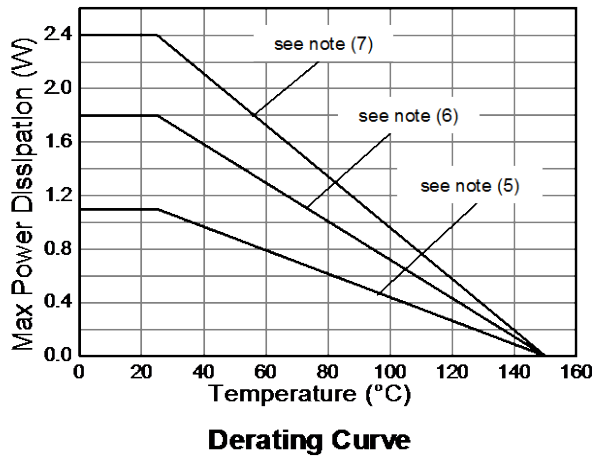
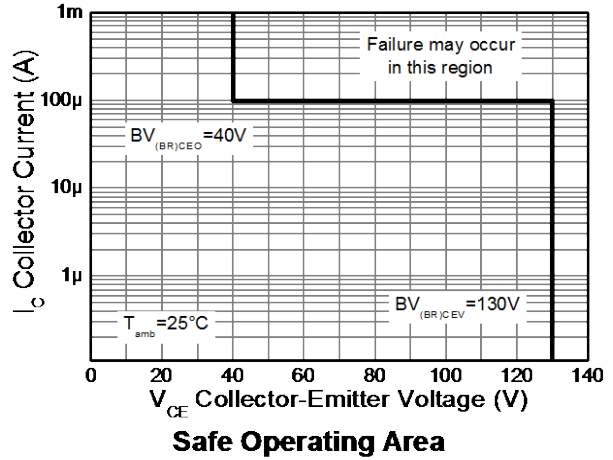
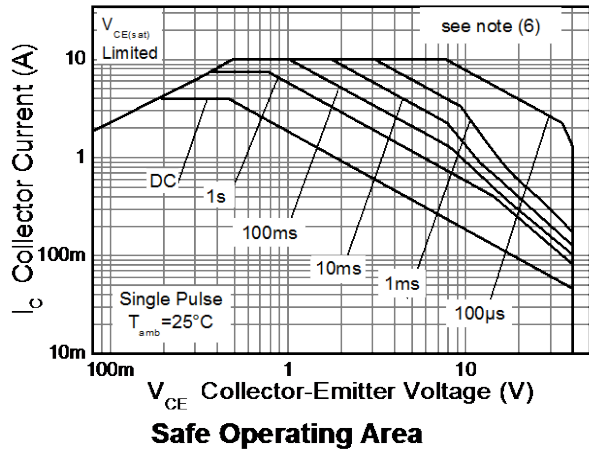
Characteristic	Symbol	Value	Unit
Collector-Base Voltage	$V_{CBO}$	130	V
Collector-Emitter Voltage (forward blocking)	$V_{CEX}$	130	V
Collector-Emitter Voltage	$V_{CEO}$	40	V
Emitter-collector voltage (reverse blocking)	$V_{ECO}$	6	V
Emitter-Base Voltage	$V_{EBO}$	7	V
Continuous Collector Current	$I_C$	5	A
Peak Pulse Collector Current	$I_{CM}$	10	A
Base current	$I_B$	1	A

**Thermal Characteristics** (@  $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

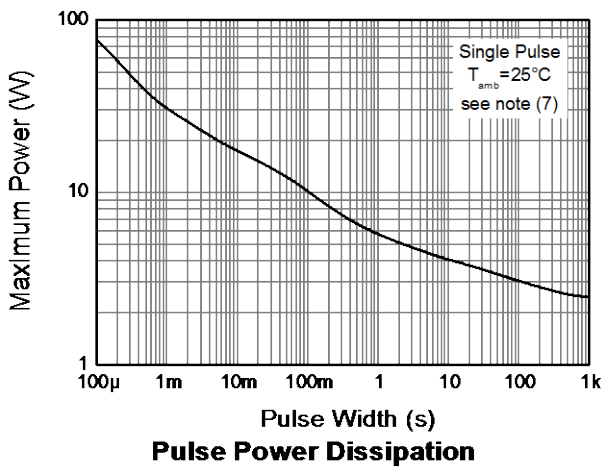
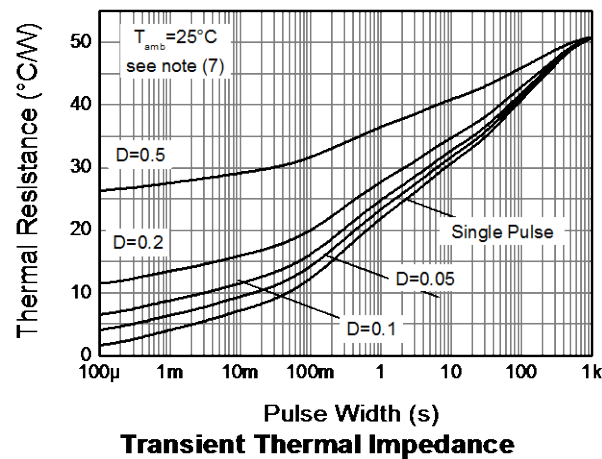
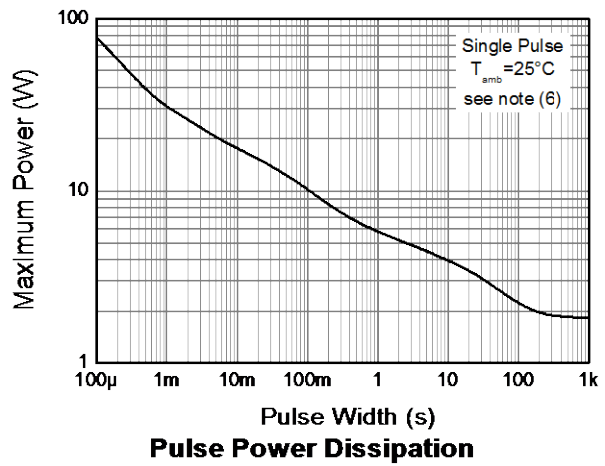
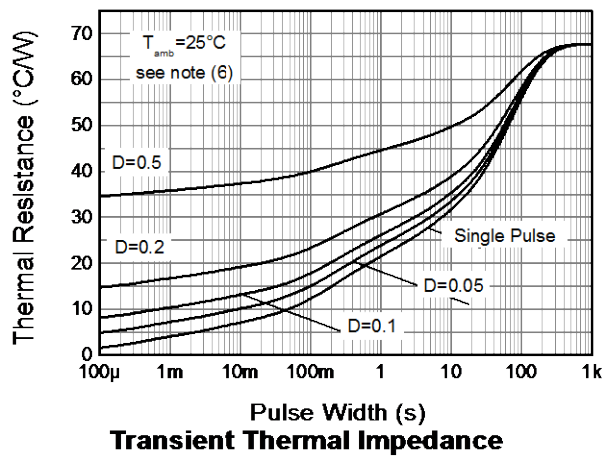
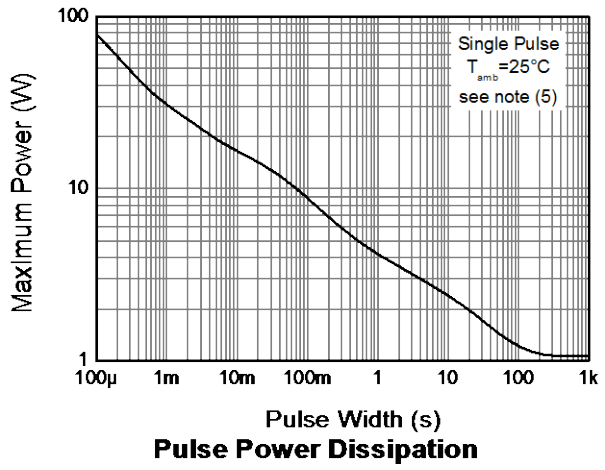
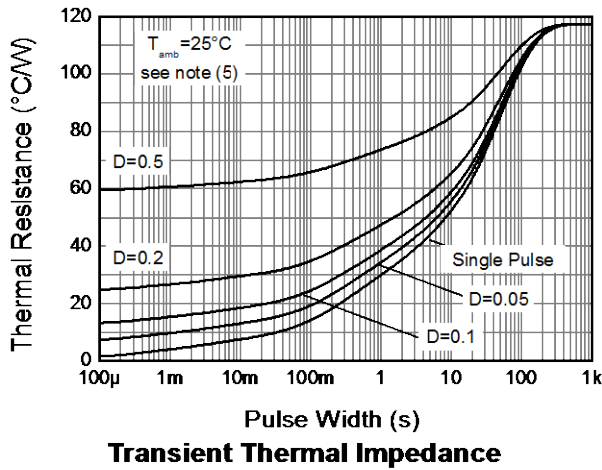
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	$P_D$	1.1	W mW/ $^\circ\text{C}$
Linear Derating Factor		8.8	
Power Dissipation (Note 6)		1.8	
Linear Derating Factor		14.4	
Power Dissipation (Note 7)		2.4	
Linear Derating Factor		19.2	
Power Dissipation (Note 8)		4.46	
Linear Derating Factor		35.7	
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	117	$^\circ\text{C/W}$
Thermal Resistance, Junction to Ambient (Note 6)		63	
Thermal Resistance, Junction to Ambient (Note 7)		51	
Thermal Resistance, Junction to Ambient (Note 8)		28	
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	$^\circ\text{C}$

- Notes:
5. For a device surface mounted on 15mm x 15mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions; device measured when operating in steady state condition.
  6. Same as note (5), except the device is mounted on 25mm x 25mm x 1.6mm single sided 2oz weight copper.
  7. Same as note (5), except the device is mounted on 50mm x 50mm x 1.6mm single sided 2oz weight copper.
  8. Same as note (5), except the device is measured at  $t < 5$  seconds.

**Thermal Characteristics and Derating Information**



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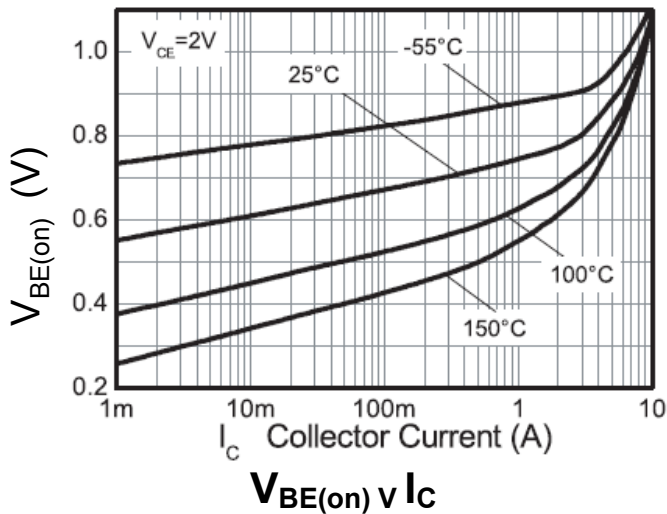
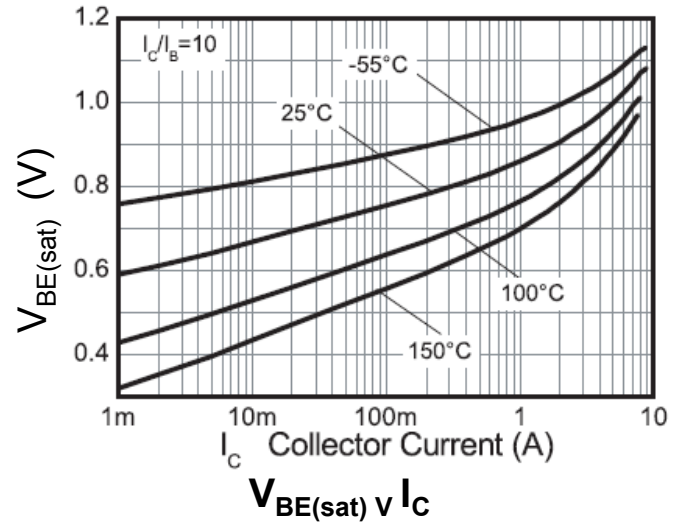
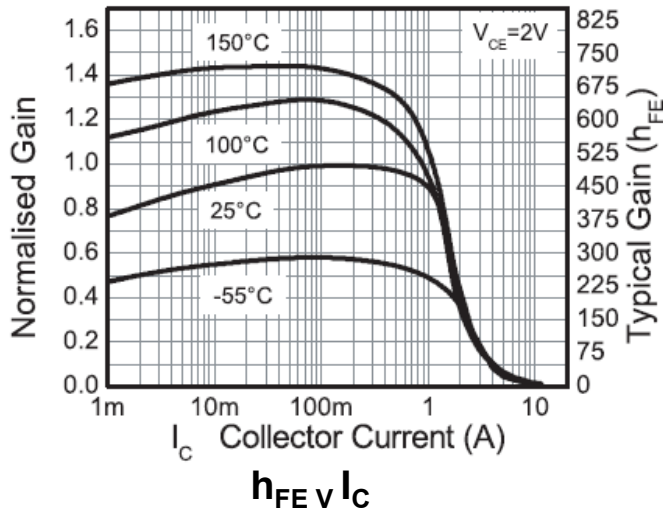
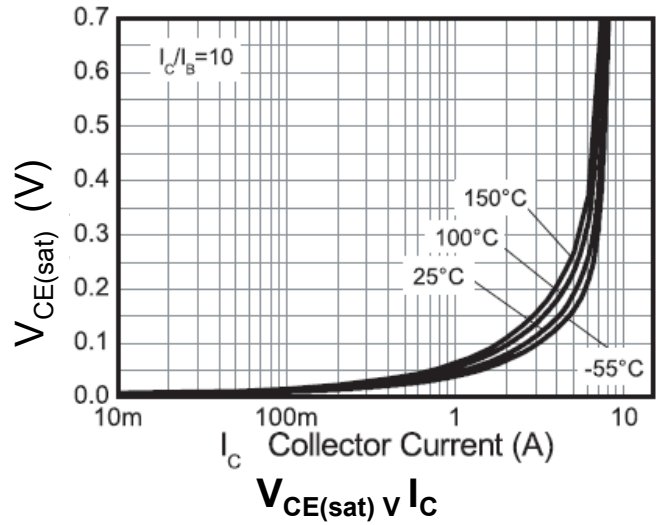
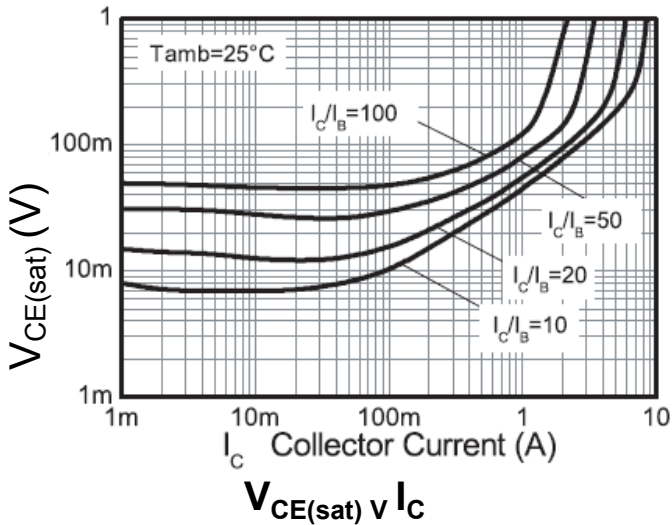


**Electrical Characteristics** (@  $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	$BV_{CBO}$	130	170	—	V	$I_C = 100\mu\text{A}$
Collector-Emitter Breakdown Voltage (forward blocking)	$BV_{CEX}$	130	170	—	V	$I_C = 100\mu\text{A}$ ; $R_{BE} \leq 1\text{k}\Omega$ or $-1\text{V} < V_{BE} < 0.25\text{V}$
Collector-Emitter Breakdown Voltage (Note 9)	$BV_{CEO}$	40	63	—	V	$I_C = 10\text{mA}$
Emitter-Base Breakdown Voltage	$BV_{EBO}$	7	8.3	—	V	$I_E = 100\mu\text{A}$
Emitter-Collector Breakdown voltage (reverse blocking)	$BV_{ECX}$	6	7.4	—	V	$I_E = 100\mu\text{A}$ , $R_{BC} \leq 1\text{k}\Omega$ or $0.25\text{V} > V_{BC} > -0.25\text{V}$
Emitter-Collector Breakdown voltage	$BV_{ECO}$	6	7.4	—	V	$I_E = 100\mu\text{A}$
Collector Base Cut-Off Current	$I_{CBO}$	—	1	50	nA $\mu\text{A}$	$V_{CB} = 100\text{V}$ $V_{CB} = 100\text{V}$ , $T_A = +100^\circ\text{C}$
Collector Emitter Cut-Off Current	$I_{CEX}$ $R \leq 1\text{k}\Omega$	—	—	100	nA	$V_{CE} = 100\text{V}$ ; $R_{BE} \leq 1\text{k}\Omega$ or $-1\text{V} < V_{BE} < 0.25\text{V}$
Emitter Cut-Off Current	$I_{EBO}$	—	1	50	nA	$V_{EB} = 5.6\text{V}$
Collector-Emitter Saturation Voltage (Note 9)	$V_{CE(sat)}$	—	50 125 140 190	60 215 215 260	mV	$I_C = 1\text{A}$ , $I_B = 100\text{mA}$ $I_C = 1\text{A}$ , $I_B = 10\text{mA}$ $I_C = 2\text{A}$ , $I_B = 40\text{mA}$ $I_C = 5\text{A}$ , $I_B = 500\text{mA}$
Base-Emitter Saturation Voltage (Note 9)	$V_{BE(sat)}$	—	1000	1100	mV	$I_C = 5\text{A}$ , $I_B = 500\text{mA}$
Base-Emitter Turn-On Voltage (Note 9)	$V_{BE(on)}$	—	910	1000	mV	$I_C = 5\text{A}$ , $V_{CE} = 2\text{V}$
DC Current Gain (Note 9)	$h_{FE}$	300 300 20 —	450 450 40 10	900 — — —	—	$I_C = 10\text{mA}$ , $V_{CE} = 2\text{V}$ $I_C = 1\text{A}$ , $V_{CE} = 2\text{V}$ $I_C = 5\text{A}$ , $V_{CE} = 2\text{V}$ $I_C = 10\text{A}$ , $V_{CE} = 2\text{V}$
Transitional frequency	$f_T$	—	190	—	MHz	$I_C = 50\text{mA}$ , $V_{CE} = 10\text{V}$ , $f = 100\text{MHz}$
Output Capacitance	$C_{obo}$	—	11.7	20	pF	$V_{CB} = 10\text{V}$ , $f = 1\text{MHz}$
Delay time	$t_d$	—	64	—	ns	$V_{CC} = 10\text{V}$ $I_C = 1\text{A}$ , $I_{B1} = -I_{B2} = 10\text{mA}$
Rise time	$t_r$		108			
Storage time	$t_s$		428			
Fall time	$t_f$		130			

Note: 9. Measured under pulsed conditions. Pulse width  $\leq 300\mu\text{s}$ . Duty cycle  $\leq 2\%$ .

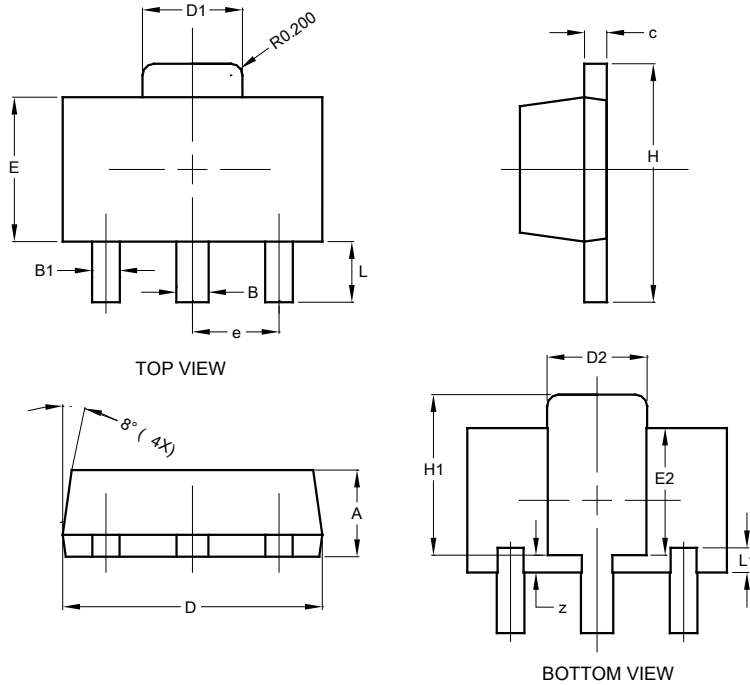
**Typical Electrical Characteristics** (@  $T_A = +25^\circ\text{C}$ , unless otherwise specified.)



**Package Outline Dimensions**

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

**SOT89**

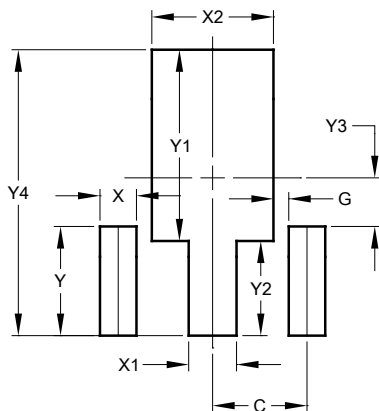


SOT89			
Dim	Min	Max	Typ
A	1.40	1.60	1.50
B	0.50	0.62	0.56
B1	0.42	0.54	0.48
c	0.35	0.43	0.38
D	4.40	4.60	4.50
D1	1.62	1.83	1.733
D2	1.61	1.81	1.71
E	2.40	2.60	2.50
E2	2.05	2.35	2.20
e	-	-	1.50
H	3.95	4.25	4.10
H1	2.63	2.93	2.78
L	0.90	1.20	1.05
L1	0.327	0.527	0.427
z	0.20	0.40	0.30
All Dimensions in mm			

**Suggested Pad Layout**

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

**SOT89**



Dimensions	Value (in mm)
C	1.500
G	0.244
X	0.580
X1	0.760
X2	1.933
Y	1.730
Y1	3.030
Y2	1.500
Y3	0.770
Y4	4.530

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