

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 ZXTN25040DZ
- **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

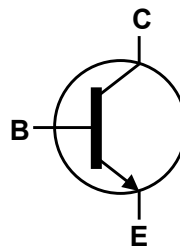
- Case: SOT89
- Case Material: Molded Plastic. "Green" Molding Compound. UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 ^{Ⓔ3}
- Weight: 0.05 grams (Approximate)

Application

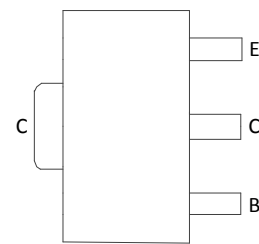
- Emergency lighting circuits
- Motor driving (including DC fans)
- Solenoid, relay and actuator drivers
- DC-DC modules
- Backlight inverters
- Power switches
- MOSFET gate drivers



Top View



Device Symbol



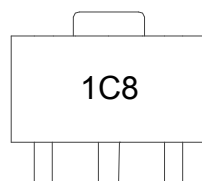
Top View Pin Out

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.)

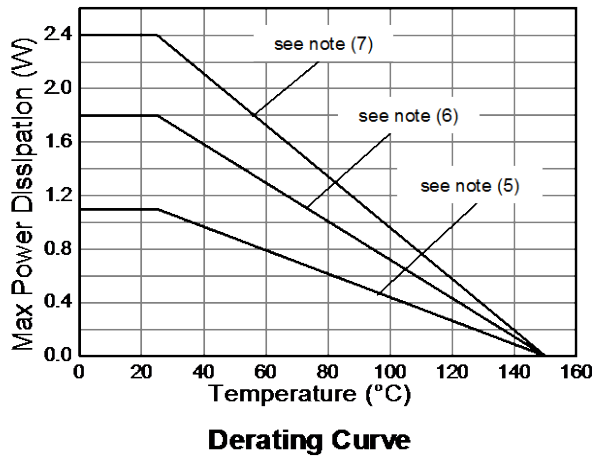
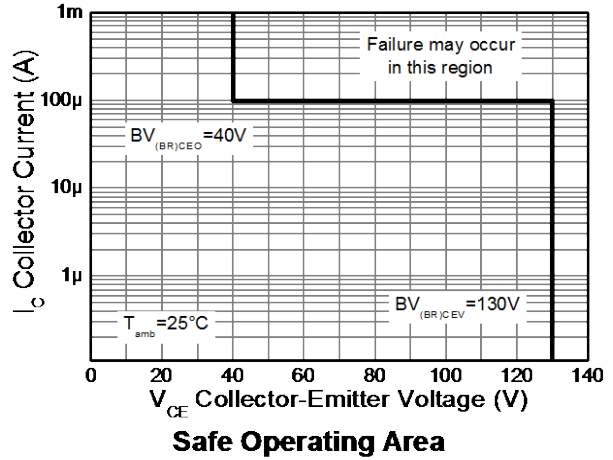
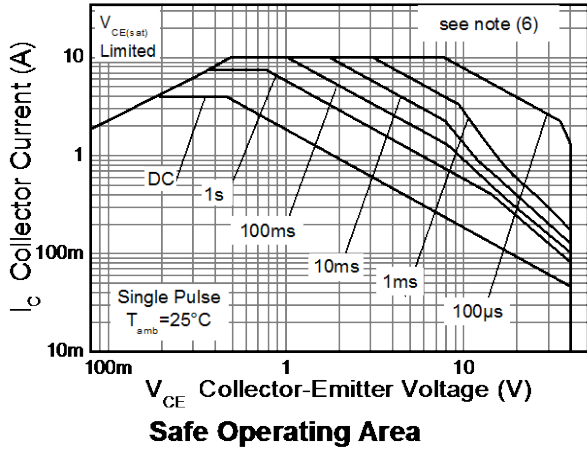
Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CB0}	130	V
Collector-Emitter Voltage (forward blocking)	V_{CEX}	130	V
Collector-Emitter Voltage	V_{CEO}	40	V
Emitter-collector voltage (reverse blocking)	V_{ECO}	6	V
Emitter-Base Voltage	V_{EBO}	7	V
Continuous Collector Current	I_C	5	A
Peak Pulse Collector Current	I_{CM}	10	A
Base current	I_B	1	A

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

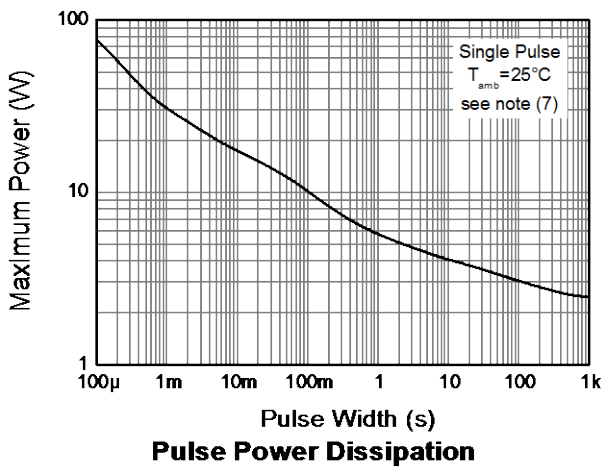
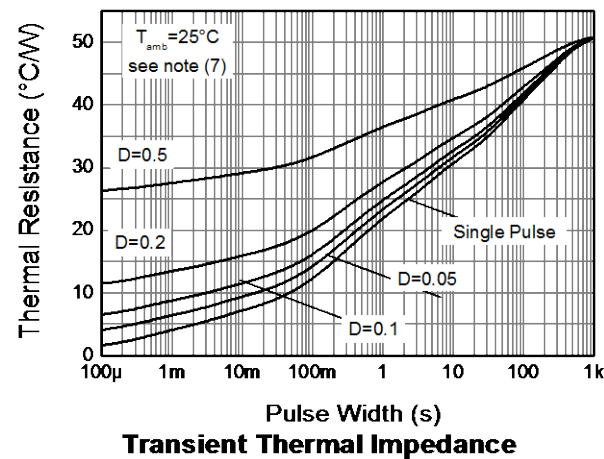
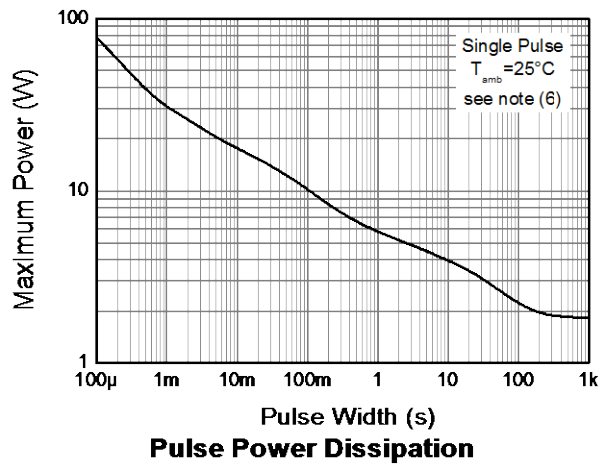
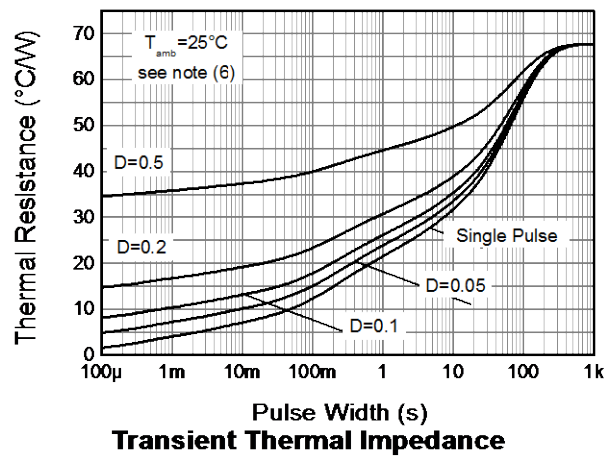
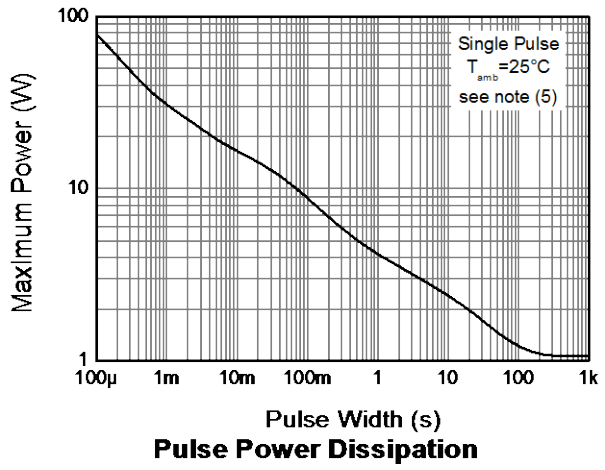
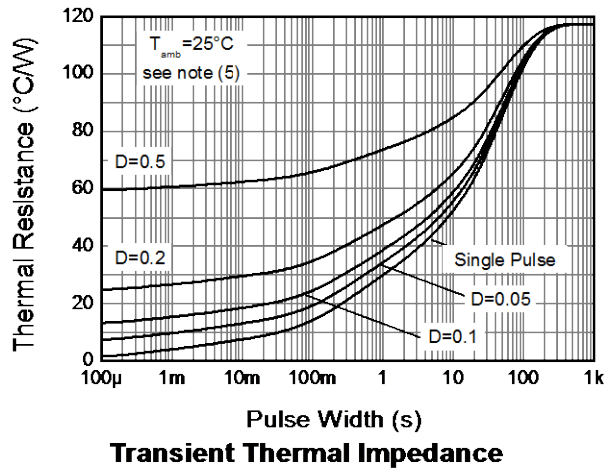
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P_D	1.1	W mW/ $^\circ\text{C}$
Linear Derating Factor		8.8	
Power Dissipation (Note 6)		1.8	
Linear Derating Factor		14.4	
Power Dissipation (Note 7)		2.4	
Linear Derating Factor		19.2	
Power Dissipation (Note 8)		4.46	
Linear Derating Factor		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



Thermal Characteristics and Derating Information

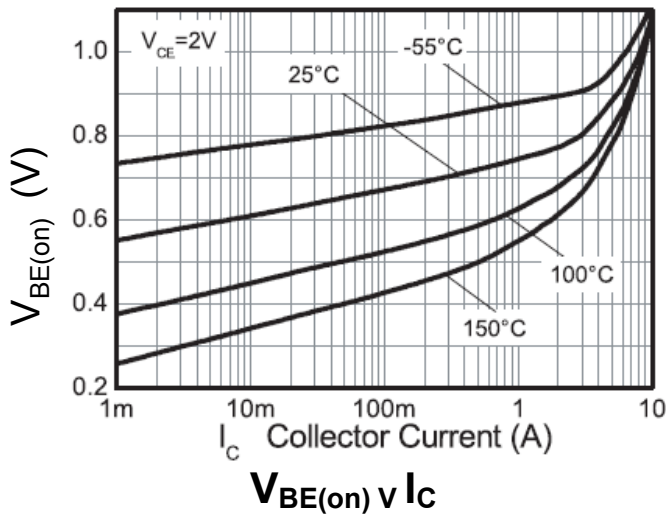
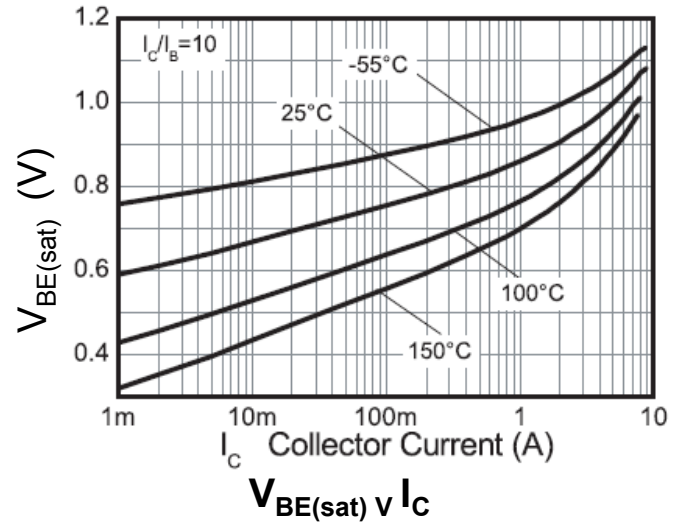
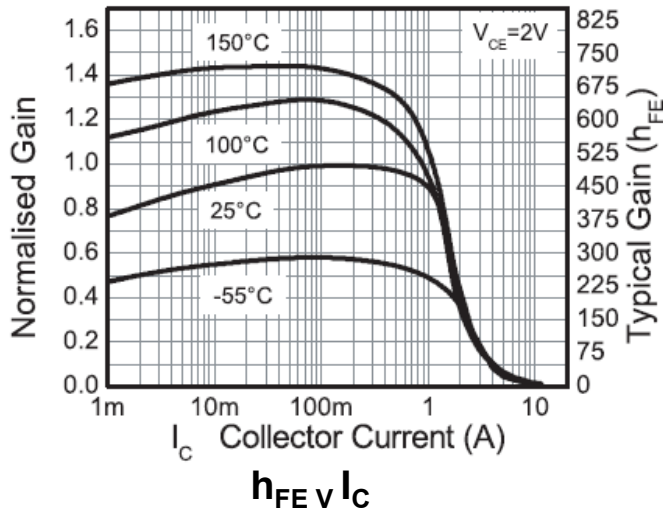
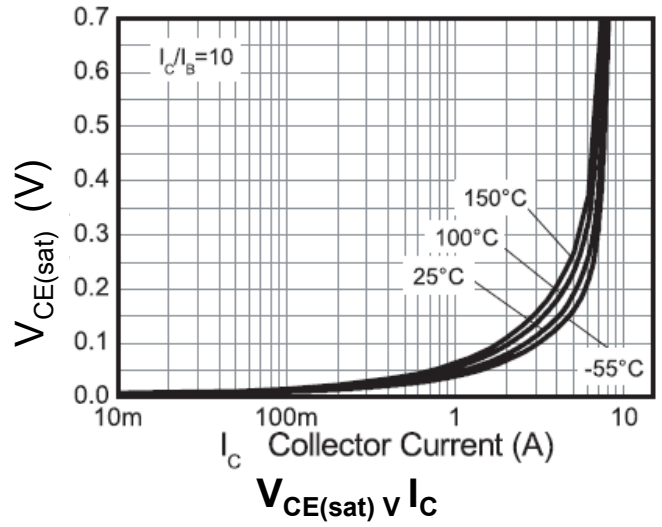
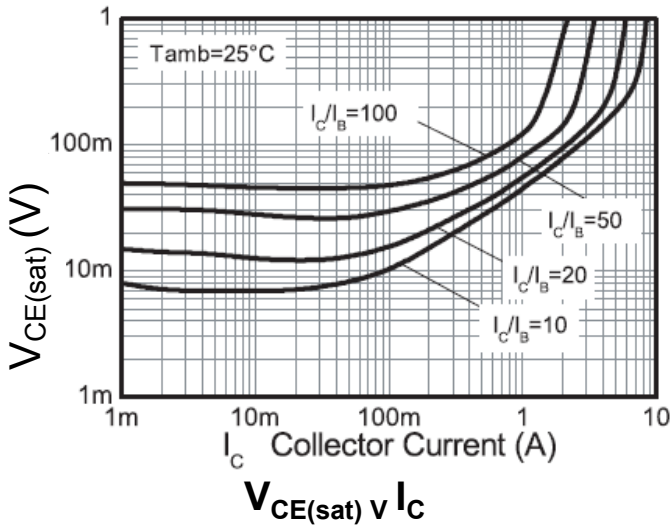


Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

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 μA	$V_{CB} = 100\text{V}$ $V_{CB} = 100\text{V}$, $T_A = +100^\circ\text{C}$
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 $\leq 2\%$.

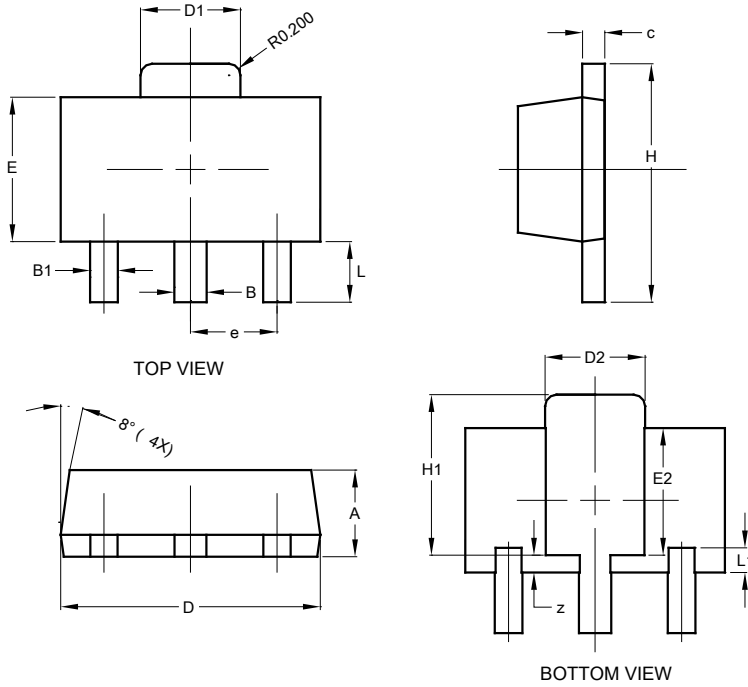
Typical Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)



Package Outline Dimensions

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

SOT89

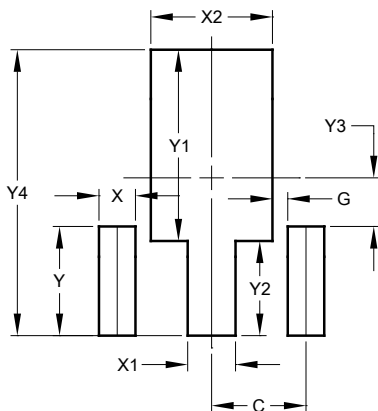


SOT89			
Dim	Min	Max	Typ
A	1.40	1.60	1.50
B	0.50	0.62	0.56
B1	0.42	0.54	0.48
c	0.35	0.43	0.38
D	4.40	4.60	4.50
D1	1.62	1.83	1.733
D2	1.61	1.81	1.71
E	2.40	2.60	2.50
E2	2.05	2.35	2.20
e	-	-	1.50
H	3.95	4.25	4.10
H1	2.63	2.93	2.78
L	0.90	1.20	1.05
L1	0.327	0.527	0.427
z	0.20	0.40	0.30
All Dimensions in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