

Features

- $BV_{CEO} > 60V$
- $I_C = 5A$ Continuous Collector Current
- Low Saturation Voltage $V_{CE(sat)} < 70mV @ 1A$
- $R_{sat} = 48m\Omega$ for a Low Equivalent On-Resistance
- $P_D = 2.4W$ Power Dissipation
- **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](https://www.diodes.com/contact-us) 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: 0.055 grams (Approximate)

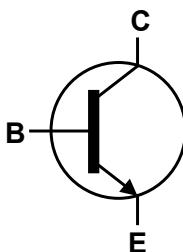
Applications

- Emergency Lighting Circuits
- Motor Driving (including DC fans)
- Solenoid, Relay and Actuator Drivers
- DC-DC Modules
- Backlight inverters
- Power Switches
- MOSFET Gate Drivers

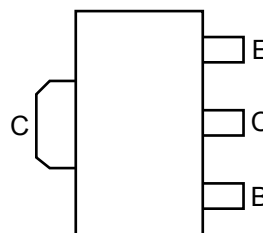
SOT89



Top View



Equivalent Circuit



Top View
Pin-Out

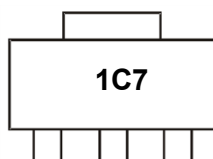
Ordering Information (Notes 4)

Product	Compliance	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTN25060BZTA	Standard	1C7	7	12mm	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

SOT89



1C7= Product Type Marking Code

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

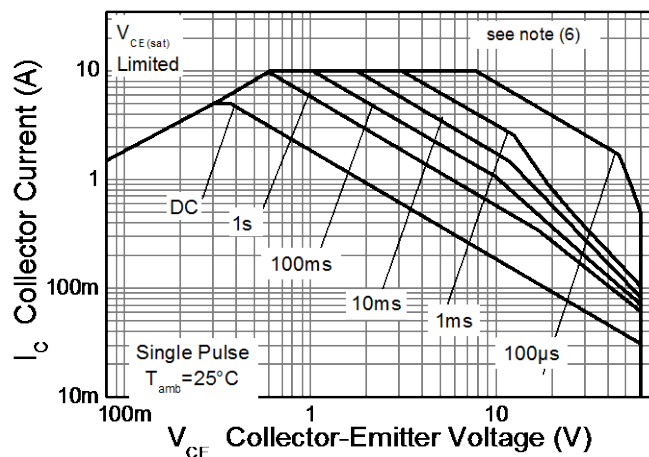
Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	150	V
Collector-Emitter Voltage (Forward Blocking)	V_{CEX}	150	V
Collector-Emitter Voltage	V_{CEO}	60	V
Emitter-Collector Voltage (Reverse Blocking)	V_{ECO}	6	V
Emitter-Base Voltage	V_{EBO}	7	V
Continuous Collector Current	I_C	5	A
Peak Pulse Collector Current (Single Pulse)	I_{CM}	10	A
Base Current	I_B	1	A

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

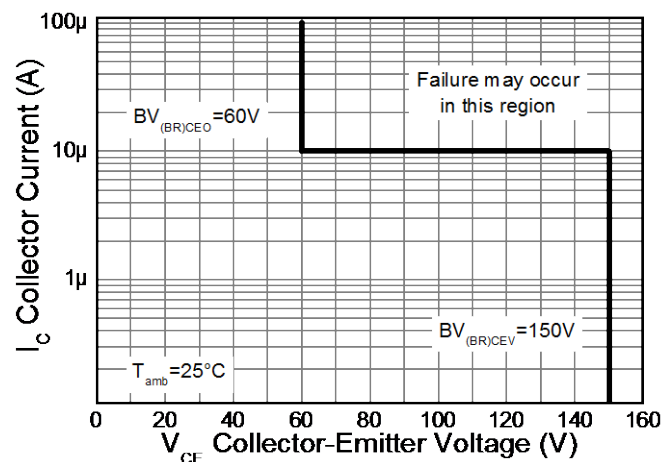
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P_D	1.1	mW/ $^\circ\text{C}$
Linear Derating Factor		8.8	
Power Dissipation (Note 6)		1.8	
Linear Derating Factor		14.4	
Power Dissipation (Note 7)		2.4	
Linear Derating Factor		19.2	
Power Dissipation (Note 8)	$R_{\theta JA}$	4.46	$^\circ\text{C/W}$
Linear Derating Factor		35.7	
Thermal Resistance, Junction to Ambient (Note 5)		117	
Thermal Resistance, Junction to Ambient (Note 6)		68	
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:
- For a device mounted with the exposed collector pad on 15mm x 15mm 1oz copper that is on a single-sided 1.6mm FR4 PCB; device is measured under still air conditions whilst operating in a steady-state.
 - Same as Note (5), except the device is mounted on 25mm x 25mm 2oz copper.
 - Same as Note (5), except the device is mounted on 50mm x 50mm 2oz copper.
 - Same as Note (5), measured at $t < 5$ seconds.

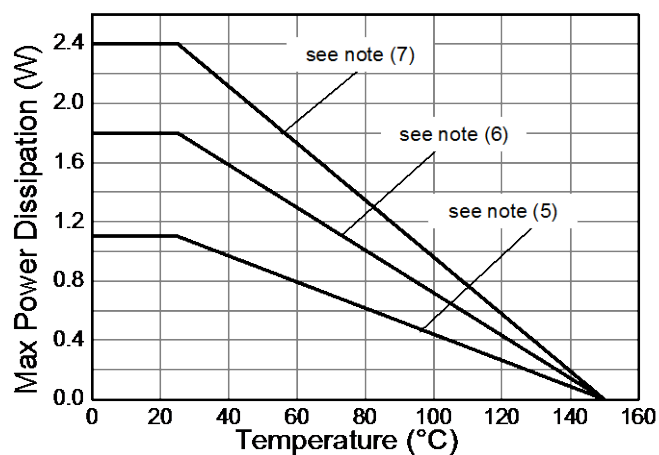
Thermal Characteristics and Derating Information



Safe Operating Area

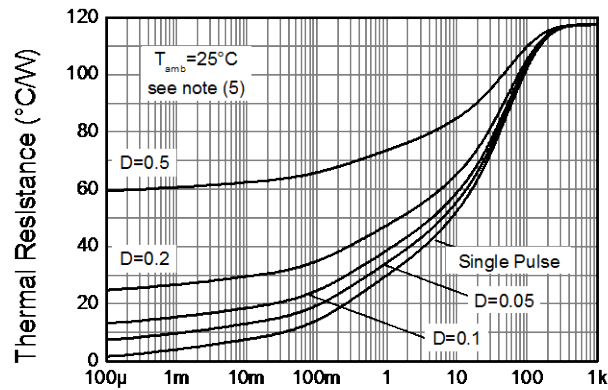


Safe Operating Area

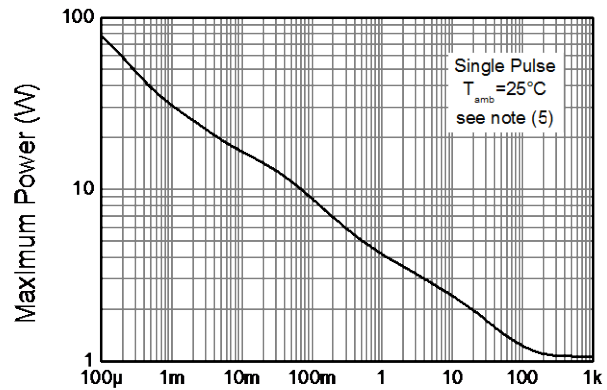


Derating Curve

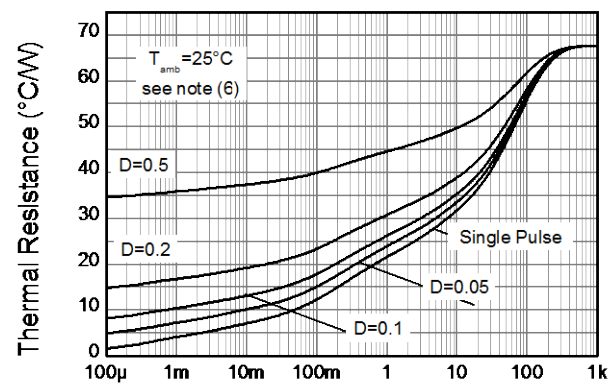
Thermal Characteristics and Derating Information



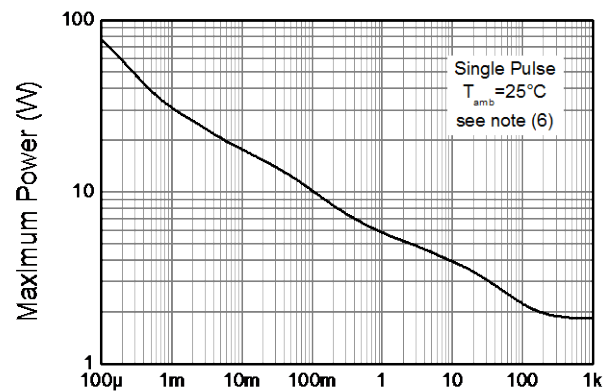
Transient Thermal Impedance



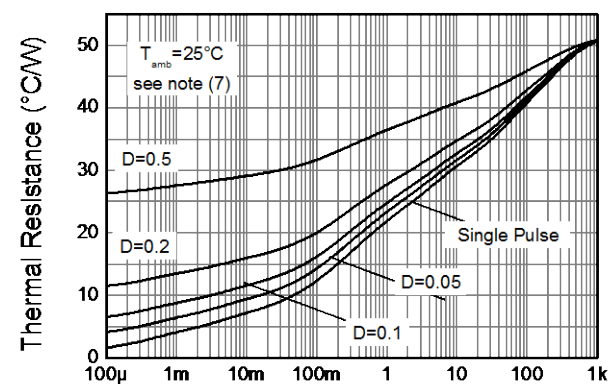
Pulse Power Dissipation



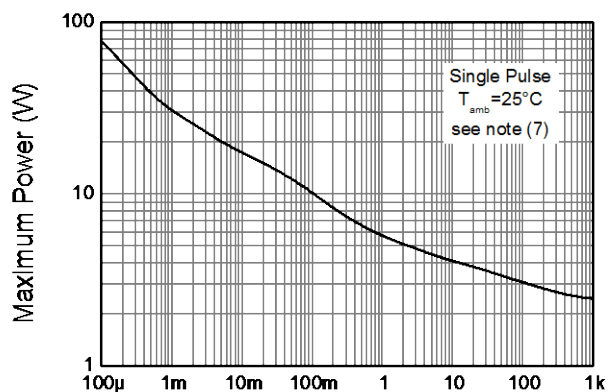
Transient Thermal Impedance



Pulse Power Dissipation



Transient Thermal Impedance



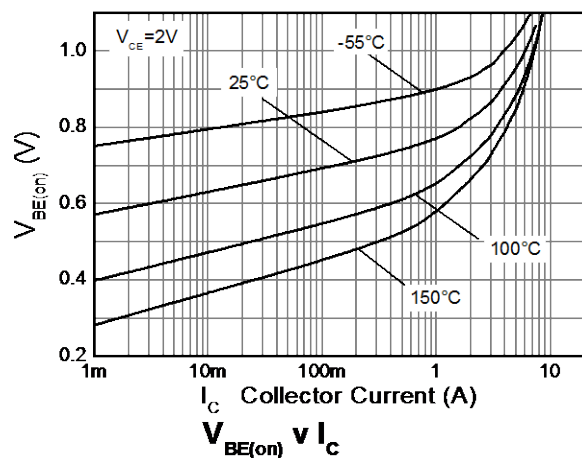
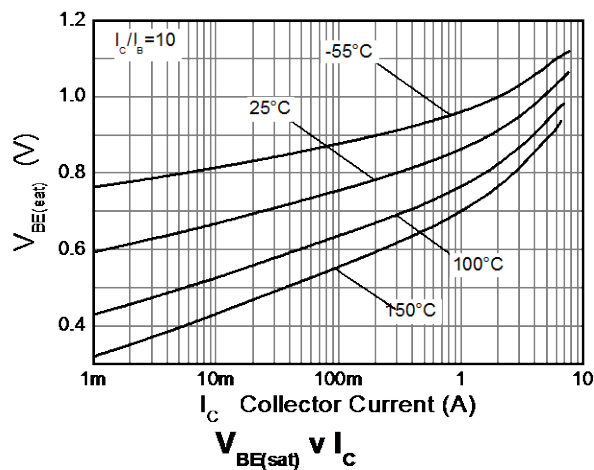
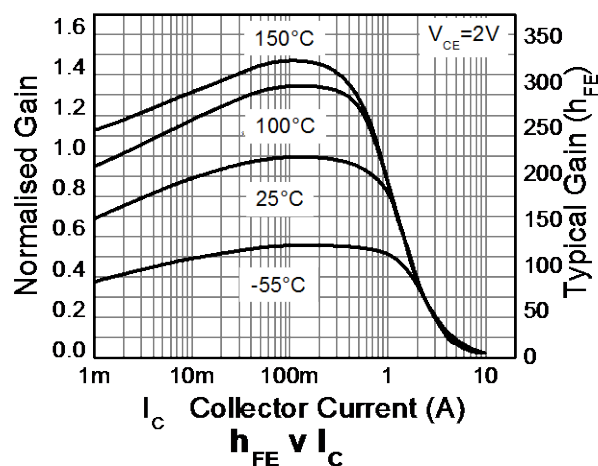
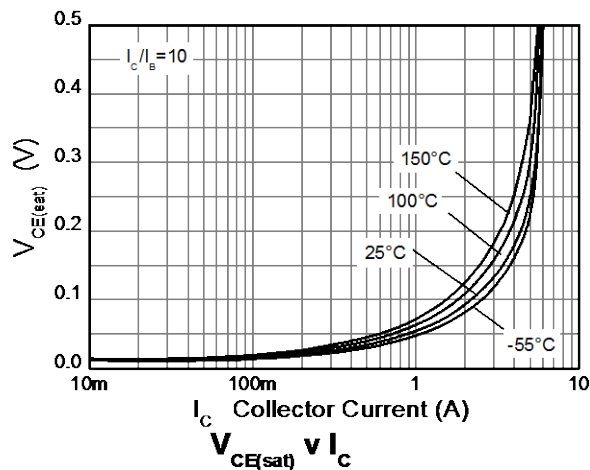
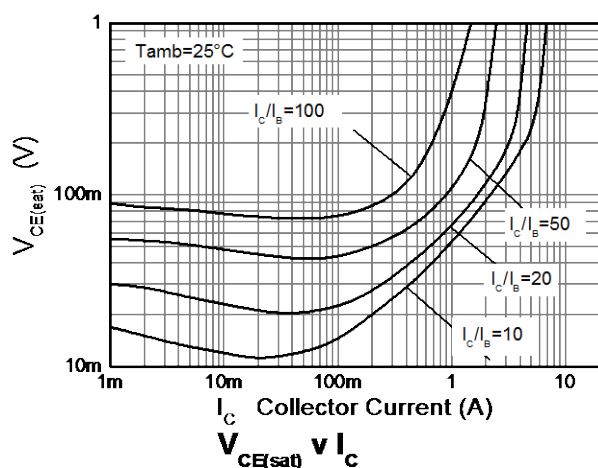
Pulse Power Dissipation

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}	150	190	—	V	$I_C = 100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Forward Blocking)	BV_{CEX}	150	190	—	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}	60	80	—	V	$I_C = 10\text{mA}$
Emitter-Base Breakdown Voltage	BV_{EBO}	7	8	—	V	$I_E = 100\mu\text{A}$
Emitter-Collector Breakdown Voltage (Reverse Blocking)	BV_{ECX}	6	8	—	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 (Base Open)	BV_{ECO}	6	7	—	V	$I_E = 100\mu\text{A}$
Collector-Base Cutoff Current	I_{CBO}	—	1	50 20	nA μA	$V_{CB} = 120\text{V}$ $V_{CB} = 120\text{V}$, $T_{amb} = 100^\circ\text{C}$
Collector-Emitter Cut-Off Current	I_{CEX}	—	—	100	nA	$V_{CE} = 120\text{V}$, $R_{BE} \leq 1\text{k}\Omega$ or $-1\text{V} < V_{BE} < 0.25\text{V}$
Emitter-Base Cut-Off Current	I_{EBO}	—	1	50	nA	$V_{EB} = 5.6\text{V}$
Collector-Emitter Saturation Voltage (Note 9)	$V_{CE(sat)}$	—	55 70 185 240	70 90 230 305	mV	$I_C = 1\text{A}$, $I_B = 100\text{mA}$ $I_C = 1\text{A}$, $I_B = 50\text{mA}$ $I_C = 4\text{A}$, $I_B = 400\text{mA}$ $I_C = 5\text{A}$, $I_B = 500\text{mA}$
Base-Emitter Saturation Voltage (Note 9)	$V_{BE(sat)}$	—	1020	1100	mV	$I_C = 5\text{A}$, $I_B = 500\text{mA}$
Base-Emitter Turn-On Voltage (Note 9)	$V_{BE(on)}$	—	960	1050	mV	$I_C = 5\text{A}$, $V_{CE} = 2\text{V}$
DC Current Gain (Note 9)	h_{FE}	100 90 45 —	200 180 90 20	300 — — —	—	$I_C = 10\text{mA}$, $V_{CE} = 2\text{V}$ $I_C = 1\text{A}$, $V_{CE} = 2\text{V}$ $I_C = 2\text{A}$, $V_{CE} = 50\text{V}$ $I_C = 5\text{A}$, $V_{CE} = 5\text{V}$
Transitional frequency	f_T	—	185	—	MHz	$I_C = 100\text{mA}$, $V_{CE} = 5\text{V}$ $f = 100\text{MHz}$
Output capacitance	C_{obo}	—	11.5	20	pF	$V_{CB} = 10\text{V}$, $f = 1\text{MHz}$
Delay Time	t_d	—	16	—	ns	$V_{CC} = 10\text{V}$, $I_{CC} = 500\text{mA}$ $I_{B1} = -I_{B2} = 50\text{mA}$
Rise Time	t_r	—	15	—	ns	
Storage Time	t_s	—	509	—	ns	
Fall Time	t_f	—	57	—	ns	

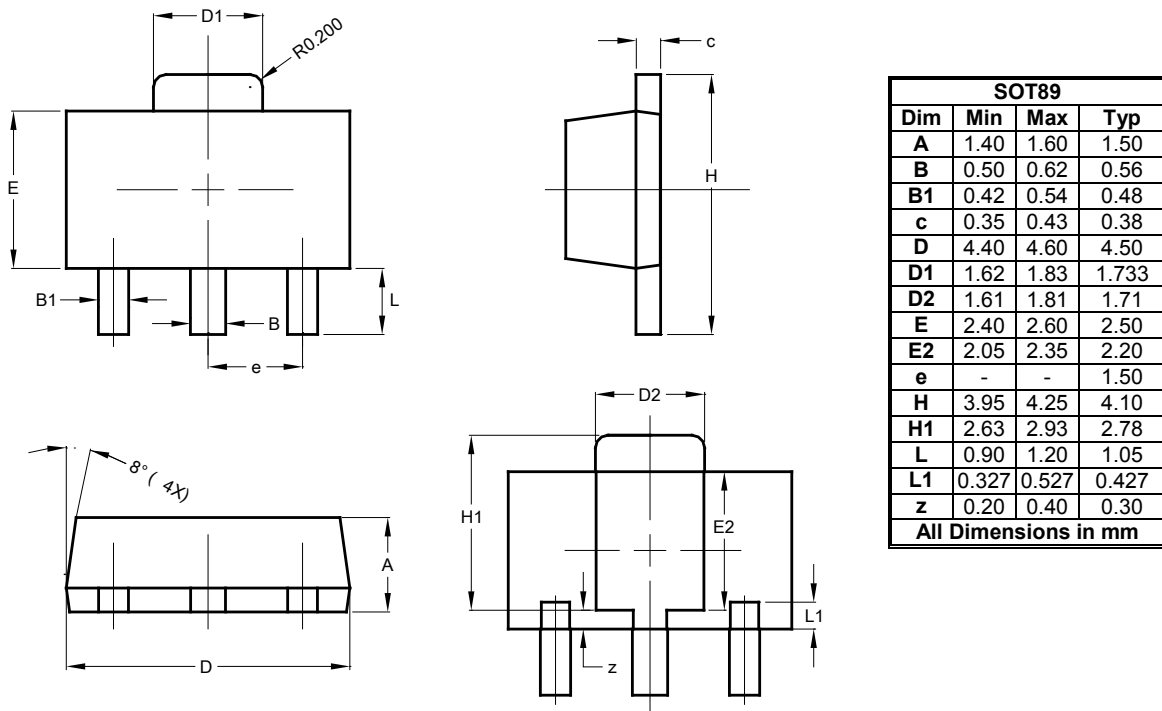
Note: 9. Measured under pulsed conditions. Pulse width $\leq 300\mu\text{s}$. Duty cycle $\leq 2\%$

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



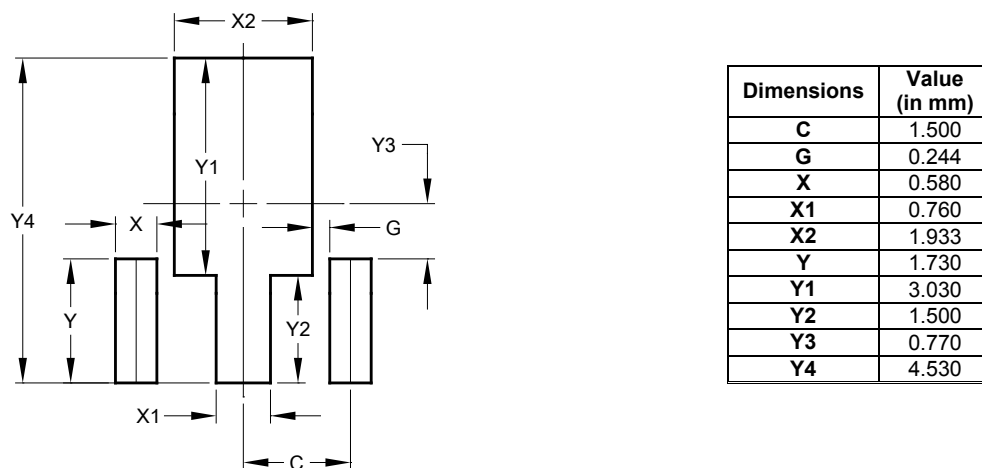
Package Outline Dimensions

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



Suggested Pad Layout

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