

## 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](mailto:contact@diodes.com) or your local Diodes representative.**  
<https://www.diodes.com/quality/product-definitions/>

## Mechanical Data

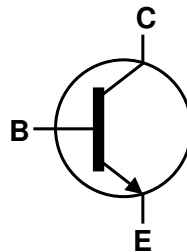
- Package: SOT89
- Package Material: Molded Plastic. "Green" Molding Compound. UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 @3
- Weight: 0.055 grams (Approximate)

## Applications

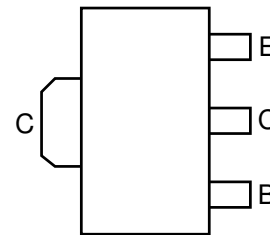
- Emergency lighting circuits
- Motor driving (including DC fans)
- Solenoid, relay, and actuator drivers
- DC-DC modules
- Backlight inverters
- Power switches
- MOSFET gate drivers



Top View



Equivalent Circuit



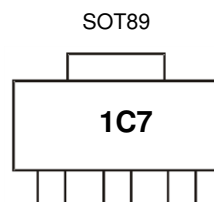
Top View  
Pin-Out

## Ordering Information (Note 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



1C7= Product Type Marking Code

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

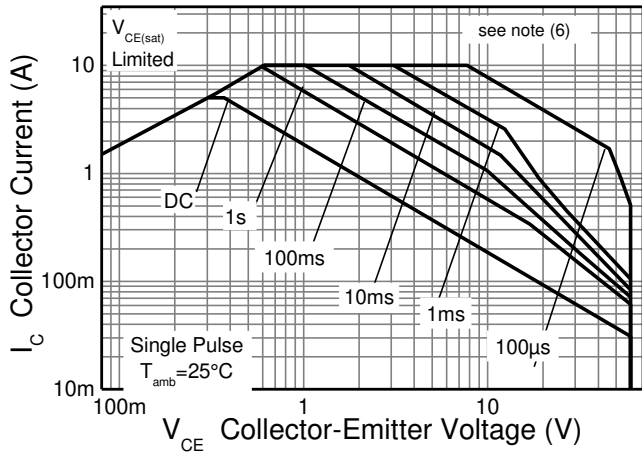
Characteristic	Symbol	Value	Unit
Collector-Base Voltage	$V_{CBO}$	150	V
Collector-Emitter Voltage (Forward Blocking)	$V_{CEX}$	150	V
Collector-Emitter Voltage	$V_{CEO}$	60	V
Emitter-Collector Voltage (Reverse Blocking)	$V_{ECO}$	6	V
Emitter-Base Voltage	$V_{EBO}$	7	V
Continuous Collector Current	$I_C$	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.)

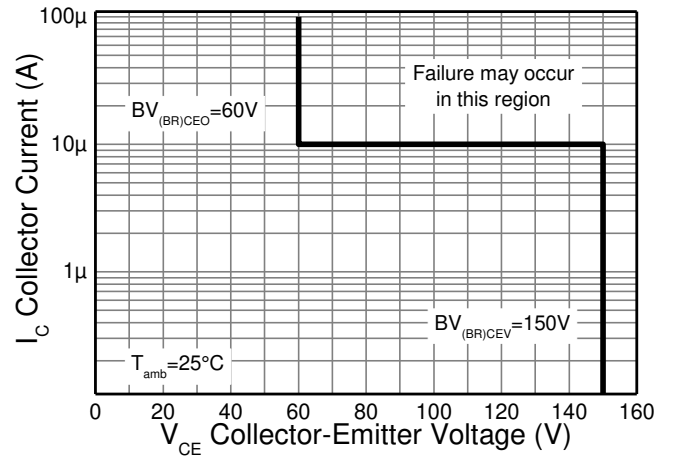
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5) Linear Derating Factor	$P_D$	1.1	W
Power Dissipation (Note 6) Linear Derating Factor		8.8	mW/°C
Power Dissipation (Note 7) Linear Derating Factor		1.8	W
Power Dissipation (Note 8) Linear Derating Factor		14.4	mW/°C
Power Dissipation (Note 5) Linear Derating Factor		2.4	W
Power Dissipation (Note 6) Linear Derating Factor		19.2	mW/°C
Power Dissipation (Note 7) Linear Derating Factor		4.46	W
Power Dissipation (Note 8) Linear Derating Factor		35.7	mW/°C
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	117	°C/W
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	°C

- Notes:
5. 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.
  6. Same as Note (5), except the device is mounted on 25mm x 25mm 2oz copper.
  7. Same as Note (5), except the device is mounted on 50mm x 50mm 2oz copper.
  8. Same as Note (5), measured at  $t < 5$  seconds.

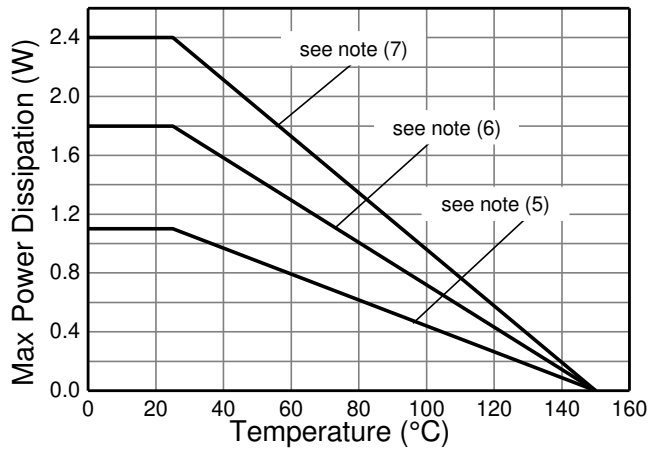
**Thermal Characteristics and Derating Information**



**Safe Operating Area**

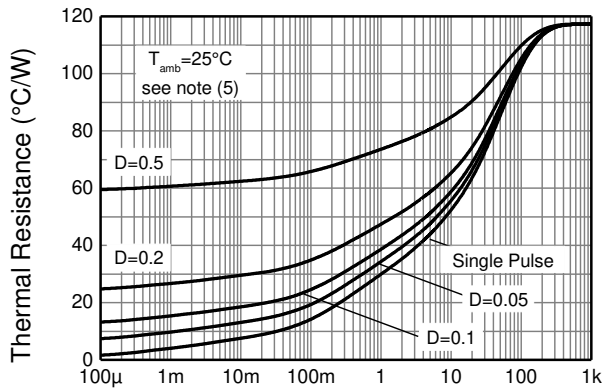


**Safe Operating Area**

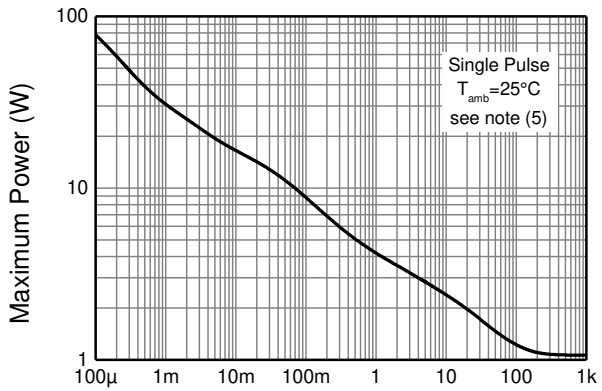


**Derating Curve**

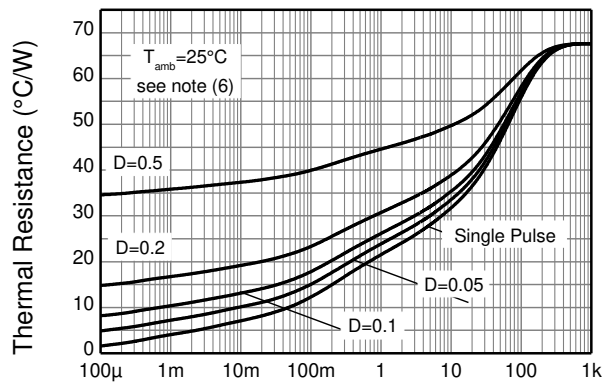
**Thermal Characteristics and Derating Information**



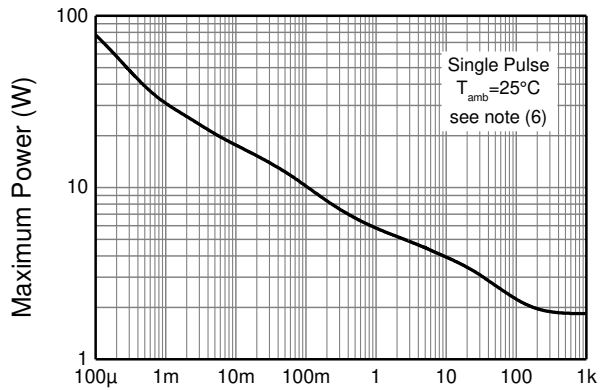
Pulse Width (s)  
**Transient Thermal Impedance**



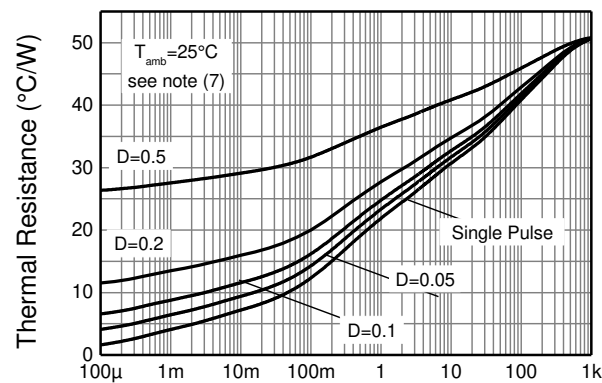
Pulse Width (s)  
**Pulse Power Dissipation**



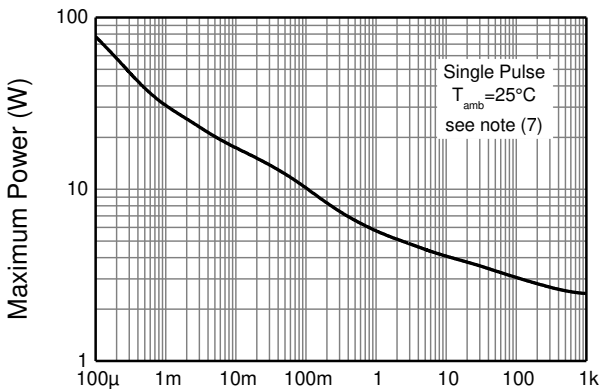
Pulse Width (s)  
**Transient Thermal Impedance**



Pulse Width (s)  
**Pulse Power Dissipation**



Pulse Width (s)  
**Transient Thermal Impedance**



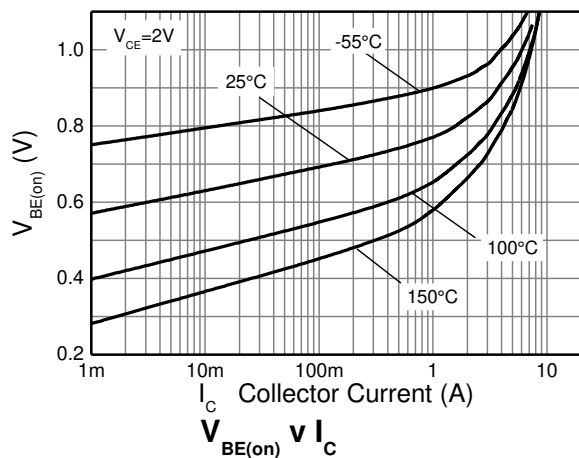
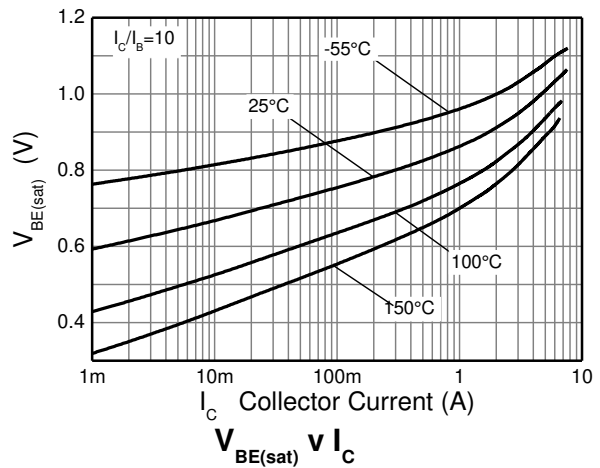
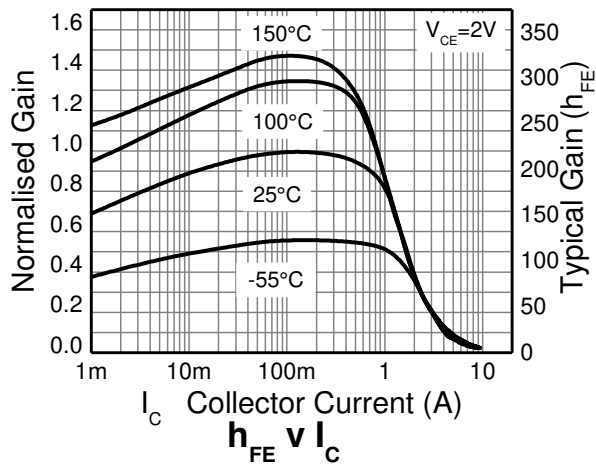
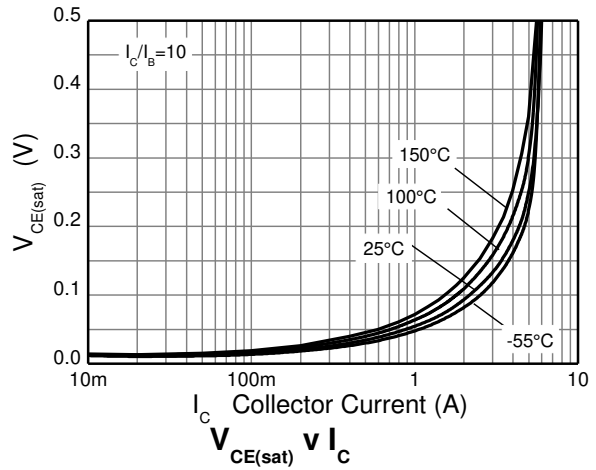
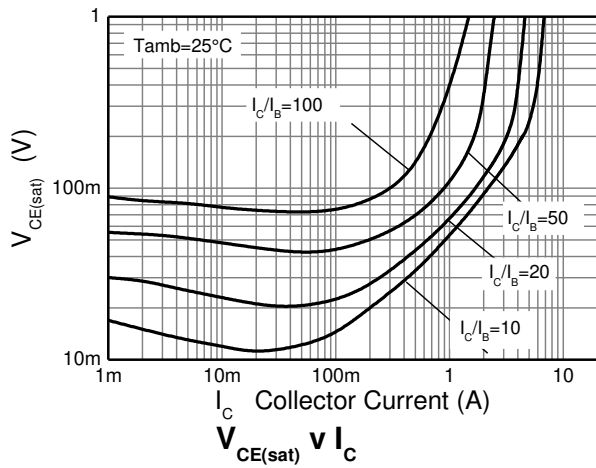
Pulse Width (s)  
**Pulse Power Dissipation**

**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 $-1\text{V} < V_{BC} < 0.25\text{V}$
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 $\mu\text{A}$	$V_{CB} = 120\text{V}$ $V_{CB} = 120\text{V}$ , $T_{\text{amb}} = 100^\circ\text{C}$
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)	$V_{CE(\text{sat})}$	—	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)	$V_{BE(\text{sat})}$	—	1020	1100	mV	$I_C = 5\text{A}$ , $I_B = 500\text{mA}$
Base-Emitter Turn-On Voltage (Note 9)	$V_{BE(\text{on})}$	—	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 — — —	—	$I_C = 10\text{mA}$ , $V_{CE} = 2\text{V}$ $I_C = 1\text{A}$ , $V_{CE} = 2\text{V}$ $I_C = 2\text{A}$ , $V_{CE} = 2\text{V}$ $I_C = 5\text{A}$ , $V_{CE} = 5\text{V}$
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	

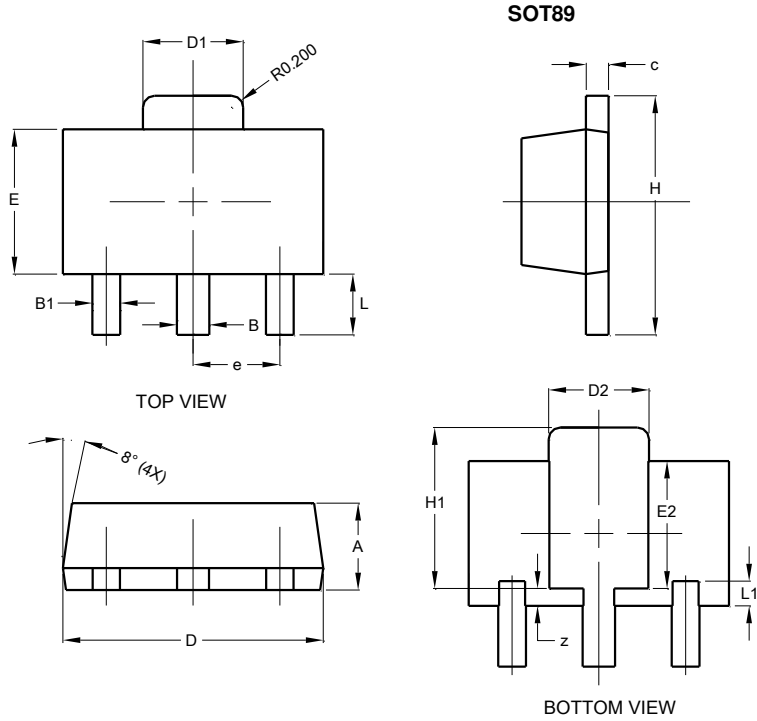
 Note: 9. Measured under pulsed conditions. Pulse width  $\leq 300\mu\text{s}$ . Duty cycle  $\leq 2\%$

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



**Package Outline Dimensions**

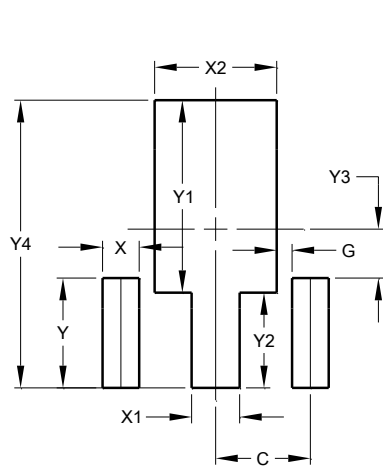
Please see <http://www.diodes.com/package-outlines.html> for the latest version.



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.



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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