

Features

- $BV_{CEO} > 100V$
- $BV_{ECO} > 6V$
- $I_C = 2.5A$ Continuous Collector Current
- $I_{CM} = 3.5A$ Peak Collector Current
- $V_{CE(SAT)} < 100mV @ 1A$
- $R_{CE(SAT)} = 80m\Omega$ for a Low Equivalent On-Resistance
- Complementary PNP Type: ZXTN25100CZ
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

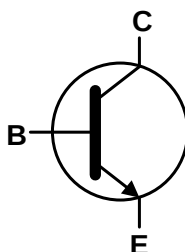
Mechanical Data

- 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 
- Weight: 0.05 grams (Approximate)

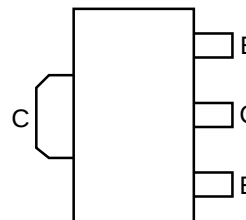
SOT89



Top View



Device Symbol



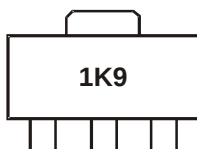
Top View
Pin Out

Ordering Information (Note 4)

Part Number	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity Per Reel
ZXTN25100DZTA	AEC-Q101	1K9	7	12	1,000

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
 2. See http://www.diodes.com/quality/lead_free.html 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



1K9 = Product Type Marking Code

Absolute Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V _{CBO}	180	V
Collector-Emitter Voltage (Forward Blocking)	V _{CEX}	180	V
Collector-Emitter Voltage	V _{CEO}	100	V
Emitter-Collector Voltage (Reverse Blocking)	V _{ECO}	6	V
Emitter-Base Voltage	V _{EBO}	7	V
Continuous Collector Current	I _C	2.5	A
Peak Pulse Current	I _{CM}	3.5	A
Base Current	I _B	1	A

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

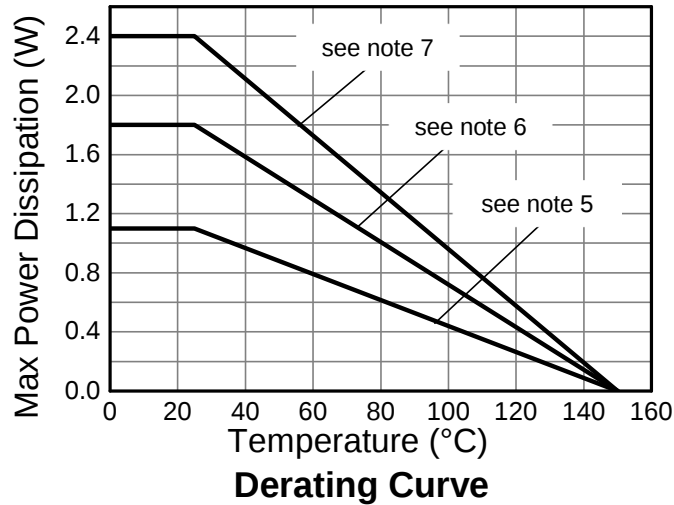
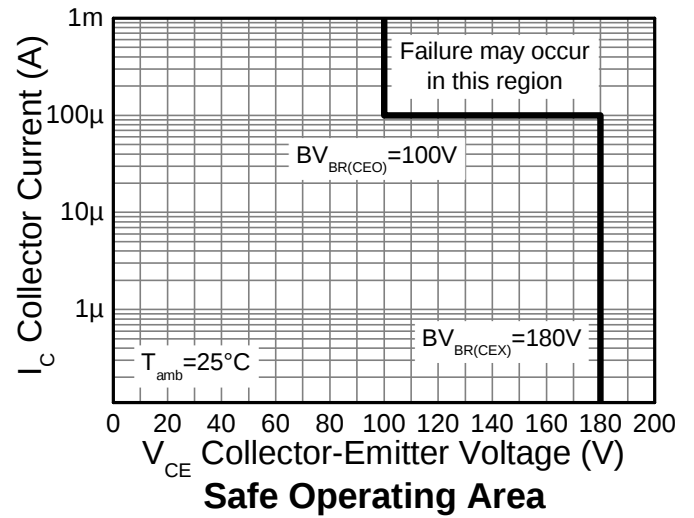
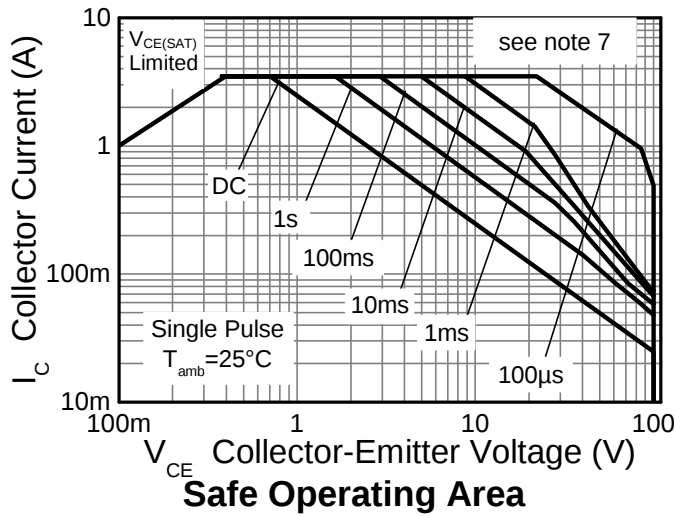
Characteristic	Symbol	Value	Unit
Power Dissipation Linear Derating Factor	P _D	1.1	W mW/°C
		8.8	
		1.8	
		14.4	
		2.4	
Thermal Resistance, Junction to Ambient Air	R _{θJA}	19.2	°C/W
		4.46	
		35.7	
		117	
		68	
Thermal Resistance, Junction to Lead	R _{θJL}	51	°C/W
		28	
		7.95	
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

ESD Ratings (Note 10)

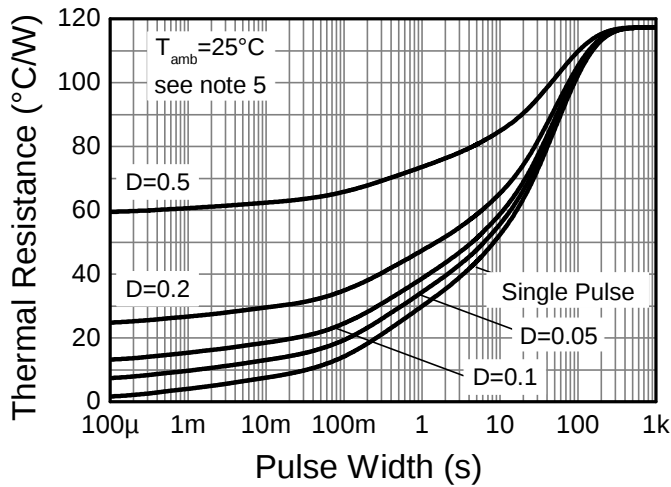
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

- Notes:
- For a device mounted with the exposed collector pad on 15mm x 15mm 1oz copper that is on a single-sided 0.6mm FR-4 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 7, except the device is measured at t<5 seconds.
 - Thermal resistance from junction to solder-point (on the exposed collector pad).
 - Refer to JEDEC specification JESD22-A114 and JESD22-A115.

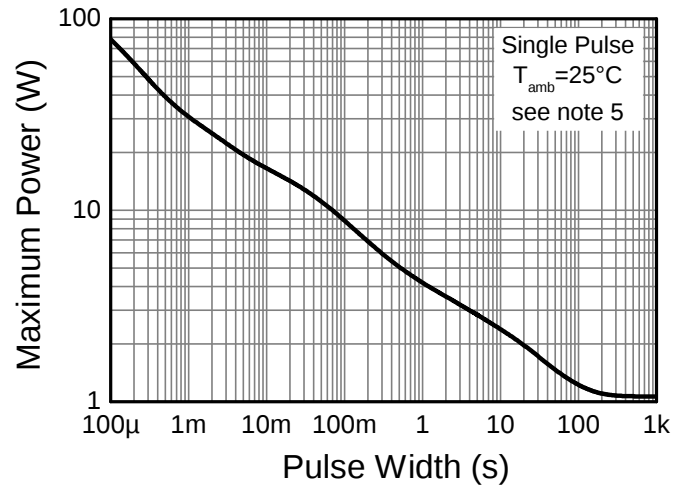
Thermal Characteristics and Derating Information



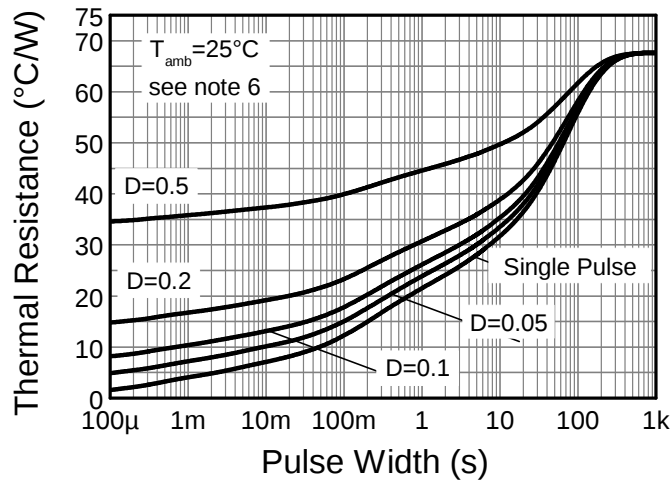
Thermal Characteristics and Derating Information



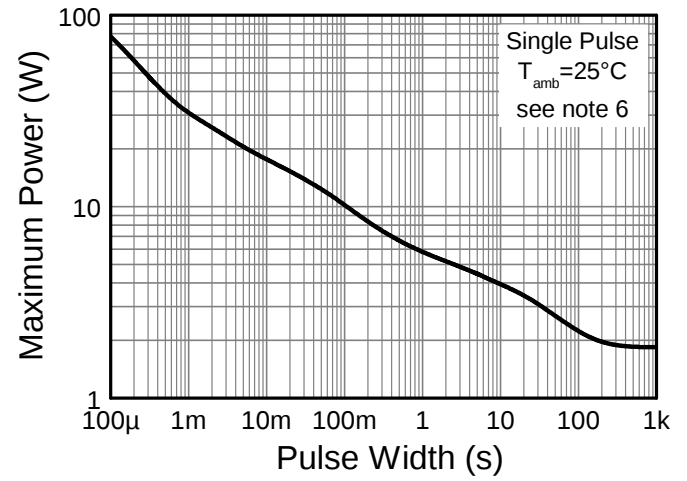
Transient Thermal Impedance



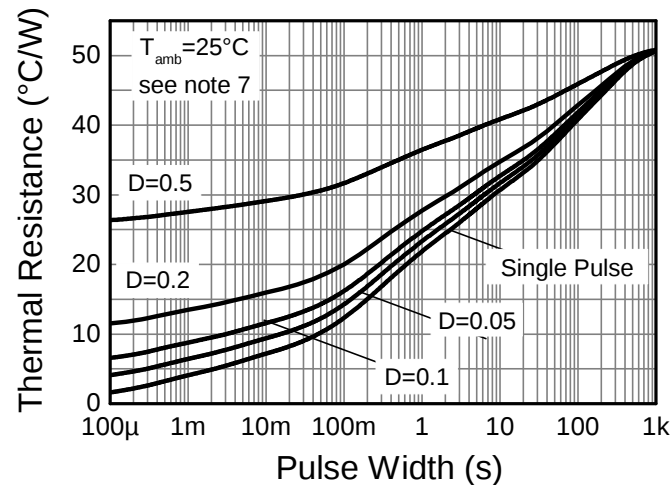
Pulse Power Dissipation



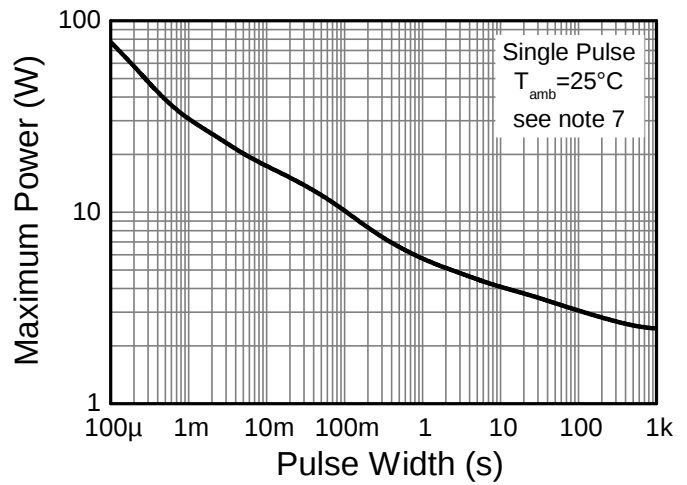
Transient Thermal Impedance



Pulse Power Dissipation



Transient Thermal Impedance



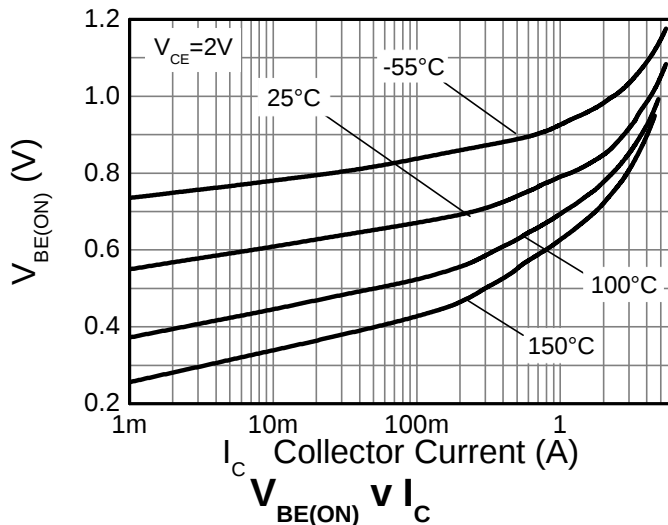
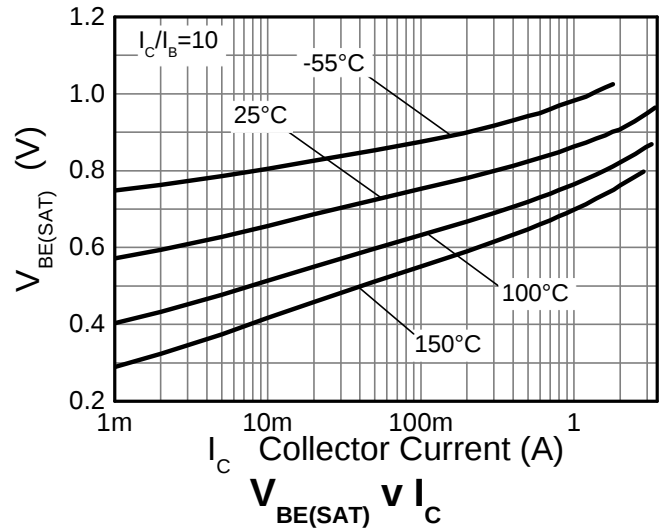
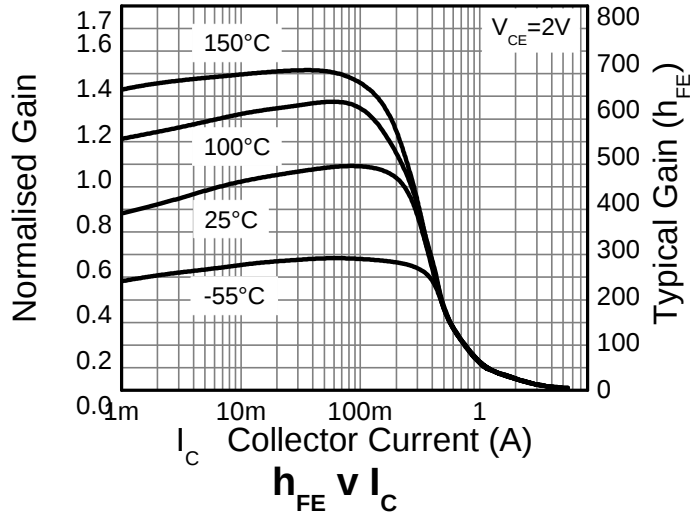
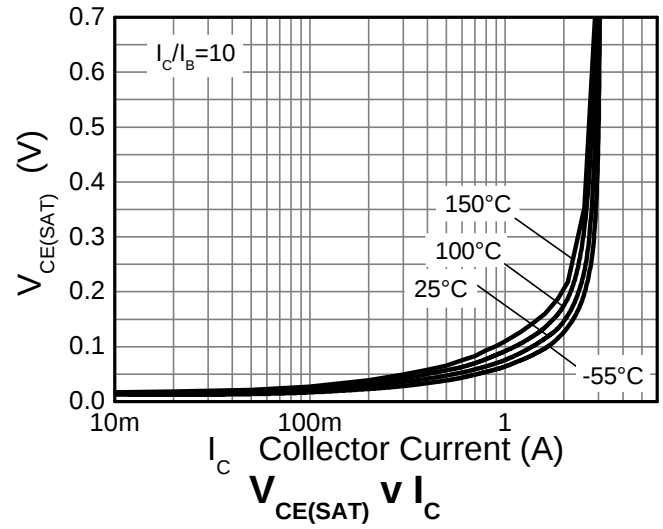
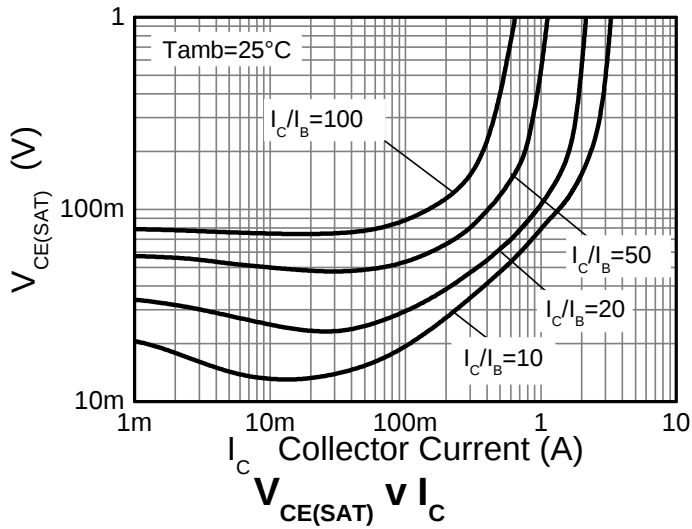
Pulse Power Dissipation

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV _{CBO}	180	220	—	V	I _C = 100μA
Collector-Emitter Breakdown Voltage (Forward Blocking)	BV _{CEX}	180	220	—	V	I _C = 100μA, R _{BE} < 1kΩ or -1V > V _{BE} > 0.25V
Collector-Emitter Breakdown Voltage (Note 11)	BV _{CEO}	100	130	—	V	I _C = 10mA
Emitter-Collector Breakdown Voltage (Reverse Blocking)	BV _{ECX}	6	8.2	—	V	I _E = 100μA, R _{BC} < 1kΩ or 0.25V > V _{BC} > -0.25V
Emitter-Collector Breakdown Voltage (Reverse Blocking)	BV _{ECO}	6	8.7	—	V	I _E = 100μA
Emitter-Base Breakdown Voltage	BV _{EBO}	7	8.3	—	V	I _E = 100μA
Collector-Base Cutoff Current	I _{CBO}	—	<1	50 0.5	nA μA	V _{CB} = 180V V _{CB} = 180V, T _A = +100°C
Collector-Emitter Cutoff Current	I _{CEX}	—	—	100	nA	V _{CE} = 100V, R _{BE} < 1kΩ or 1V < V _{BE} < 0.25V
Emitter Cutoff Current	I _{EBO}	—	<1	50	nA	V _{EB} = 5.6V
DC Current Transfer Static Ratio (Note 11)	h _{FE}	300 120 40 —	450 170 60 20	900 — — —	—	I _C = 10mA, V _{CE} = 2V I _C = 0.5A, V _{CE} = 2V I _C = 1A, V _{CE} = 2V I _C = 2.5A, V _{CE} = 2V
Collector-Emitter Saturation Voltage (Note 11)	V _{CE(SAT)}	—	120 80 220	170 100 345	mV	I _C = 0.5A, I _B = 10mA I _C = 1A, I _B = 100mA I _C = 2.5A, I _B = 250mA
Base-Emitter Saturation Voltage (Note 11)	V _{BE(SAT)}	—	935	1000	mV	I _C = 2.5A, I _B = 250mA
Base-Emitter Turn-on Voltage (Note 11)	V _{BE(ON)}	—	890	950	mV	I _C = 2.5A, V _{CE} = 2V
Transitional Frequency	f _T	—	175	—	MHz	I _E = 50mA, V _{CE} = 10V f = 100MHz
Input Capacitance	C _{IBO}	—	154	250	pF	V _{EB} = 0.5V, f = 1MHz
Output Capacitance	C _{OBO}	—	8.7	15	pF	V _{CB} = 10V, f = 1MHz
Delay Time	t _D	—	16.4	—	ns	I _C = 500mA, V _{CC} = 10V, I _{B1} = -I _{B2} = 50mA
Rise Time	t _R	—	115	—	ns	
Storage Time	t _S	—	763	—	ns	
Fall Time	t _F	—	158	—	ns	

Note: 11. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

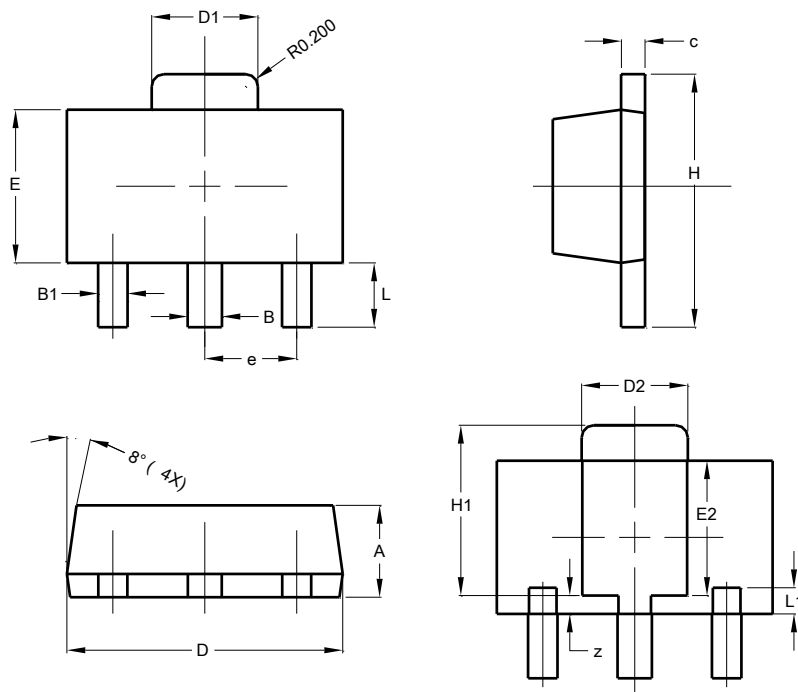
Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)



Package Outline Dimensions

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

SOT89

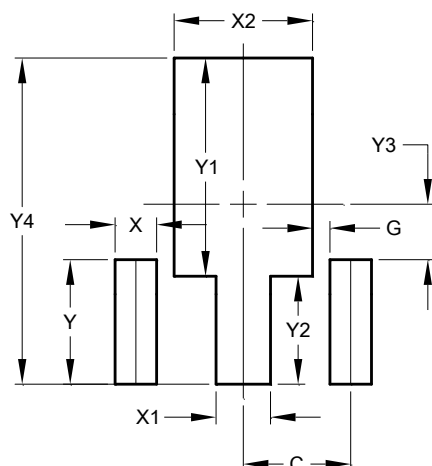


SOT89			
Dim	Min	Max	Typ
A	1.40	1.60	1.50
B	0.50	0.62	0.56
B1	0.42	0.54	0.48
c	0.35	0.43	0.38
D	4.40	4.60	4.50
D1	1.62	1.83	1.733
D2	1.61	1.81	1.71
E	2.40	2.60	2.50
E2	2.05	2.35	2.20
e	-	-	1.50
H	3.95	4.25	4.10
H1	2.63	2.93	2.78
L	0.90	1.20	1.05
L1	0.327	0.527	0.427
z	0.20	0.40	0.30
All Dimensions in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

Note: For high voltage applications, the appropriate industry sector guidelines should be considered with regards to creepage and clearance distances between device Terminals and PCB tracking.

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