

**100V PNP MEDIUM POWER TRANSISTOR IN SOT89**

**Features**

- $BV_{CEO} > -100V$
- $BV_{ECO} > -7V$
- $I_C = -2A$  High Continuous Collector Current
- $I_{CM} = -3A$  Peak Collector Current
- $V_{CE(SAT)} < 130mV @ -1A$
- $R_{CE(SAT)} = 100m\Omega$  for a Low Equivalent On-Resistance
- Complementary NPN Type: ZXTN19100CZ
- **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**
- **PPAP Capable (Note 4)**

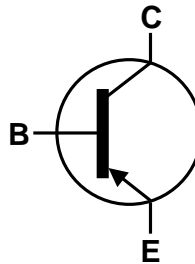
**Mechanical Data**

- 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 208②③
- Weight: 0.05 grams (Approximate)

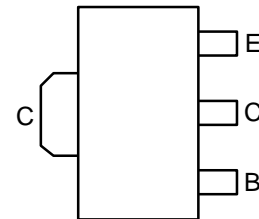
SOT89



Top View



Device Symbol



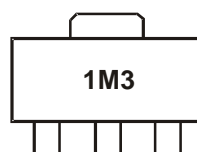
Top View  
Pin Out

**Ordering Information** (Notes 4 & 5)

Product	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
ZXTP19100CZTA	AEC-Q101	1M3	7	12	1,000
ZXTP19100CZQTA	Automotive	1M3	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](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. Automotive products are AEC-Q101 qualified and are PPAP capable. Automotive, AEC-Q101 and standard products are electrically and thermally the same, except where specified. For more information, please refer to [http://www.diodes.com/quality/product\\_compliance\\_definitions/](http://www.diodes.com/quality/product_compliance_definitions/).
  5. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

**Marking Information**



1M3 = Product Type Marking Code

**Absolute Maximum Ratings** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Limit	Unit
Collector-Base Voltage	V <sub>CBO</sub>	-110	V
Collector-Emitter Voltage (Forward Blocking)	V <sub>CEX</sub>	-110	V
Collector-Emitter Voltage	V <sub>CEO</sub>	-100	V
Emitter-Collector Voltage (Reverse Blocking)	V <sub>ECO</sub>	-7	V
Emitter-Base Voltage	V <sub>EBO</sub>	-7	V
Continuous Collector Current	I <sub>C</sub>	-2	A
Peak Pulse Current	I <sub>CM</sub>	-3	A
Base Current	I <sub>B</sub>	-1	A

**Thermal Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

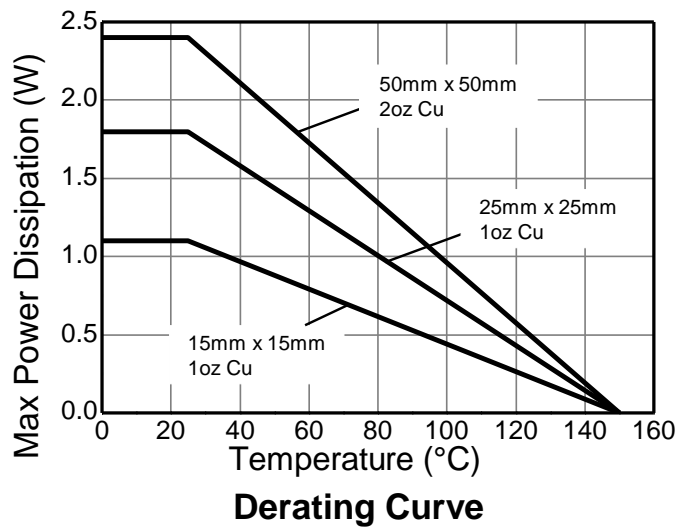
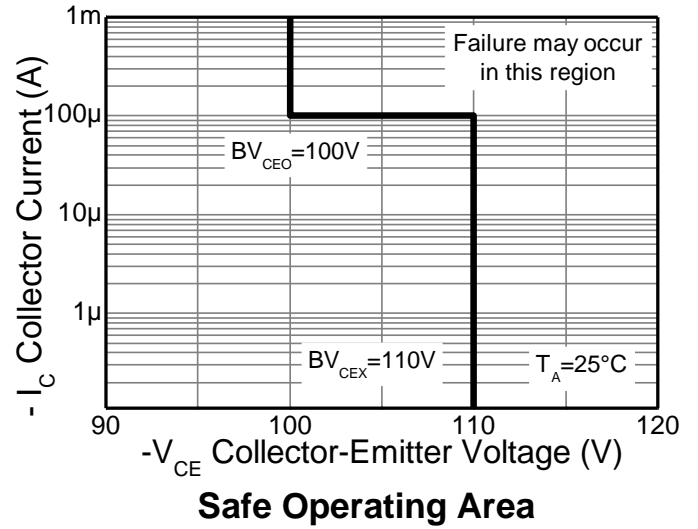
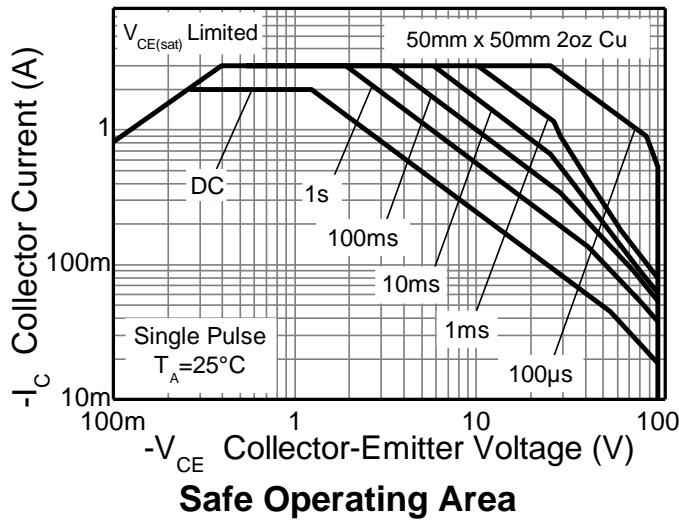
Characteristic	Symbol	Value	Unit	
Power Dissipation Linear Derating Factor	P <sub>D</sub>	1.1	W mW/°C	
		(Note 6)		8.8
		(Note 7)		1.8
		(Note 8)		14.4
				2.4
Thermal Resistance, Junction to Ambient Air	R <sub>θJA</sub>	19.2	°C/W	
		(Note 9)		4.46
		(Note 6)		117
		(Note 7)		68
Thermal Resistance, Junction to Lead	R <sub>θJL</sub>	(Note 8)	51	
		(Note 9)	28	
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C	

**ESD Ratings** (Note 11)

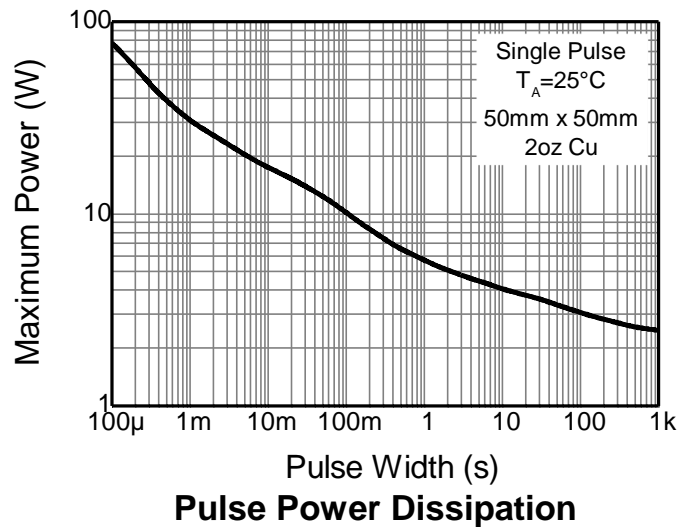
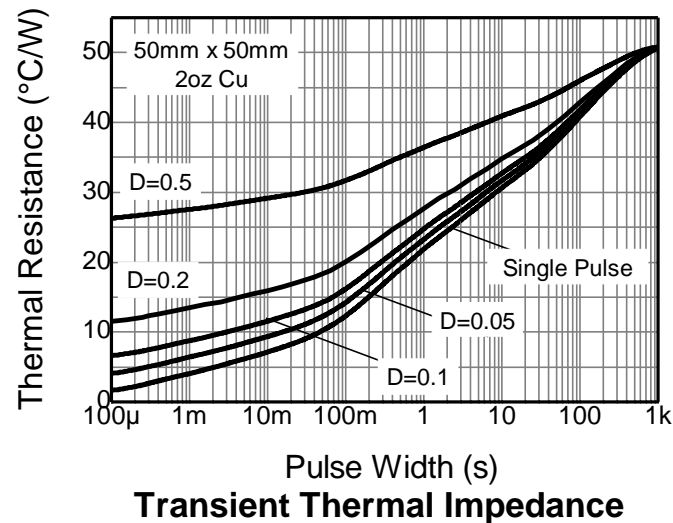
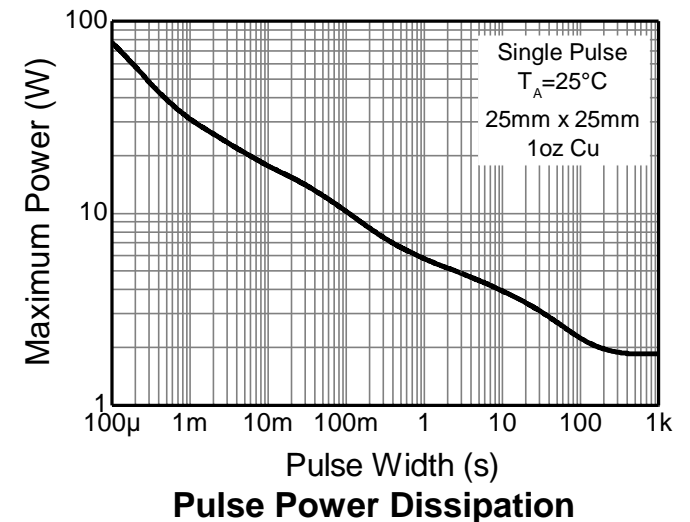
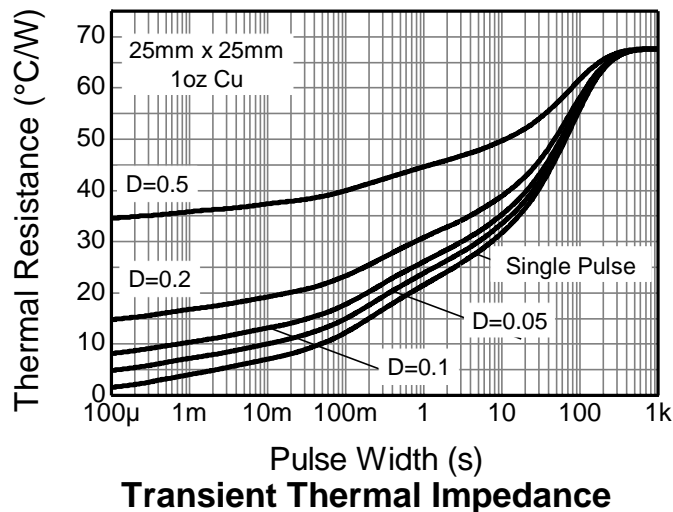
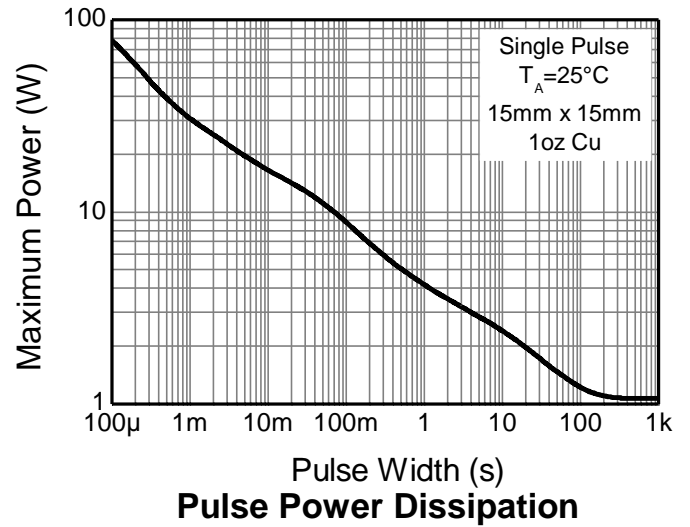
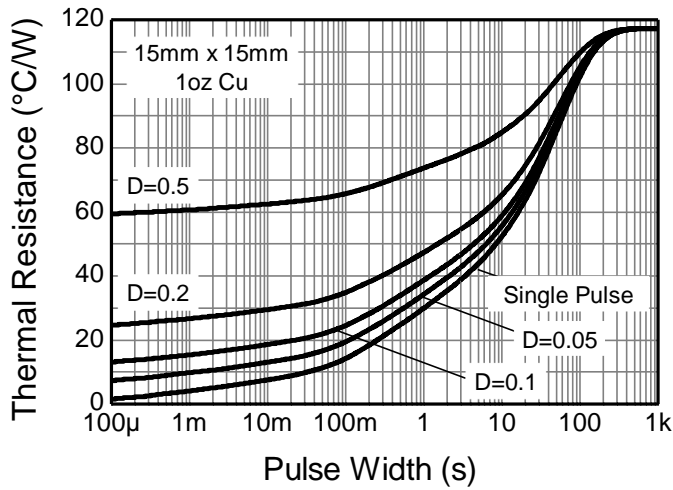
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

- Notes:
- For a device mounted with the exposed collector pad on 15mm x 15mm 1oz copper that is on a single-sided 0.6mm FR4 PCB; device is measured under still air conditions whilst operating in a steady-state.
  - Same as Note 6, except the device is mounted on 25mm x 25mm 1oz copper.
  - Same as Note 6, except the device is mounted on 50mm x 50mm 2oz copper.
  - Same as Note 8, 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 (cont.)**

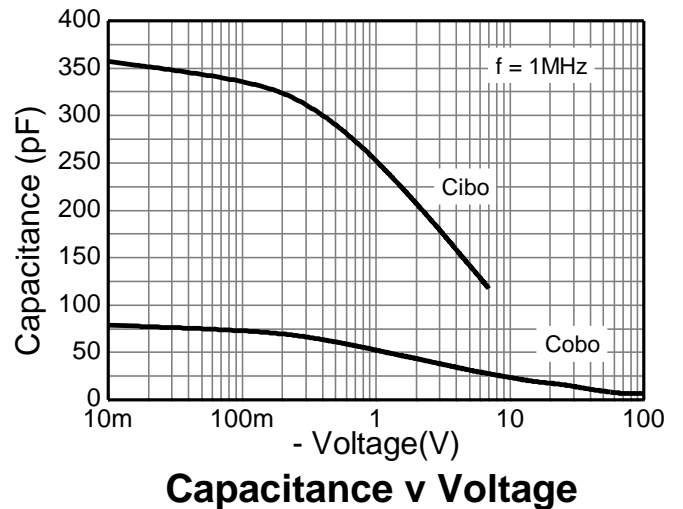
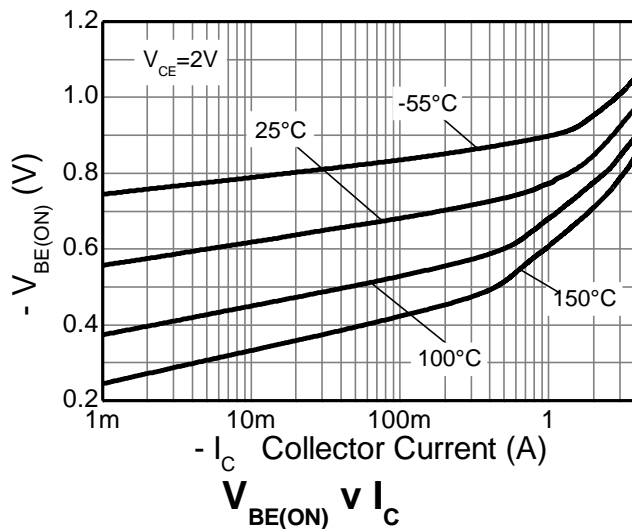
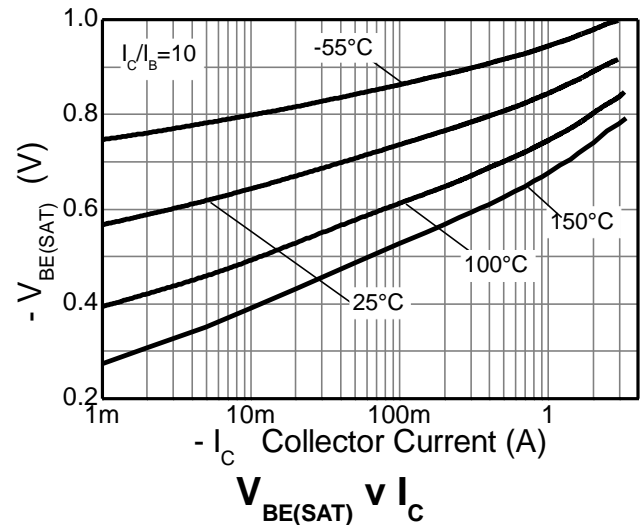
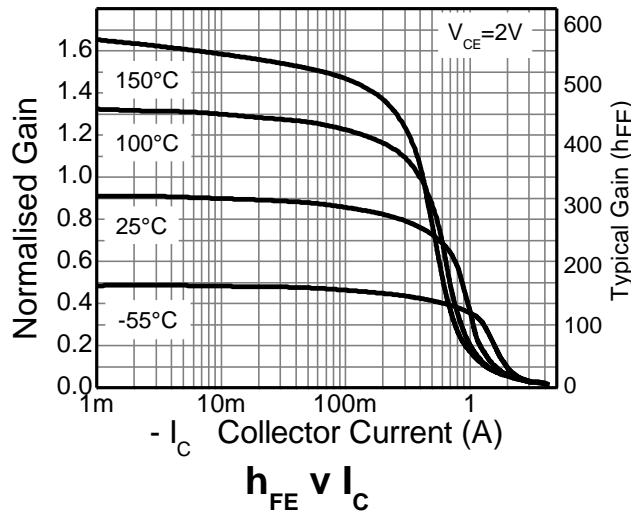
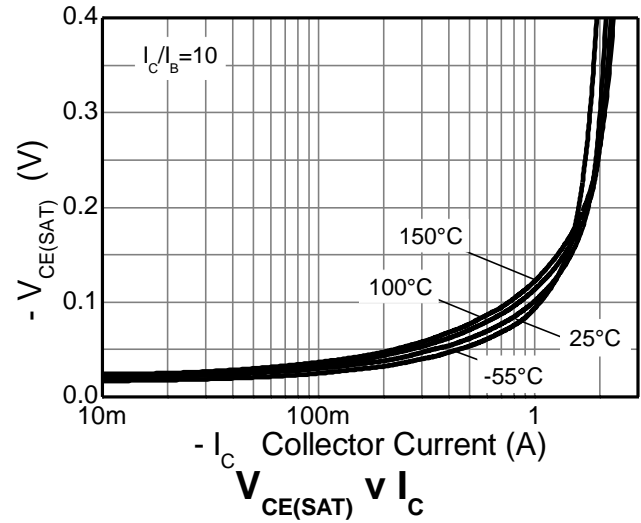
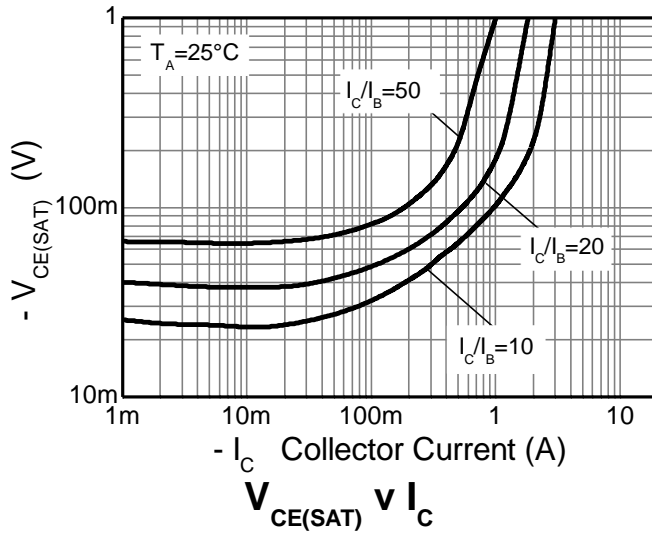


**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV <sub>CBO</sub>	-110	-135	—	V	I <sub>C</sub> = -100μA
Collector-Emitter Breakdown Voltage	BV <sub>CEX</sub>	-110	-135	—	V	I <sub>E</sub> = -100μA, R <sub>BC</sub> <1kΩ or 0.25V > V <sub>BC</sub> > -0.25V
Collector-Emitter Breakdown Voltage (Note 12)	BV <sub>CEO</sub>	-100	-135	—	V	I <sub>C</sub> = -10mA
Emitter-Collector Breakdown Voltage (Reverse Blocking)	BV <sub>ECX</sub>	-7	-8.3	—	V	I <sub>E</sub> = -100μA, R <sub>BC</sub> <1kΩ or 0.25V > V <sub>BC</sub> > -0.25V
Emitter-Collector Breakdown Voltage (Reverse Blocking)	BV <sub>ECO</sub>	-7	-8.7	—	V	I <sub>E</sub> = -100μA
Emitter-Base Breakdown Voltage	BV <sub>EBO</sub>	-7	-8.3	—	V	I <sub>E</sub> = -100μA
Collector-Base Cutoff Current	I <sub>CBO</sub>	—	<1	-50 -0.5	nA μA	V <sub>CB</sub> = -110V V <sub>CB</sub> = -110V, T <sub>A</sub> = +100°C
Emitter Cutoff Current	I <sub>EBO</sub>	—	<1	-50	nA	V <sub>EB</sub> = -5.6V
DC Current Transfer Static Ratio (Note 12)	h <sub>FE</sub>	200 70 20	300 130 25	500 — —	—	I <sub>C</sub> = -100mA, V <sub>CE</sub> = -2V I <sub>C</sub> = -1A, V <sub>CE</sub> = -2V I <sub>C</sub> = -2A, V <sub>CE</sub> = -2V
Collector-Emitter Saturation Voltage (Note 12)	V <sub>CE(sat)</sub>	—	-100 -100 -180 -220	-130 -125 -230 -295	mV	I <sub>C</sub> = -0.5mA, I <sub>B</sub> = -20mA I <sub>C</sub> = -1A, I <sub>B</sub> = -100mA I <sub>C</sub> = -1A, I <sub>B</sub> = -50mA I <sub>C</sub> = -2A, I <sub>B</sub> = -200mA
Base-Emitter Saturation Voltage (Note 12)	V <sub>BE(sat)</sub>	—	-890	-1000	mV	I <sub>C</sub> = -2A, I <sub>B</sub> = -200mA
Base-Emitter Turn-on Voltage (Note 12)	V <sub>BE(on)</sub>	—	-840	-950	mV	I <sub>C</sub> = -2A, V <sub>CE</sub> = -2V
Transitional Frequency	f <sub>T</sub>	—	142	—	MHz	I <sub>E</sub> = -100mA, V <sub>CE</sub> = -10V f = 50MHz
Input Capacitance	C <sub>ibo</sub>	—	291	400	pF	V <sub>EB</sub> = -0.5V, f = 1MHz,
Output Capacitance	C <sub>obo</sub>	—	23.5	40	pF	V <sub>CB</sub> = -10V, f = 1MHz,
Delay Time	t <sub>d</sub>	—	24.7	—	ns	I <sub>C</sub> = -500mA, V <sub>CC</sub> = -10V, I <sub>B1</sub> = -I <sub>B2</sub> = -50mA R <sub>b</sub> = 100Ω, R <sub>c</sub> = 20Ω
Rise Time	t <sub>r</sub>	—	22.4	—	ns	
Storage Time	t <sub>s</sub>	—	660	—	ns	
Fall Time	t <sub>f</sub>	—	107	—	ns	

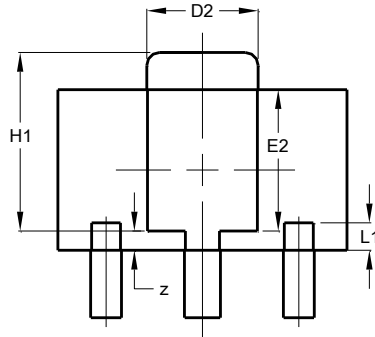
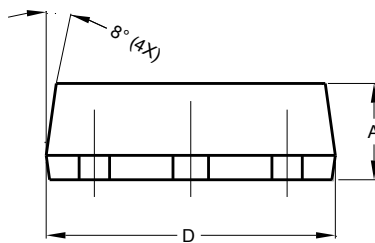
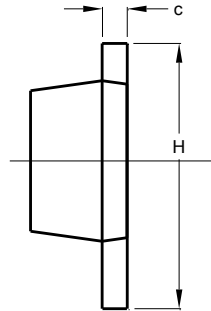
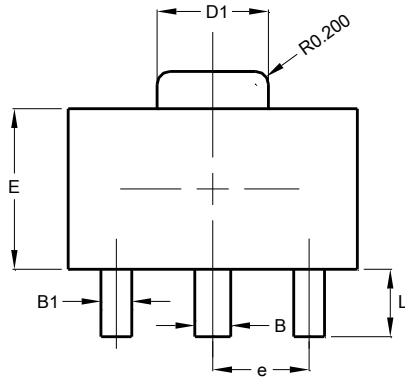
Note: 12. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

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



## Package Outline Dimensions

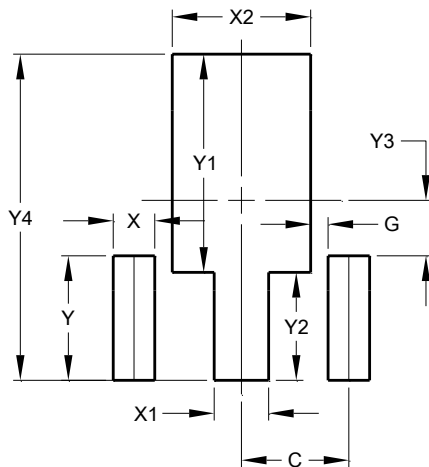
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



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 AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> 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

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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