

80V NPN MEDIUM POWER TRANSISTOR IN SOT89
Features

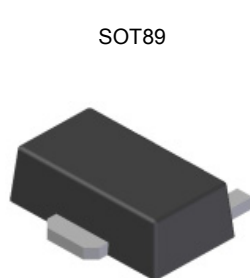
- $BV_{CE0} > 80V$
- $I_C = -1A$ High Continuous Current
- Low saturation voltage $V_{CE(sat)} < 250mV @ 150mA$
- Complementary type BSR33
- **Totally Lead-Free & Fully RoHS compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **PPAP capable (Note 4)**

Application

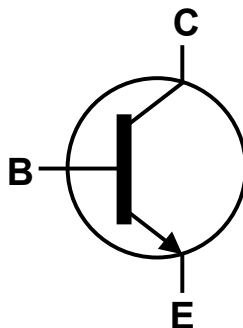
- Load management functions
- Solenoid, relay and actuator drivers
- DC – DC modules

Mechanical Data

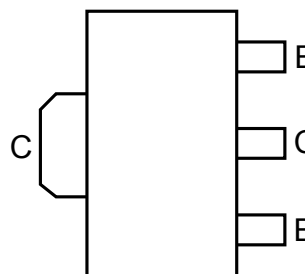
- Case: SOT89
- Case Material: Molded Plastic, "Green" Molding Compound
UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish, Solderable per MIL-STD-202,
Method 208 **(e3)**
- Weight: 0.052 grams (Approximate)



Top View



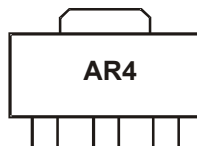
Device Symbol


 Top View
 Pin-Out

Ordering Information (Notes 4 & 5)

Product	Compliance	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
BSR43TA	AEC-Q101	AR4	7	12	1,000
BSR43QTA	Automotive	AR4	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. Automotive products are AEC-Q10x qualified and are PPAP capable. Automotive, AEC-Q10x 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/.
 5. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>

Marking Information


AR4 = Product Type Marking Code

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V _{CBO}	90	V
Collector-Emitter Voltage	V _{CEO}	80	V
Emitter-Base Voltage	V _{EBO}	5	V
Continuous Collector Current	I _C	1	A
Peak Pulse Current	I _{CM}	2	A
Peak Base Current	I _{BM}	200	mA

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

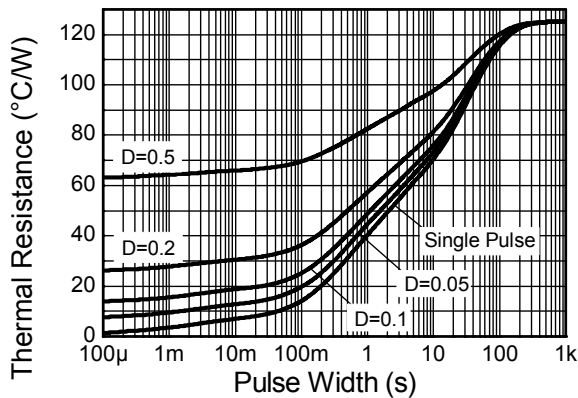
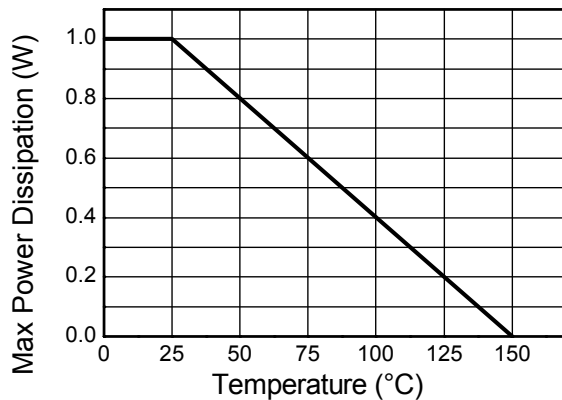
Characteristic	Symbol	Value	Unit
Power Dissipation	P _D	1	W
		1.5	
		2.1	
Thermal Resistance, Junction to Ambient Air	R _{θJA}	125	°C/W
		83	
		60	
Thermal Resistance, Junction to Lead	R _{θJL}	13	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-65 to +150	°C

ESD Ratings (Note 9)

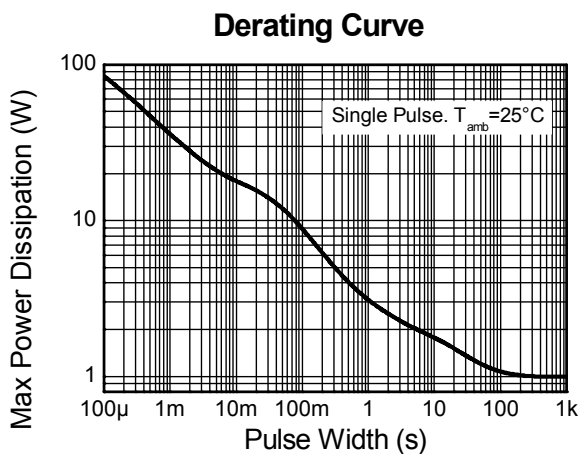
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

- Notes:
- For a device mounted with the exposed collector pad on 15mm x 15mm 1oz copper that is on a single-sided 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 1oz copper.
 - Same as note (5), except the device is mounted on 50mm x 50mm 1oz copper.
 - Thermal resistance from junction to solder-point (on the exposed collector pad).
 - Refer to JEDEC specification JESD22-A114 and JESD22-A115.

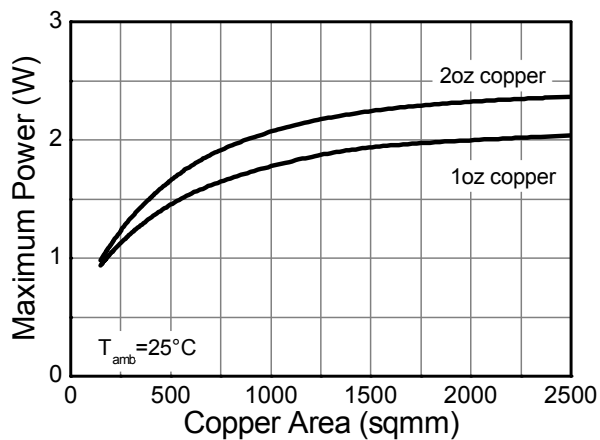
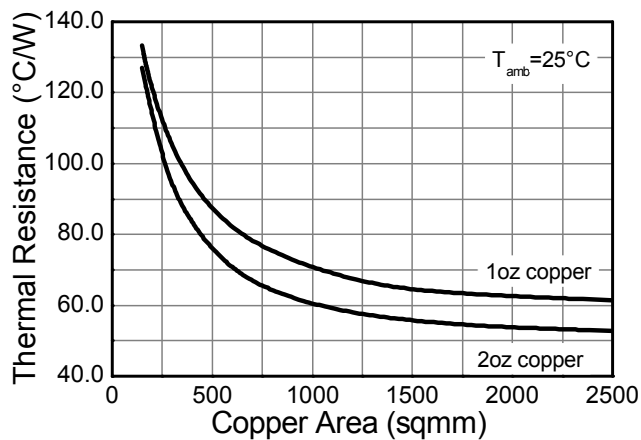
Thermal Characteristics and Derating Information



Transient Thermal Impedance



Pulse Power Dissipation

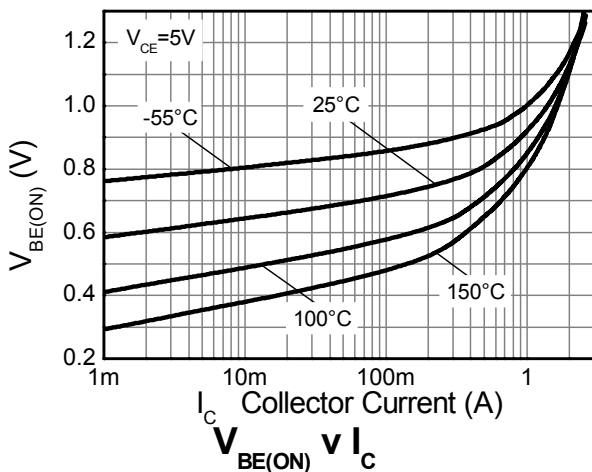
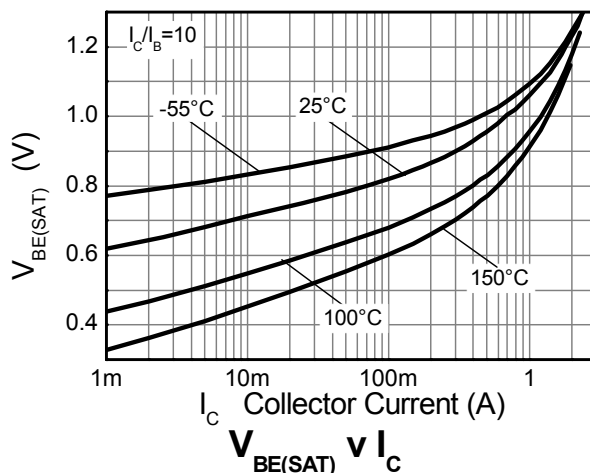
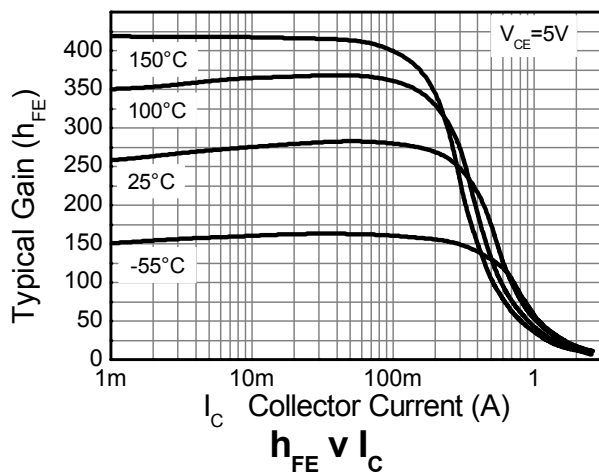
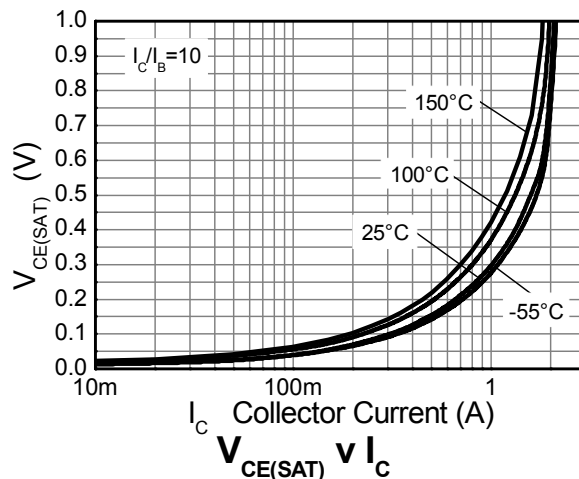
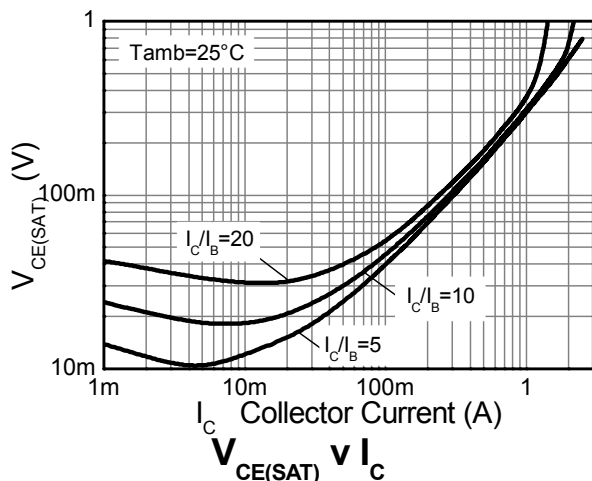


Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ.	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV _{CBO}	90	—	—	V	I _C = 100μA
Collector-Emitter Breakdown Voltage (Note 11)	BV _{CEO}	80	—	—	V	I _C = 10mA
Emitter-Base Breakdown Voltage	BV _{EBO}	5	—	—	V	I _E = 100μA
Collector Cutoff Current	I _{CBO}	—	—	100 50	nA μA	V _{CB} = 60V V _{CB} = 60V, T _J = +150°C
DC current transfer Static ratio (Note 11)	h _{FE}	30 100 50	— — —	— 300 —	—	I _C = 100μA, V _{CE} = 5V I _C = 100mA, V _{CE} = 5V I _C = 500mA, V _{CE} = 5V
Collector-Emitter Saturation Voltage (Note 11)	V _{CE(sat)}	— —	— —	0.25 0.5	V	I _C = 150mA, I _B = 15mA I _C = 500mA, I _B = 50mA
Base-Emitter Saturation Voltage (Note 11)	V _{BE(sat)}	—	—	1.0 1.2	V	I _C = 150mA, I _B = 15mA I _C = 500mA, I _B = 50mA
Transitional Frequency	f _T	100	—	—	MHz	I _C = 50mA, V _{CE} = 10V f = 35MHz
Output capacitance	C _{obo}	—	—	12	pF	V _{CB} = 10V, f = 1MHz
Input Capacitance	C _{ibo}	—	—	90	pF	V _{CB} = 0.5V, f = 1MHz
Turn-On Time	T _{on}	—	—	250	ns	V _{CC} = 20V, I _C = 100mA
Turn-Off Time	T _{off}	—	—	1000	ns	I _{B1} = I _{B2} = 5mA

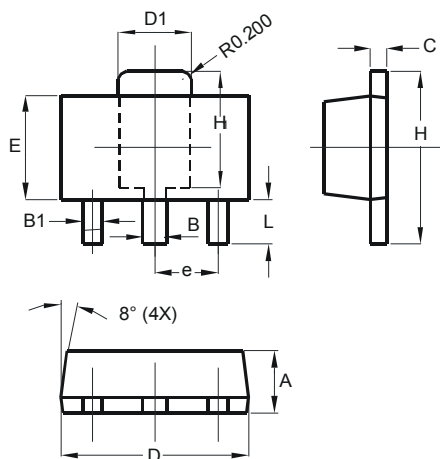
Note: 11. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

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



Package Outline Dimensions

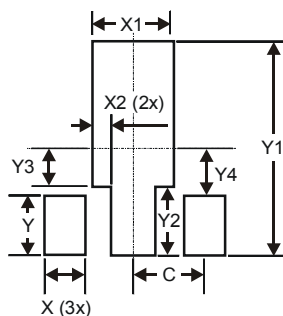
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



SOT89		
Dim	Min	Max
A	1.40	1.60
B	0.44	0.62
B1	0.35	0.54
C	0.35	0.44
D	4.40	4.60
D1	1.62	1.83
E	2.29	2.60
e	1.50 Typ	
H	3.94	4.25
H1	2.63	2.93
L	0.89	1.20
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)
X	0.900
X1	1.733
X2	0.416
Y	1.300
Y1	4.600
Y2	1.475
Y3	0.950
Y4	1.125
C	1.500

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