

**80V NPN SILICON PLANAR DARLINGTON TRANSISTOR  
IN SOT89**

**Features**

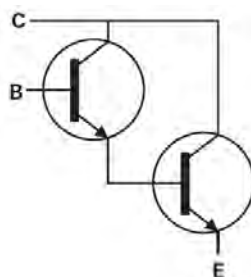
- $BV_{CEO} > 80V$
- High current gain
- Max Continuous Current  $I_C = 500mA$
- Fast switching
- **Lead Free, RoHS Compliant (Note 1)**
- **Halogen and Antimony Free, "Green" Device (Note 2)**
- **Qualified to AEC-Q101 Standards for High Reliability**

**Mechanical Data**

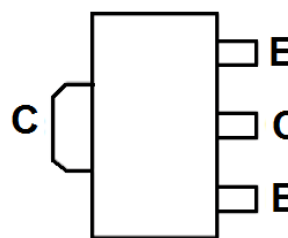
- Case: SOT89
- Moisture Sensitivity: Level 1 per J-STD-020
- UL Flammability Rating 94V-0
- Terminals: Matte Tin Finish
- Weight: 0.052 grams (Approximate)



Top View



Device symbol



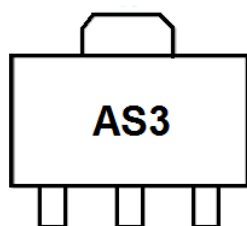
Top View  
Pin-out

**Ordering Information** (Note 3)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
BST52TA	AS3	7	12	1,000

- Notes:
1. No purposefully added lead.
  2. Halogen and Antimony Free. Diodes Inc's "Green" Policy can be found on our website at <http://www.diodes.com>
  3. For packaging details, go to our website at <http://www.diodes.com>

**Marking Information**



AS3 = Product Type Marking Code

**Maximum Ratings** @T<sub>A</sub> = 25°C unless otherwise specified

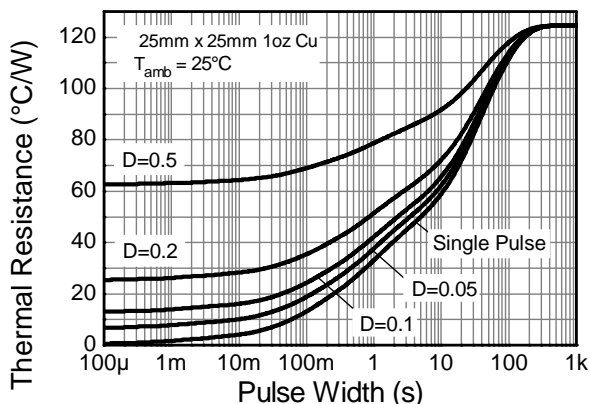
Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CBO</sub>	90	V
Collector-Emitter Voltage	V <sub>CEO</sub>	80	V
Emitter-Base Voltage	V <sub>EBO</sub>	10	V
Continuous Collector Current	I <sub>C</sub>	500	mA
Peak Pulse Current	I <sub>CM</sub>	1.5	A
Base Current	I <sub>B</sub>	100	mA

**Thermal Characteristics** @T<sub>A</sub> = 25°C unless otherwise specified

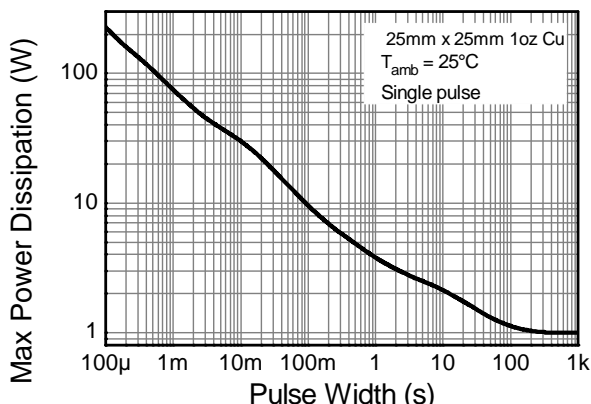
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 4)	P <sub>D</sub>	1	W
Thermal Resistance, Junction to Ambient (Note 4)	R <sub>θJA</sub>	125	°C/W
Thermal Resistance, Junction to Leads (Note 5)	R <sub>θJL</sub>	8.66	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

- Notes:
- For a device surface mounted on 25mm X 25mm FR4 PCB with high coverage of single sided 1 oz copper, in still air conditions; the device is measured when operating in a steady-state condition.
  - Thermal resistance from junction to solder-point (on the exposed collector pad).

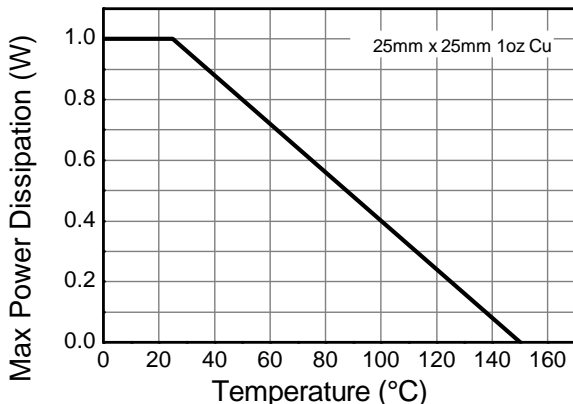
**Thermal Characteristics**



**Transient Thermal Impedance**



**Pulse Power Dissipation**



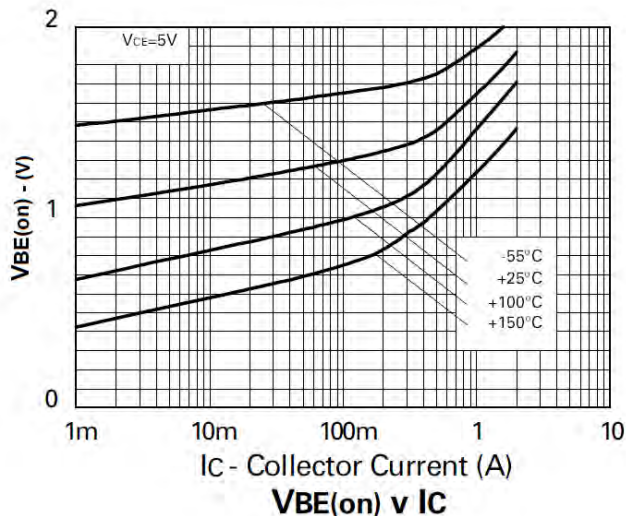
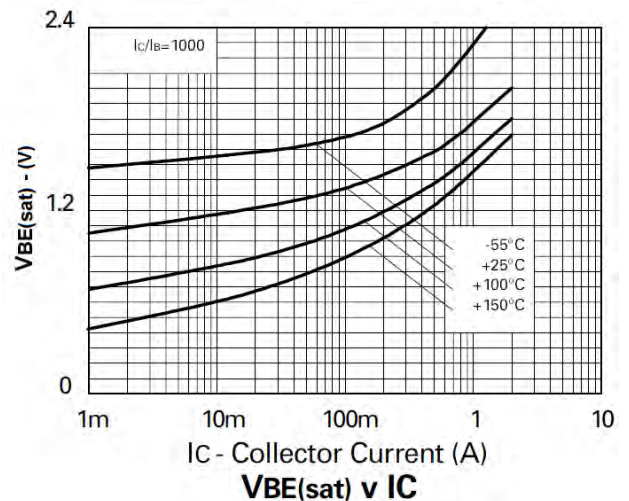
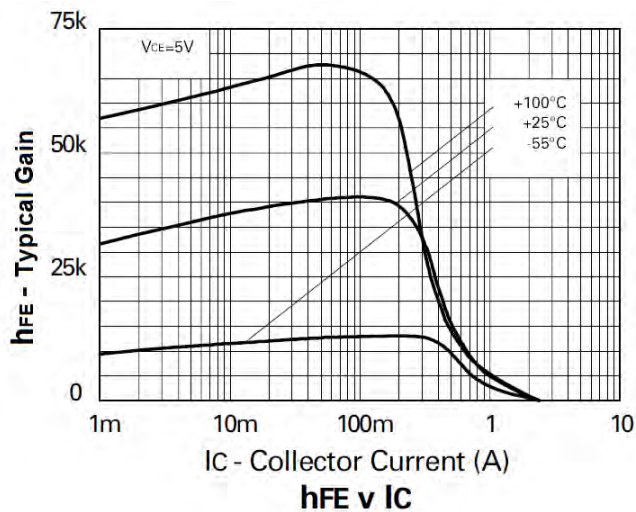
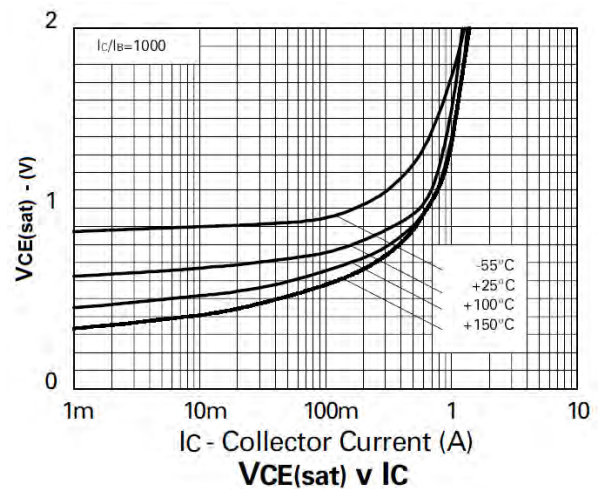
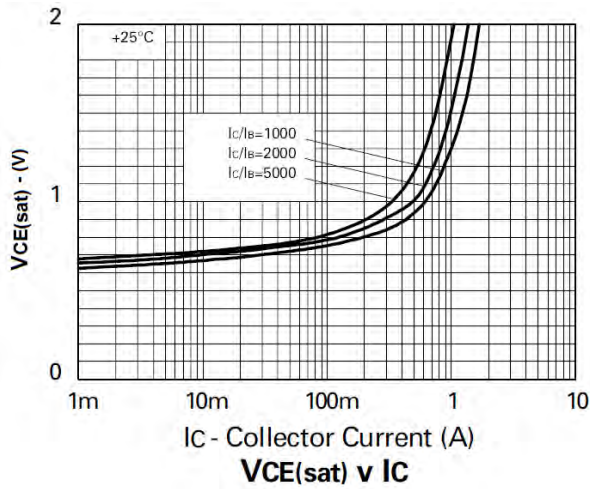
**Derating Curve**

**Electrical Characteristics** @ $T_A = 25^\circ\text{C}$  unless otherwise specified

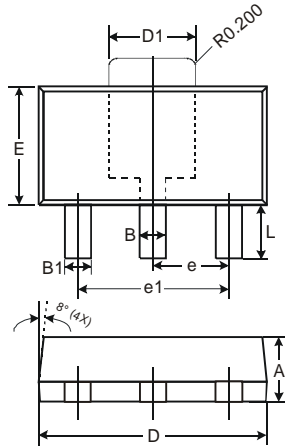
Characteristic	Symbol	Min	Typ.	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	$BV_{CBO}$	90	-	-	V	$I_C = 10\mu\text{A}$
Collector-Emitter Breakdown Voltage (Notes 6)	$BV_{CEO}$	80	-	-	V	$I_C = 10\text{mA}$
Emitter-Base Breakdown Voltage	$BV_{EBO}$	10	-	-	V	$I_E = 10\mu\text{A}$
Collector Cutoff Current	$I_{CES}$	-	-	10	$\mu\text{A}$	$V_{CE} = 80\text{V}$
Emitter Cutoff Current	$I_{EBO}$	-	-	10	$\mu\text{A}$	$V_{EB} = 8\text{V}$
DC current transfer Static ratio (Notes 6)	$h_{FE}$	1000 2000	-	-		$I_C = 150\text{mA}, V_{CE} = 10\text{V}$ $I_C = 500\text{mA}, V_{CE} = 10\text{V}$
Collector-Emitter Saturation Voltage (Notes 6)	$V_{CE(sat)}$	-	-	1.3 1.3	V	$I_C = 500\text{mA}, I_B = 0.5\text{mA}$ $I_C = 500\text{mA}, I_B = 0.5\text{mA}, T_J = 150^\circ\text{C}$
Base-Emitter Saturation Voltage (Notes 6)	$V_{BE(sat)}$	-	-	1.9	V	$I_C = 500\text{mA}, I_B = 0.5\text{mA}$
Turn On Time	$t_{ON}$	-	0.4	-	$\mu\text{s}$	$I_C = 500\text{mA},$ $I_{Bon} = I_{Boff} = 0.5\text{mA}$
Turn Off Time	$t_{OFF}$		1.5			

Notes: 6. Measured under pulsed conditions. Pulse width  $\leq 300\mu\text{s}$ . Duty cycle  $\leq 2\%$ .

**Typical Electrical Characteristics**

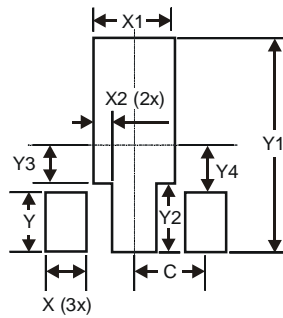


**Package Outline Dimensions**



SOT89		
Dim	Min	Max
A	1.40	1.60
B	0.44	0.62
B1	0.35	0.54
C	0.35	0.43
D	4.40	4.60
D1	1.52	1.83
E	2.29	2.60
e	1.50 Typ	
e1	3.00 Typ	
H	3.94	4.25
L	0.89	1.20
All Dimensions in mm		

**Suggested Pad Layout**



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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