60V PNP LOW SATURATION MEDIUM POWER TRANSISTOR IN SOT89

Features

- BV_{CEO} > -60V
- I_C = -4.3A high continuous current
- R_{SAT} = 32mΩ for a low equivalent On-Resistance
- Low saturation voltage $V_{CE(sat)}$ < -65mV @ I_C = -1A
- h_{FE} specified up to -10A for high current gain hold up
- Complementary NPN type: ZXTN2010Z
- **Lead-Free Finish; 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 208 e3
- Weight: 0.05 grams (Approximate)

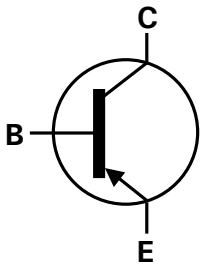
Application

- Emergency lighting circuits
- Motor driving (including DC fans)
- Backlight inverters
- Power switches
- Gate driving MOSFETs and IGBTs

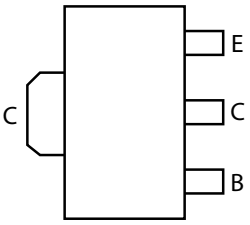
SOT89



Top View



Device Symbol



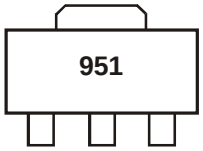
Top View
Pin Out

Ordering Information (Note 4 & 5)

Product	Compliance	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXTP2012ZTA	AEC-Q101	951	7	12	1,000
ZXTP2012Z-13R	AEC-Q101	951	13	12	4,000
ZXTP2012ZQTA	Automotive	951	7	12	1,000

Notes:
1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
2. See http://www.diodes.com 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.
5. For packaging details, go to our website at http://www.diodes.com

Marking Information



951 = Product Type Marking Code

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	-100	V
Collector-Emitter Voltage	V_{CEO}	-60	V
Emitter-Base Voltage	V_{EBO}	-7	V
Continuous Collector Current	I_C	-4.3	A
Peak Pulse Current	I_{CM}	-15	A

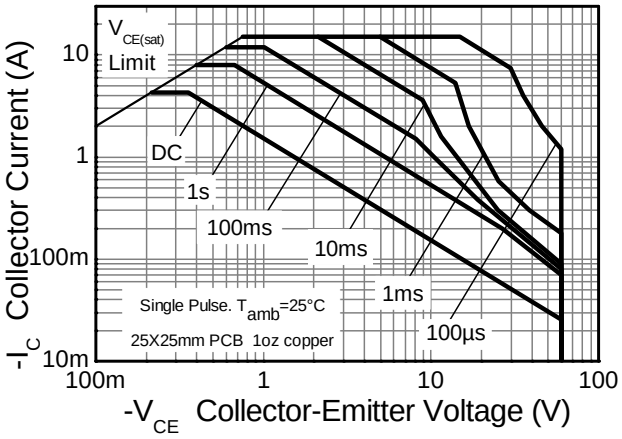
Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 6) Linear derating factor	P_D	1.5 12	W mW/°C
Power Dissipation (Note 7) Linear derating factor	P_D	2.1 16.8	W mW/°C
Thermal Resistance, Junction to Ambient (Note 6)	$R_{\theta JA}$	83	°C/W
Thermal Resistance, Junction to Ambient (Note 7)	$R_{\theta JA}$	60	°C/W
Thermal Resistance, Junction to Leads (Note 8)	$R_{\theta JL}$	3.23	°C/W
Operating and Storage Temperature Range	T_J,T_{STG}	-55 to +150	°C

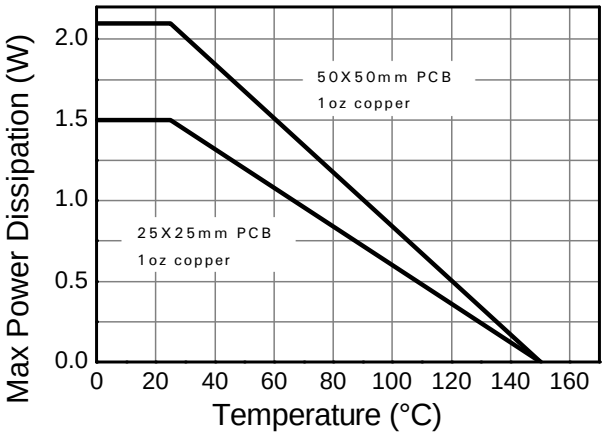
Notes:
6. For a device surface mounted on 25mm x 25mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions; device measured when operating in steady state condition.
7. Same as note (6), except the device is mounted on 50mm X 50mm single sided 1oz weight copper.
8. Thermal resistance from junction to solder-point (on the exposed collector pad).

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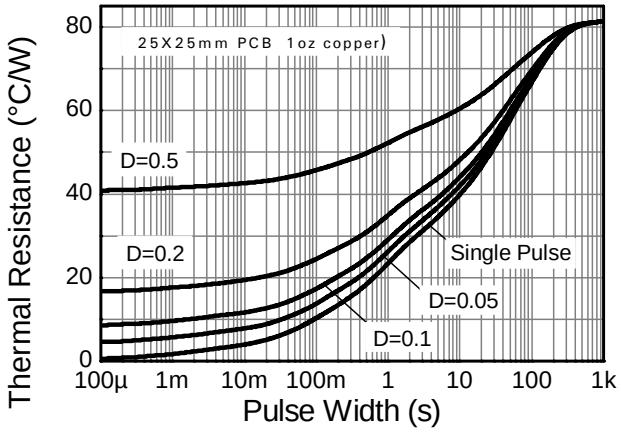
Thermal Characteristics and Derating Information



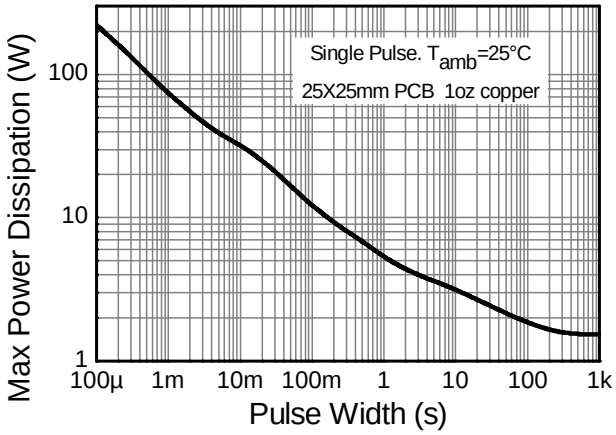
Safe Operating Area



Derating Curve



Transient Thermal Impedance



Pulse Power Dissipation

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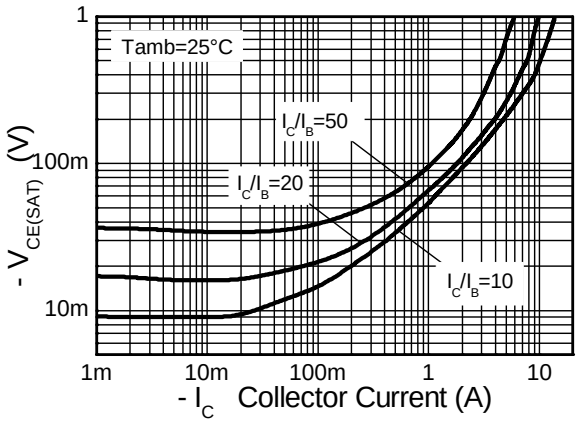
Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	-100	-120	-	V	I_C = -100µA
Collector-Emitter Breakdown Voltage (Notes 9)	BV_{CER}	-100	-120	-	V	I_C = -1µA, R_B ≤ 1kΩ
Collector-Emitter Breakdown Voltage (Notes 9)	BV_{CEO}	-60	-80	-	V	I_C = -10mA
Emitter-Base Breakdown Voltage	BV_{EBO}	-7	-8.1	-	V	I_E = -100µA
Collector Cutoff Current	I_{CBO}	-	< -1 	-20 -500	nA nA	V_{CB} = -80V V_{CB} = -80V, T_A = +100°C
Collector Cutoff Current	I_{CER} R ≤1kΩ	-	< -1 	-20 -500	nA nA	V_{CB} = -80V V_{CB} = -80V, T_A = +100°C
Emitter Cutoff Current	I_{EBO}	-	< -1	-10	nA	V_{EB} = -6V
DC current transfer Static ratio (Notes 9)	h_{FE}	100 100 45 10	250 200 90 25	300		I_C = -10mA, V_{CE} = -1V I_C = -2A, V_{CE} = -1V I_C = -5A, V_{CE} = -1V I_C = -10A, V_{CE} = -1V
Collector-Emitter Saturation Voltage (Notes 9)	$V_{CE(sat)}$	-	-14 -50 -75 -160	-20 -65 -110 -215	mV	I_C = -100mA, I_B = -10mA I_C = -1A, I_B = -100mA I_C = -2A, I_B = -200mA I_C = -5A, I_B = -500mA
Base-Emitter Saturation Voltage (Notes 9)	$V_{BE(sat)}$	-	-950	-1050	mV	I_C = -5A, I_B = -500mA
Base-Emitter Turn-on Voltage (Notes 9)	$V_{BE(on)}$	-	-840	-950	mV	I_C = -5A, V_{CE} = -1V
Transitional Frequency (Notes 9)	f_T	-	120	-	MHz	I_C = -100mA, V_{CE} = -10V, f = 50MHz
Output capacitance	C_{obo}	-	48	-	pF	V_{CB} = -10V, f = 1MHz,
Switching Time	t_{ON}	-	39	-	ns	V_{CC} = -10V, I_C = -1A,
	t_{OFF}		370			I_{B1} = I_{B2} = -100mA

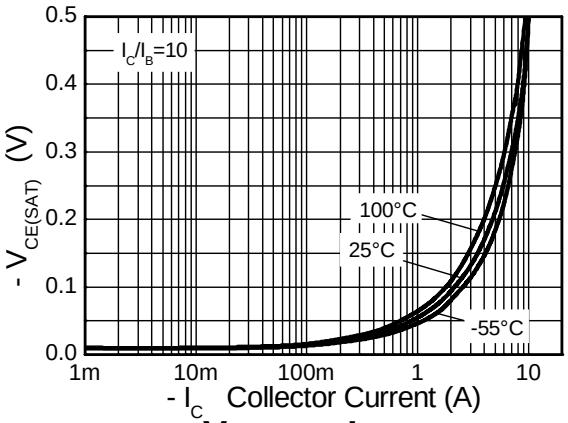
Notes: 9. Measured under pulsed conditions. Pulse width ≤ 300µs. Duty cycle ≤ 2%.

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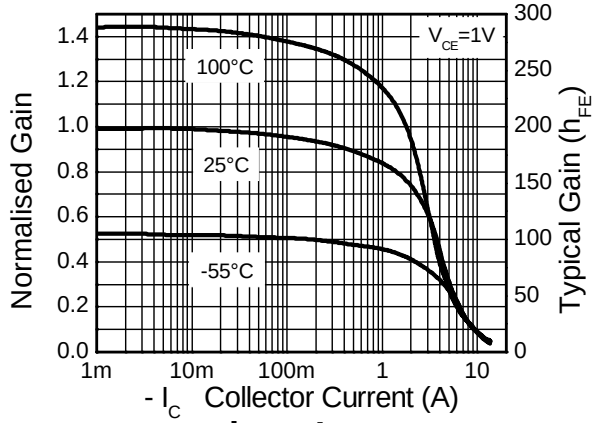
Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)



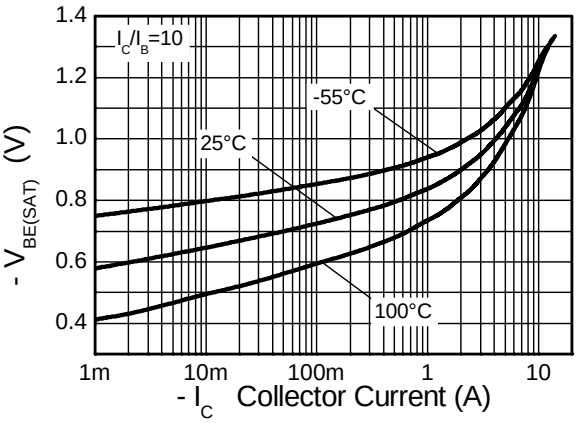
$V_{CE(SAT)}$ v I_C



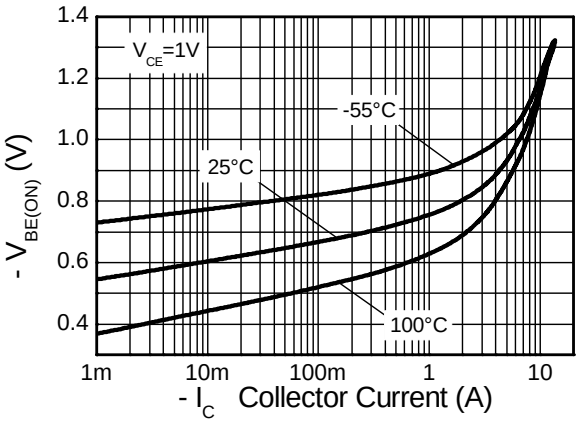
$V_{CE(SAT)}$ v I_C



h_{FE} v I_C



$V_{BE(SAT)}$ v I_C

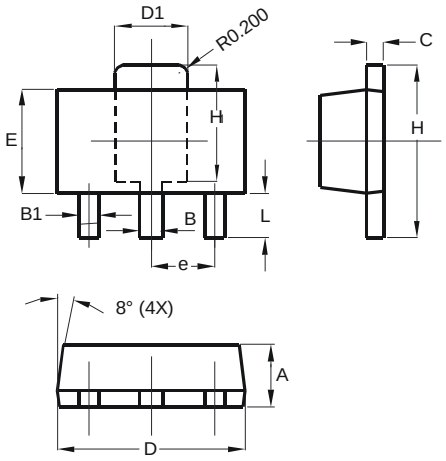


$V_{BE(ON)}$ v I_C

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Package Outline Dimensions

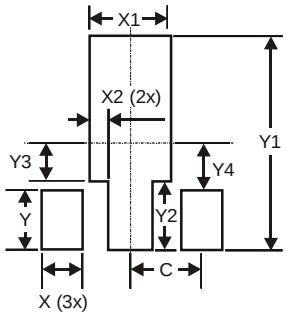
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for latest version.



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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