

Features

- $BV_{CEO} > -60V$
- $I_C = -4.3A$ High Continuous Current
- $R_{SAT} = 32m\Omega$ 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

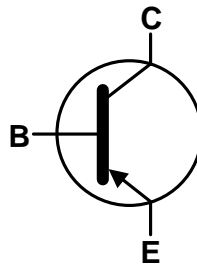
- Case: SOT89
- Case Material: Molded Plastic. "Green" Molding Compound. UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 (3)
- Weight: 0.05 grams (Approximate)

Application

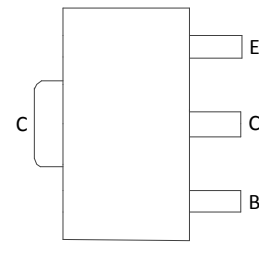
- Emergency Lighting Circuits
- Motor Driving (Including DC Fans)
- Backlight Inverters
- Power Switches
- Gate Driving MOSFETs and IGBTs



Top View



Device Symbol



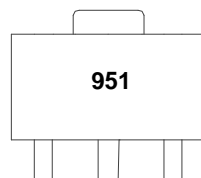
Top View Pin Out

Ordering Information (Note 5)

Part Number	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) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied.
 2. See <https://www.diodes.com/quality/lead-free/> 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 <https://www.diodes.com/quality/>.
 5. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information



951 = Product Type Marking Code

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

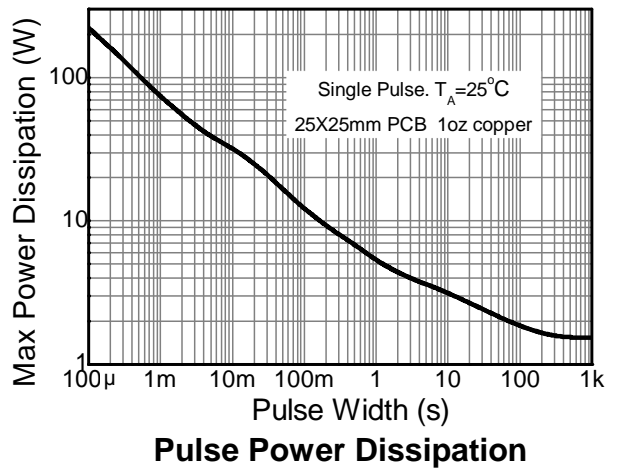
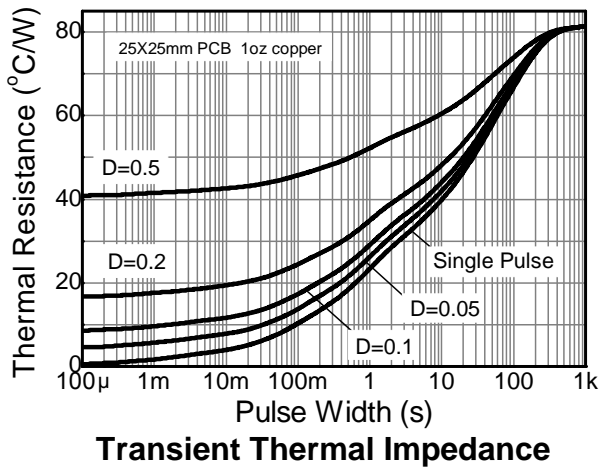
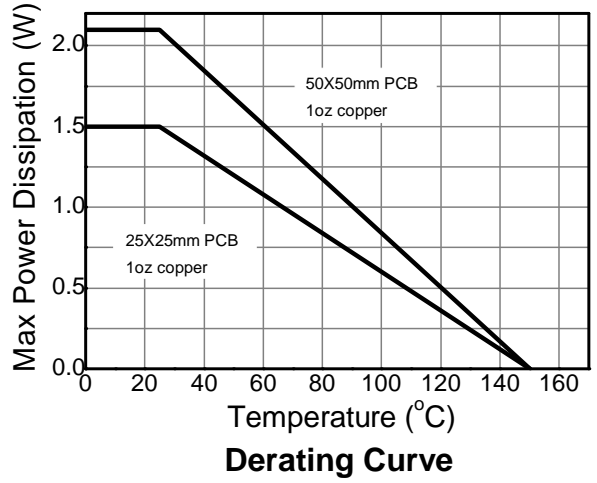
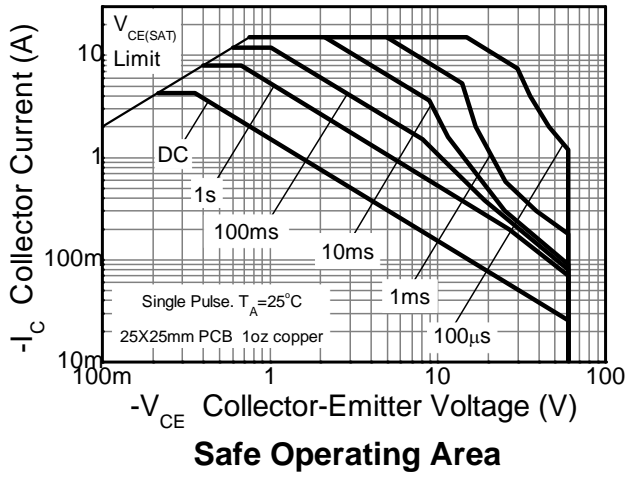
Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V _{CBO}	-100	V
Collector-Emitter Voltage	V _{CEO}	-60	V
Emitter-Base Voltage	V _{EBO}	-7	V
Base Current	I _B	-2	A
Continuous Collector Current	I _C	-4.3	A
Peak Pulse Current	I _{CM}	-15	A

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

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 6)	P _D	1.5	W
Linear Derating Factor		12	mW/°C
Power Dissipation (Note 7)	P _D	2.1	W
Linear Derating Factor		16.8	mW/°C
Thermal Resistance, Junction to Ambient (Note 6)	R _{θJA}	83	°C/W
Thermal Resistance, Junction to Ambient (Note 7)	R _{θJA}	60	°C/W
Thermal Resistance, Junction to Leads (Note 8)	R _{θJL}	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 FR-4 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).

Thermal Characteristics and Derating Information

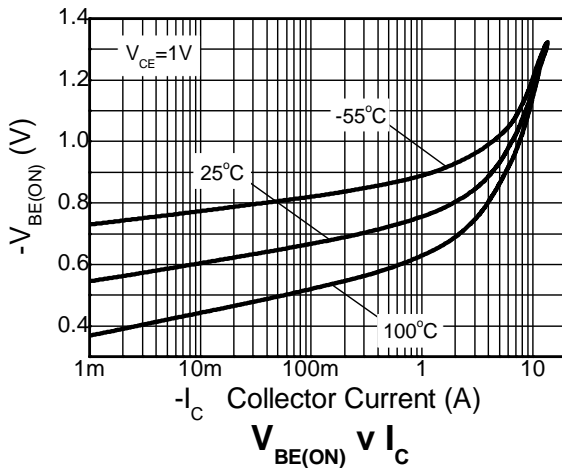
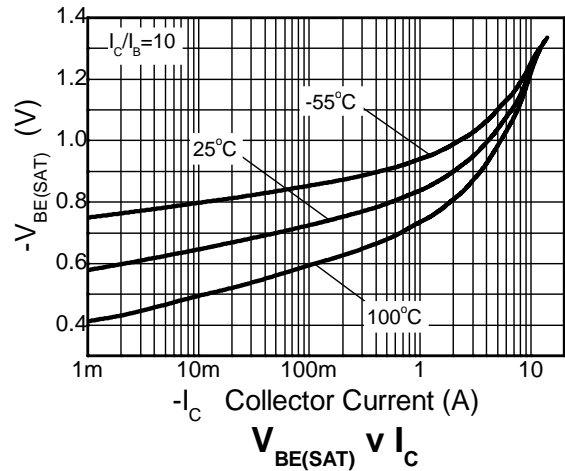
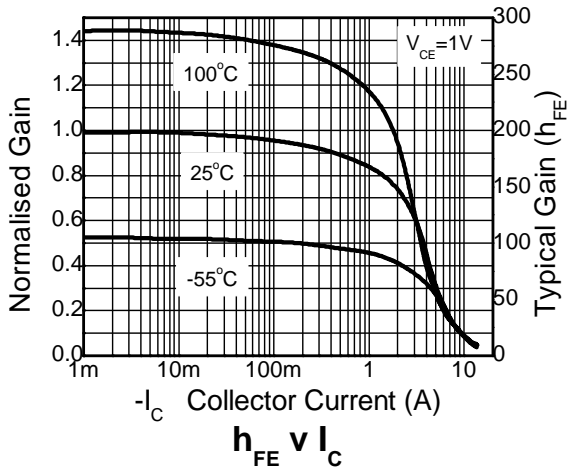
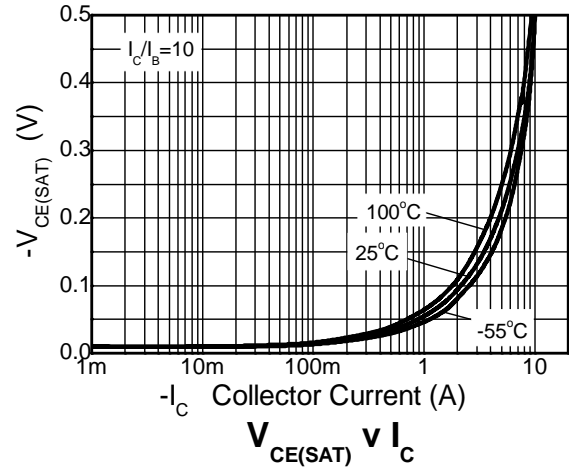
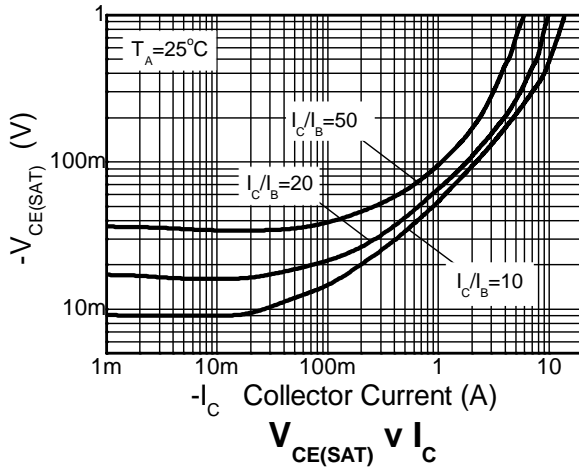


Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	-100	-120	—	V	$I_C = -100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Note 9)	BV_{CER}	-100	-120	—	V	$I_C = -1\mu\text{A}$, $R_B \leq 1\text{k}\Omega$
Collector-Emitter Breakdown Voltage (Note 9)	BV_{CEO}	-60	-80	—	V	$I_C = -10\text{mA}$
Emitter-Base Breakdown Voltage	BV_{EBO}	-7	-8.1	—	V	$I_E = -100\mu\text{A}$
Collector Cutoff Current	I_{CBO}	—	< -1	-20	nA	$V_{CB} = -80\text{V}$
Collector Cutoff Current	I_{CER} $R \leq 1\text{k}\Omega$	—	< -1	-20	nA	$V_{CB} = -80\text{V}$, $T_A = +100^\circ\text{C}$
Emitter Cutoff Current	I_{EBO}	—	< -1	-10	nA	$V_{CB} = -80\text{V}$, $T_A = +100^\circ\text{C}$
DC Current Transfer Static Ratio (Note 9)	h_{FE}	100	250	—	—	$I_C = -10\text{mA}$, $V_{CE} = -1\text{V}$
		100	200	300		$I_C = -2\text{A}$, $V_{CE} = -1\text{V}$
		45	90	—		$I_C = -5\text{A}$, $V_{CE} = -1\text{V}$
		10	25	—		$I_C = -10\text{A}$, $V_{CE} = -1\text{V}$
Collector-Emitter Saturation Voltage (Note 9)	$V_{CE(SAT)}$	—	-14 -50 -75 -160	-20 -65 -110 -215	mV	$I_C = -100\text{mA}$, $I_B = -10\text{mA}$ $I_C = -1\text{A}$, $I_B = -100\text{mA}$ $I_C = -2\text{A}$, $I_B = -200\text{mA}$ $I_C = -5\text{A}$, $I_B = -500\text{mA}$
Base-Emitter Saturation Voltage (Note 9)	$V_{BE(SAT)}$	—	-950	-1050	mV	$I_C = -5\text{A}$, $I_B = -500\text{mA}$
Base-Emitter Turn-on Voltage (Note 9)	$V_{BE(ON)}$	—	-840	-950	mV	$I_C = -5\text{A}$, $V_{CE} = -1\text{V}$
Transitional Frequency (Note 9)	f_T	—	120	—	MHz	$I_C = -100\text{mA}$, $V_{CE} = -10\text{V}$, $f = 50\text{MHz}$
Output Capacitance	C_{OBO}	—	48	—	pF	$V_{CB} = -10\text{V}$, $f = 1\text{MHz}$
Switching Time	t_{ON}	—	39	—	ns	$V_{CC} = -10\text{V}$, $I_C = -1\text{A}$, $I_{B1} = -I_{B2} = -100\text{mA}$
	t_{OFF}	—	370	—		

Note: 9. Measured under pulsed conditions. Pulse width $\leq 300\mu\text{s}$. Duty cycle $\leq 2\%$.

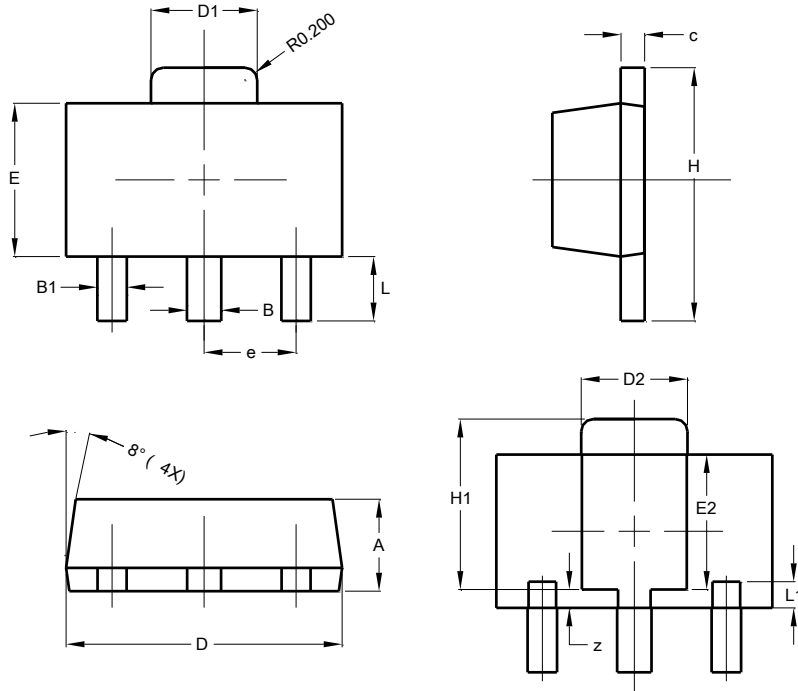
Typical Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)



Package Outline Dimensions

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

SOT89

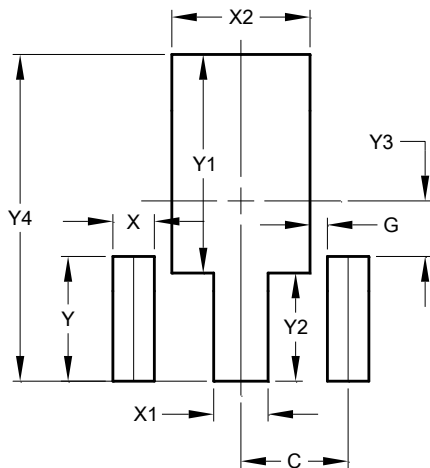


SOT89			
Dim	Min	Max	Typ
A	1.40	1.60	1.50
B	0.50	0.62	0.56
B1	0.42	0.54	0.48
c	0.35	0.43	0.38
D	4.40	4.60	4.50
D1	1.62	1.83	1.733
D2	1.61	1.81	1.71
E	2.40	2.60	2.50
E2	2.05	2.35	2.20
e	-	-	1.50
H	3.95	4.25	4.10
H1	2.63	2.93	2.78
L	0.90	1.20	1.05
L1	0.327	0.527	0.427
z	0.20	0.40	0.30
All Dimensions in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

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