

60V PNP LOW SATURATION MEDIUM POWER TRANSISTOR IN SOT89

Features

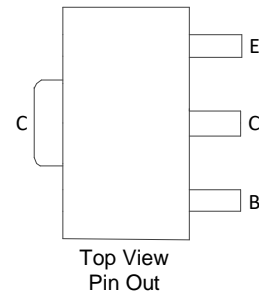
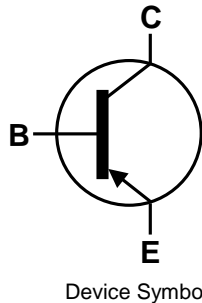
- $BV_{CEO} > -60V$
- $I_C = -4.3A$ High Continuous Current
- $R_{SAT} = 32m\Omega$ for a Low Equivalent On-Resistance
- Low Saturation Voltage $V_{CE(sat)} < -65mV @ I_C = -1A$
- h_{FE} Specified up to $-10A$ for High Current Gain Hold up
- Complementary NPN Type: ZXTN2010ZQ
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **The ZXTP2012ZQ is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF16949 certified facilities.**
<https://www.diodes.com/quality/product-definitions/>

Mechanical Data

- Package: SOT89
- Package 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

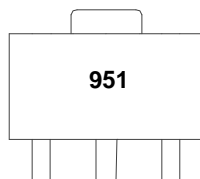


Ordering Information (Note 4)

Part Number	Compliance	Package	Marking	Reel Size (inches)	Tape Width (mm)	Packing	
						Qty.	Carrier
ZXTP2012ZQTA	Automotive	SOT89	951	7	12	1,000	Reel

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
 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. 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.)

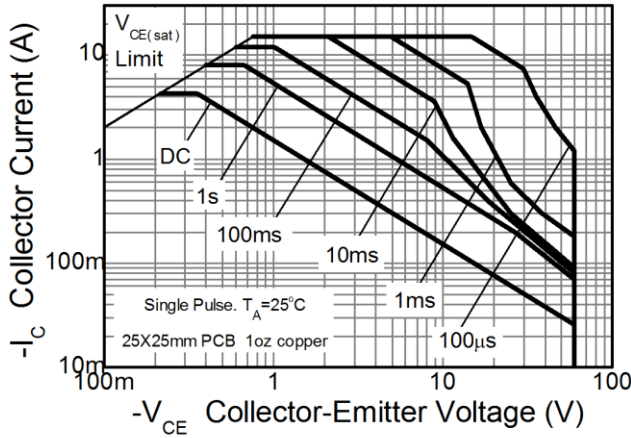
Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V _{CB0}	-100	V
Collector-Emitter Voltage	V _{CEO}	-60	V
Emitter-Base Voltage	V _{EBO}	-7	V
Base Current	I _B	-2	A
Continuous Collector Current	I _C	-4.3	A
Peak Pulse Current	I _{CM}	-15	A

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

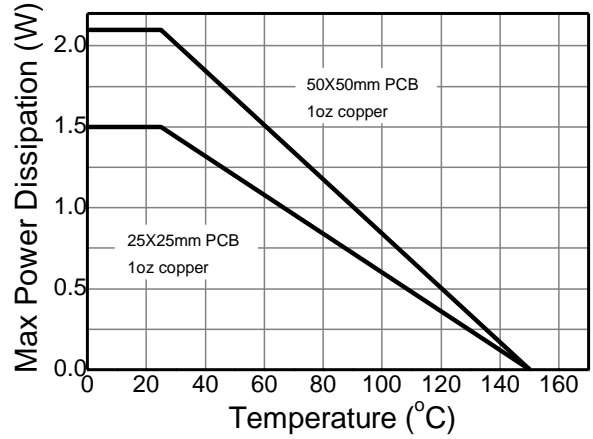
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5) Linear Derating Factor	P _D	1 8	W mW/°C
Power Dissipation (Note 6) Linear Derating Factor	P _D	1.5 12	W mW/°C
Power Dissipation (Note 7) Linear Derating Factor	P _D	2.1 16.8	W mW/°C
Thermal Resistance, Junction to Ambient (Note 5)	R _{θJA}	125	°C/W
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 Case (Note 5)	R _{θJC}	21	°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:
5. Minimum recommended pad layout
 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 (5), 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).

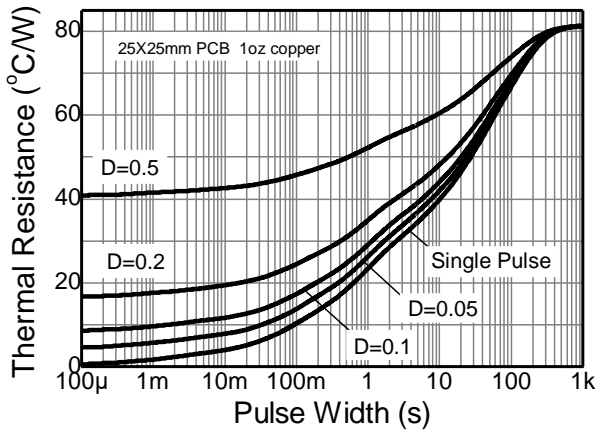
Thermal Characteristics and Derating Information



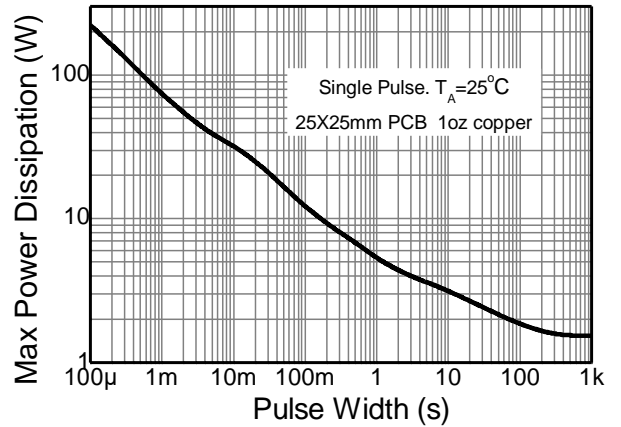
Safe Operating Area



Derating Curve



Transient Thermal Impedance



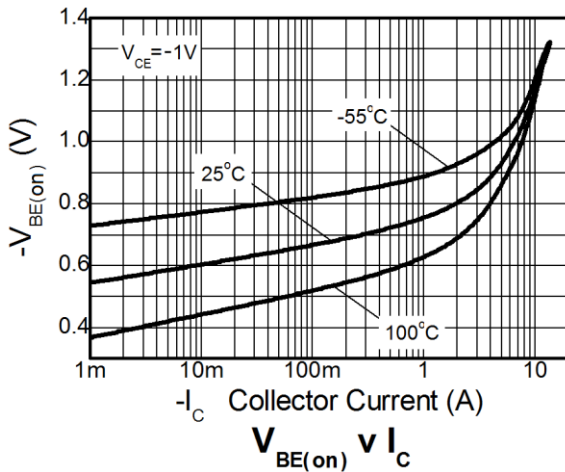
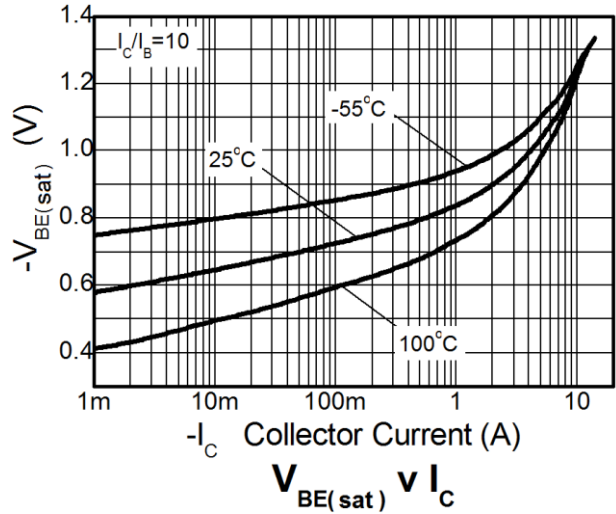
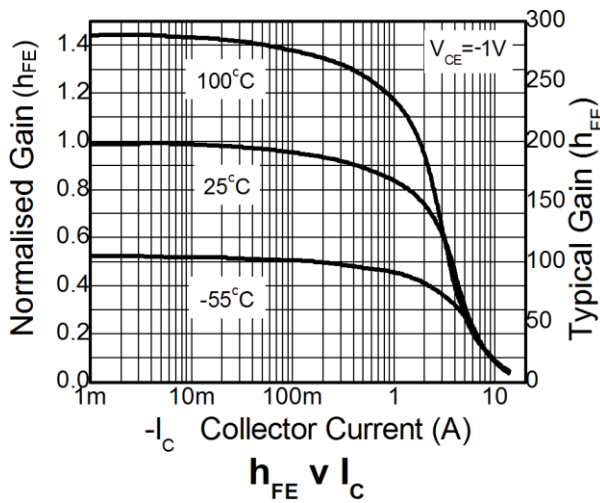
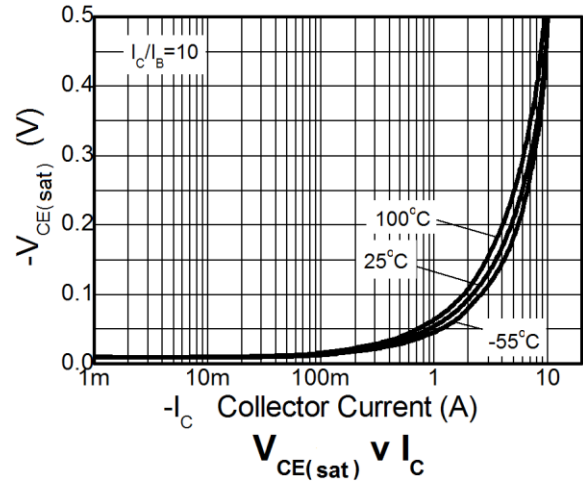
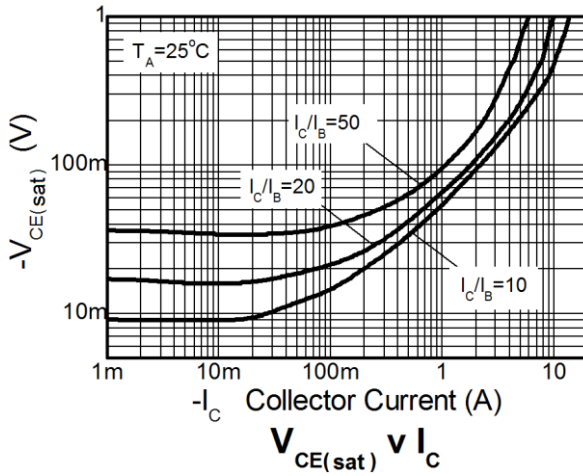
Pulse Power Dissipation

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV _{CBO}	-100	-120	—	V	I _C = -100μA
Collector-Emitter Breakdown Voltage (Note 9)	BV _{CER}	-100	-120	—	V	I _C = -1μA, R _B ≤ 1kΩ
Collector-Emitter Breakdown Voltage (Note 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	nA	V _{CB} = -80V
		—	—	-500	nA	V _{CB} = -80V, T _A = +100°C
Collector Cutoff Current	I _{CER} R ≤ 1kΩ	—	-1	-20	nA	V _{CB} = -80V
		—	—	-500	nA	V _{CB} = -80V, T _A = +100°C
Emitter Cutoff Current	I _{EBO}	—	-1	-10	nA	V _{EB} = -6V
DC Current Transfer Static Ratio (Note 9)	h _{FE}	100	250	—	—	I _C = -10mA, V _{CE} = -1V
		100	200	300	—	I _C = -2A, V _{CE} = -1V
		45	90	—	—	I _C = -5A, V _{CE} = -1V
		10	25	—	—	I _C = -10A, V _{CE} = -1V
Collector-Emitter Saturation Voltage (Note 9)	V _{CE(sat)}	—	-14	-20	mV	I _C = -100mA, I _B = -10mA
		—	-50	-65		I _C = -1A, I _B = -100mA
		—	-75	-110		I _C = -2A, I _B = -200mA
		—	-160	-215		I _C = -5A, I _B = -500mA
Base-Emitter Saturation Voltage (Note 9)	V _{BE(sat)}	—	-950	-1050	mV	I _C = -5A, I _B = -500mA
Base-Emitter Turn-on Voltage (Note 9)	V _{BE(on)}	—	-840	-950	mV	I _C = -5A, V _{CE} = -1V
Transitional Frequency (Note 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 I _{B1} = -I _{B2} = -100mA
	t _{off}	—	370	—		

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

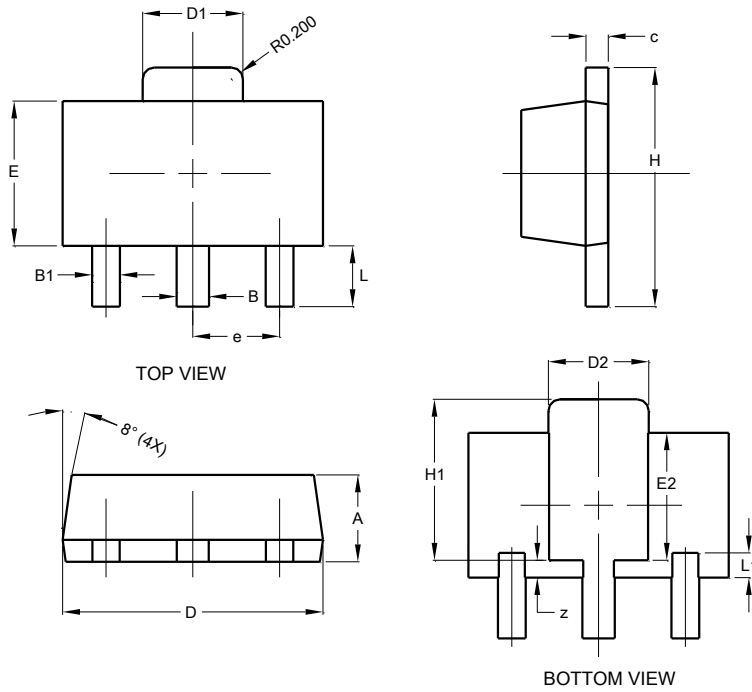
Typical Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)



Package Outline Dimensions

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

SOT89

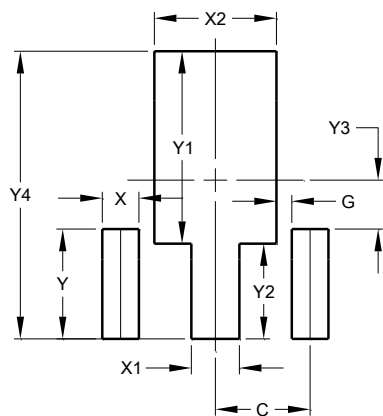


SOT89			
Dim	Min	Max	Typ
A	1.40	1.60	1.50
B	0.50	0.62	0.56
B1	0.42	0.54	0.48
c	0.35	0.43	0.38
D	4.40	4.60	4.50
D1	1.62	1.83	1.733
D2	1.61	1.81	1.71
E	2.40	2.60	2.50
E2	2.05	2.35	2.20
e	-	-	1.50
H	3.95	4.25	4.10
H1	2.63	2.93	2.78
L	0.90	1.20	1.05
L1	0.327	0.527	0.427
z	0.20	0.40	0.30
All Dimensions in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