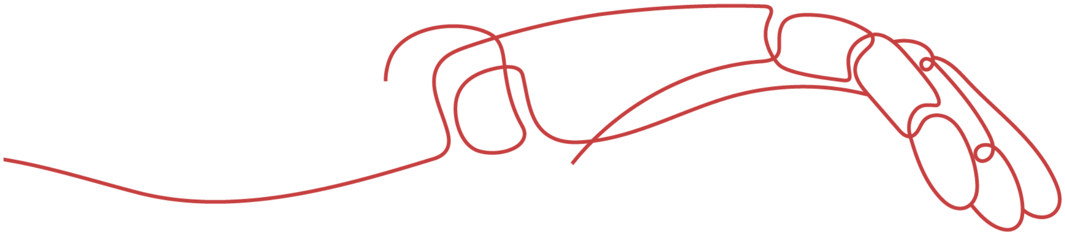
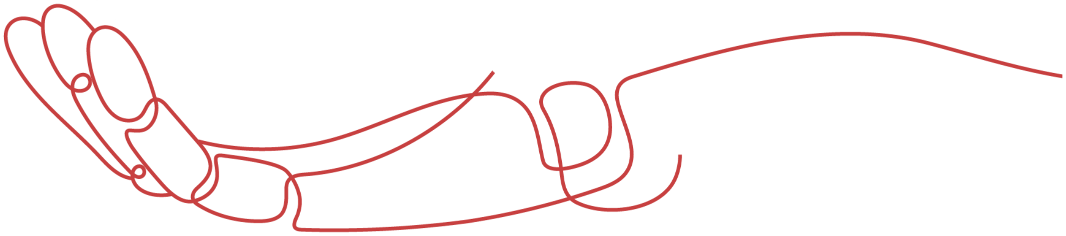
JG® Techology



PRODUCT DATA SHEET



To learn more about JGSEMI, please visit our website at

Datasheet Resources Samples

Please note: Please check the JINGAO Semiconductor website to verify the updated device numbers. The most current and up-to-date ordering information can be found at www.jg-semi.cn. Please email any questions regarding the system integration to JINGAO_questions@jgsemi.com.

ZXTP2012ZQTA

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)**

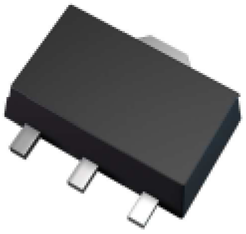
Mechanical Data

- 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 ⓔ3
- Weight: 0.05 grams (Approximate)

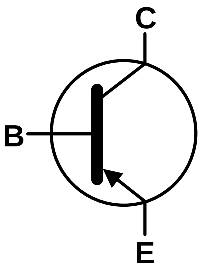
Application

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

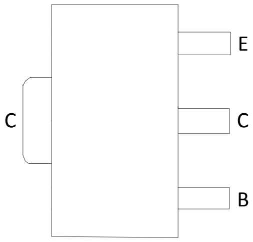
SOT89



Top View



Device Symbol



Top View
Pin Out

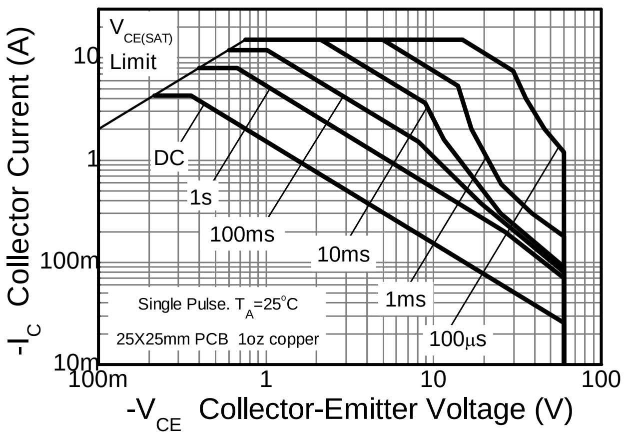
Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

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

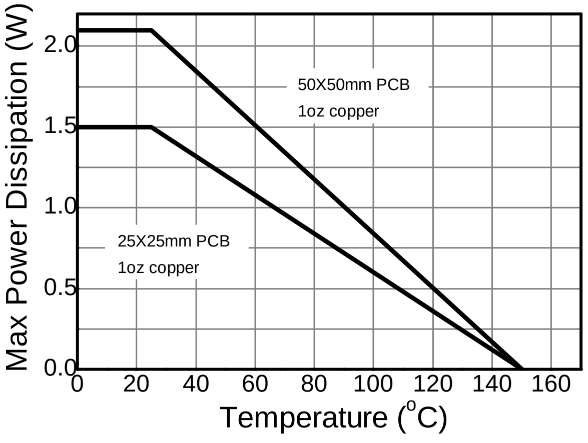
Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 6) 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

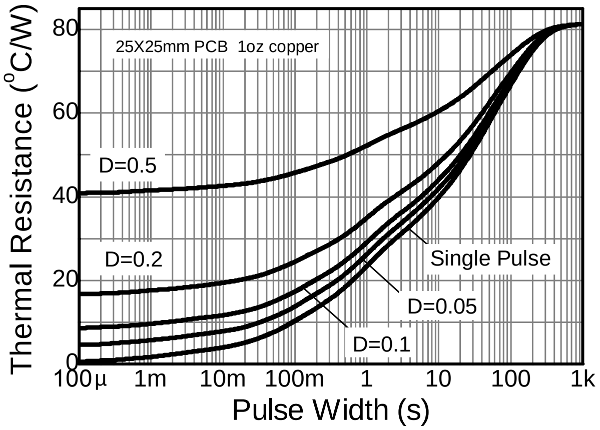
Notes:
6. For a device surface mounted on 25mm x 25mm x 1.6mm FR-4 PCB with high coverage of single sided 1oz copper, in still air conditions; device measured when operating in steady state condition.
7. Same as note (6), except the device is mounted on 50mm x 50mm single sided 1oz weight copper.
8. Thermal resistance from junction to solder-point (on the exposed collector pad).



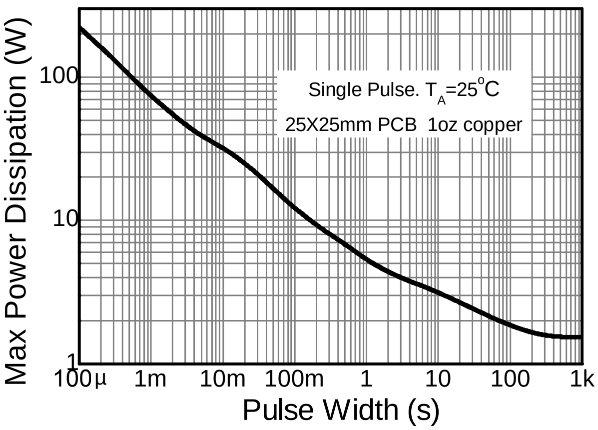
Safe Operating Area



Derating Curve



Transient Thermal Impedance



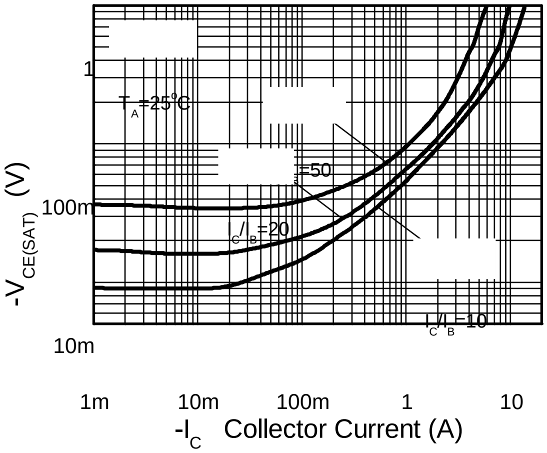
Pulse Power Dissipation

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

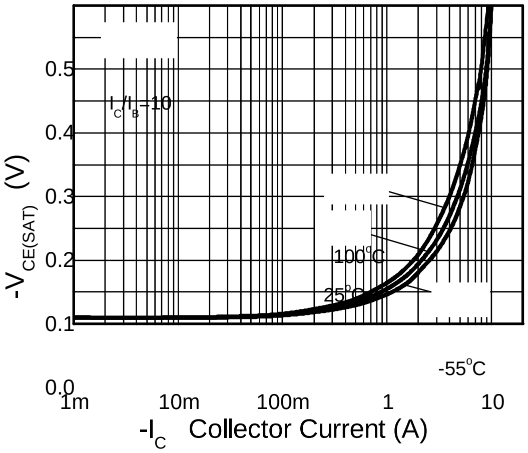
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	-100	-120	—	V	$I_C = -100\mu A$
Collector-Emitter Breakdown Voltage (Note 9)	BV_{CER}	-100	-120	—	V	$I_C = -1\mu A$, $R_B \le 1k\Omega$
Collector-Emitter Breakdown Voltage (Note 9)	BV_{CEO}	-60	-80	—	V	$I_C = -10mA$
Emitter-Base Breakdown Voltage	BV_{EBO}	-7	-8.1	—	V	$I_E = -100\mu A$
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 (Note 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 (Note 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 (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%.

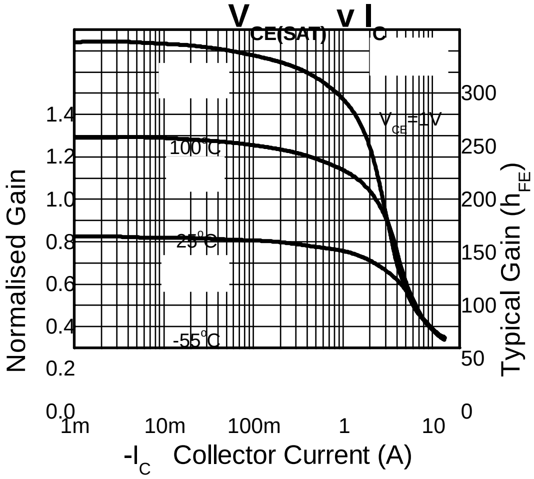
Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)



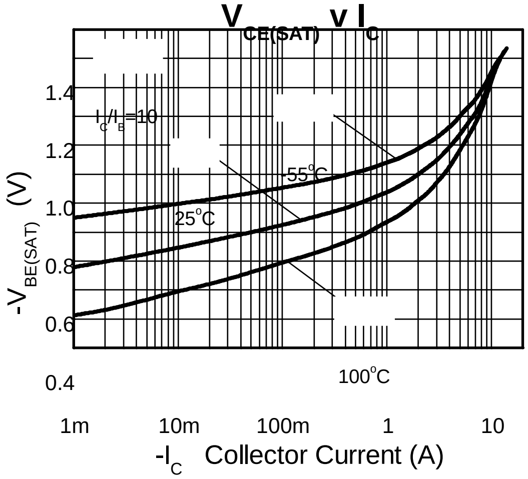
$V_{CE(SAT)}$ v I_C



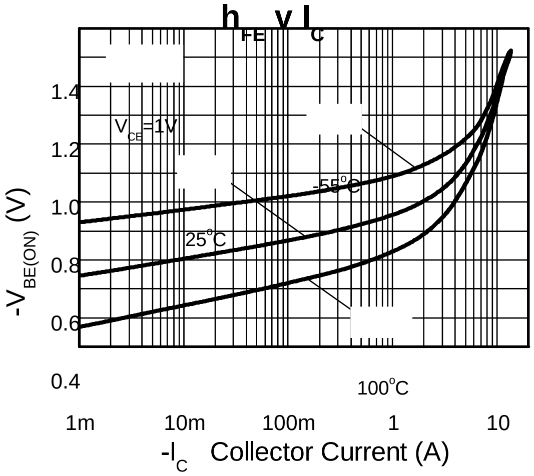
$V_{CE(SAT)}$ v I_C



h_{FE} v I_C



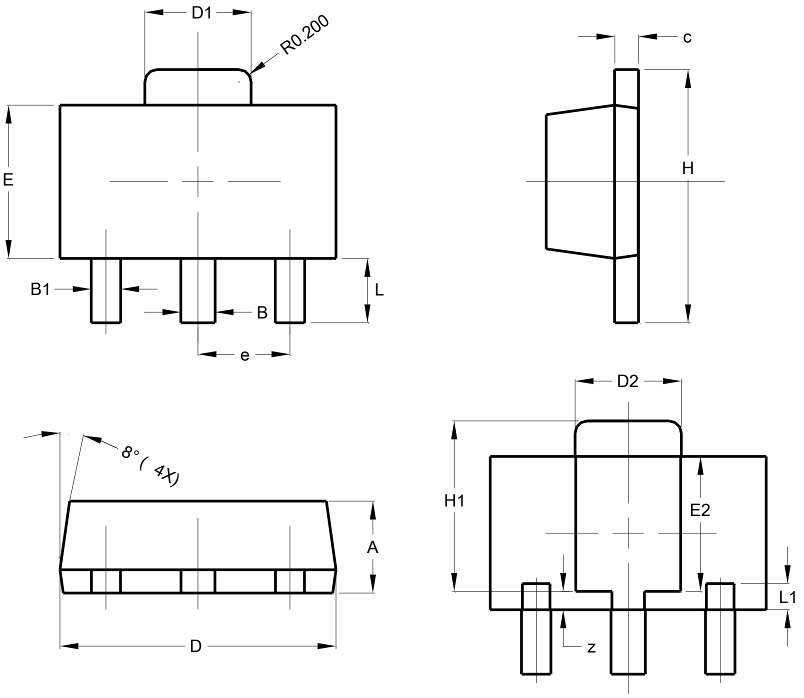
$V_{BE(SAT)}$ v I_C



$V_{BE(ON)}$ v I_C

Package Outline Dimensions

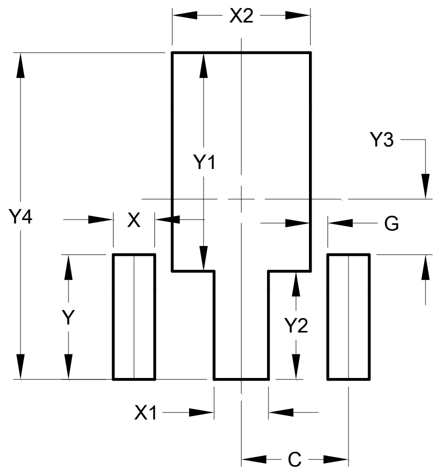
SOT89



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

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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