



YOUSHANG SEMICONDUCTOR

设计研发新型功率器件

各类小信号开关

中低压及高压大电流等场效应管

0755-83047638

ysbdt@szyoushang.cn

www.szyoushang.cn



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Features

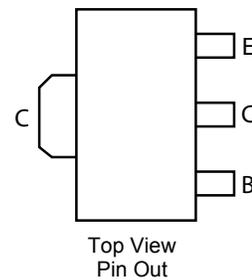
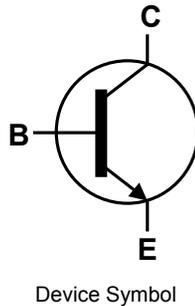
- $BV_{CEO} > 100V$
- $I_C = 4.5A$ high Continuous Current
- $I_{CM} = 10A$ Peak Pulse Current
- $R_{CE(sat)} = 31m\Omega$ for a low equivalent On-Resistance
- Low saturation voltage $V_{CE(sat)} < 60mV @ I_C = 1A$
- h_{FE} specified up to 10A for high current gain hold up

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)

Applications

- Motor driving
- Line switching
- High side switches
- Subscriber line interface cards (SLIC)



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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CB0}	200	V
Collector-Emitter Voltage	V_{CEO}	100	V
Emitter-Base Voltage	V_{EBO}	7	V
Continuous Collector Current	I_C	4.5	A
Peak Pulse Current	I_{CM}	10	A

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

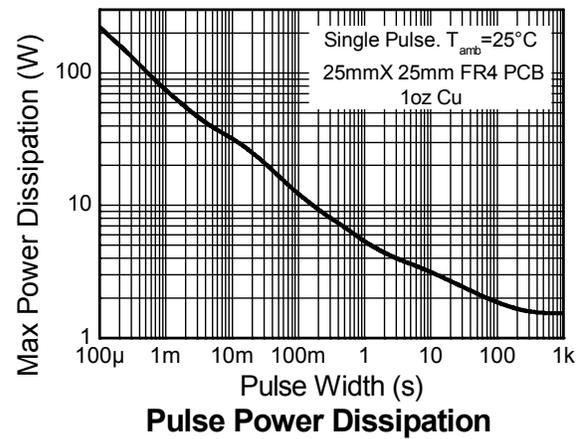
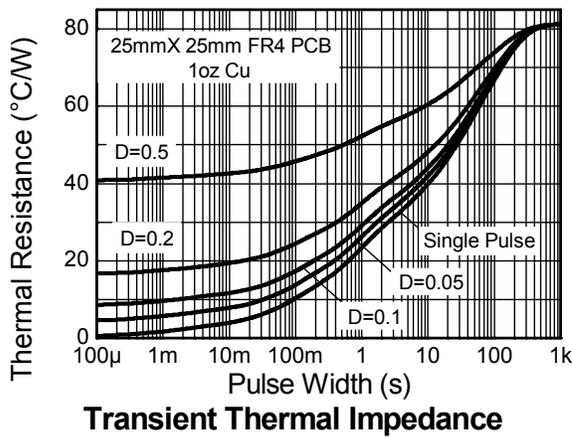
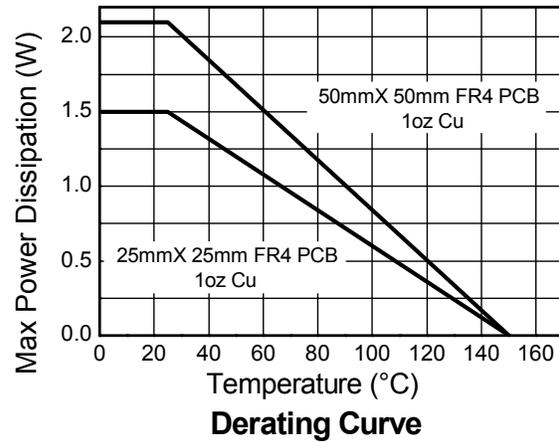
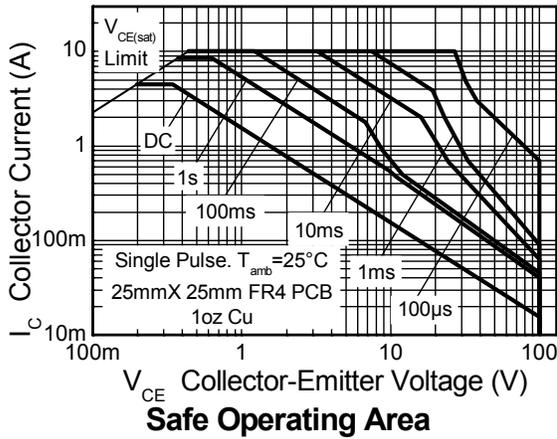
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5) Linear derating factor	P_D	1.5 12	W mW/ $^{\circ}\text{C}$
Power Dissipation (Note 6) Linear derating factor	P_D	2.1 16.8	W mW/ $^{\circ}\text{C}$
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	83	$^{\circ}\text{C}/\text{W}$
Thermal Resistance, Junction to Ambient (Note 6)	$R_{\theta JA}$	60	$^{\circ}\text{C}/\text{W}$
Thermal Resistance, Junction to Ambient (Note 7)	$R_{\theta JL}$	3.23	$^{\circ}\text{C}/\text{W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^{\circ}\text{C}$

ESD Ratings (Note 8)

Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	≥ 400	V	C

- Notes:
5. 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.
 6. Same as note (5), except the device is mounted on 50mm X 50mm single sided 1oz weight copper.
 7. Thermal resistance from junction to solder-point (at the end of the collector lead).
 8. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

Thermal Characteristics and Derating Information

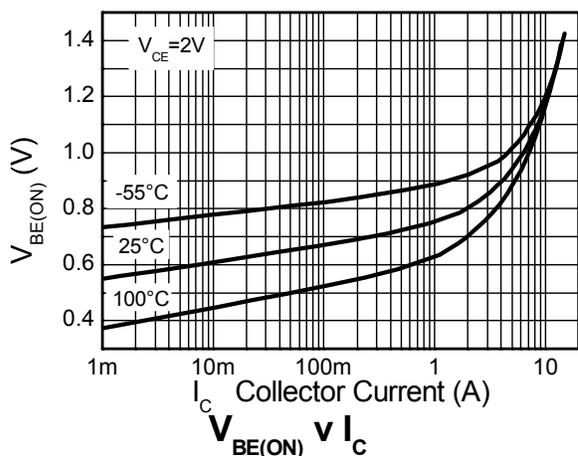
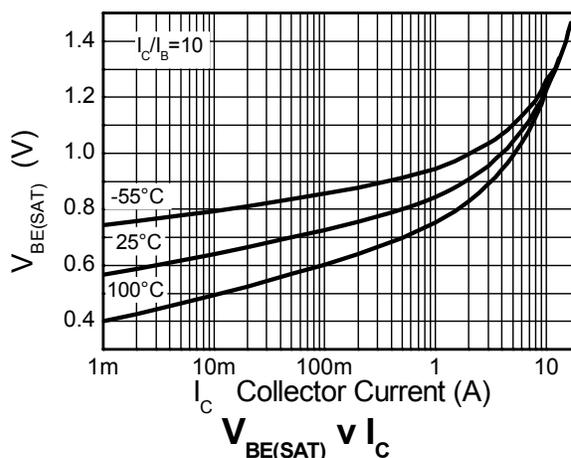
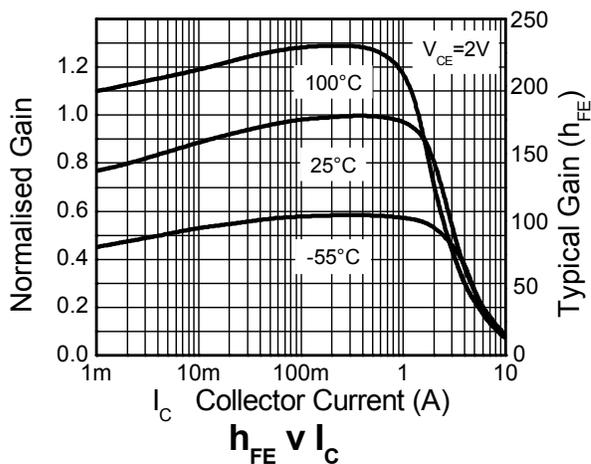
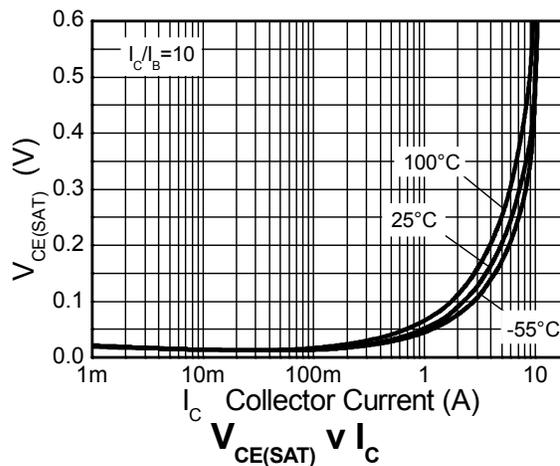
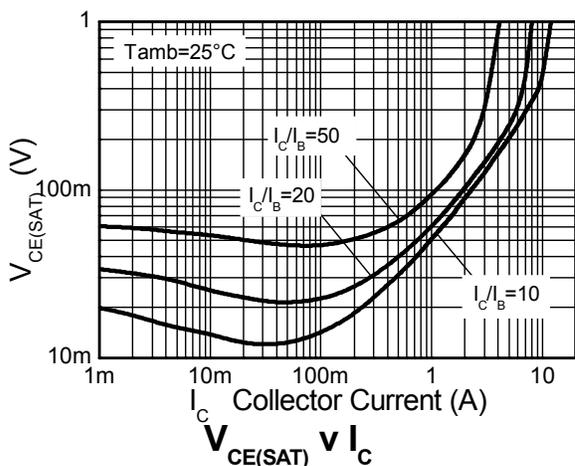


Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

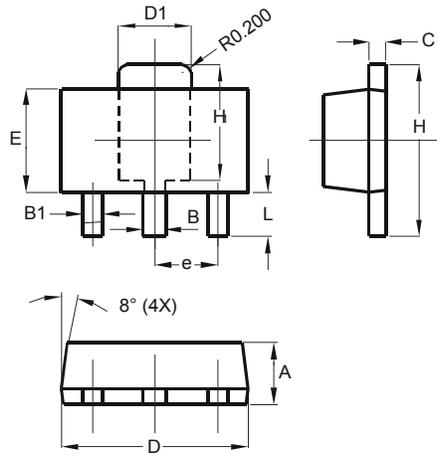
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	200	235	-	V	$I_C = 100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Notes 9)	BV_{CER}	200	235	-	V	$I_C = 1\mu\text{A}$, $R_B \leq 1\text{k}\Omega$
Collector-Emitter Breakdown Voltage (Notes 9)	BV_{CEO}	100	115	-	V	$I_C = 1\text{mA}$
Emitter-Base Breakdown Voltage	BV_{EBO}	7	8.1	-	V	$I_E = 100\mu\text{A}$
Collector Cutoff Current	I_{CBO}	-	<1	50	nA	$V_{CB} = 150\text{V}$
		-	-	500	nA	$V_{CB} = 150\text{V}$, $T_A = +100^\circ\text{C}$
Collector Cutoff Current	I_{CER}	-	<1	100	nA	$V_{CB} = 150\text{V}$
	$R \leq 1\text{k}\Omega$	-	-	500	nA	$V_{CB} = 150\text{V}$, $T_A = +100^\circ\text{C}$
Emitter Cutoff Current	I_{EBO}	-	<1	10	nA	$V_{EB} = 6\text{V}$
DC Current Transfer Static Ratio (Notes 9)	h_{FE}	100	230	-	-	$I_C = 10\text{mA}$, $V_{CE} = 2\text{V}$
		100	200	300		$I_C = 2\text{A}$, $V_{CE} = 2\text{V}$
		30	60	-		$I_C = 5\text{A}$, $V_{CE} = 2\text{V}$
		10	20	-		$I_C = 10\text{A}$, $V_{CE} = 2\text{V}$
Collector-Emitter Saturation Voltage (Notes 9)	$V_{CE(sat)}$	-	20	30	mV	$I_C = 100\text{mA}$, $I_B = 5\text{mA}$
		-	45	60		$I_C = 1\text{A}$, $I_B = 100\text{mA}$
		-	85	115		$I_C = 2\text{A}$, $I_B = 100\text{mA}$
		-	155	195		$I_C = 5\text{A}$, $I_B = 500\text{mA}$
Base-Emitter Saturation Voltage (Notes 9)	$V_{BE(sat)}$	-	1000	1100	mV	$I_C = 5\text{A}$, $I_B = 500\text{mA}$
Base-Emitter Turn-on Voltage (Notes 9)	$V_{BE(on)}$	-	900	1000	mV	$I_C = 5\text{A}$, $V_{CE} = 2\text{V}$
Transitional Frequency	f_T	-	130	-	MHz	$I_C = 100\text{mA}$, $V_{CE} = 10\text{V}$, $f = 50\text{MHz}$
Output Capacitance	C_{obo}	-	26	-	pF	$V_{CB} = 10\text{V}$, $f = 1\text{MHz}$,
Switching Time	t_{on}	-	41	-	ns	$V_{CC} = 10\text{V}$, $I_C = 1\text{A}$, $I_{B1} = I_{B2} = 100\text{mA}$
	t_{off}	-	1010	-		

 Notes: 8. 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.)

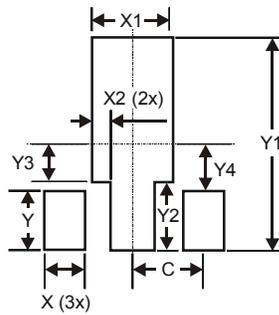


Package Outline Dimensions



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



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