



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

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企业微信二维码



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Features

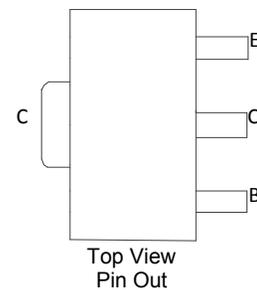
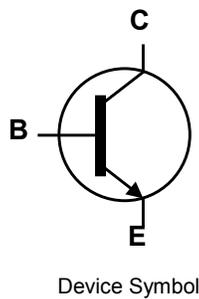
- $BV_{CEO} > 25V$
- $I_C = 5.5A$ Continuous Current
- Low Saturation Voltage $V_{CE(sat)} < 0.2V @ 6.5A$
- $R_{sat} = 25m\Omega$ for a Low Equivalent On-Resistance

Application

- Emergency lighting circuits
- Motor driving (including DC fans)
- Solenoid, relay and actuator drivers
- DC modules
- Backlight Inverters

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)



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

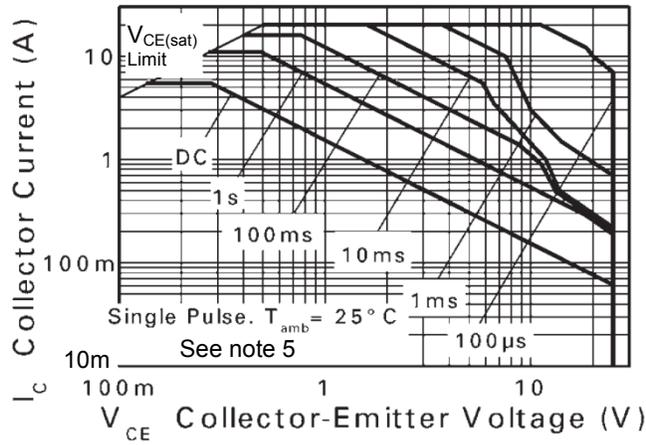
Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	60	V
Collector-Emitter Voltage	V_{CEO}	25	V
Emitter-Base Voltage	V_{EBO}	7	V
Continuous Collector Current	I_C	5.5	A
Peak Pulse Collector Current (single pulse)	I_{CM}	20	A

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

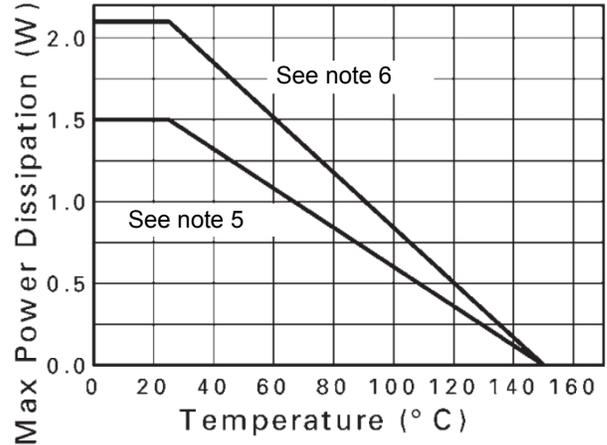
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P_D	1.5	W mW/ $^\circ\text{C}$
Linear Derating Factor		12	
Power Dissipation (Note 6)		2.1	
Linear Derating Factor		16.8	
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	83	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction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

- 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 x 1.6mm single sided 2oz weight copper.

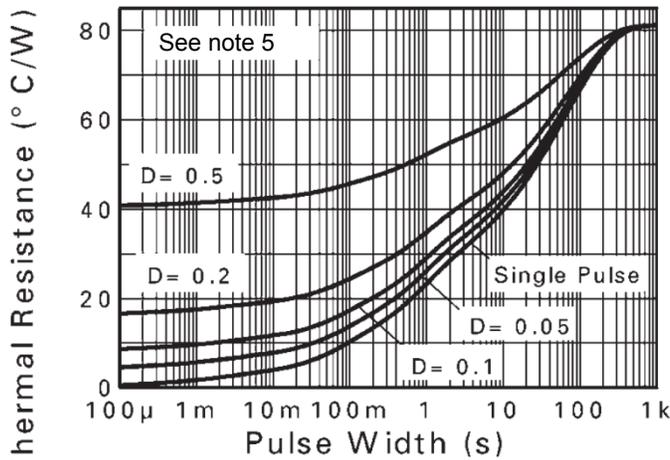
Thermal Characteristics and Derating Information



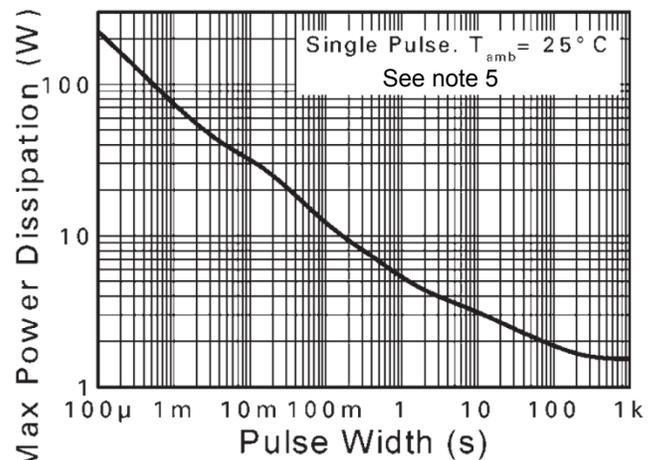
Safe Operating Area



Derating Curve



Transient Thermal Impedance



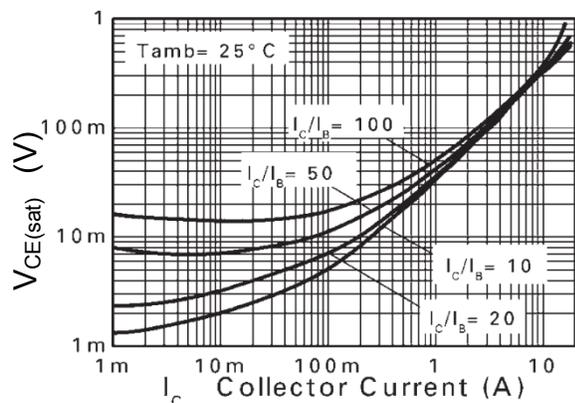
Pulse Power Dissipation

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

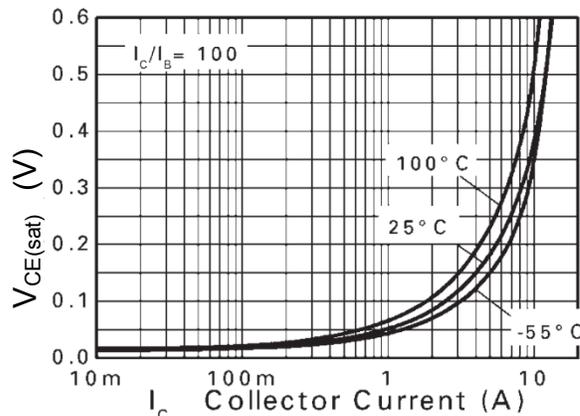
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	60	120	—	V	$I_C = 100\mu\text{A}$
Collector-emitter breakdown voltage	BV_{CER}	60	120	—	V	$I_C = 1\mu\text{A}$, $R_{BE} \leq 1\text{k}\Omega$
Collector- Emitter Breakdown Voltage (Note 7)	BV_{CEO}	25	35	—	V	$I_C = 10\text{mA}$
Emitter-Base Breakdown Voltage	BV_{EBO}	7.0	8.1	—	V	$I_E = 100\mu\text{A}$
Collector Base Cut-Off Current	I_{CBO}	—	—	20 0.5	nA μA	$V_{CB} = 50\text{V}$ $V_{CB} = 50\text{V}$, $T_A = +100^\circ\text{C}$
Collector Emitter Cut-Off Current	I_{CER} $R_{\leq 1\text{k}\Omega}$	—	—	20 0.5	nA μA	$V_{CB} = 50\text{V}$ $V_{CB} = 50\text{V}$, $T_{amb} = 100^\circ\text{C}$
Emitter Cut-Off Current	I_{EBO}	—	—	10	nA	$V_{EB} = 6\text{V}$
Collector-Emitter Saturation Voltage (Note 7)	$V_{CE(sat)}$	—	25 30 45 105 160	35 45 70 130 200	mV	$I_C = 500\text{mA}$, $I_B = 10\text{mA}$ $I_C = 1\text{A}$, $I_B = 100\text{mA}$ $I_C = 1\text{A}$, $I_B = 10\text{mA}$ $I_C = 2\text{A}$, $I_B = 10\text{mA}$ $I_C = 6.5\text{A}$, $I_B = 150\text{mA}$
Base-Emitter Saturation Voltage (Note 7)	$V_{BE(sat)}$	—	950	1050	mV	$I_C = 6.5\text{A}$, $I_B = 150\text{mA}$
Base-Emitter Turn-On Voltage (Note 7)	$V_{BE(on)}$	—	860	960	mV	$I_C = 6.5\text{A}$, $V_{CE} = 1\text{V}$
DC Current Gain (Note 7)	h_{FE}	300 300 200 40	400 450 275 55	—	—	$I_C = 10\text{mA}$, $V_{CE} = 1\text{V}$ $I_C = 1\text{A}$, $V_{CE} = 1\text{V}$ $I_C = 7\text{A}$, $V_{CE} = 1\text{V}$ $I_C = 20\text{A}$, $V_{CE} = 1\text{V}$
Transitional frequency	f_T	—	150	—	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 times	t_{on}	—	33	—	ns	$V_{CC} = 10\text{V}$ $I_C = 1\text{A}$, $I_{B1} = -I_{B2} = 100\text{mA}$
	t_{off}	—	464	—		

 Note: 7. Measured under pulsed conditions. Pulse width $\leq 300\mu\text{s}$. Duty cycle $\leq 2\%$.

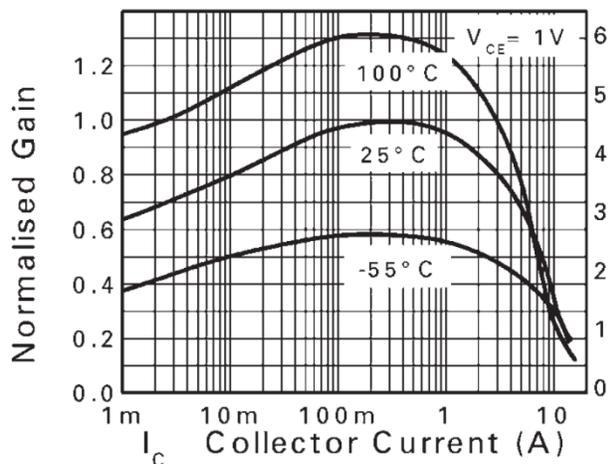
Typical Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)



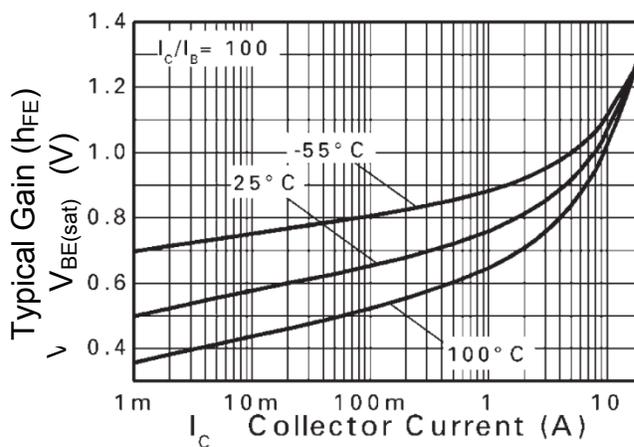
$V_{CE(sat)} \text{ v } I_C$



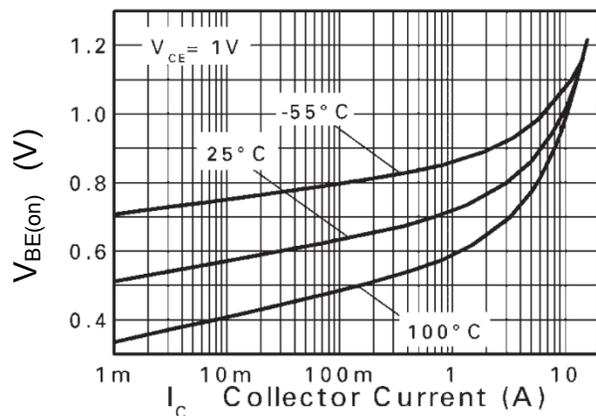
$V_{CE(sat)} \text{ v } I_C$



$h_{FE} \text{ v } I_C$



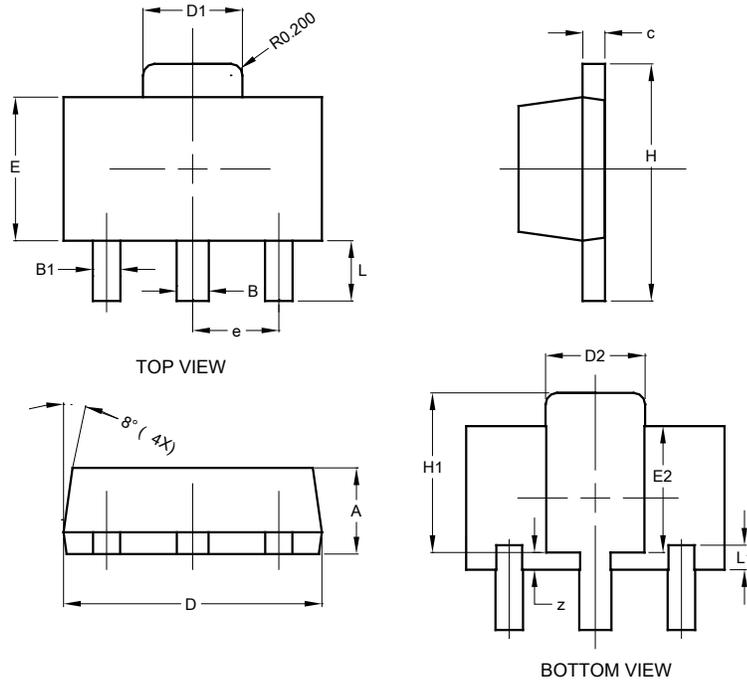
$V_{BE(sat)} \text{ v } I_C$



$V_{BE(on)} \text{ v } I_C$

Package Outline Dimensions

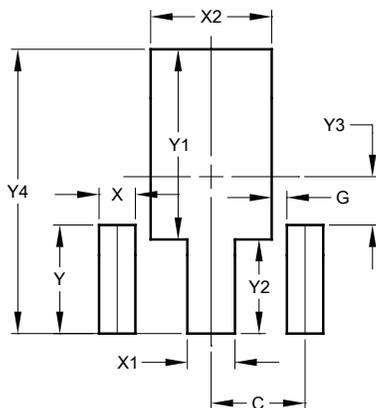
SOT89



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