



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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Features

- $BV_{CEO} > -30V$
- $I_C = -5.5A$ Continuous Collector Current
- $I_{CM} = -20A$ Peak Pulse Current
- Low Saturation Voltage $V_{CE(SAT)} < -60mV$ max @ $-1A$
- $R_{SAT} = 24m\Omega$ @ $-5.5A$ for Low Equivalent On-Resistance
- Exceptional Gain Linearity Down to $-10mA$
- h_{FE} Specified up to $-20A$ for High 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 
- Weight: 0.05 grams (Approximate)

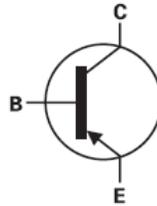
Applications

- DC-DC Converters
- MOSFET Gate Drivers
- Charging Circuits
- Power Switches
- Motor Control

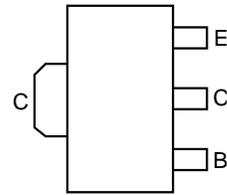
SOT89



Top View



Device Schematic



Pin-Out Top View

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V _{CB0}	-50	V
Collector-Emitter Voltage	V _{CEO}	-30	V
Emitter-Base Voltage	V _{EBO}	-7	V
Continuous Collector Current	I _C	-5.5	A
Peak Pulse Current	I _{CM}	-20	A

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

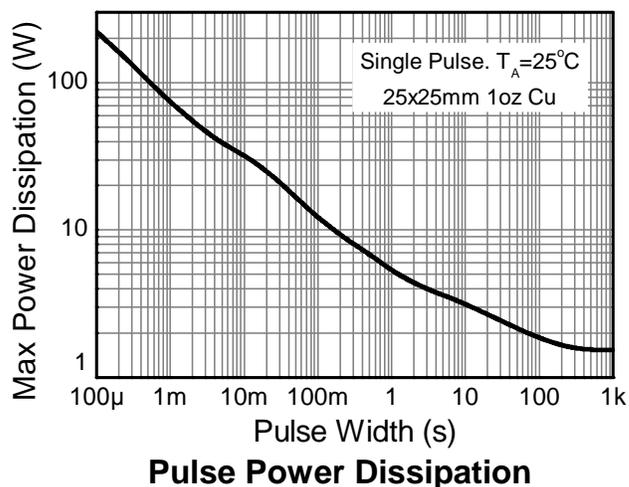
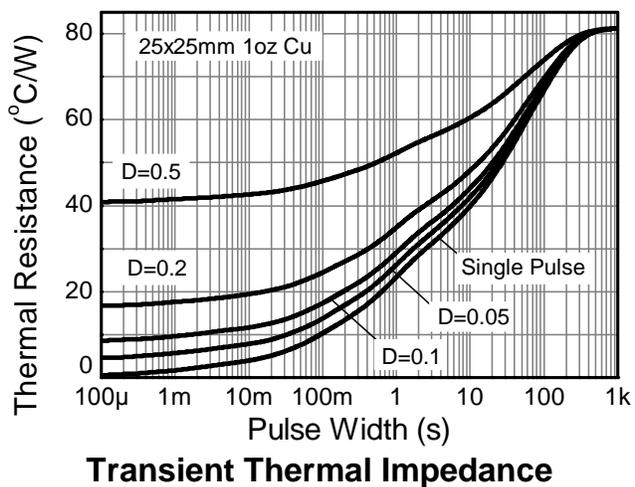
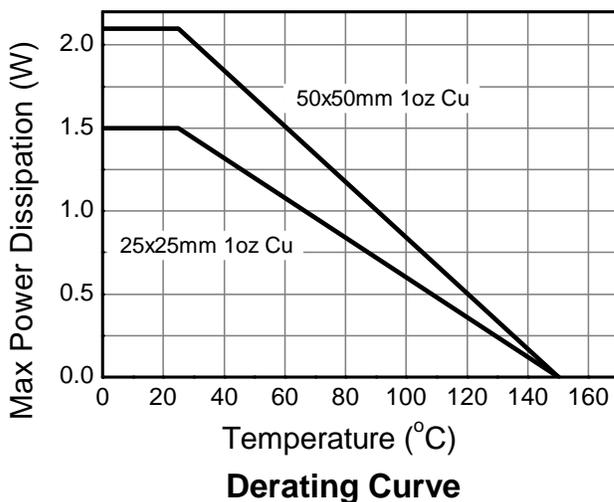
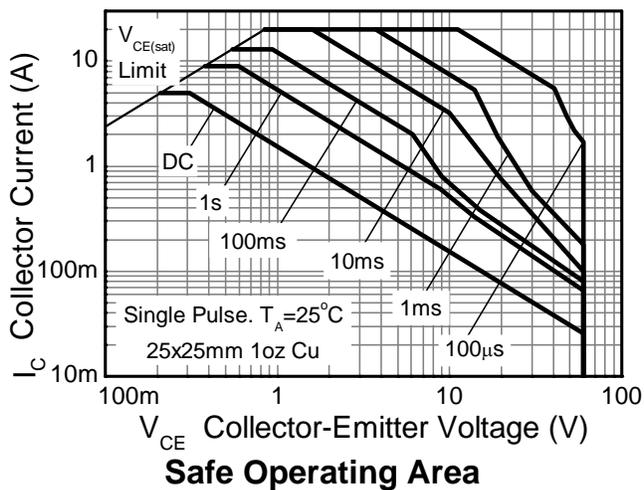
Characteristic		Symbol	Value	Unit
Power Dissipation Linear Derating Factor	(Note 5)	P _D	1.5	W mW/°C
			12	
	(Note 6)		2.1 16.8	
Thermal Resistance, Junction to Ambient	(Note 5)	R _{θJA}	83	°C/W
	(Note 6)	R _{θJA}	60	
Thermal Resistance, Junction to Lead	(Note 7)	R _{θJL}	3.23	
Operating and Storage Temperature Range		T _J , T _{STG}	-55 to +150	°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 mounted with the collector lead on 25mm x 25mm 1oz copper that is on a single-sided 1.6mm FR-4 PCB; device is measured under still air conditions whilst operating in steady-state.
 6. Same as Note 5, except the device is mounted on 50mm x 50mm 1oz 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

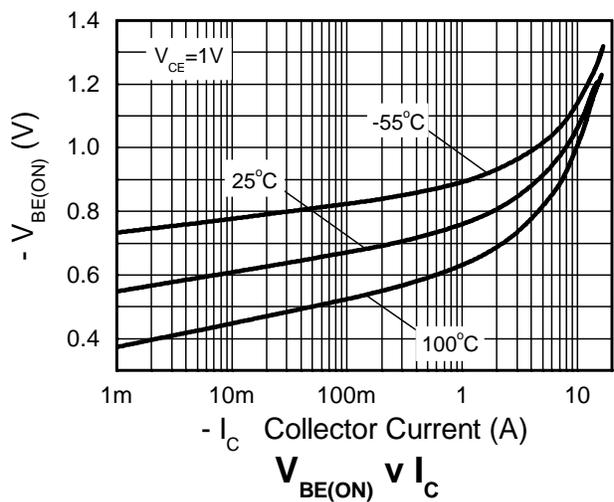
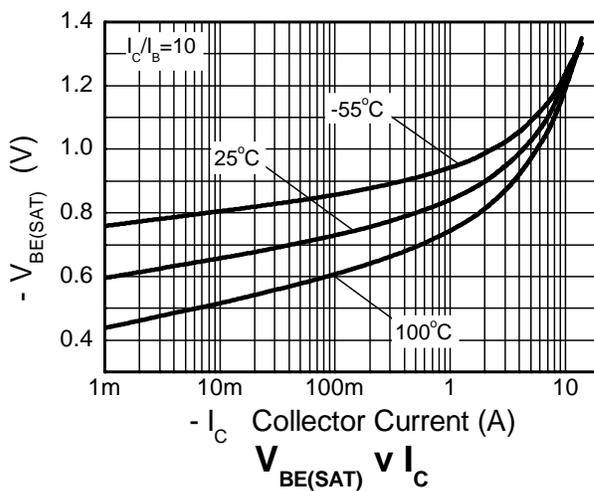
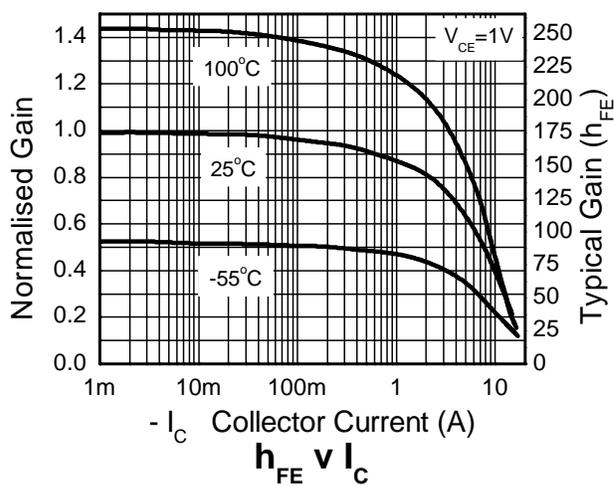
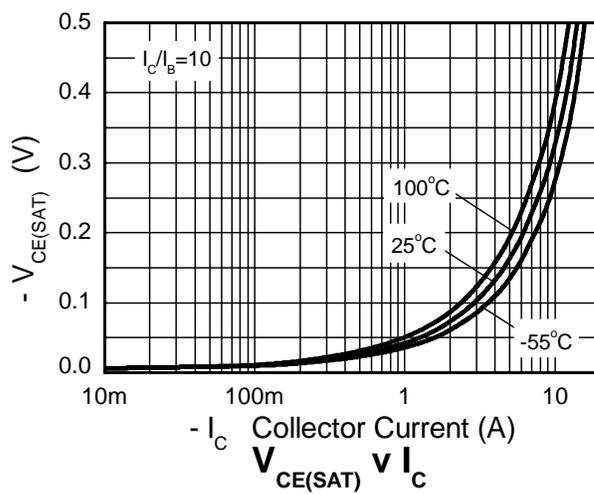
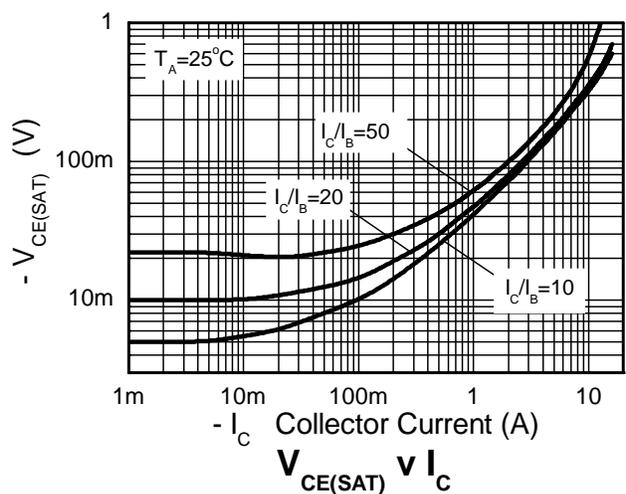


Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	-50	-70	—	V	$I_C = -100\mu\text{A}$
Collector-Emitter Breakdown Voltage	BV_{CER}	-50	-70	—	V	$I_C = -1\mu\text{A}$, $R_B \leq 1\text{k}\Omega$
Collector-Emitter Breakdown Voltage (Note 9)	BV_{CEO}	-30	-40	—	V	$I_C = -10\text{mA}$
Emitter-Base Breakdown Voltage	BV_{EBO}	-7	-8	—	V	$I_E = -100\mu\text{A}$
Collector Cutoff Current	I_{CBO}	—	< -1	-20	nA	$V_{CB} = -40\text{V}$
		—	—	-0.5	μA	$V_{CB} = -40\text{V}$, $T_A = +100^\circ\text{C}$
Collector Cutoff Current	I_{CER}	—	< -1	-20	nA	$V_{CB} = -40\text{V}$, $R \leq 1\text{k}\Omega$
		—	—	-0.5	μA	$V_{CB} = -40\text{V}$, $T_A = +100^\circ\text{C}$, $R \leq 1\text{k}\Omega$
Emitter Cutoff Current	I_{EBO}	—	< -1	-10	nA	$V_{EB} = -6\text{V}$
Collector-Emitter Saturation Voltage (Note 9)	$V_{CE(SAT)}$	—	-25 -35 -55 -55 -130	-40 -55 -80 -80 -175	mV	$I_C = -0.5\text{A}$, $I_B = -20\text{mA}$ $I_C = -1\text{A}$, $I_B = -100\text{mA}$ $I_C = -1\text{A}$, $I_B = -20\text{mA}$ $I_C = -2\text{A}$, $I_B = -200\text{mA}$ $I_C = -5.5\text{A}$, $I_B = -500\text{mA}$
Base-Emitter Saturation Voltage (Note 9)	$V_{BE(SAT)}$	—	-970	-1070	mV	$I_C = -5.5\text{A}$, $I_B = -500\text{mA}$
Base-Emitter Turn-On Voltage (Note 9)	$V_{BE(ON)}$	—	-860	-960	mV	$I_C = -5.5\text{A}$, $V_{CE} = -1\text{V}$
DC Current Gain (Note 9)	h_{FE}	100 100 70 10	225 200 145 20	300	—	$I_C = -10\text{mA}$, $V_{CE} = -1\text{V}$ $I_C = -1\text{A}$, $V_{CE} = -1\text{V}$ $I_C = -5\text{A}$, $V_{CE} = -1\text{V}$ $I_C = -20\text{A}$, $V_{CE} = -1\text{V}$
Transition Frequency	f_T	—	110	—	MHz	$V_{CE} = -10\text{V}$, $I_C = -100\text{mA}$, $f = 50\text{MHz}$
Output Capacitance (Note 9)	C_{OBO}	—	83	—	pF	$V_{CB} = -10\text{V}$, $f = 1\text{MHz}$
Switching Times	t_{ON}	—	43	—	ns	$V_{CC} = -10\text{V}$, $I_C = -1\text{A}$, $I_{B1} = -I_{B2} = 100\text{mA}$
	t_{OFF}	—	230	—		

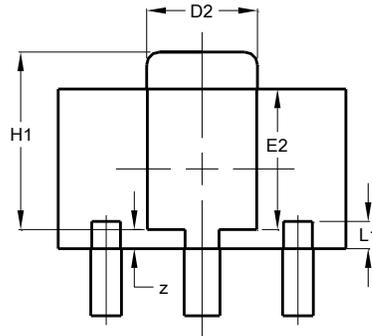
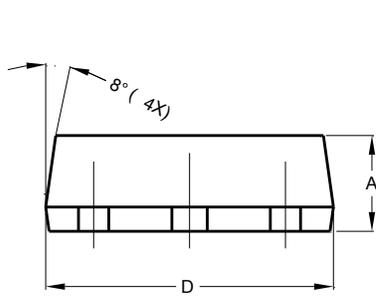
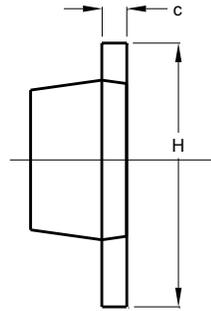
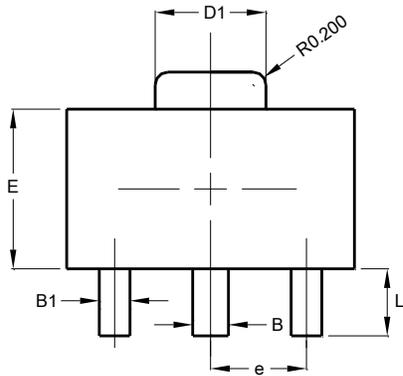
 Note: 9. Measured under pulsed conditions. Pulse width $\leq 300\mu\text{s}$. Duty cycle $\leq 2\%$.

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



Package Outline Dimensions

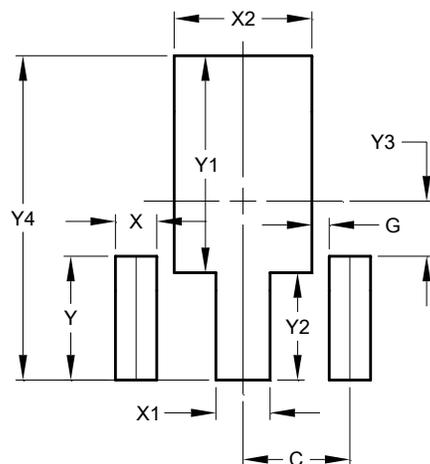
SOT89



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