



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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Description

This bipolar junction transistor (BJT) is designed to meet the stringent requirement of automotive applications.

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

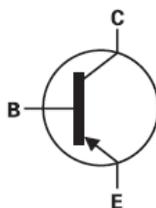
- Case: SOT89
- Case Material: Molded Plastic. "Green" Molding Compound. UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish—Matte Tin Plated Leads. Solderable per MIL-STD-202, Method 208 
- Weight: 0.05 grams (Approximate)

Applications

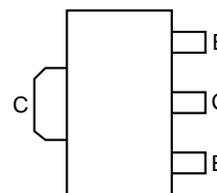
- DC-DC Converters
- MOSFET Gate Drivers
- Charging Circuits
- Power Switches
- Motor Control



Top View



Device Schematic



Pin-Out Top View

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	-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 (@ $T_A = +25^{\circ}\text{C}$, unless otherwise specified.)

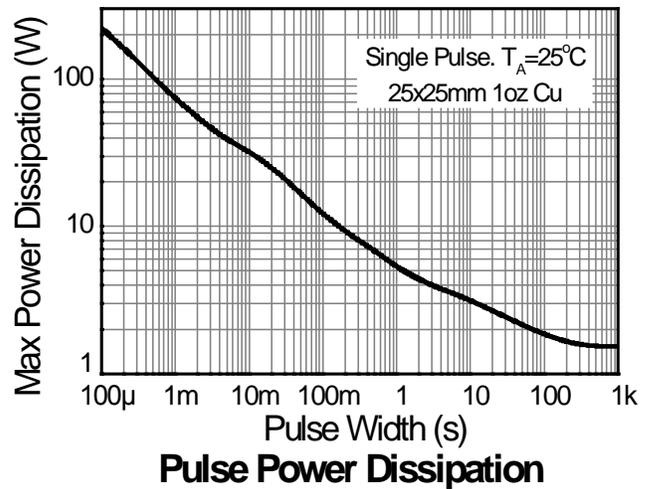
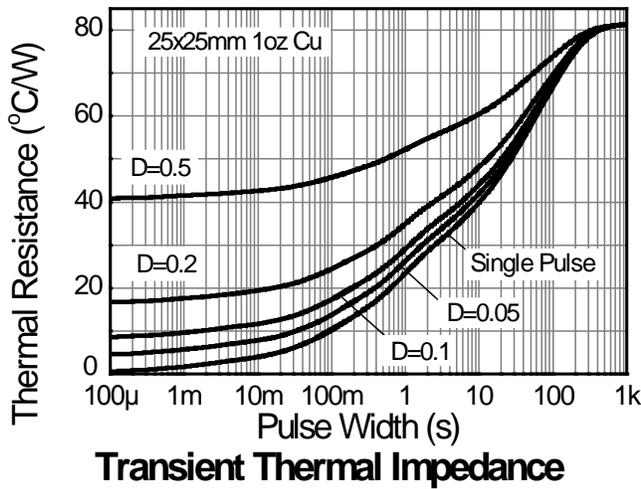
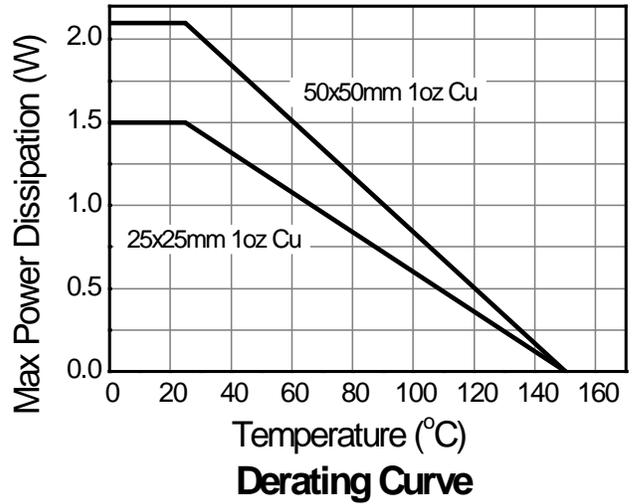
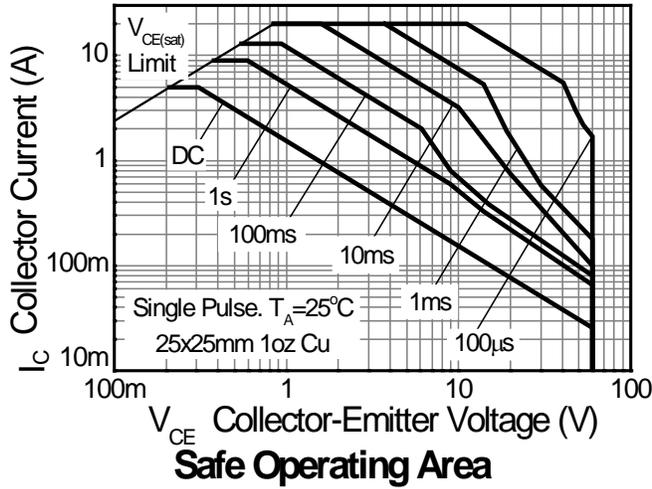
Characteristic		Symbol	Value	Unit
Power Dissipation Linear Derating Factor	(Note 6)	P_D	1.5	W
	(Note 7)		12	
Thermal Resistance, Junction to Ambient	(Note 6)	$R_{\theta JA}$	2.1	$\text{mW}/^{\circ}\text{C}$
	(Note 7)	$R_{\theta JA}$	16.8	
Thermal Resistance, Junction to Lead	(Note 6)	$R_{\theta JA}$	83	$^{\circ}\text{C}/\text{W}$
	(Note 7)	$R_{\theta JA}$	60	
Operating and Storage Temperature Range	(Note 8)	$R_{\theta JL}$	3.23	$^{\circ}\text{C}$
		T_J, T_{STG}	-55 to +150	$^{\circ}\text{C}$

ESD Ratings (Note 9)

Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge—Human Body Model	ESD HBM	4000	V	3A
Electrostatic Discharge—Machine Model	ESD MM	400	V	C

- Notes:
6. For a device mounted with the collector lead on 25mm × 25mm 1oz copper that is on a single-sided 1.6mm FR-4 PCB; device is measured under still air conditions while operating in steady-state.
 7. Same as Note 5, except the device is mounted on 50mm × 50mm 1oz copper.
 8. Thermal resistance from junction to solder-point (at the end of the collector lead).
 9. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

Thermal Characteristics and Derating Information

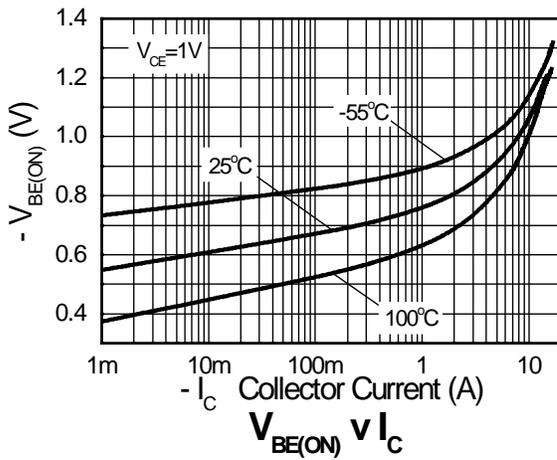
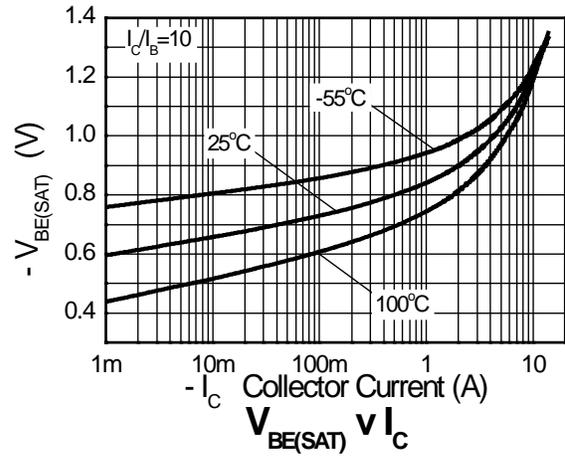
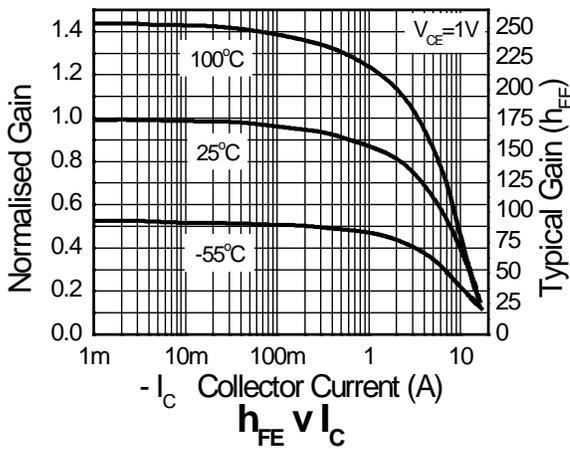
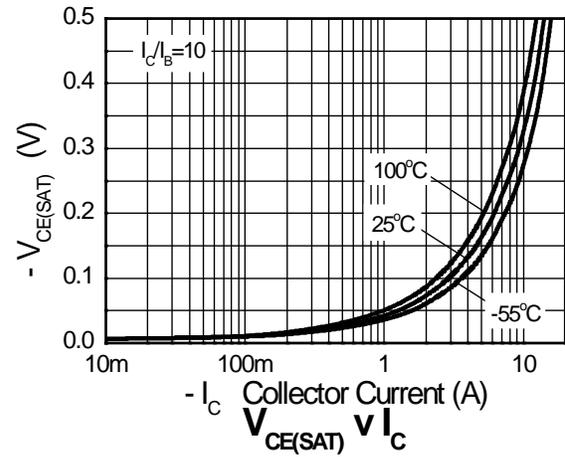
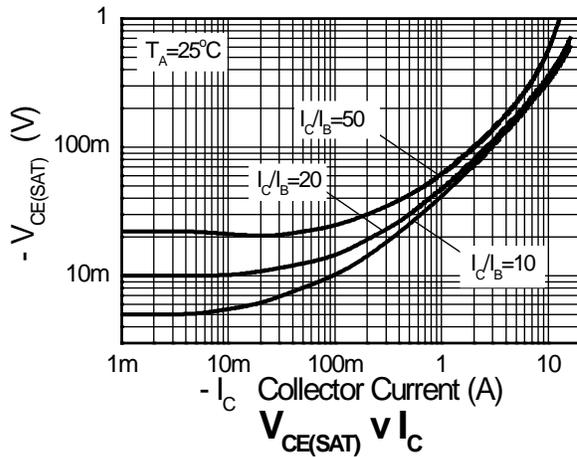


Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

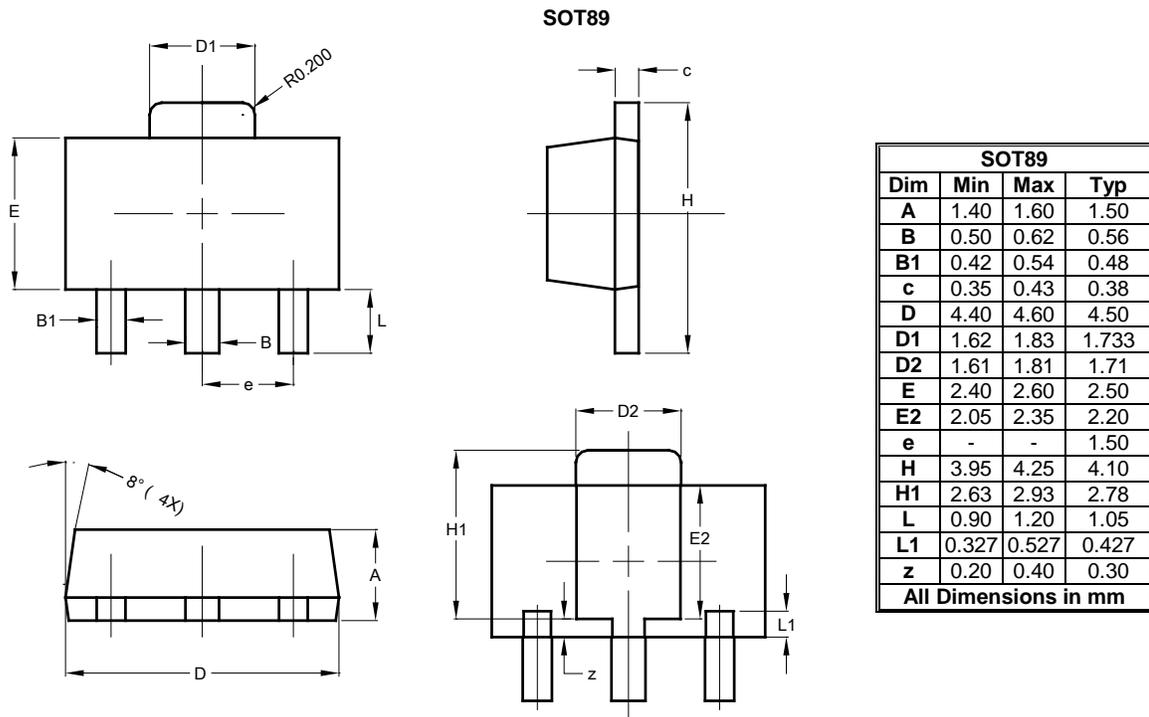
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV _{CBO}	-50	-70	—	V	I _C = -100μA
Collector-Emitter Breakdown Voltage	BV _{CER}	-50	-70	—	V	I _C = -1μA, R _B ≤ 1kΩ
Collector-Emitter Breakdown Voltage (Note 10)	BV _{CEO}	-30	-40	—	V	I _C = -10mA
Emitter-Base Breakdown Voltage	BV _{EBO}	-7	-8	—	V	I _E = -100μA
Collector Cutoff Current	I _{CBO}	—	< -1	-20	nA	V _{CB} = -40V
		—	—	-0.5	μA	V _{CB} = -40V, T _A = +100°C
Collector Cutoff Current	I _{CER}	—	< -1	-20	nA	V _{CB} = -40V, R _S ≤ 1kΩ
		—	—	-0.5	μA	V _{CB} = -40V, T _A = +100°C, R _S ≤ 1kΩ
Emitter Cutoff Current	I _{EBO}	—	< -1	-10	nA	V _{EB} = -6V
Collector-Emitter Saturation Voltage (Note 10)	V _{CE(SAT)}	—	-25 -35 -55 -55 -130	-40 -55 -80 -80 -175	mV	I _C = -0.5A, I _B = -20mA I _C = -1A, I _B = -100mA I _C = -1A, I _B = -20mA I _C = -2A, I _B = -200mA I _C = -5.5A, I _B = -500mA
Base-Emitter Saturation Voltage (Note 10)	V _{BE(SAT)}	—	-970	-1070	mV	I _C = -5.5A, I _B = -500mA
Base-Emitter Turn-On Voltage (Note 10)	V _{BE(ON)}	—	-860	-960	mV	I _C = -5.5A, V _{CE} = -1V
DC Current Gain (Note 10)	h _{FE}	100 100 70 10	225 200 145 20	300	—	I _C = -10mA, V _{CE} = -1V I _C = -1A, V _{CE} = -1V I _C = -5A, V _{CE} = -1V I _C = -20A, V _{CE} = -1V
Transition Frequency	f _T	—	110	—	MHz	V _{CE} = -10V, I _C = -100mA, f = 50MHz
Output Capacitance (Note 10)	C _{OBO}	—	83	—	pF	V _{CB} = -10V, f = 1MHz
Switching Times	t _{ON}	—	43	—	ns	V _{CC} = -10V, I _C = -1A, I _{B1} = -I _{B2} = 100mA
	t _{OFF}	—	230	—		

Note: 10. 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



Suggested Pad Layout

