优尚

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

- $BV_{CEO} > 25V$
- $I_C = 5.5A$ High Continuous Current
- $I_{CM} = 20A$ Peak Pulse Current
- Very Low Saturation Voltages
- Extremely Low Equivalent On-Resistance; $R_{CE(SAT)} = 25m\Omega$ at 6.5A
- Excellent h_{FE} Characteristics up to 20A

Mechanical Data

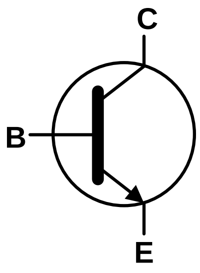
- Case: SOT89
- Case Material: Molded Plastic. “Green” Molding Compound. UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Plated Leads. Solderable per MIL-STD-202, Method 208 (e3)
- Weight: 0.05 grams (Approximate)

Applications

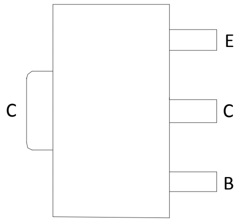
- Emergency Lighting Circuits
- Motor Driving (Including DC Fans)
- Solenoid, Relay and Actuator Drivers
- DC DC Modules
- Backlight Inverters

SOT89

Top View



Device Symbol



Top View
Pin-Out

Absolute Maximum Ratings (@T_A = +25°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 Current	I_{CM}	20	A

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

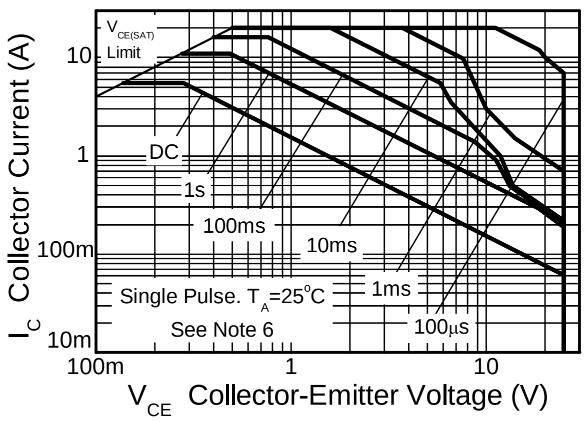
Characteristic		Symbol	Value	Unit
Power Dissipation Linear Derating Factor	(Note 6)	P_D	1.5 12	W mW/°C
	(Note 7)		2.1 16.8	
Thermal Resistance, Junction to Ambient Air	(Note 6)	$R_{\theta JA}$	83	°C/W
	(Note 7)		60	
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

ESD Ratings (Note 8)

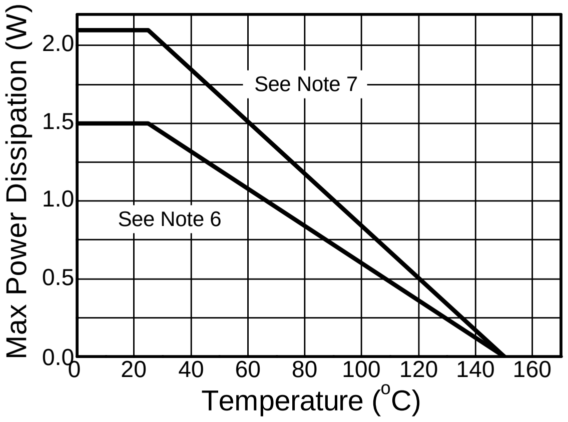
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

Notes:
6. For a device mounted with the exposed collector pad 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 a steady-state.
7. Same as note (6), except the device is mounted on 50mm x 50mm 1oz copper.
8. Refer to JEDEC specification NK-JESD22-A114 and NK-JESD22-A115.

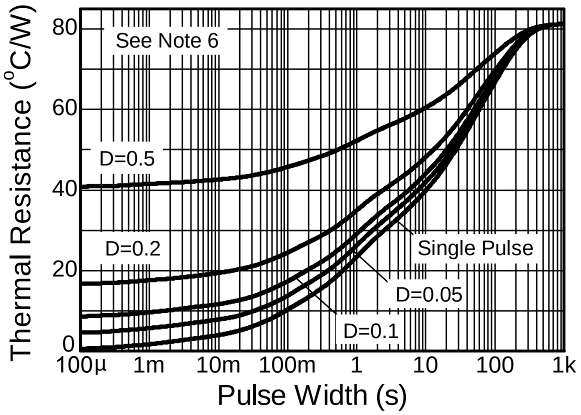
Thermal Characteristics and Derating Information



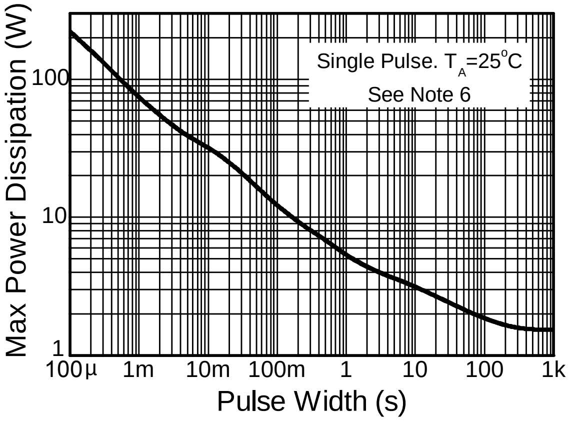
Safe Operating Area



Derating Curve



Transient Thermal Impedance



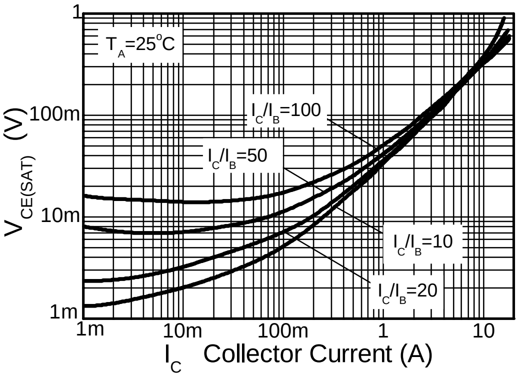
Pulse Power Dissipation

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

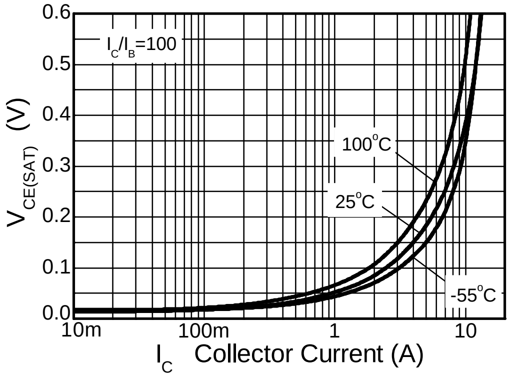
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	60	120	—	V	I_C = 100µA
Collector-Emitter Breakdown Voltage	BV_{CER}	60	120	—	V	I_C = 1µA, R_B ≤ 1kΩ
Collector-Emitter Breakdown Voltage (Note 9)	BV_{CEO}	25	35	—	V	I_C = 10mA
Emitter-Base Breakdown Voltage	BV_{EBO}	7	8.1	—	V	I_E = 100µA
Collector Cutoff Current	I_{CBO}	—	—	20 0.5	nA µA	V_{CB} = 50V V_{CB} = 50V, T_A = +100°C
Collector Cutoff Current	I_{CER} R ≤ 1kΩ	—	—	20 0.5	nA µA	V_{CB} = 50V V_{CB} = 50V, T_A = +100°C
Emitter Cutoff Current	I_{EBO}	—	—	10	nA	V_{EB} = 5.6V
DC Current Transfer Static Ratio (Note 9)	h_{FE}	300 300 200 40	400 450 275 55	—	—	I_C = 10mA, V_{CE} = 1V I_C = 1A, V_{CE} = 1V I_C = 7A, V_{CE} = 1V I_C = 20A, V_{CE} = 1V
Collector-Emitter Saturation Voltage (Note 9)	$V_{CE(SAT)}$	—	25 30 45 105 160	35 45 70 130 200	mV	I_C = 500mA, I_B = 10mA I_C = 1A, I_B = 100mA I_C = 1A, I_B = 10mA I_C = 2A, I_B = 10mA I_C = 6.5A, I_B = 150mA
Base-Emitter Saturation Voltage (Note 9)	$V_{BE(SAT)}$	—	950	1050	mV	I_C = 6.5A, I_B = 150mA
Base-Emitter Turn-on Voltage (Note 9)	$V_{BE(ON)}$	—	860	960	mV	I_C = 6.5A, V_{CE} = 1V
Transitional Frequency	f_T	—	150	—	MHz	I_C = 100mA, V_{CE} = 10V, f = 50MHz
Output Capacitance	C_{OBO}	—	48	—	pF	V_{CB} = 10V, f = 1MHz
Switching Time	t_{ON}	—	33	—	ns	V_{CC} = 10V, I_C = 1A, I_{B1} = -I_{B2} = 100mA
	t_{OFF}		464			

Note 9: Measured under pulsed conditions. Pulse width = 300µs. Duty cycle ≤ 2%.

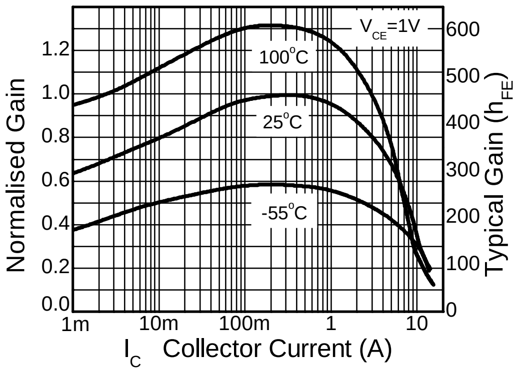
Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)



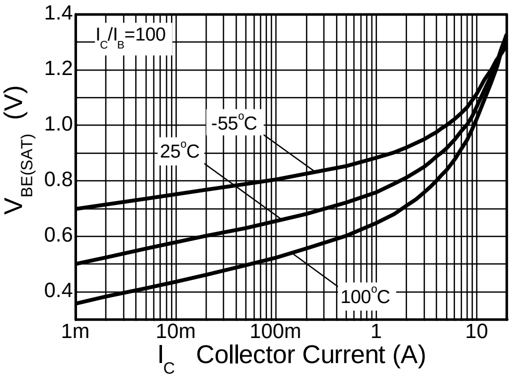
$V_{CE(SAT)}$ v I_C



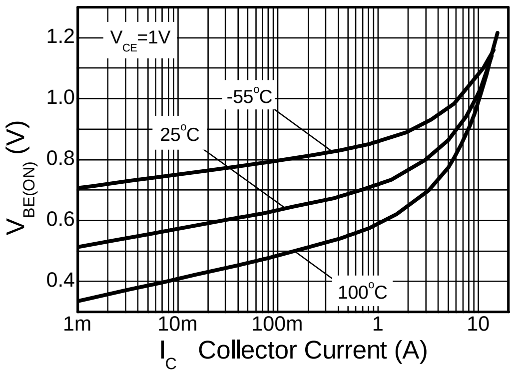
$V_{CE(SAT)}$ v I_C



h_{FE} v I_C



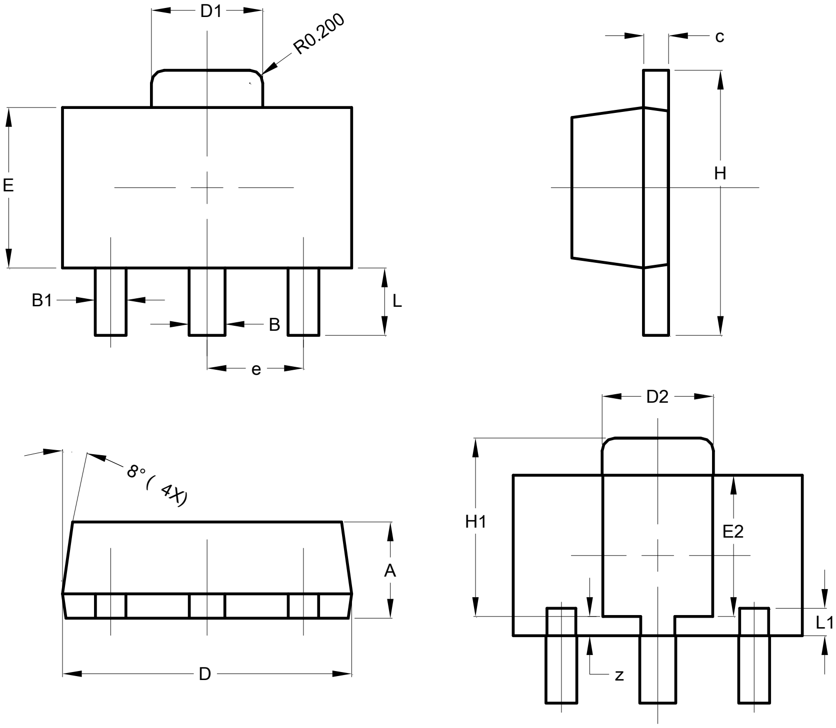
$V_{BE(SAT)}$ v I_C



$V_{BE(ON)}$ v I_C

Package Outline Dimensions

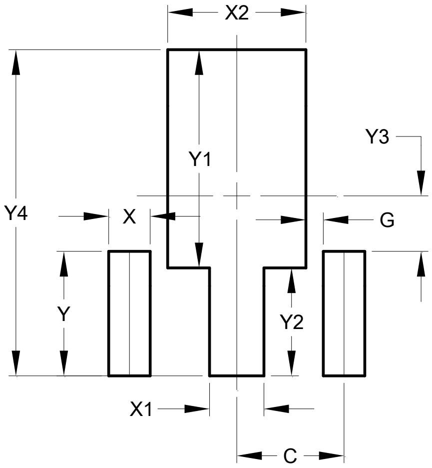
SOT89



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