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 requirements of Automotive Applications.

Mechanical Data

- Case: SOT89
- Case Material: Molded Plastic, “Green” Molding Compound
- Moisture Sensitivity: Level 1 per J-STD-020
- UL Flammability Rating 94V-0
- Terminals: Matte Tin Finish, Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.052 grams (Approximate)

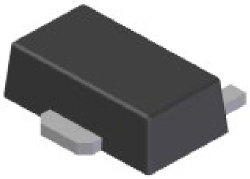
Features

- BV_{CEO} > 100V
- I_C = 1A high Continuous Current
- Low saturation voltage $V_{CE(sat)}$ < 300mV @ 250mA

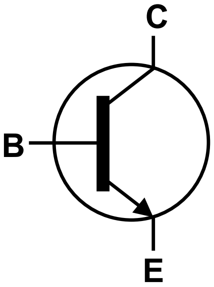
Application

- Load management functions
- Solenoid, relay and actuator drivers
- DC – DC modules

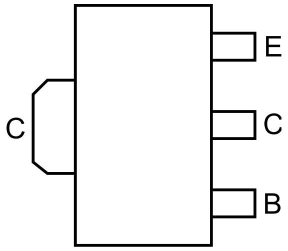
SOT89



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}	120	V
Collector-Emitter Voltage	V_{CEO}	100	V
Emitter-Base Voltage	V_{EBO}	7	V
Continuous Collector Current	I_C	1	A
Peak Pulse Current	I_{CM}	2	A
Continuous Base Current	I_B	200	mA

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

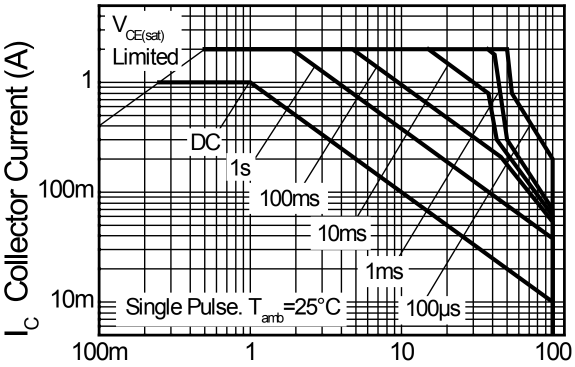
Characteristic	Symbol	Value	Unit
Collector Power Dissipation (Note 5)	P_D	1	W
Thermal Resistance, Junction to Ambient Air (Note 5)	$R_{\theta JA}$	125	°C/W
Thermal Resistance, Junction to Leads (Note 6)	$R_{\theta JL}$	10.01	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

ESD Ratings (Note 7)

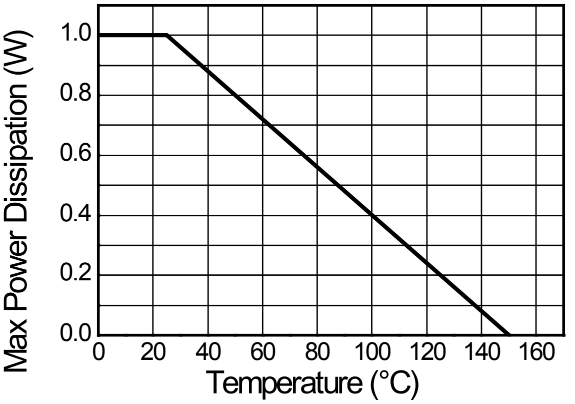
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

Notes:
5. For the device mounted on 15mm x 15mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.
6. Thermal resistance from junction to solder-point (on the exposed collector pad).
7. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

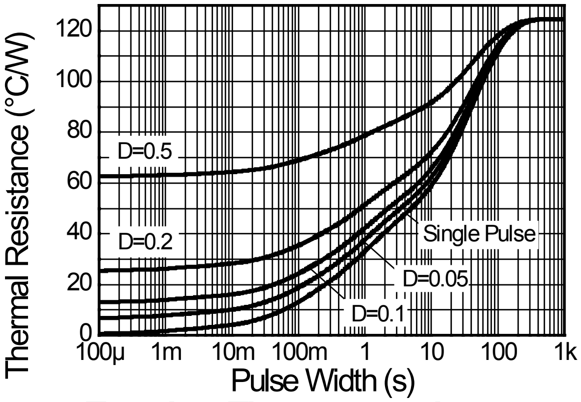
Thermal Characteristics and Derating Information



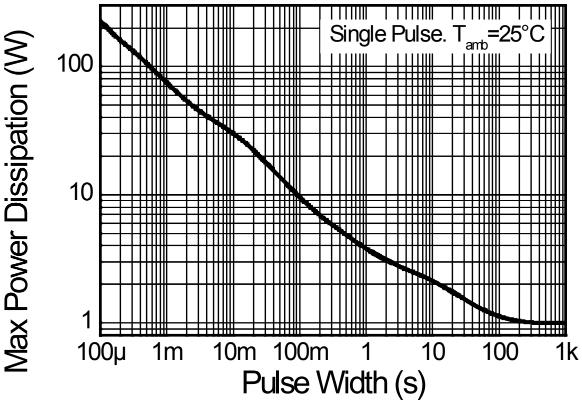
Safe Operating Area



Derating Curve



Transient Thermal Impedance



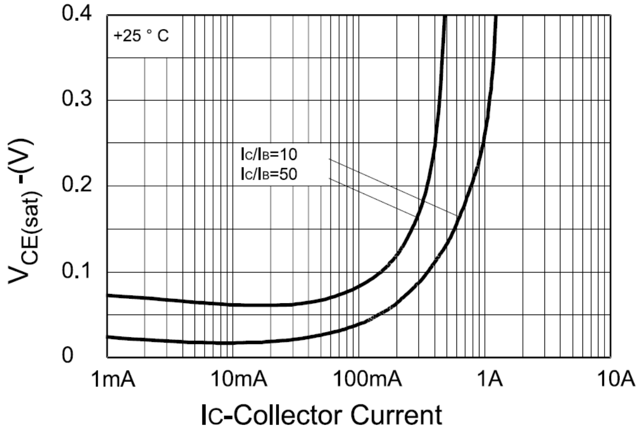
Pulse Power Dissipation

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

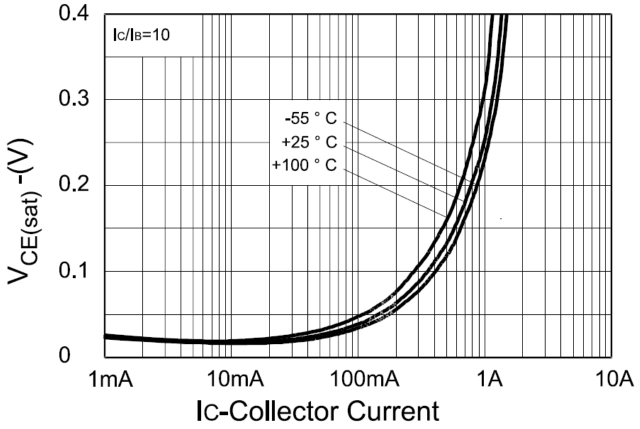
Characteristic	Symbol	Min	Typ.	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	120	-	-	V	I_C = 100µA
Collector-Emitter Breakdown Voltage (Note 8)	BV_{CEO}	100	-	-	V	I_C = 1mA
Emitter-Base Breakdown Voltage	BV_{EBO}	7	-	-	V	I_E = 100µA
Collector Cutoff Current	I_{CBO}	-	-	100	nA	V_{CB} = 100V
Emitter Cutoff Current	I_{EBO}	-	-	100	nA	V_{EB} = 5V
Emitter Cutoff Current	I_{CES}	-	-	100	nA	V_{CES} = 100V
DC current transfer Static ratio (Note 8)	h_{FE}	100	-	-	-	I_C = 1mA, V_{CE} = 10V
		100	-	300		I_C = 250mA, V_{CE} = 10V
		60	-	-		I_C = 500mA, V_{CE} = 10V
		20	-	-		I_C = 1A, V_{CE} = 10V
Collector-Emitter Saturation Voltage (Note 8)	$V_{CE(sat)}$	-	-	0.3	V	I_C = 500mA, I_B = 50mA
		-	-	0.6		I_C = 1A, I_B = 100mA
Base-Emitter Saturation Voltage (Note 8)	$V_{BE(sat)}$	-	-	1.15	V	I_C = 1A, I_B = 100mA
Base-Emitter Turn-on Voltage (Note 8)	$V_{BE(on)}$	-	-	1.0	V	I_C = 1A, V_{CE} = 10V
Transitional Frequency	f_t	150	-	-	MHz	I_C = 50mA, V_{CE} = 10V f = 100MHz
Output capacitance	C_{obo}	-	-	10	pF	V_{CB} = 10V, f = 1MHz,

Notes: 8. Measured under pulsed conditions. Pulse width ≤ 300µs. Duty cycle ≤ 2%.

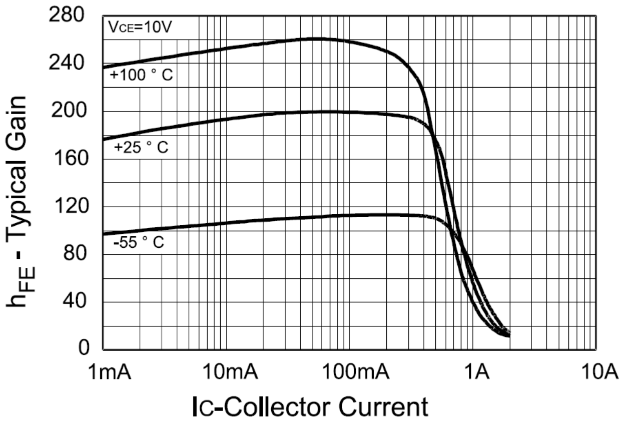
Typical Electrical Characteristics (@ T_A = +25°C, unless otherwise specified.)



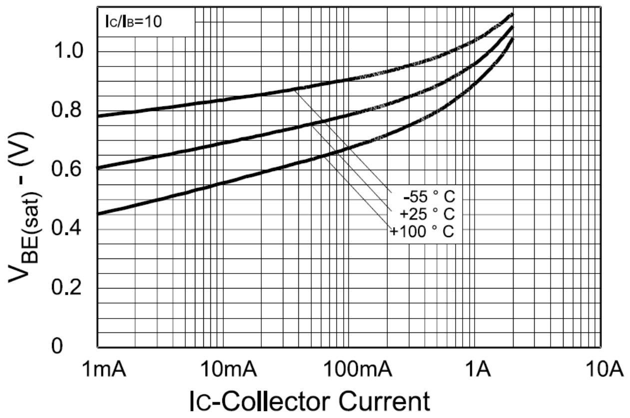
VCE(sat) v IC



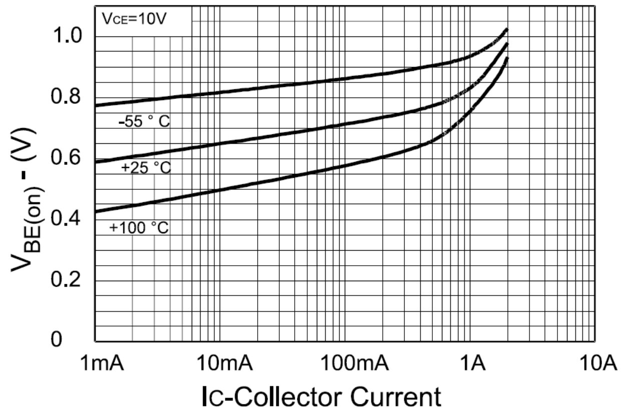
VCE(sat) v IC



hFE V IC

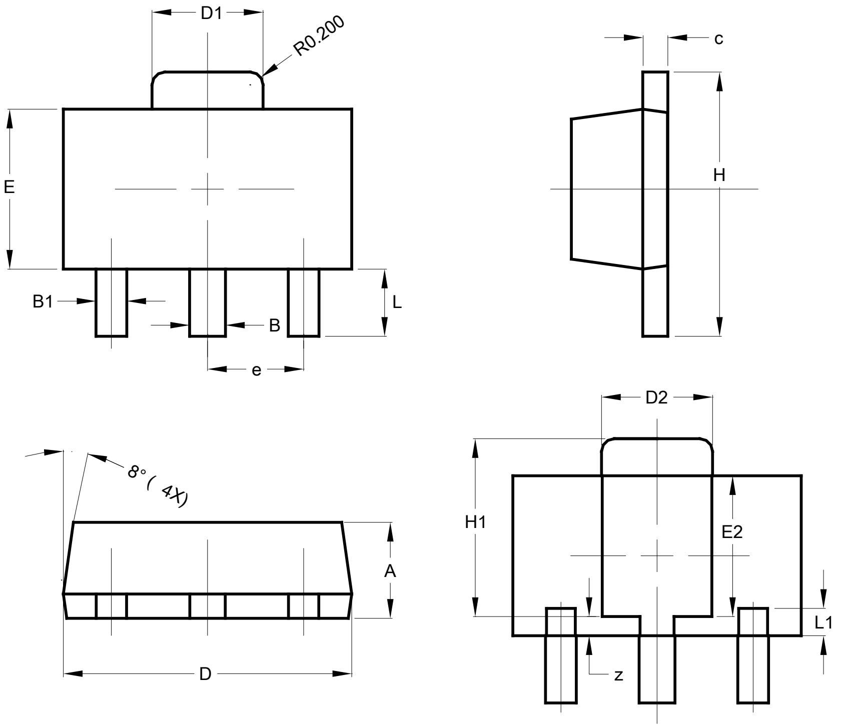


VBE(sat) v IC



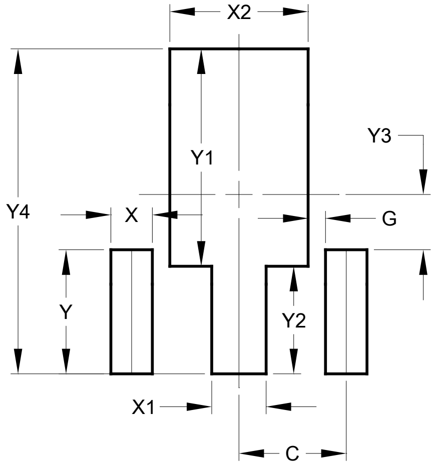
VBE(on) v IC

Package Outline Dimensions



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



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