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.

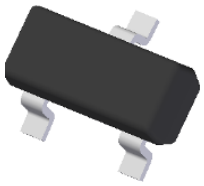
Features

- BV_{CEO} > -60V
- I_C = -1A Continuous Collector Current
- I_{CM} = -2A Peak Pulse Current
- Epitaxial Planar Die Construction
- Ideal for Medium Power Amplification and Switching

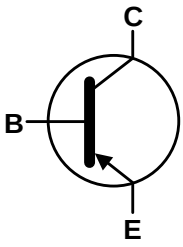
Mechanical Data

- Case: SOT23
- Case Material: Molded Plastic, “Green” Molding Compound. UL Flammability Classification 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 0.008 grams (Approximate)

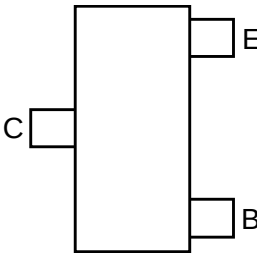
SOT23



Top View



Device Symbol



Top View
Pin-Out

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

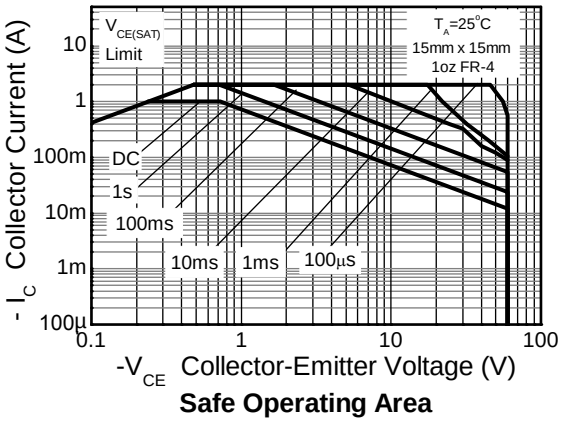
Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	-80	V
Collector-Emitter Voltage	V_{CEO}	-60	V
Emitter-Base Voltage	V_{EBO}	-5	V
Continuous Collector Current	I_C	-1	A
Peak Pulse Collector Current	I_{CM}	-2	A
Base Current (DC)	I_B	-300	mA
Peak Base Current	I_{BM}	-1	A

Thermal Characteristics @T_A = 25°C unless otherwise specified

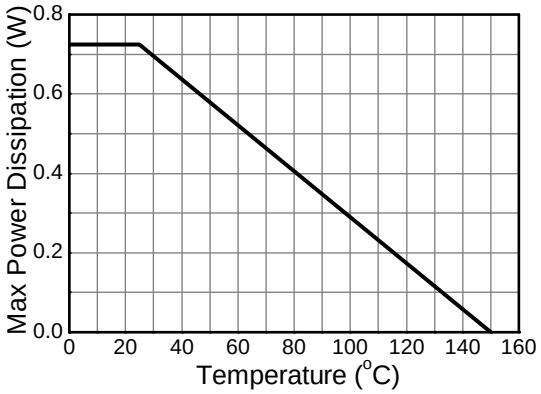
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 7)	P_D	725	mW
Thermal Resistance, Junction to Ambient (Note 7)	$R_{\theta JA}$	172	°C/W
Thermal Resistance, Junction to Ambient Air (Note 6)	$R_{\theta JA}$	79	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

Notes: 6. Operated under pulsed conditions: pulse width ≤100ms, duty cycle ≤ 0.25.
7. Device mounted on 15mm x 15mm x1.6mm FR-4 PCB with high coverage of single sided 1oz copper, in still air conditions.

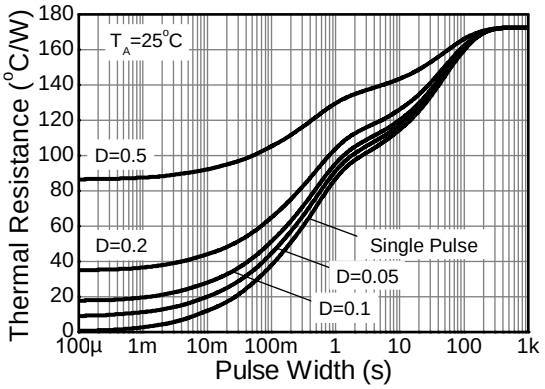
Thermal Characteristics



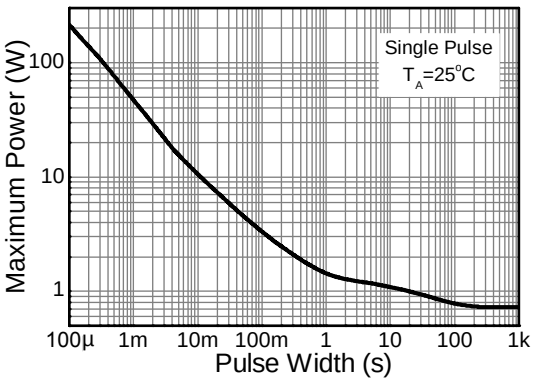
Safe Operating Area



Derating Curve



Transient Thermal Impedance



Pulse Power Dissipation

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Conditions
Collector-Base Breakdown Voltage	BV_{CBO}	-80	—	—	V	I_C = -100μA
Collector-Emitter Breakdown Voltage (Note 8)	BV_{CEO}	-60	—	—	V	I_C = -10mA
Emitter-Base Breakdown Voltage	BV_{EBO}	-5	—	—	V	I_E = -100μA
Collector-Base Cutoff Current	I_{CBO}	—	—	-100	nA	V_{CB} = -20V, I_E = 0
		—	—	-50	μA	V_{CB} = -20V, I_E = 0, T_A = +150°C
Emitter-Base Cutoff Current	I_{EBO}	—	—	-100	nA	V_{EB} = -5V, I_C = 0
DC Current Gain (Note 6)	h_{FE}	200	—	—	—	V_{CE} = -5V, I_C = -1mA
		150	—	—		V_{CE} = -5V, I_C = -500mA
		100	—	—		V_{CE} = -5V, I_C = -1A
Collector-Emitter Saturation Voltage (Note 8)	$V_{CE(SAT)}$	—	—	-175	mV	I_C = -100mA, I_B = -1mA
		—	—	-180		I_C = -500mA, I_B = -50mA
		—	—	-340		I_C = -1A, I_B = -100mA
Equivalent On-Resistance	$R_{CE(SAT)}$	—	—	340	mΩ	I_E = -1A, I_B = -100mA
Base-Emitter Saturation Voltage	$V_{BE(SAT)}$	—	—	-1.1	V	I_C = -1A, I_B = -50mA
Base-Emitter Turn-On Voltage	$V_{BE(ON)}$	—	—	-0.9	V	V_{CE} = -5V, I_C = -1A
Transition Frequency	f_T	150	—	—	MHz	V_{CE} = -10V, I_C = -50mA, f = 100MHz
Output Capacitance	C_{OB}	—	—	15	pF	V_{CB} = -10V, f = 1MHz
Turn-On Time	t_{ON}	—	75	—	ns	V_{CC} = -10V, I_C = -0.5A, I_{B1} = I_{B2} = -25mA
Delay Time	t_D	—	35	—	ns	
Rise Time	t_R	—	40	—	ns	
Turn-Off Time	t_{OFF}	—	265	—	ns	
Storage Time	t_S	—	230	—	ns	
Fall Time	t_F	—	35	—	ns	

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

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

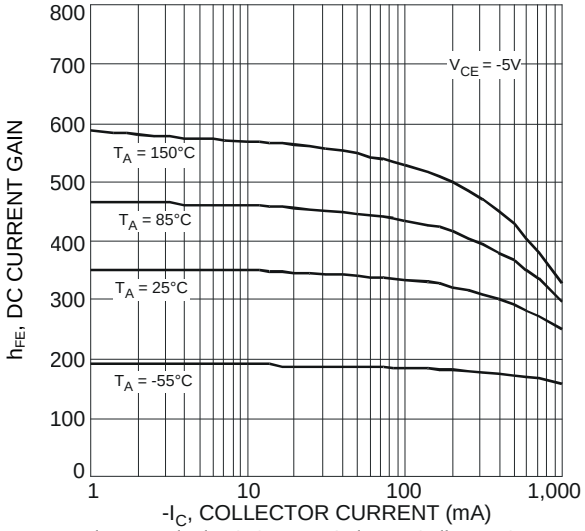


Fig. 1 Typical DC Current Gain vs. Collector Current

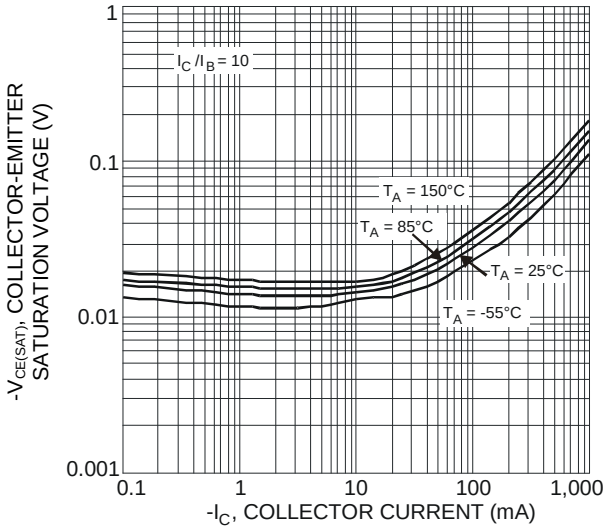


Fig. 2 Typical Collector-Emitter Saturation Voltage vs. Collector Current

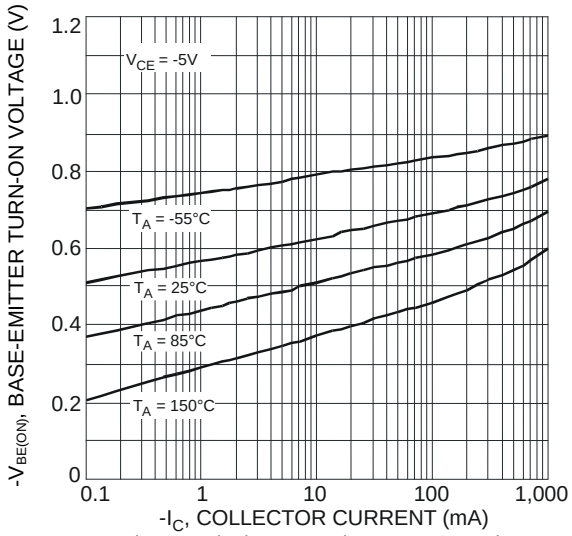


Fig. 3 Typical Base-Emitter Turn-On Voltage vs. Collector Current

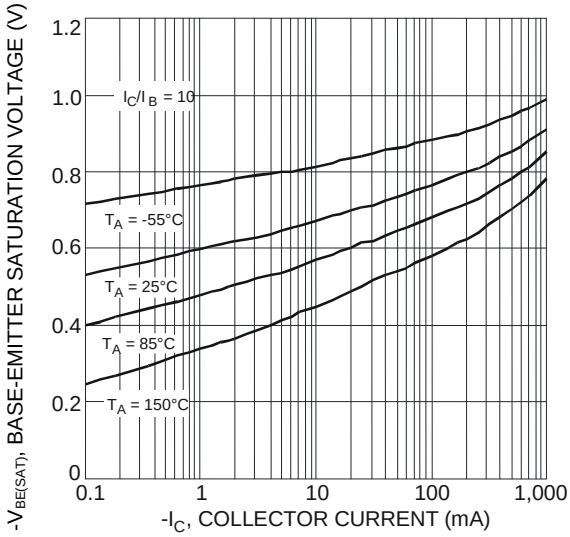


Fig. 4 Typical Base-Emitter Saturation Voltage vs. Collector Current

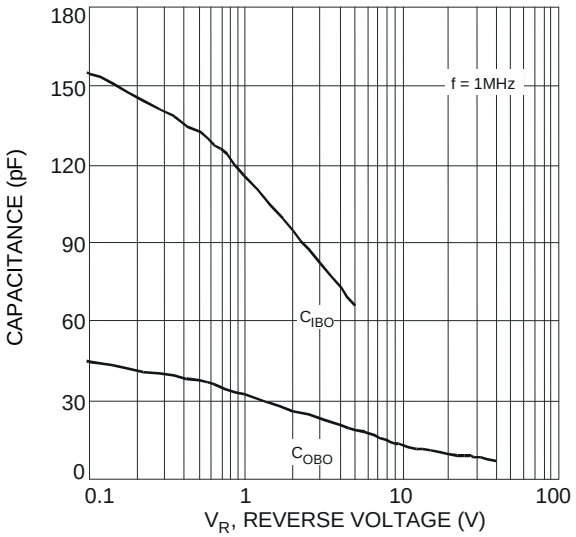
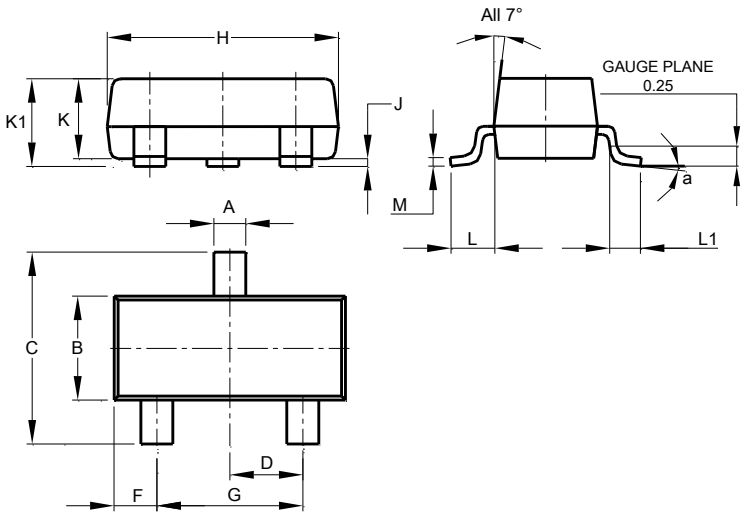


Fig. 5 Typical Capacitance Characteristics

Package Outline Dimensions

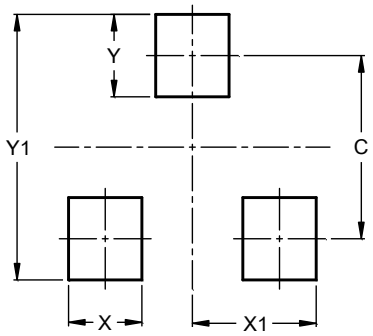
SOT23



SOT23			
Dim	**Min**	**Max**	**Typ**
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	0°	8°	--

Suggested Pad Layout

SOT23



Dimensions	Value (in mm)
C	2.0
X	0.8
X1	1.35
Y	0.9
Y1	2.9