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

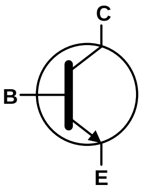
- $BV_{CEO} > 45V$
- $I_C = 100mA$ Collector Current
- Epitaxial Planar Die Construction
- Ultra-Small Surface Mount Package

Mechanical Data

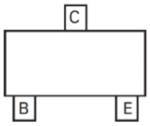
- Case: SOT523
- Case Material: Molded Plastic. “Green” Molding Compound. UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Plated Leads. Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.002 grams (Approximate)

SOT523

Top View



Device Symbol



Pin-Out
Top View

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	50	V
Collector-Emitter Voltage	V_{CEO}	45	V
Emitter-Base Voltage	V_{EBO}	6.0	V
Collector Current	I_C	100	mA

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

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 6)	P_D	150	mW
Thermal Resistance, Junction to Ambient (Note 6)	$R_{\theta JA}$	833	°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: 6. For a device mounted with the collector lead on minimum recommended pad layout 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. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

Thermal Characteristics and Derating Information

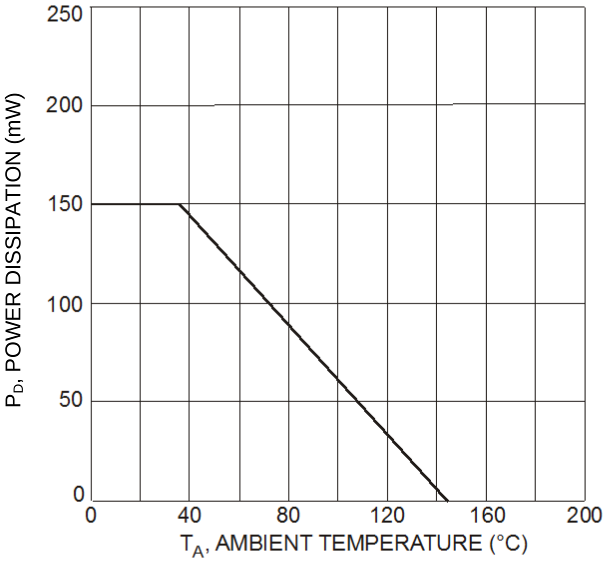


Fig. 1, Power Derating Curve

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 8)						
Collector-Base Breakdown Voltage	BV_{CBO}	50	—	—	V	I_C = 10µA, I_E = 0
Collector-Emitter Breakdown Voltage	BV_{CEO}	45	—	—	V	I_C = 1mA, I_B = 0
Emitter-Base Breakdown Voltage	BV_{EBO}	6.0	—	—	V	I_E = 10µA, I_C = 0
ON CHARACTERISTICS (Note 8)						
DC Current Gain	h_{FE}	200	290	450	—	V_{CE} = 5.0V, I_C = 2.0mA
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	—	—	250	mV	I_C = 10mA, I_B = 0.5mA
				600		I_C = 100mA, I_B = 5mA
Base-Emitter Saturation Voltage	$V_{BE(SAT)}$	—	700	—	mV	I_C = 10mA, I_B = 0.5mA
			900			I_C = 100mA, I_B = 5mA
Base-Emitter Turn-On Voltage	$V_{BE(ON)}$	580	660	700	mV	V_{CE} = 5.0V, I_C = 2.0mA
		—	—	770		V_{CE} = 5.0V, I_C = 10mA
Collector-Emitter Cutoff Current	I_{CBO}	—	—	15	nA	V_{CB} = 30V
				5.0	µA	V_{CB} = 30V, T_A = +150°C
SMALL SIGNAL CHARACTERISTICS						
Output Capacitance	C_{OBO}	—	—	4.5	pF	V_{CB} = 10V, f = 1.0MHz
Current Gain-Bandwidth Product	f_T	100	—	—	MHz	V_{CE} = 5V, I_C = 10mA, f = 100MHz
Noise Figure	NF	—	—	1.0	dB	V_{CE} = 5V, R_S = 2kΩ, f = 1MHz, BW = 200Hz

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

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

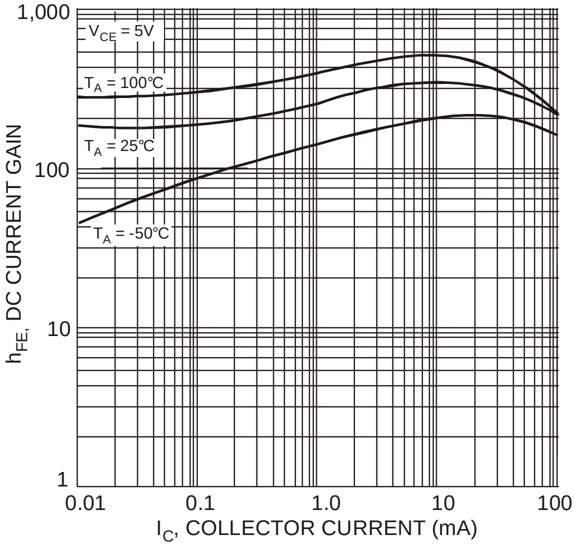


Fig. 2, DC Current Gain vs Collector Current

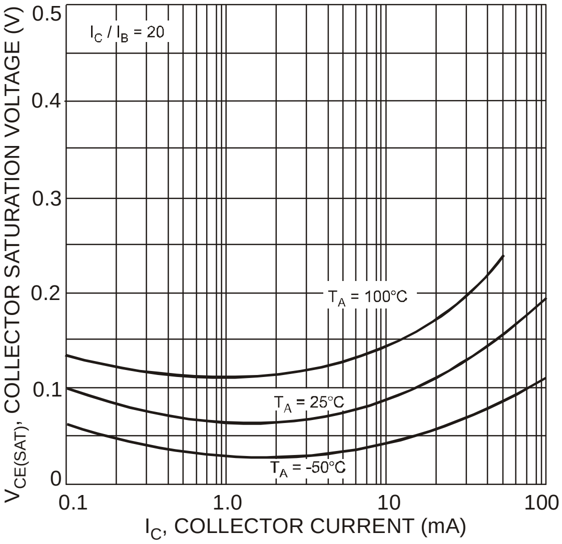


Fig. 3, Collector Saturation Voltage vs Collector Current

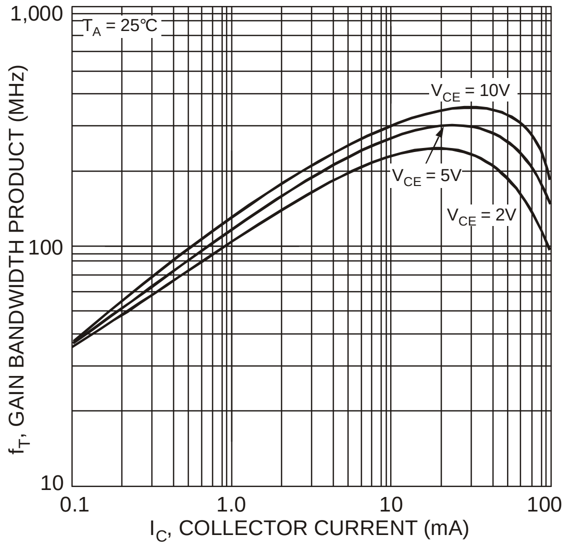
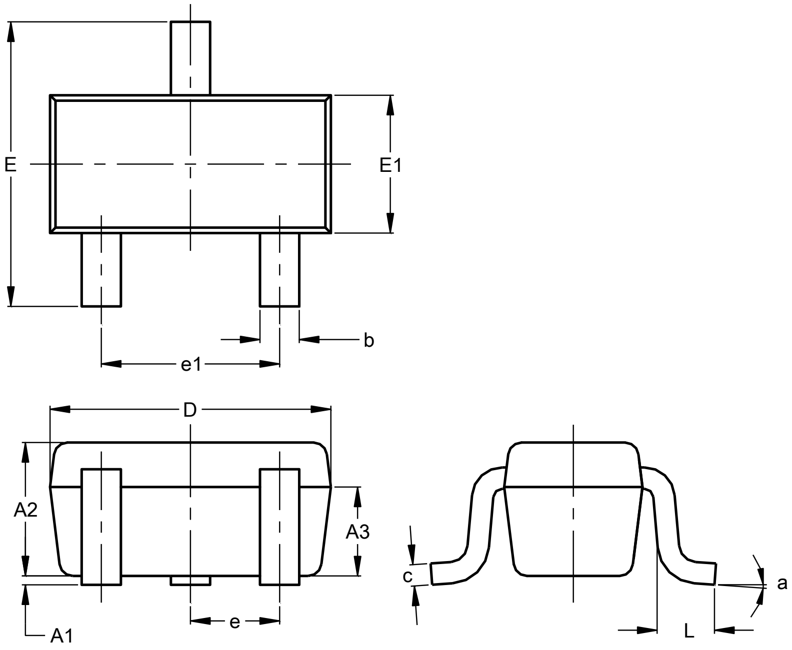


Fig. 4, Gain Bandwidth Product vs Collector Current

Package Outline Dimensions

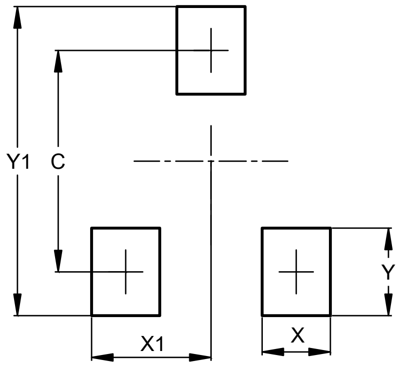
SOT523



SOT523			
Dim	**Min**	**Max**	**Typ**
A1	0.00	0.10	0.05
A2	0.60	0.80	0.75
A3	0.45	0.65	0.50
b	0.15	0.30	0.22
c	0.10	0.20	0.12
D	1.50	1.70	1.60
E	1.45	1.75	1.60
E1	0.75	0.85	0.80
e	0.50 BSC		
e1	0.90	1.10	1.00
L	0.20	0.40	0.33
a	0°	—	8°
All Dimensions in mm			

Suggested Pad Layout

SOT523



Dimensions	Value (in mm)
C	1.29
X	0.40
X1	0.70
Y	0.51
Y1	1.80