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.

Applications

- Medium Power Switching or Amplification Applications
- AF Driver and Output Stages

Features

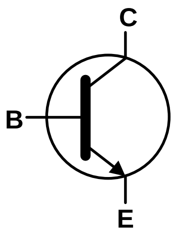
- BV_{CEO} > 80V
- I_C = 1A High Continuous Collector Current
- I_{CM} = 2A Peak Pulse Current
- 2W Power Dissipation
- Low Saturation Voltage $V_{CE(SAT)}$ < 500mV @ 0.5A
- Complementary PNP Type: NK-BCP5316Q

Mechanical Data

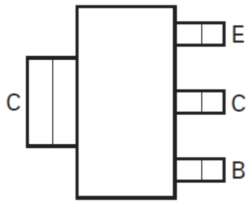
- Case: SOT223
- Case Material: Molded Plastic, “Green” Molding Compound. UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish—Matte Tin Plated Leads. Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.112 grams (Approximate)

SOT223

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}	100	V
Collector-Emitter Voltage	V_{CEO}	80	V
Emitter-Base Voltage	V_{EBO}	5	V
Continuous Collector Current	I_C	1	A
Peak Pulse Collector Current	I_{CM}	2	
Continuous Base Current	I_B	100	mA
Peak Pulse Base Current	I_{BM}	200	

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

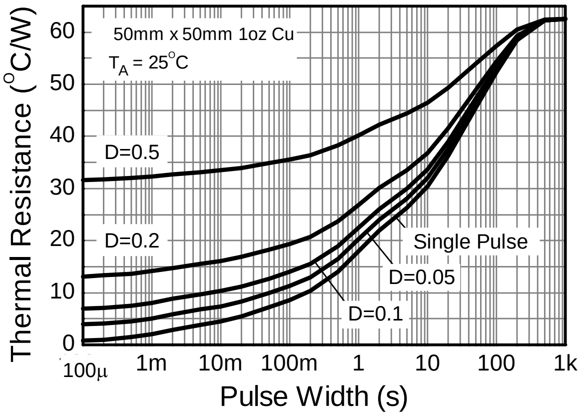
Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 6)	P_D	2	W
Thermal Resistance, Junction to Ambient	(Note 6)	$R_{\theta JA}$	62	°C /W
Thermal Resistance, Junction to Leads	(Note 7)	$R_{\theta JL}$	19.4	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	-65 to +150	°C

ESD Ratings (Note 8)

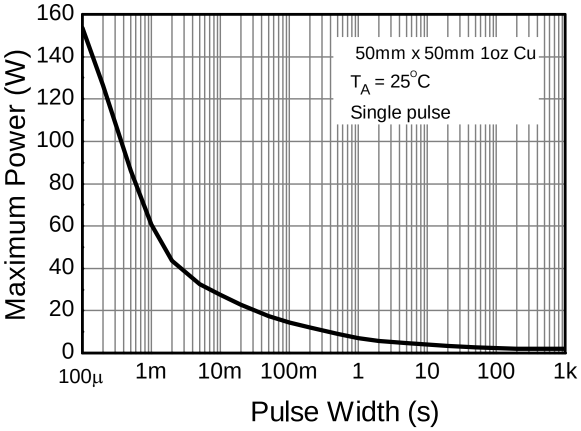
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge—Human Body Model	ESD HBM	4000	V	3A
Electrostatic Discharge—Machine Model	ESD MM	400	V	C

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

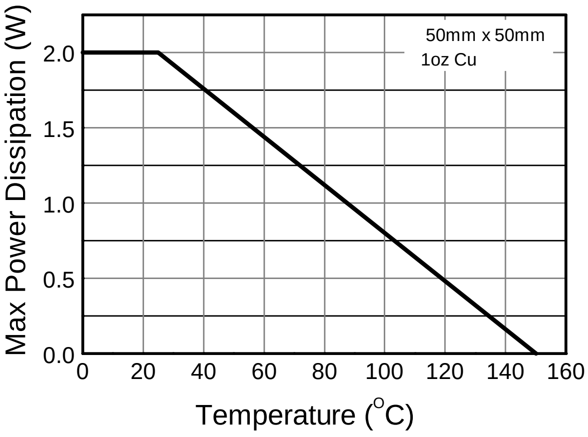
Thermal Characteristics and Derating Information



Transient Thermal Impedance



Pulse Power Dissipation



Derating Curve

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	100	—	—	V	I_C = 100µA
Collector-Emitter Breakdown Voltage (Note 9)	BV_{CEO}	80	—	—	V	I_C = 10mA
Emitter-Base Breakdown Voltage	BV_{EBO}	5	—	—	V	I_E = 10µA
Collector Cut-Off Current	I_{CBO}	—	—	0.1 20	µA	V_{CB} = 30V V_{CB} = 30V, T_A = +150°C
Emitter Cut-Off Current	I_{EBO}	—	—	20	nA	V_{EB} = 4V
Static Forward Current Transfer Ratio (Note 9)	h_{FE}	25 63 25	—	160	—	I_C = 5mA, V_{CE} = 2V I_C = 150mA, V_{CE} = 2V I_C = 500mA, V_{CE} = 2V
Collector-Emitter Saturation Voltage (Note 9)	$V_{CE(SAT)}$	—	—	0.5	V	I_C = 500mA, I_B = 50mA
Base-Emitter Turn-On Voltage (Note 9)	$V_{BE(ON)}$	—	—	1.0	V	I_C = 500mA, V_{CE} = 2V
Transition Frequency	f_T	100	150	—	MHz	I_C = 50mA, V_{CE} = 10V f = 100MHz
Output Capacitance	C_{OBO}	—	—	25	pF	V_{CB} = 10V, f = 1MHz

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

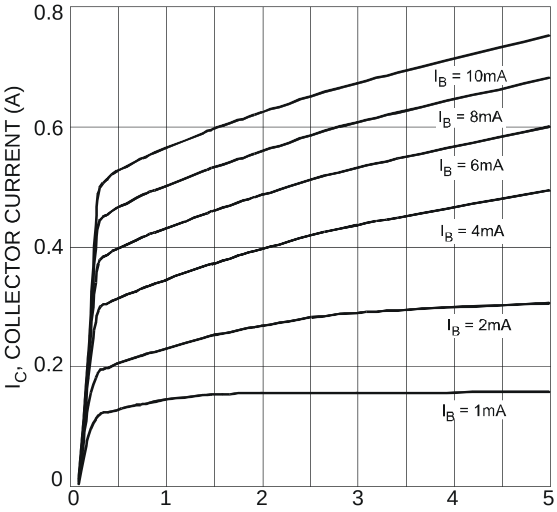


Fig. 1 Typical Collector Current vs. Collector-Emitter Voltage

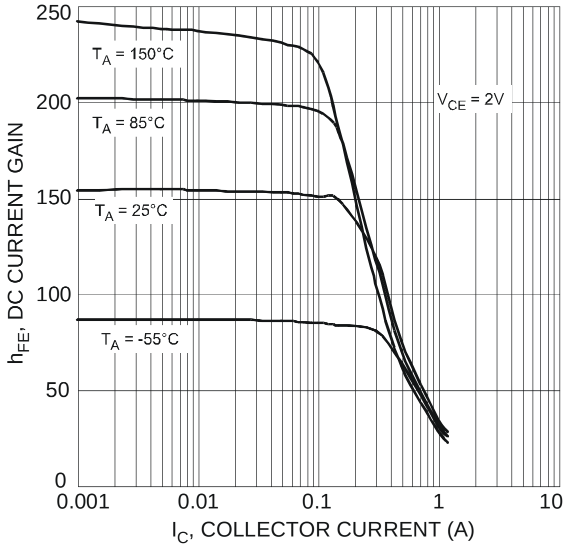


Fig. 2 Typical DC Current Gain vs. Collector Current

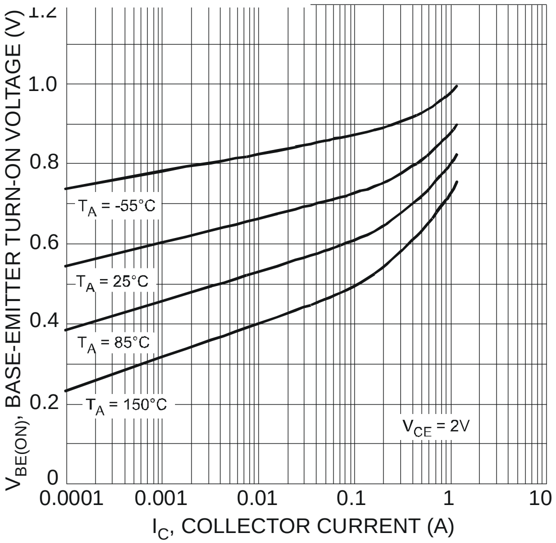


Fig. 3 Typical Base-Emitter Turn-On Voltage vs. Collector Current

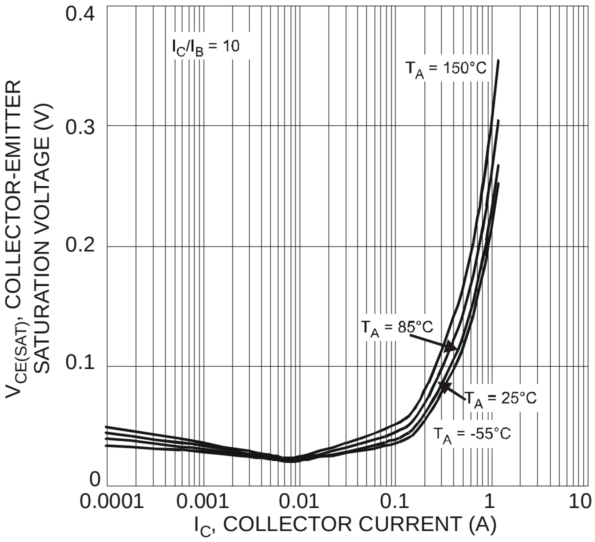


Fig. 4 Typical Collector-Emitter Saturation Voltage vs. Collector Current

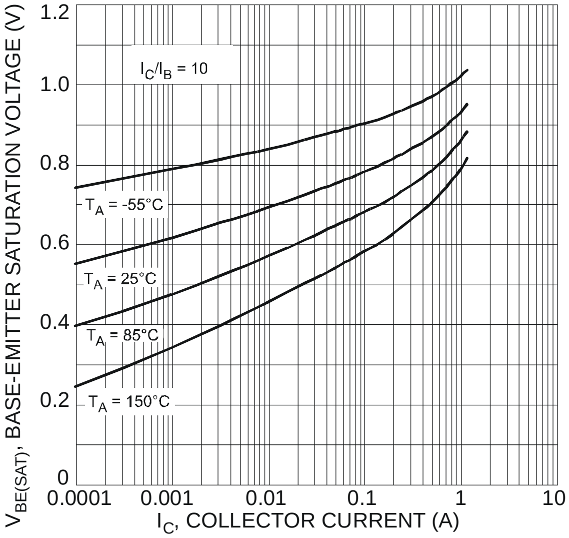


Fig. 5 Typical Base-Emitter Saturation Voltage vs. Collector Current

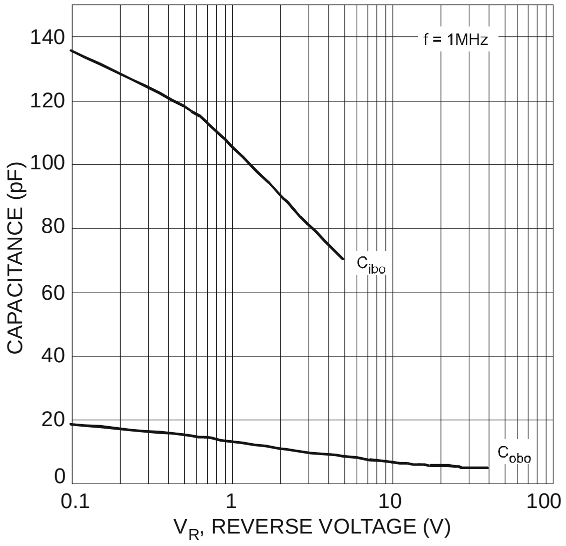


Fig. 6 Typical Capacitance Characteristics

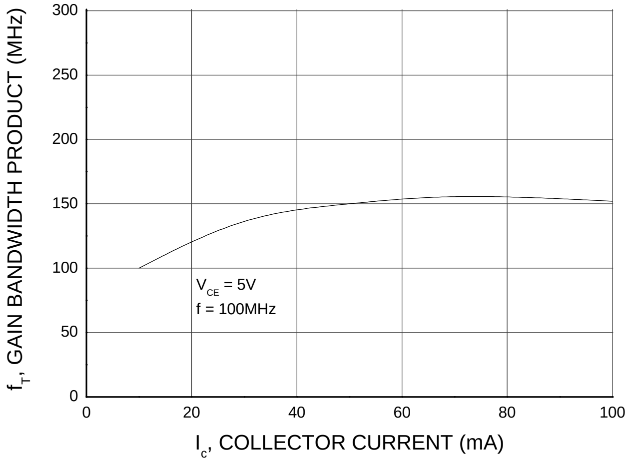
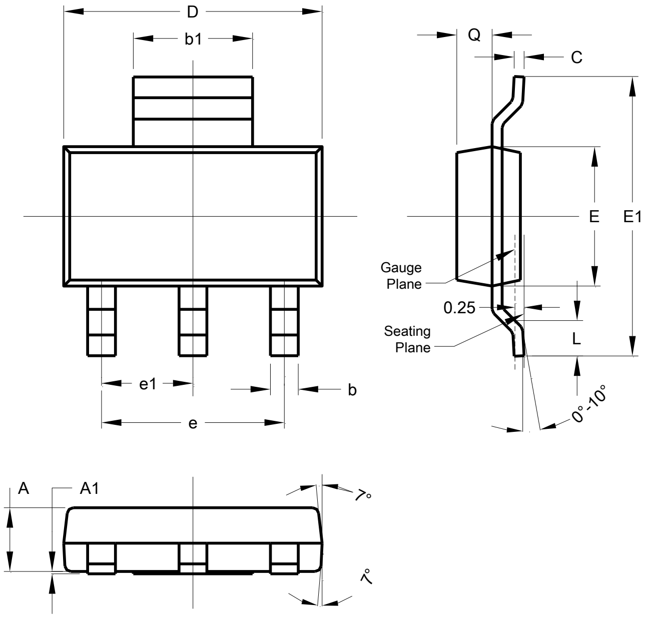


Fig. 7 Typical Gain-bandwidth Product vs. Collector Current

Package Outline Dimensions

SOT223



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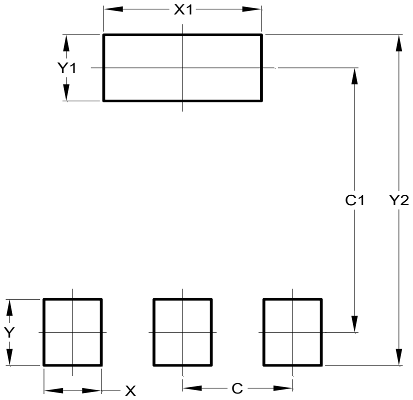
Dim	**Min**	**Max**	**Typ**
A	1.55	1.65	1.60
A1	0.010	0.15	0.05
b	0.60	0.80	0.70
b1	2.90	3.10	3.00
C	0.20	0.30	0.25
D	6.45	6.55	6.50
E	3.45	3.55	3.50
E1	6.90	7.10	7.00
e	-	-	4.60
e1	-	-	2.30
L	0.85	1.05	0.95
Q	0.84	0.94	0.89
All Dimensions in mm			

Suggested Pad Layout

SOT223



Dimensions	Value (in mm)
C	2.30
C1	6.40
X	1.20
X1	3.30
Y	1.60
Y1	1.60
Y2	8.00