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} > 160V
- BV_{EBO} > 6V
- I_C = 600mA Continuous Collector Current
- Low Saturation Voltage (150mV max @10mA)
- h_{FE} specified up to 50mA for a high gain hold up
- Complementary PNP Type: NK-DZT5401

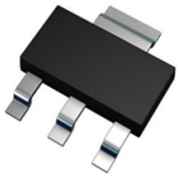
Mechanical Data

- Case: SOT223
- 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. Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.112 grams (Approximate)

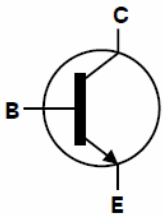
Applications

- High Voltage Amplification Applications
- High Voltage Switching

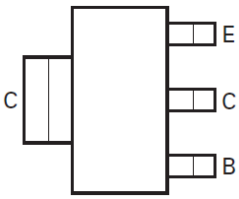
SOT223



Top View



Device Schematic



Pin-Out Top View

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	180	V
Collector-Emitter Voltage	V_{CEO}	160	V
Emitter-Base Voltage	V_{EBO}	6	V
Continuous Collector Current	I_C	600	mA
Peak Collector Current	I_{CM}	1	A

Thermal Characteristics

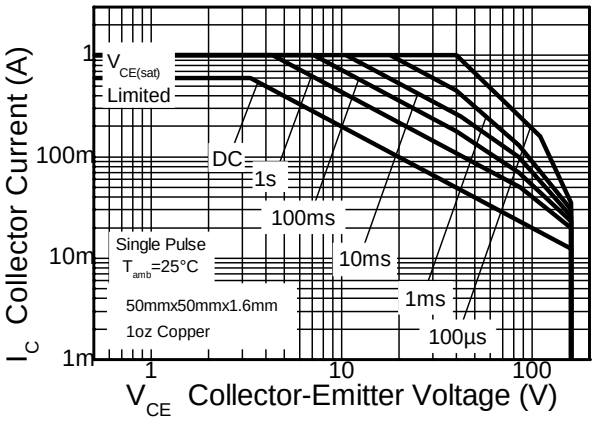
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 6)	P_D	2	W
Thermal Resistance, Junction to Ambient (Note 6)	$R_{\theta JA}$	62.5	°C/W
Thermal Resistance, Junction to Leads (Note 7)	$R_{\theta JL}$	34.05	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

ESD Ratings (Note 8)

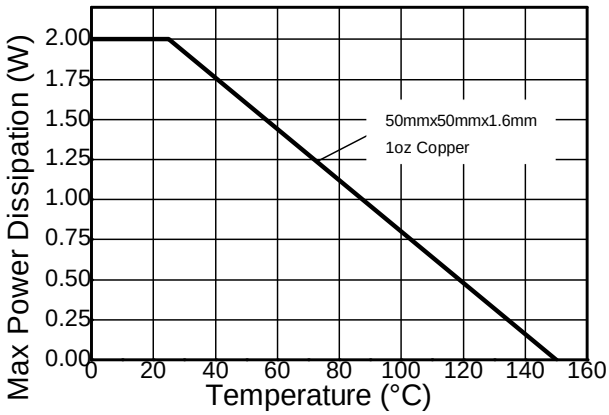
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

Notes: 6. Device mounted on 50mm X 50mm X 1.6mm FR-4 PCB with high coverage of single sided 1 oz. copper, in still air condition.
7. Thermal resistance from junction to solder-point (at the end of the collector lead).
8. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

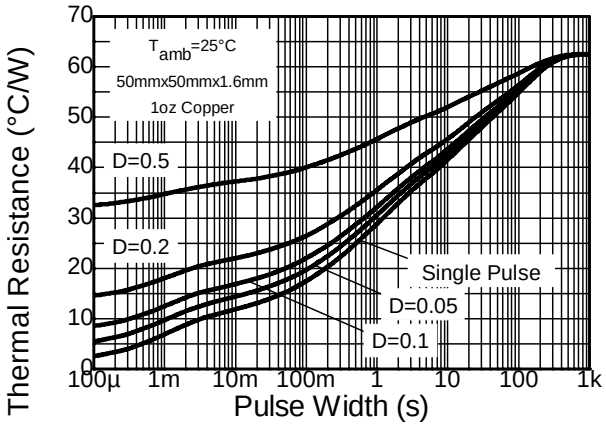
Thermal Characteristics and Derating Information



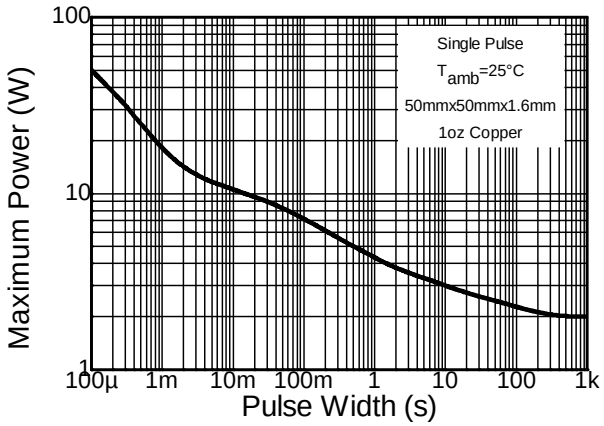
Safe Operating Area



Derating Curve



Transient Thermal Impedance



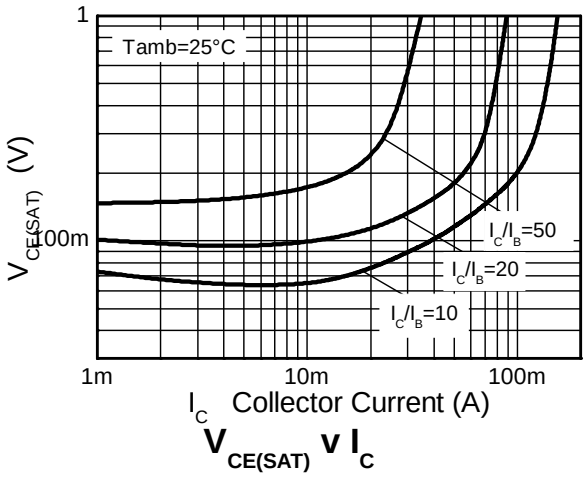
Pulse Power Dissipation

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

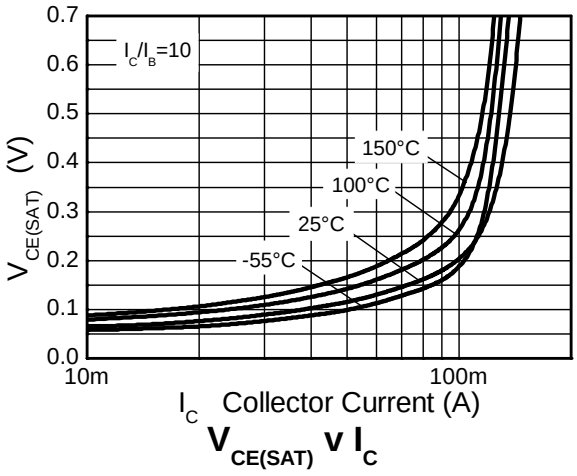
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Collector-Base Breakdown Voltage	BV_{CBO}	180	270	—	V	I_C = 100μA, I_E = 0
Collector-Emitter Breakdown Voltage (Note 9)	BV_{CEO}	160	200	—	V	I_C = 1mA, I_B = 0
Emitter-Base Breakdown Voltage	BV_{EBO}	6.0	7.85	—	V	I_E = 100μA, I_C = 0
Collector Cutoff Current	I_{CBO}	— —	<1 —	50 50	nA μA	V_{CB} = 120V, I_E = 0 V_{CB} = 120V, I_E = 0, T_A = +100°C
Emitter Cutoff Current	I_{EBO}	—	<1	50	nA	V_{EB} = 4V, I_C = 0
ON CHARACTERISTICS (Note 9)						
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	— —	65 115	150 200	mV mV	I_C = 10mA, I_B = 1mA I_C = 50mA, I_B = 5mA
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	— —	760 840	1,000 1,200	mV mV	I_C = 10mA, I_B = 1mA I_C = 50mA, I_B = 5mA
DC Current Gain	h_{FE}	80 80 30	130 145 65	— 250 —	—	I_C = 1mA, V_{CE} = 5V I_C = 10mA, V_{CE} = 5V I_C = 50mA, V_{CE} = 5V
SMALL SIGNAL CHARACTERISTICS						
Transition Frequency	f_T	100	130	300	MHz	V_{CE} = 10V, I_C = 10mA, f = 100MHz
Small Signal Current Gain	h_{fe}	50	—	260	—	V_{CE} = 10V, I_C = 10mA, f = 1kHz
Output Capacitance	C_{obo}	—	—	6	pF	V_{CB} = 10V, f = 1MHz
Noise Figure	NF	—	—	8	dB	V_{CE} = 5.0V, I_C = 200μA, R_S = 1.0kΩ, f = 1.0kHz
Delay Time	t_d	—	95	—	ns	V_{CC} = 10V, I_C = 10mA, I_{B1} = -I_{B2} = 1mA
Rise Time	t_r	—	64	—	ns	
Storage Time	t_s	—	1,256	—	ns	
Delay Time	t_f	—	140	—	ns	

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

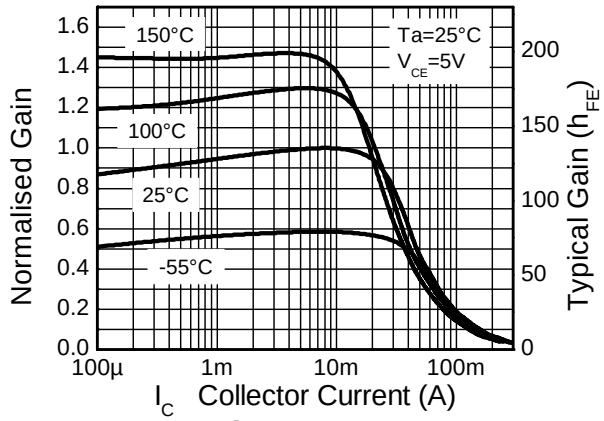
Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)



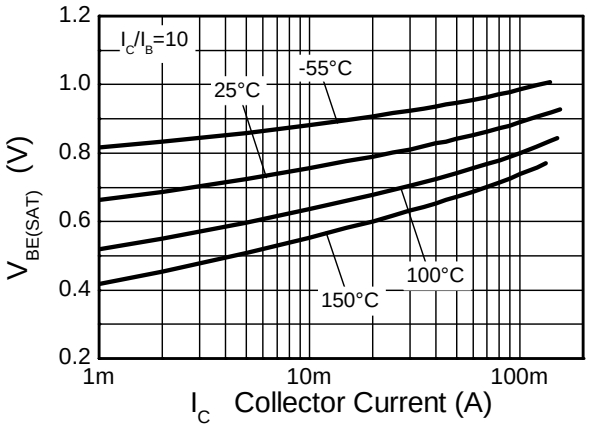
$V_{CE(SAT)}$ v I_C



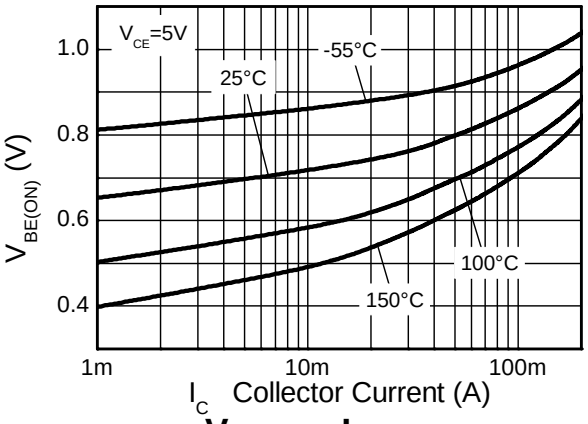
$V_{CE(SAT)}$ v I_C



h_{FE} v I_C

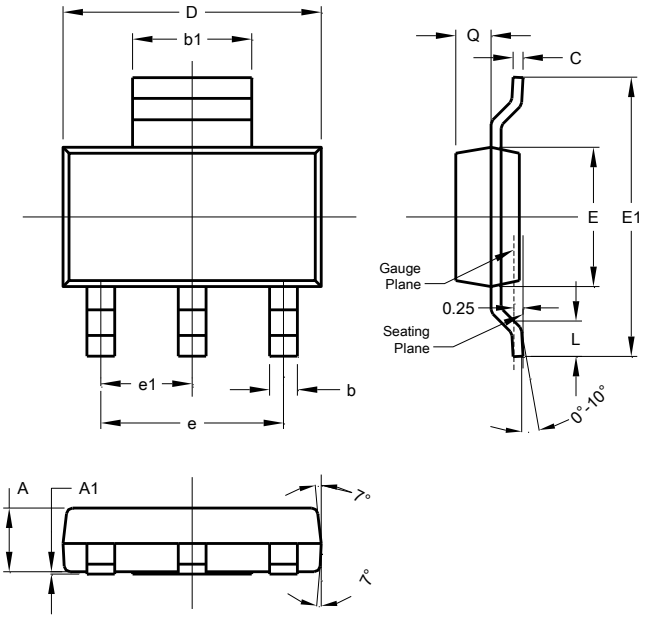


$V_{BE(SAT)}$ v I_C



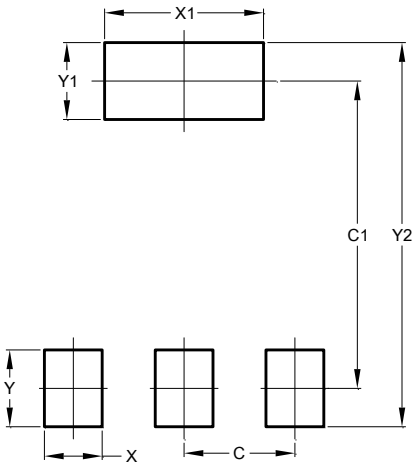
$V_{BE(ON)}$ v I_C

Package Outline Dimensions



SOT223			
Dim	**Min**	**Max**	**Typ**
A	1.55	1.65	1.60
A1	0.010	0.15	0.05
b1	2.90	3.10	3.00
b2	0.60	0.80	0.70
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



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