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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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

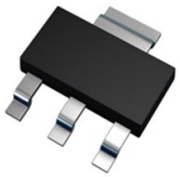
Mechanical Data

- Package: SOT223
- Package 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)

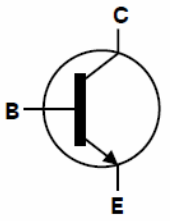
Applications

- High-voltage amplification applications
- High-voltage switching applications

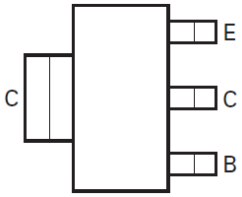
SOT223



Top View



Device Schematic



Pin-Out Top View

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 5)	P_D	2	W
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	62.5	°C/W
Thermal Resistance, Junction to Leads (Note 6)	$R_{\theta JL}$	45	°C/W
Thermal Resistance, Junction to Case (Note 7)	$R_{\theta JC}$	27	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

Notes: 5. 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
6. Thermal resistance from junction to solder-point (at the end of the collector lead).
7. Thermal resistance from junction to the top of the case.

Thermal Characteristics and Derating Information

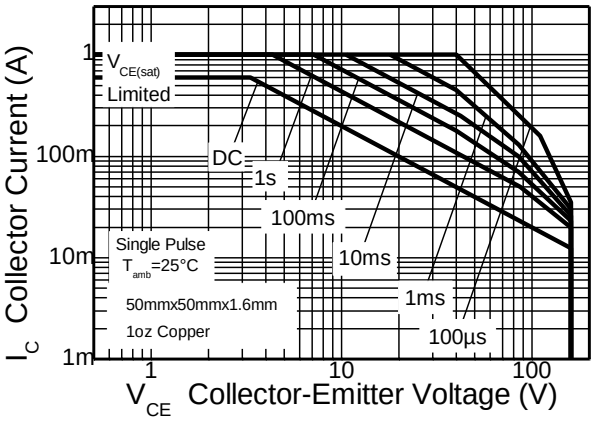


Figure 1. Safe Operating Area

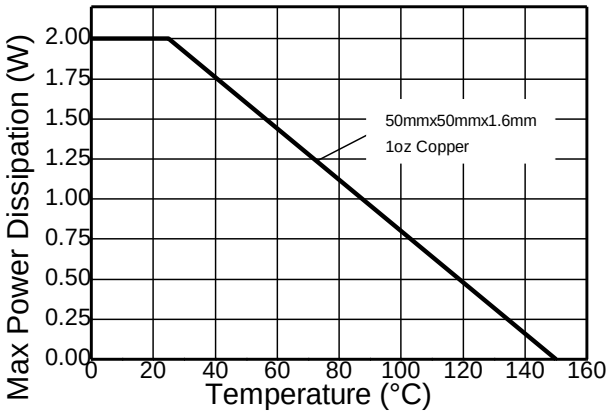


Figure 2. Derating Curve

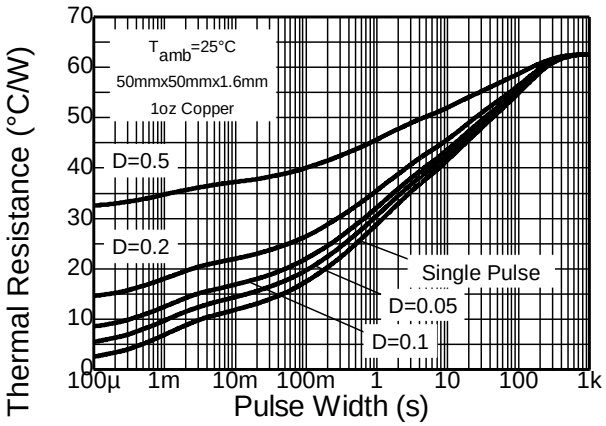


Figure 3. Transient Thermal Impedance

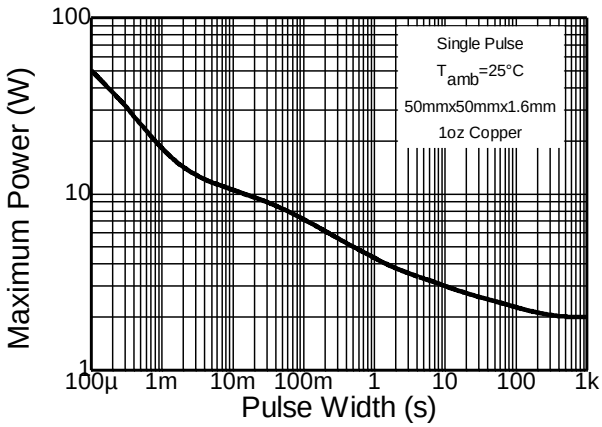


Figure 4. Pulse Power Dissipation

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
Collector-Emitter Breakdown Voltage (Note 8)	BV_{CEO}	160	200	—	V	I_C = 1mA
Emitter-Base Breakdown Voltage	BV_{EBO}	6.0	7.85	—	V	I_E = 100μA
Collector Cutoff Current	I_{CBO}	— —	1 —	50 50	nA μA	V_{CB} = 120V V_{CB} = 120V, T_A = +100°C
Emitter Cutoff Current	I_{EBO}	—	1	50	nA	V_{EB} = 4V
ON CHARACTERISTICS (Note 8)						
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	1000 1200	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	$t_{(s)}$	—	1256	—	ns	
Delay Time	$t_{(f)}$	—	140	—	ns	

Notes: 8. Pulse Test: Pulse width ≤ 300μs. Duty cycle ≤ 2.0%.

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

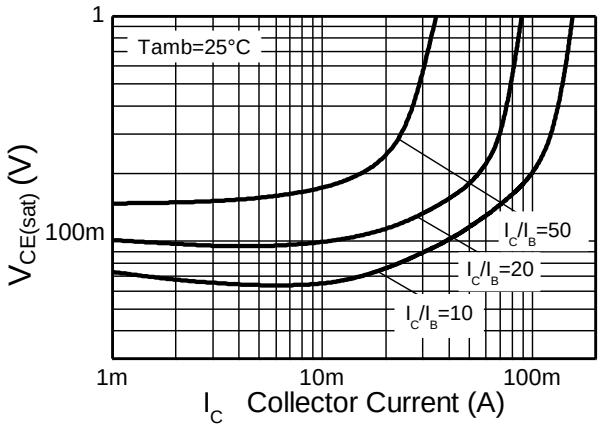


Figure 5. $V_{CE(sat)}$ v I_C

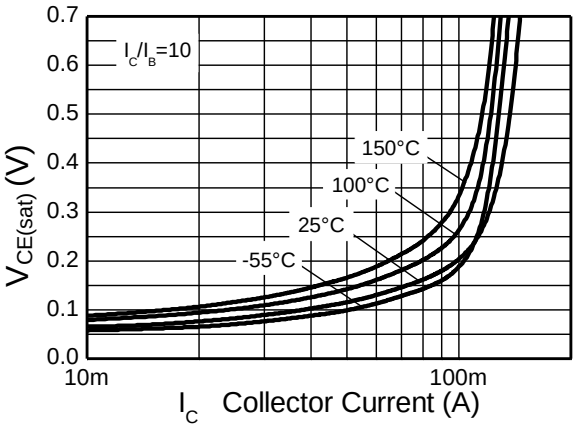


Figure 6. $V_{CE(sat)}$ v I_C

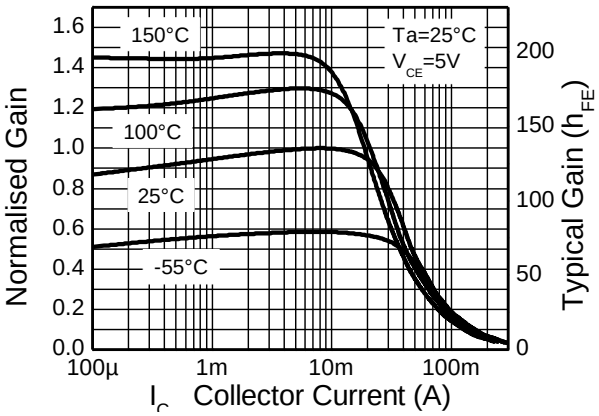


Figure 7. h_{FE} v I_C

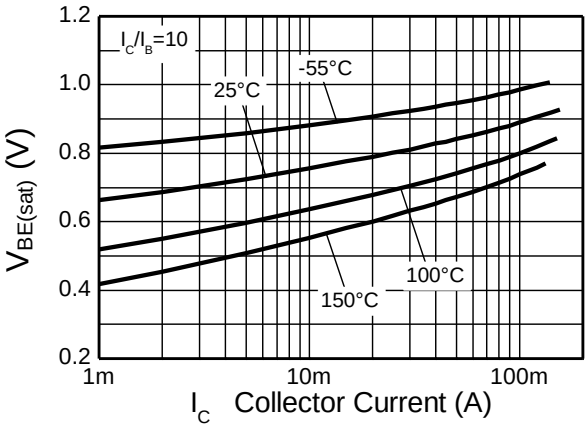


Figure 8. $V_{BE(sat)}$ v I_C

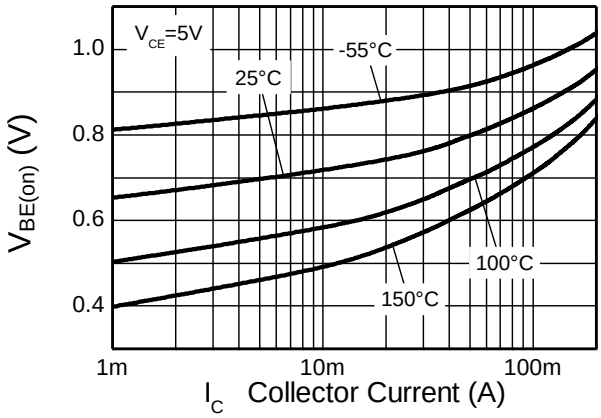
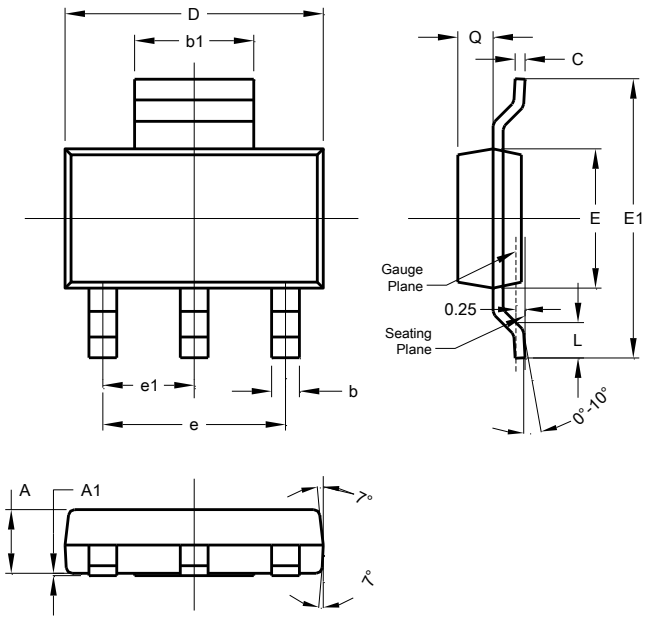


Figure 9. $V_{BE(on)}$ v I_C

Package Outline Dimensions

SOT223



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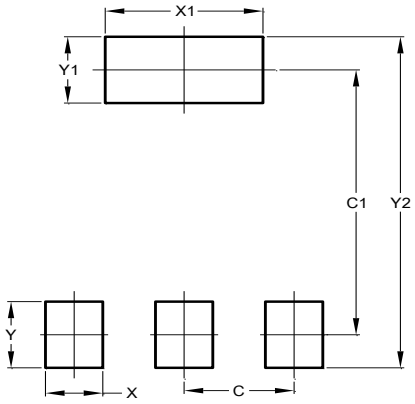
Dim	**Min**	**Max**	**Typ**
A	1.55	1.65	1.60
A1	0.010	0.15	0.05
b	0.60	0.80	0.70
b1	2.90	3.10	3.00
C	0.20	0.30	0.25
D	6.45	6.55	6.50
E	3.45	3.55	3.50
E1	6.90	7.10	7.00
e	-	-	4.60
e1	-	-	2.30
L	0.85	1.05	0.95
Q	0.84	0.94	0.89
All Dimensions in mm			

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