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

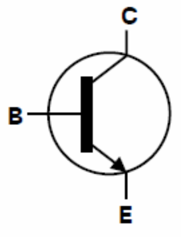
- $BV_{CEO} > 60V$
- $I_C = 3A$ High Continuous Current
- $I_{CM} = 6A$ Peak Pulse Current
- Low Saturation Voltage $V_{CE(sat)} < 300mV$ @1A
- Complementary PNP Type: DIODES™ NK-FZT751Q

Mechanical Data

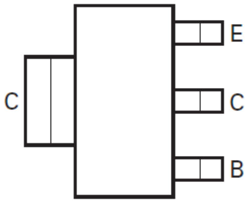
- Package: SOT223 (Type DN)
- Package Material: Molded Plastic. “Green” Molding Compound;
- UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Plated Leads; Solderable per MIL-STD-202, Method 208 ⓔ3
- Weight: 0.112 grams (Approximate)

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}	80	V
Collector-Emitter Voltage	V_{CEO}	60	V
Emitter-Base Voltage	V_{EBO}	7	V
Continuous Collector Current	I_C	3	A
Peak Pulse Current	I_{CM}	6	A

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

Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 5)	P_D	2	W
	(Note 6)		3	W
Thermal Resistance, Junction to Ambient	(Note 5)	$R_{\theta JA}$	62.5	°C/W
	(Note 6)		41.7	°C/W
Thermal Resistance, Junction to Leads (Note 7)		$R_{\theta JL}$	12.9	°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:
5. For a device mounted with the collector lead on 25mm x 25mm 2oz copper that is on a single-sided 1.6mm FR4 PCB; device is measured under still air conditions whilst operating in steady-state.
6. Same as Note 5, except the device is mounted on 50mm x 50mm 2oz copper.
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

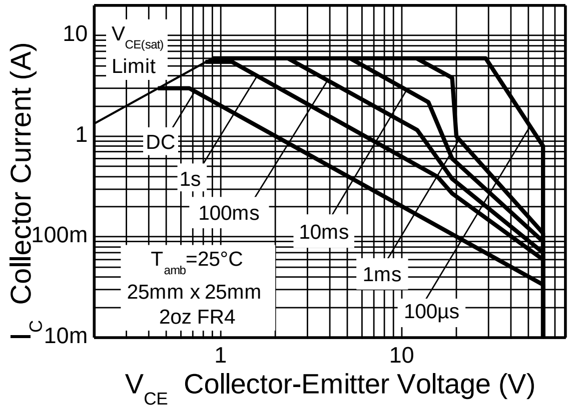


Figure 1. Safe Operating Area

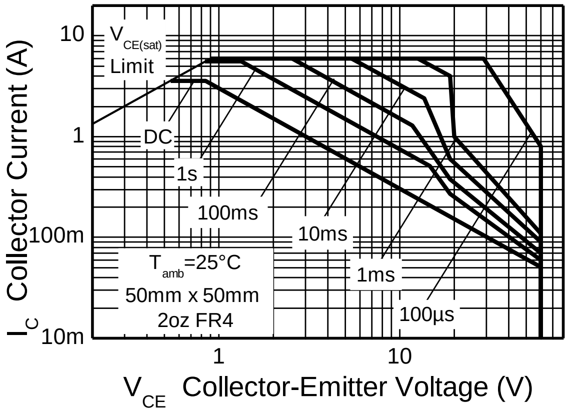


Figure 2. Safe Operating Area

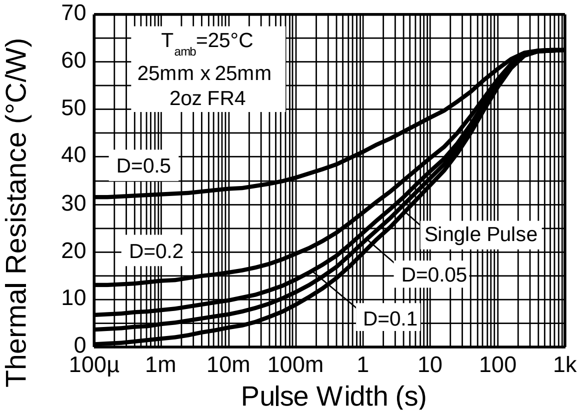


Figure 3. Transient Thermal Impedance

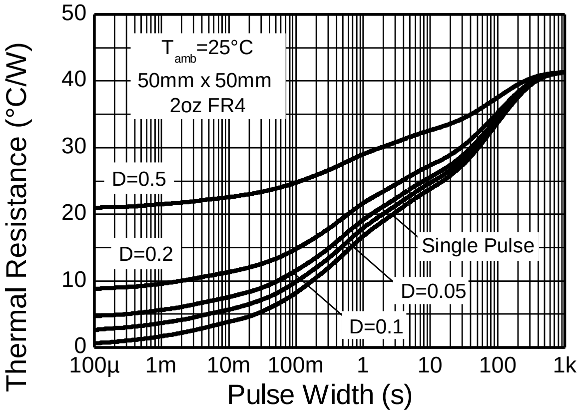


Figure 4. Transient Thermal Impedance

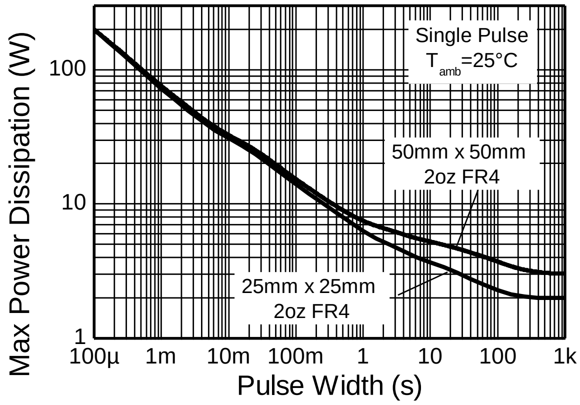


Figure 5. Power Pulse Dissipation

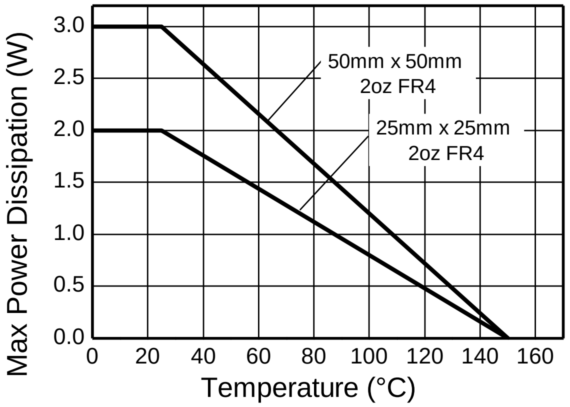


Figure 6. Power Pulse Dissipation

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	80	—	—	V	I_C = 100µA
Collector-Emitter Breakdown Voltage (Note 9)	BV_{CEO}	60	—	—	V	I_C = 10mA
Emitter-Base Breakdown Voltage	BV_{EBO}	7	—	—	V	I_E = 100µA
Collector Cut-off Current	I_{CBO}	—	—	0.1	µA	V_{CB} = 60V
		—	—	10		V_{CB} = 60V, T_A = +125°C
Emitter Cut-off Current	I_{EBO}	—	—	100	nA	V_{EB} = 4V
Collector-Emitter Saturation Voltage (Note 9)	$V_{CE(sat)}$	—	0.12	0.3	V	I_C = 1A, I_B = 100mA
		—	0.35	0.6		I_C = 3A, I_B = 300mA
Base-Emitter Saturation Voltage (Note 9)	$V_{BE(sat)}$	—	0.9	1.25	V	I_C = 1A, I_B = 100mA
Base-Emitter Turn-On Voltage (Note 9)	$V_{BE(on)}$	—	0.8	1.0	V	I_C = 1A, V_{CE} = 2V
DC Current Gain (Note 9)	h_{FE}	70	200	—	—	I_C = 50mA, V_{CE} = 2V
		100	200	300		I_C = 500mA, V_{CE} = 2V
		80	170	—		I_C = 1A, V_{CE} = 2V
		40	80	—		I_C = 2A, V_{CE} = 2V
Current Gain-Bandwidth Product (Note 9)	f_T	140	175	—	MHz	V_{CE} = 5V, I_C = 100mA, f = 100MHz
Switching Times	t_{on}	—	45	—	ns	I_C = 500mA, V_{CC} = 10V, I_{B1} = -I_{B2} = 50mA
	t_{off}	—	800	—		
Output Capacitance (Note 9)	C_{obo}	—	—	30	pF	V_{CB} = 10V, f = 1MHz

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

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

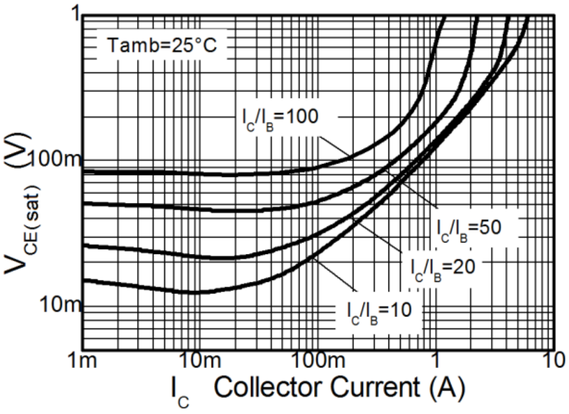


Figure 7. $V_{CE(sat)}$ v I_C

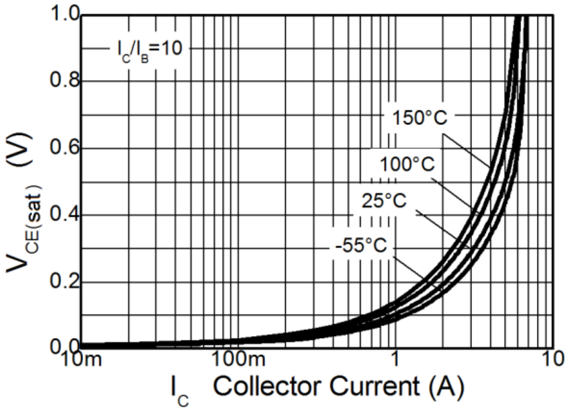


Figure 8. $V_{CE(sat)}$ v I_C

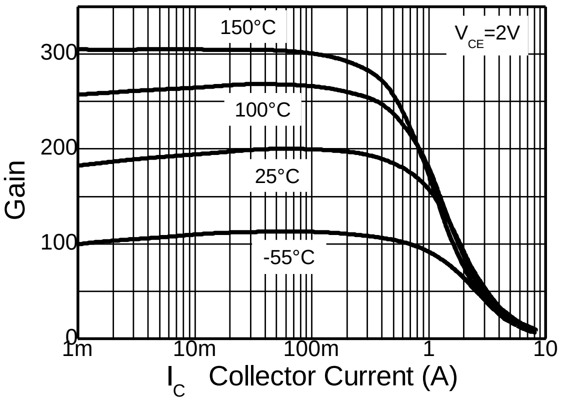


Figure 9. h_{FE} v I_C

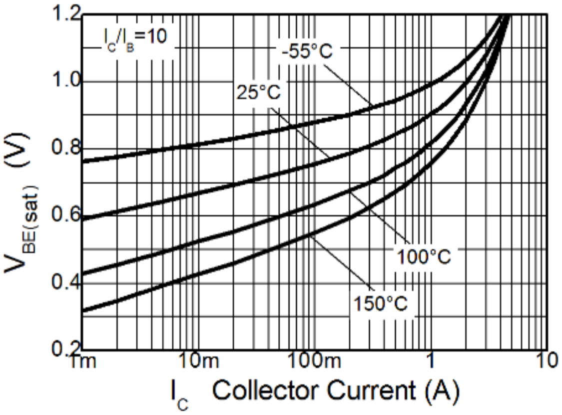


Figure 10. $V_{BE(sat)}$ v I_C

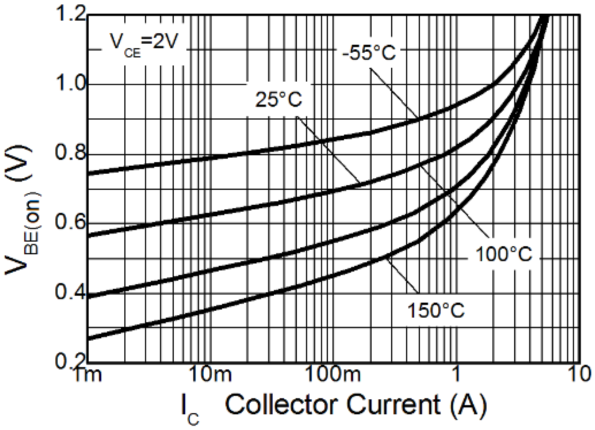
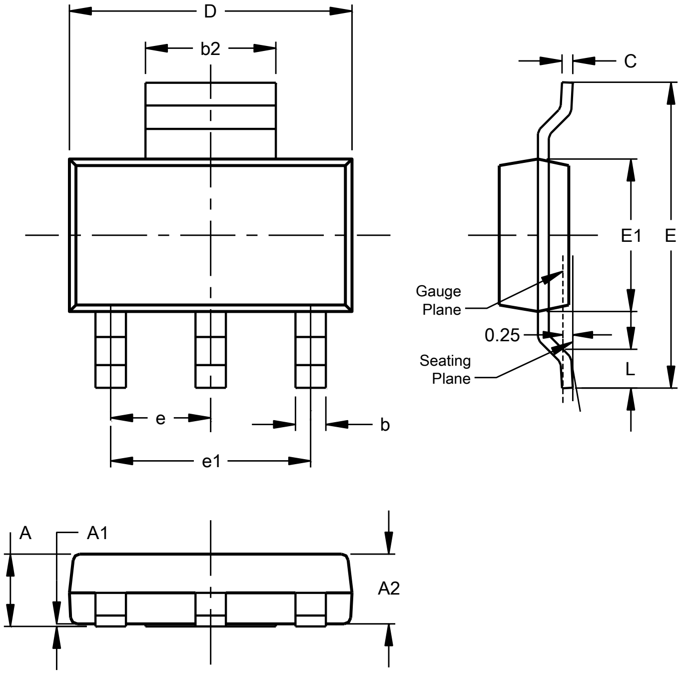


Figure 11. $V_{BE(on)}$ v I_C

Package Outline Dimensions

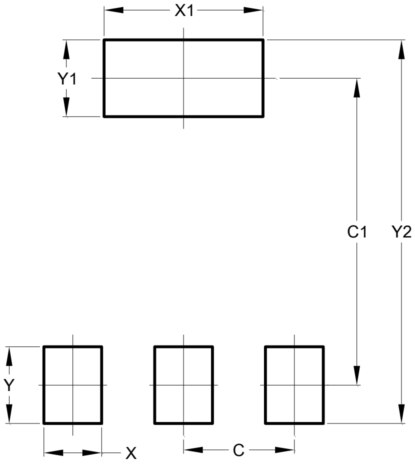
SOT223 (Type DN)



SOT223 (Type DN)			
Dim	**Min**	**Max**	**Typ**
A	--	1.70	--
A1	0.01	0.15	--
A2	1.50	1.68	1.60
b	0.60	0.80	0.70
b2	2.90	3.10	--
c	0.20	0.32	--
D	6.30	6.70	--
E	6.70	7.30	--
E1	3.30	3.70	--
e	--	--	2.30
e1	--	--	4.60
L	0.85	--	--
All Dimensions in mm			

Suggested Pad Layout

SOT223 (Type DN)



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