



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**

0755-83047638

ysbdt@szyoushang.cn

www.szyoushang.cn



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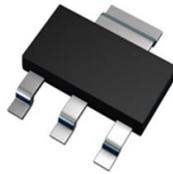
## Features

- $BV_{CEO} > 100V$
- $I_C = 2A$  High Continuous Current
- $I_{CM} = 6A$  Peak Pulse Current
- Low Saturation Voltage  $V_{CE(sat)} < 300mV @ 1A$
- Complementary PNP Type: NK-FZT753

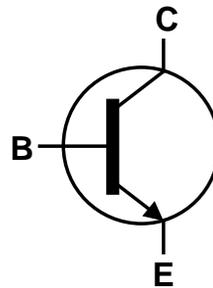
## Mechanical Data

- 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 ③
- Weight: 0.112 grams (Approximate)

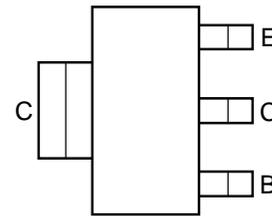
SOT223



Top View



Device Symbol



Top View  
Pin-Out

### Absolute Maximum Ratings (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CB0</sub>	120	V
Collector-Emitter Voltage	V <sub>CEO</sub>	100	V
Emitter-Base Voltage	V <sub>EBO</sub>	7	V
Continuous Collector Current	I <sub>C</sub>	2	A
Peak Pulse Current	I <sub>CM</sub>	6	A

### Thermal Characteristics (@T<sub>A</sub> = +25°C, unless otherwise specified.)

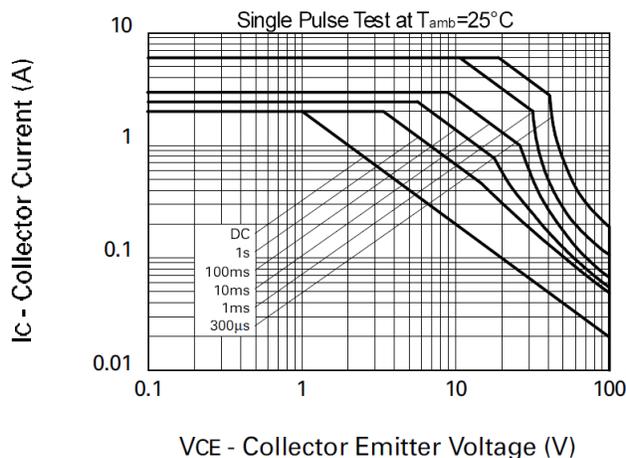
Characteristic	Symbol	Value	Unit
Power Dissipation	P <sub>D</sub>	(Note 5)	3
		(Note 6)	2
		(Note 7)	1.6
		(Note 8)	1.2
Thermal Resistance, Junction to Ambient	R <sub>θJA</sub>	(Note 5)	41.7
		(Note 6)	62.5
		(Note 7)	78.1
		(Note 8)	104
Thermal Resistance Junction to Lead	R <sub>θJL</sub>	12.9	
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

### ESD Ratings (Note 10)

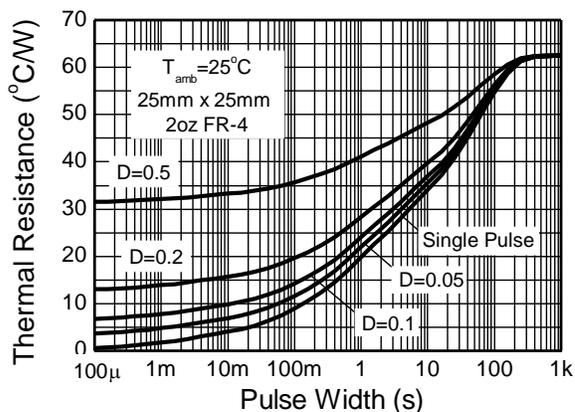
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

- Notes:
5. For a device mounted with the collector lead on 50mm x 50mm 2oz 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.
  6. Same as Note 6, except the device is mounted on 25mm x 25mm 2oz copper.
  7. Same as Note 6, except the device is mounted on 25mm x 25mm 1oz copper.
  8. Same as Note 6, except the device is mounted on minimum recommended pad layout.
  9. Thermal resistance from junction to solder-point (at the end of the collector lead).
  10. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

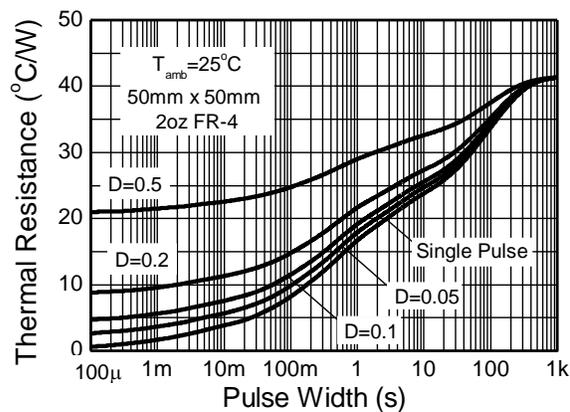
### Thermal Characteristics and Derating Information



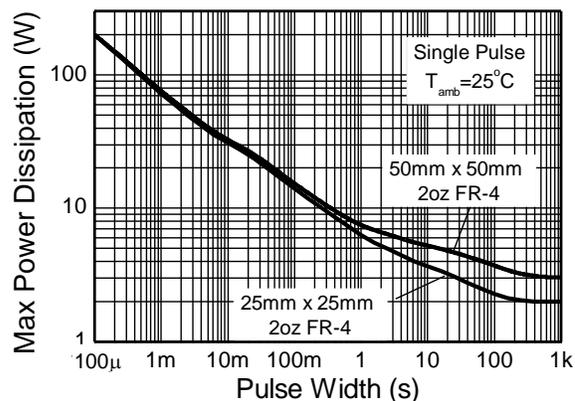
#### Safe Operating Area



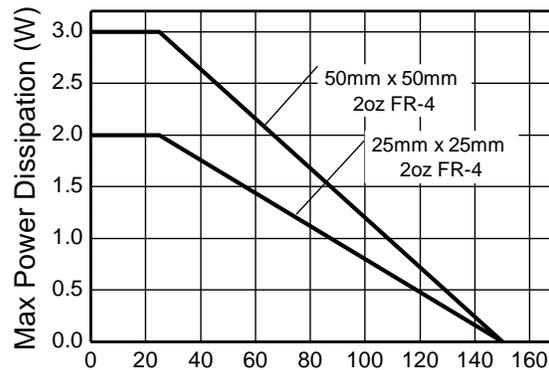
#### Transient Thermal Impedance



#### Transient Thermal Impedance



#### Pulse Power Dissipation



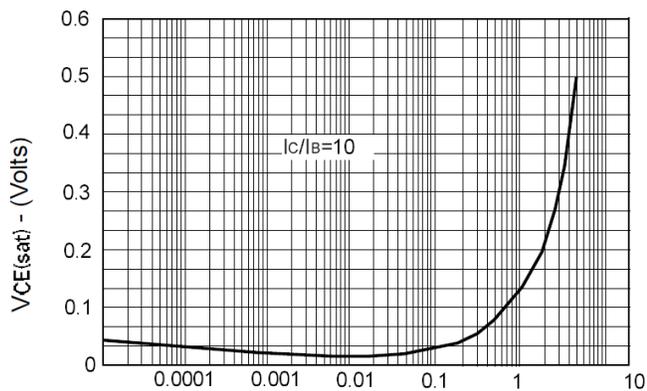
#### Derating Curve

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV <sub>CBO</sub>	120	–	–	V	I <sub>C</sub> = 100μA
Collector-Emitter Breakdown Voltage (Note 11)	BV <sub>CEO</sub>	100	–	–	V	I <sub>C</sub> = 10mA
Emitter-Base Breakdown Voltage	BV <sub>EBO</sub>	7	–	–	V	I <sub>E</sub> = 100μA
Collector Cut-Off Current	I <sub>CBO</sub>	–	1	100	nA	V <sub>CB</sub> = 100V
		–	–	10	μA	V <sub>CB</sub> = 100V, T <sub>A</sub> = +125°C
Emitter Cut-Off Current	I <sub>EBO</sub>	–	1	100	nA	V <sub>EB</sub> = 5.6V
Collector-Emitter Saturation Voltage (Note 11)	V <sub>CE(sat)</sub>	–	0.13	0.3	V	I <sub>C</sub> = 1A, I <sub>B</sub> = 100mA
		–	0.23	0.5		I <sub>C</sub> = 2A, I <sub>B</sub> = 200mA
Base-Emitter Saturation Voltage (Note 11)	V <sub>BE(sat)</sub>	–	0.9	1.25	V	I <sub>C</sub> = 1A, I <sub>B</sub> = 100mA
Base-Emitter Turn-On Voltage (Note 11)	V <sub>BE(on)</sub>	–	0.8	1.0	V	I <sub>C</sub> = 1A, V <sub>CE</sub> = 2V
DC Current Gain (Note 11)	h <sub>FE</sub>	70	200	–	–	I <sub>C</sub> = 50mA, V <sub>CE</sub> = 2V
		100	200	300		I <sub>C</sub> = 500mA, V <sub>CE</sub> = 2V
		55	110	–		I <sub>C</sub> = 1A, V <sub>CE</sub> = 2V
		25	55	–		I <sub>C</sub> = 2A, V <sub>CE</sub> = 2V
Current Gain-Bandwidth Product	f <sub>T</sub>	140	175	–	MHz	V <sub>CE</sub> = 5V, I <sub>C</sub> = 100mA, f = 100MHz
Switching Times	t <sub>on</sub>	–	80	–	ns	I <sub>C</sub> = 500mA, V <sub>CC</sub> = 10V, I <sub>B1</sub> = -I <sub>B2</sub> = 50mA
	t <sub>off</sub>	–	1200	–		
Output Capacitance	C <sub>obo</sub>	–	–	30	pF	V <sub>CB</sub> = 10V, f = 1MHz

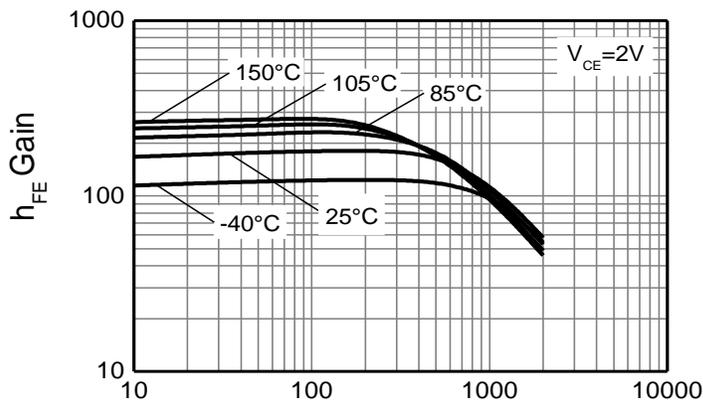
Note: 11. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

**Typical Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)



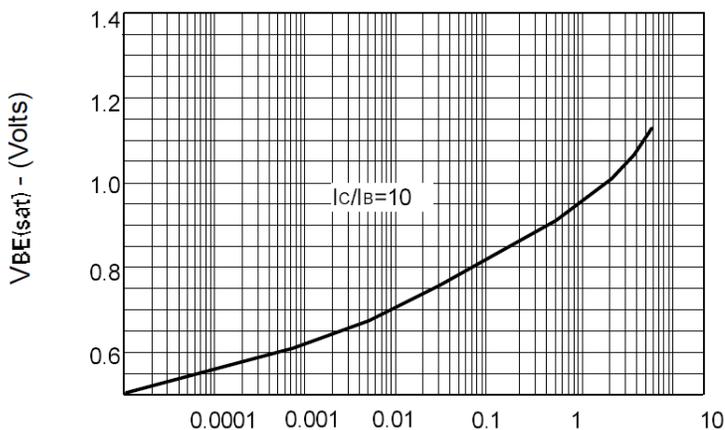
$I_C$  - Collector Current (Amps)

**VCE(sat) v IC**



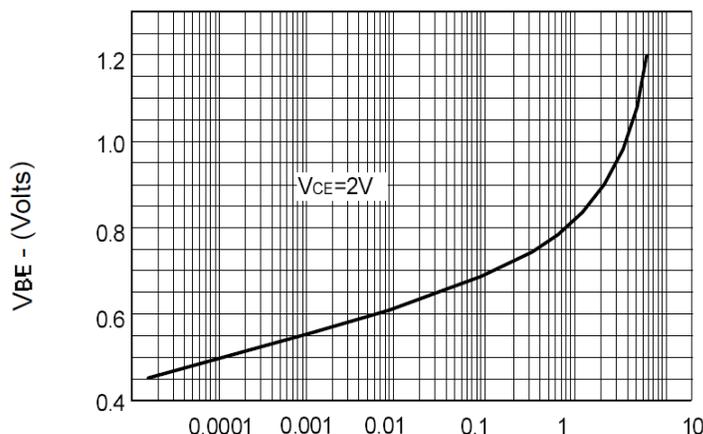
$I_C$  - Collector Current (mA)

**hFE v IC**



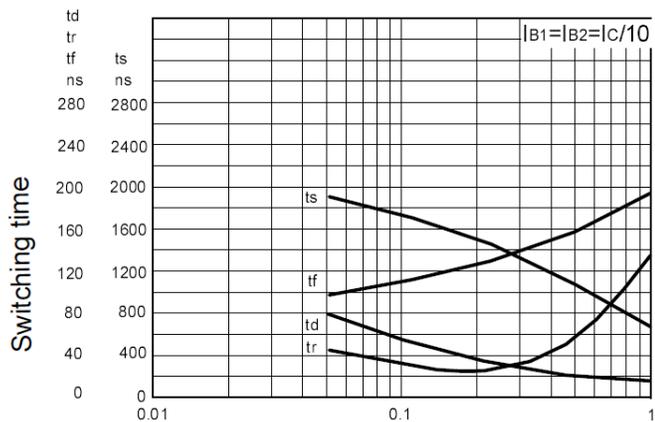
$I_C$  - Collector Current (Amps)

**VBE(sat) v IC**



$I_C$  - Collector Current (Amps)

**VBE(on) v IC**



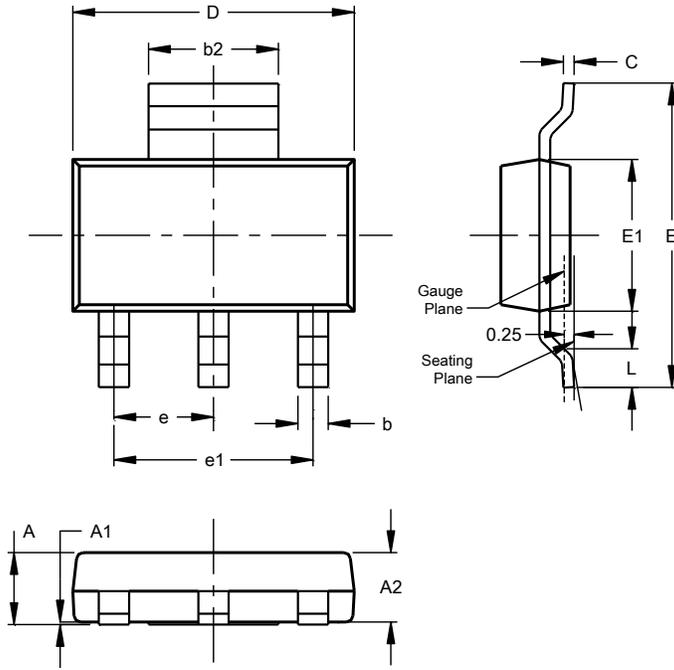
$I_C$  - Collector Current (Amps)

**Switching Speeds**

### Package Outline Dimensions

for the

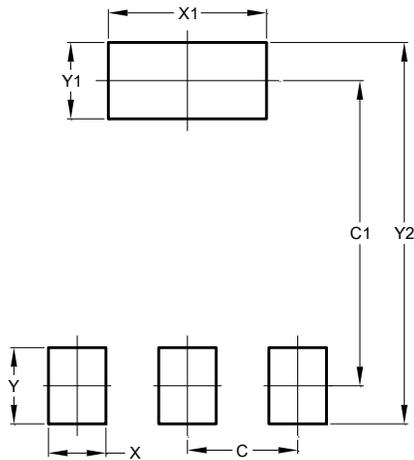
SOT223 (Type DN)



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