



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

- $BV_{CEO} > -500V$
- $I_C = -150mA$  High Continuous Current
- $I_{CM} = -500mA$  Peak Pulse Current

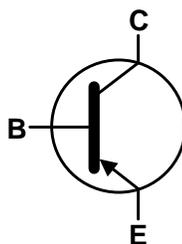
## Mechanical Data

- 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<sup>(E3)</sup>
- Weight: 0.112 grams (Approximate)

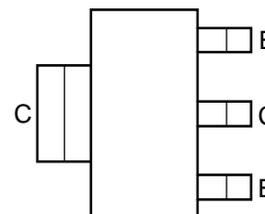
SOT223



Top View



Device Symbol



Top View  
Pin-Out

### Absolute Maximum Ratings (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	$V_{CBO}$	-500	V
Collector-Emitter Voltage	$V_{CEO}$	-500	V
Emitter-Base Voltage	$V_{EBO}$	-7	V
Continuous Collector Current	$I_C$	-150	mA
Peak Pulse Current	$I_{CM}$	-500	mA

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

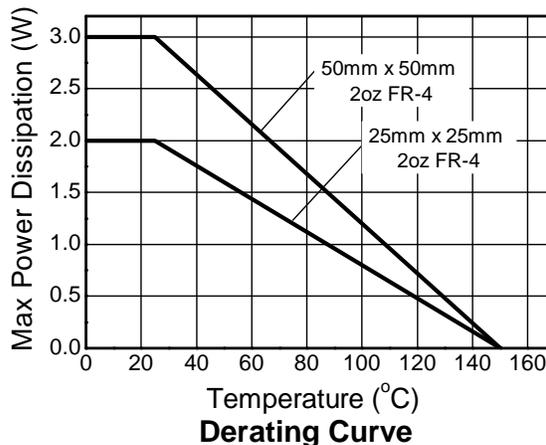
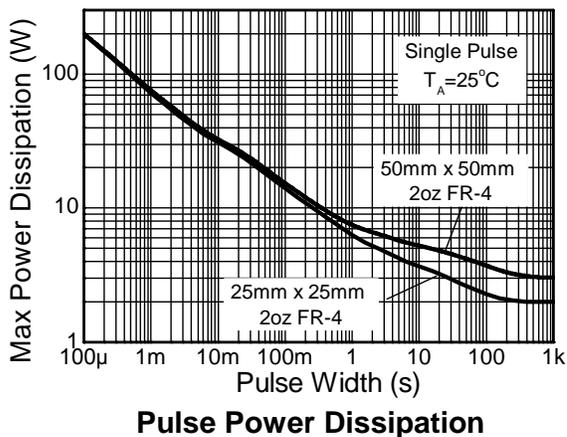
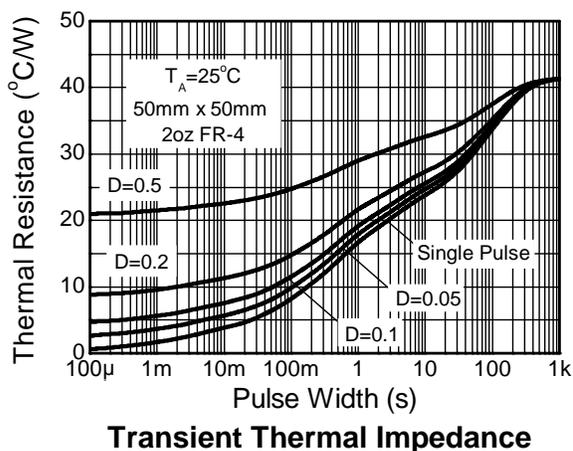
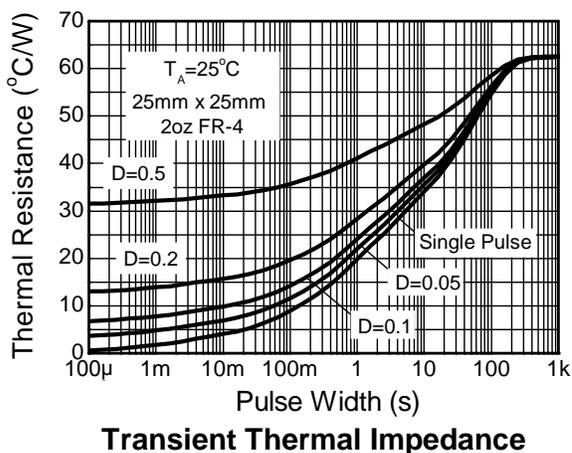
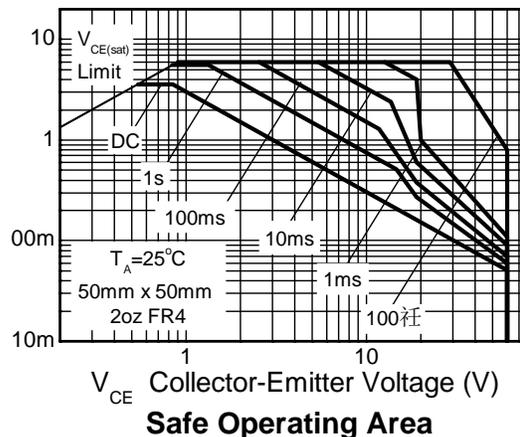
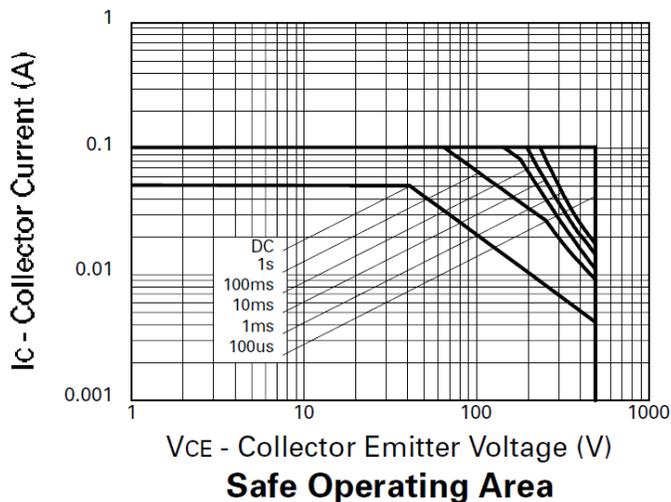
Characteristic	Symbol	Value	Unit
Power Dissipation	$P_D$	2	W
		3	W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	62.5	$^\circ\text{C/W}$
		41.7	$^\circ\text{C/W}$
Thermal Resistance, Junction to Leads	$R_{\theta JL}$	14.8	$^\circ\text{C/W}$
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	$^\circ\text{C}$

### 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 × 25mm 2oz copper that is on a single-sided 1.6mm FR-4 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 × 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**

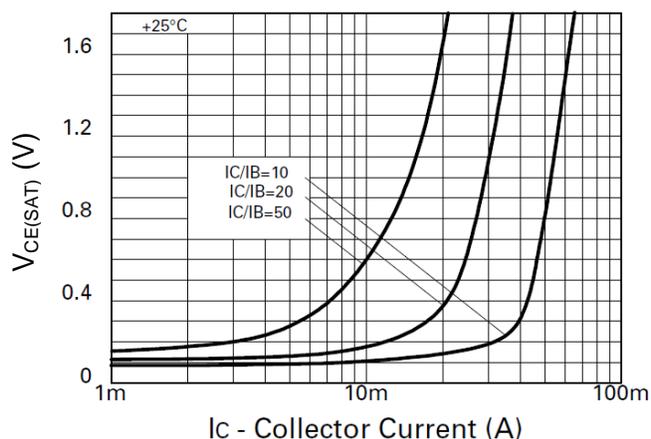


**Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

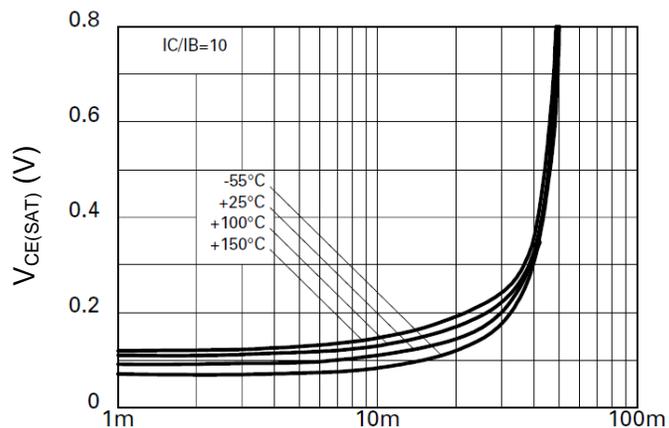
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	$BV_{CBO}$	-500	—	—	V	$I_C = -100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Note 9)	$BV_{CEO}$	-500	—	—	V	$I_C = -1\text{mA}$
Emitter-Base Breakdown Voltage	$BV_{EBO}$	-7	—	—	V	$I_E = -100\mu\text{A}$
Collector Cut-Off Current	$I_{CBO}$	—	—	-100	nA	$V_{CB} = -500\text{V}$
Collector Cut-Off Current	$I_{CES}$	—	—	-100	nA	$V_{CE} = -500\text{V}$
Emitter Cut-Off Current	$I_{EBO}$	—	—	-100	nA	$V_{EB} = -5.6\text{V}$
Collector-Emitter Saturation Voltage (Note 9)	$V_{CE(SAT)}$	—	—	-200	mV	$I_C = -20\text{mA}, I_B = -2\text{mA}$
		—	—	-500		$I_C = -50\text{mA}, I_B = -10\text{mA}$
Base-Emitter Saturation Voltage (Note 9)	$V_{BE(SAT)}$	—	—	-900	mV	$I_C = -50\text{mA}, I_B = -10\text{mA}$
Base-Emitter Turn-On Voltage (Note 9)	$V_{BE(ON)}$	—	—	-900	mV	$I_C = -50\text{mA}, V_{CE} = -10\text{V}$
DC Current Gain (Note 9)	$h_{FE}$	100	—	300	—	$I_C = -1\text{mA}, V_{CE} = -10\text{V}$
		80	—	300		$I_C = -50\text{mA}, V_{CE} = -10\text{V}$
		—	15	—		$I_C = -100\text{mA}, V_{CE} = -10\text{V}$
Current Gain-Bandwidth Product	$f_T$	60	—	—	MHz	$V_{CE} = -20\text{V}, I_C = -10\text{mA}$ $f = 50\text{MHz}$
Turn-On Time	$t_{ON}$	—	110	—	ns	$V_{CC} = -100\text{V}, I_C = -50\text{mA}$
Turn-Off Time	$t_{OFF}$	—	1.5	—	$\mu\text{s}$	$I_{B1} = -5\text{mA}, I_{B2} = 10\text{mA}$
Output Capacitance	$C_{OBO}$	—	—	8	pF	$V_{CB} = -20\text{V}, f = 1\text{MHz}$

 Note: 9. Measured under pulsed conditions. Pulse width  $\leq 300\mu\text{s}$ . Duty cycle  $\leq 2\%$ .

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

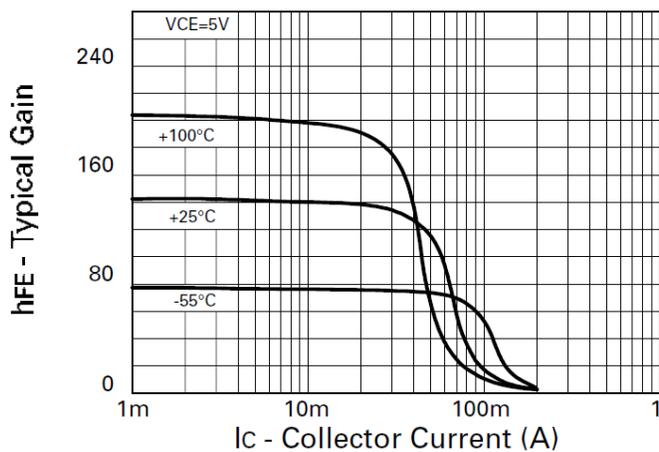


$V_{CE(SAT)} \text{ v } I_C$

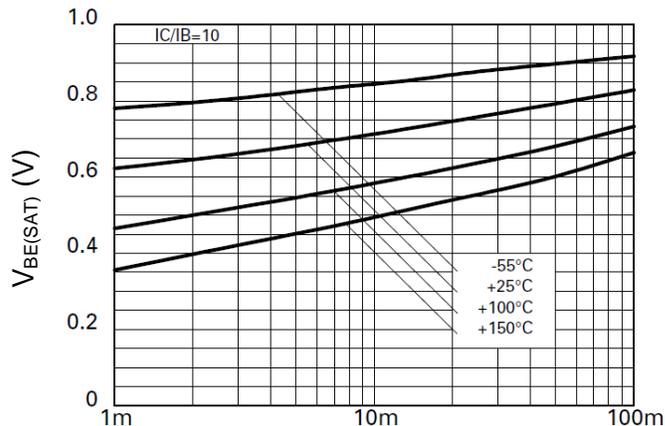


$V_{CE(SAT)} \text{ v } I_C$

$V_{CE(SAT)} \text{ v } I_C$

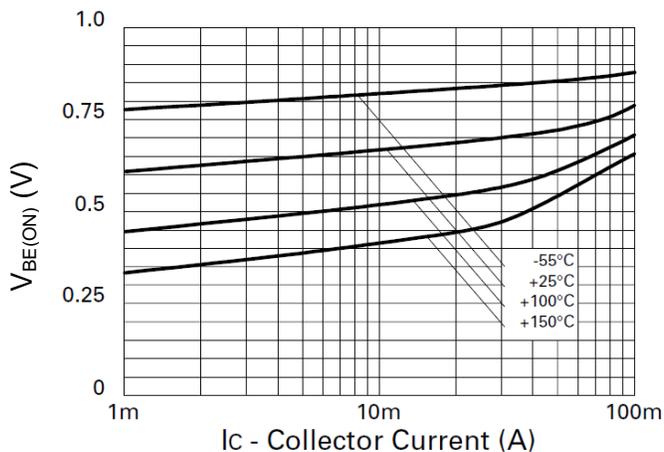


$h_{FE} \text{ v } I_C$



$V_{BE(SAT)} \text{ v } I_C$

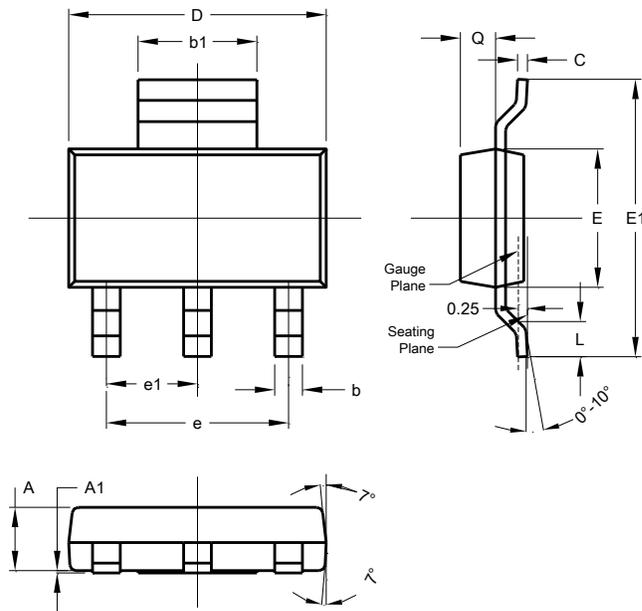
$V_{BE(SAT)} \text{ v } I_C$



$V_{BE(ON)} \text{ v } I_C$

## Package Outline Dimensions

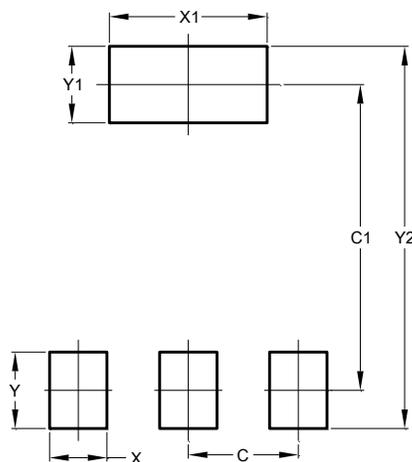
### SOT223



SOT223			
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

Note: For high voltage applications, the appropriate industry sector guidelines should be considered with regards to creepage and clearance distances between device Terminals and PCB tracking.