



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

- $BV_{CEO} > 80V$
- $BV_{CBO} > 100V$
- $I_C = 2A$ High Continuous Current
- Useful h_{FE} up to 6A

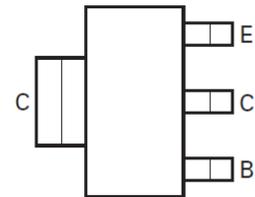
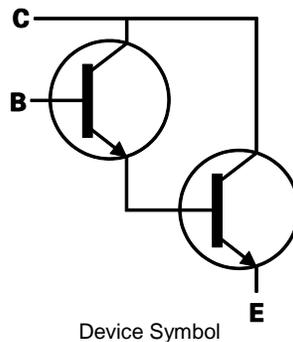
Mechanical Data

- 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 (63)
- Weight: 0.112 grams (Approximate)

SOT223 (Type DN)



Top View



Top View
Pin-Out

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V _{CB0}	100	V
Collector-Emitter Voltage	V _{CEO}	80	V
Emitter-Base Voltage	V _{EB0}	10	V
Continuous Collector Current	I _C	2	A
Peak Pulse Current	I _{CM}	6	A

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

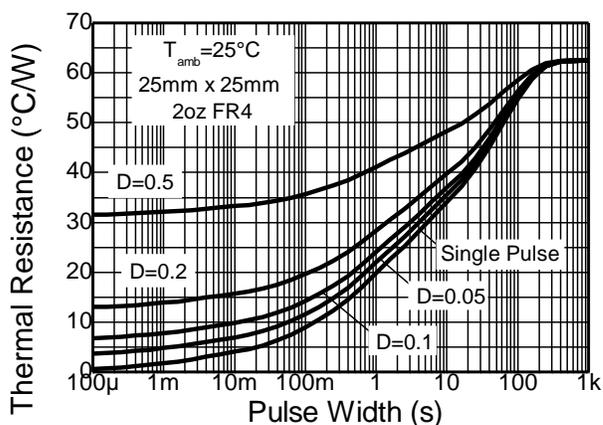
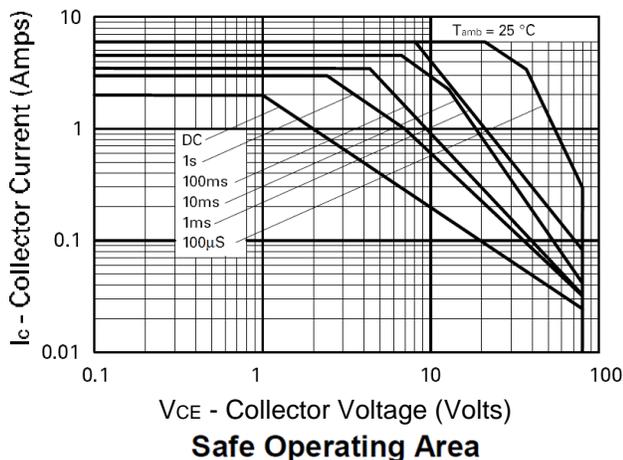
Characteristic	Symbol	Value	Unit
Power Dissipation	(Note 5)	3.0	W
	(Note 6)	2.0	
	(Note 7)	1.6	
	(Note 8)	1.2	
Thermal Resistance, Junction to Ambient	(Note 5)	41.7	°C/W
	(Note 6)	62.5	
	(Note 7)	78.1	
	(Note 8)	104	
Thermal Resistance Junction to Lead	R _{θJL}	12.9	
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

ESD Ratings (Note 10)

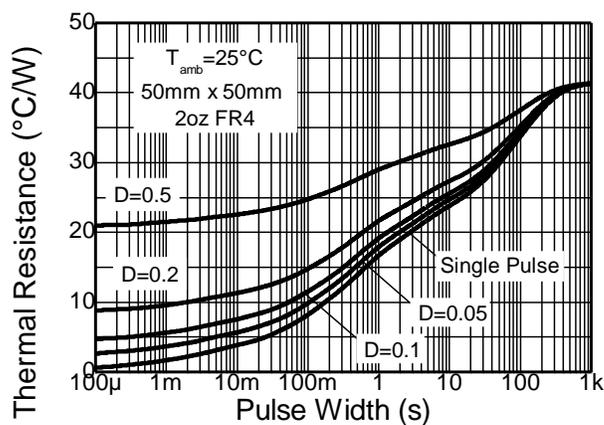
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	2,000	V	2
Electrostatic Discharge - Machine Model	ESD MM	200	V	B

- Notes:
5. For a device mounted with the collector lead on 50mm x 50mm 2oz copper that is on a single-sided 1.6mm FR4 PCB; device is measured under still air conditions whilst operating in a steady-state.
 6. Same as Note 5, except the device is mounted on 25mm x 25mm 2oz copper.
 7. Same as Note 5, except the device is mounted on 25mm x 25mm 1oz copper.
 8. Same as Note 5, 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.

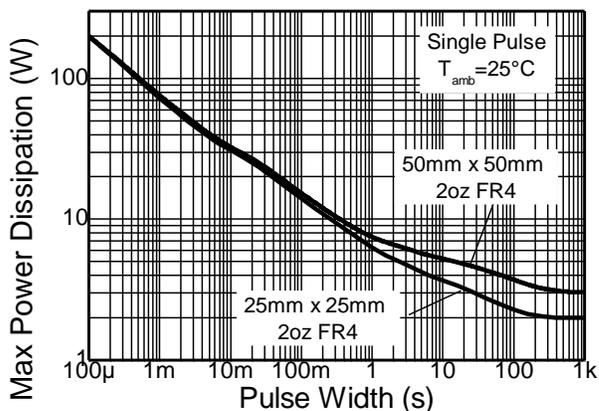
Thermal Characteristics and Derating Information



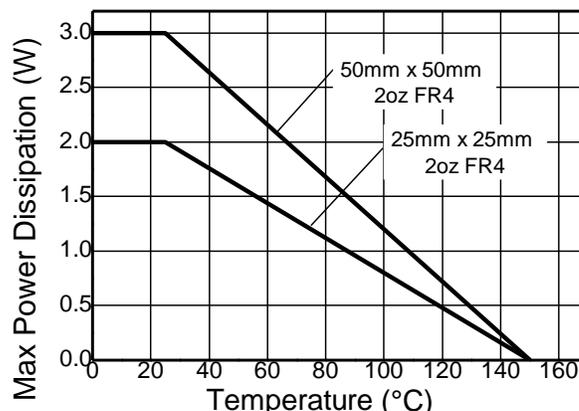
Transient Thermal Impedance



Transient Thermal Impedance



Pulse Power Dissipation



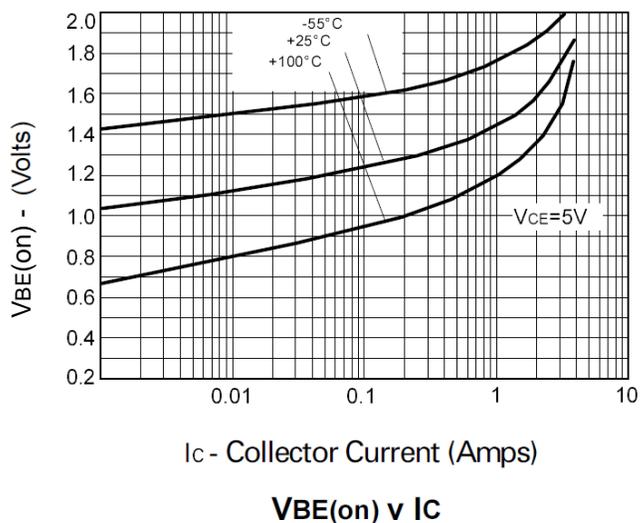
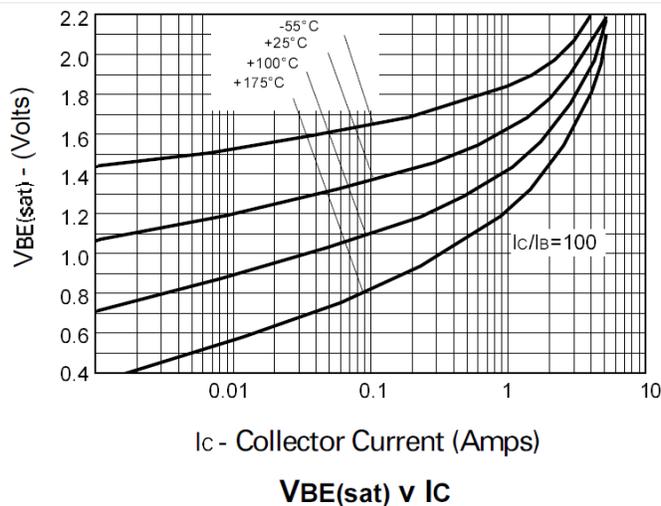
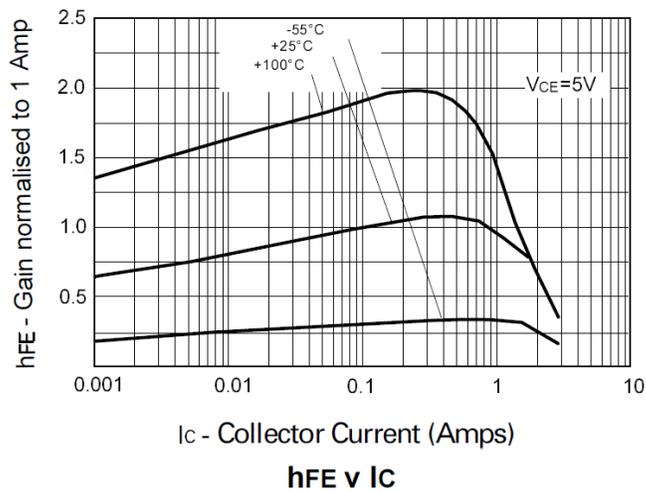
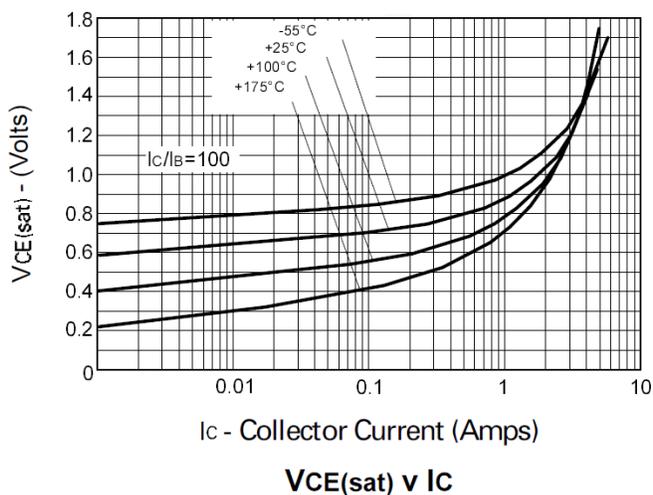
Derating Curve

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV _{CB0}	100	240	—	V	I _C = 100μA
Collector-Emitter Breakdown Voltage (Note 11)	BV _{CEO}	80	110	—	V	I _C = 10mA
Emitter-Base Breakdown Voltage	BV _{EBO}	10	16	—	V	I _E = 100μA
Collector-Base Cut-Off Current	I _{CB0}	—	—	10	nA	V _{CB} = 80V
		—	—	10	μA	V _{CB} = 80V, T _A = +100°C
Collector-Emitter Cut-Off Current	I _{CES}	—	—	10	μA	V _{CE} = 80V
Emitter Cutoff Current	I _{EBO}	—	—	100	nA	V _{EB} = 8V
DC Current Gain (Note 11)	h _{FE}	3,000	14,000	—	—	I _C = 50mA, V _{CE} = 5V
		5,000	15,000	100,000	—	I _C = 500mA, V _{CE} = 5V
		3,000	14,000	—	—	I _C = 1A, V _{CE} = 5V
		2,000	10,000	—	—	I _C = 2A, V _{CE} = 5V
		—	2,000	—	—	I _C = 5A, V _{CE} = 5V
		—	750	—	—	I _C = 6A, V _{CE} = 5V
Collector-Emitter Saturation Voltage (Note 11)	V _{CE(sat)}	—	0.79	0.88	V	I _C = 250mA, I _B = 0.25mA
		—	0.80	0.90		I _C = 0.4A, I _B = 0.4mA
		—	0.88	1.00		I _C = 1A, I _B = 1mA
		—	0.99	1.13		I _C = 2A, I _B = 20mA
		—	0.86	—		I _C = 2A, I _B = 20mA, T _J = +150°C
Base-Emitter Saturation Voltage (Note 11)	V _{BE(sat)}	—	1.70	1.95	V	I _C = 2A, I _B = 20mA
Base-Emitter Turn-On Voltage (Note 11)	V _{BE(on)}	—	1.50	1.75	V	I _C = 2A, V _{CE} = 5V
Input Capacitance (Note 11)	C _{ibo}	—	90	—	pF	V _{EB} = 0.5V, f = 1MHz
Output Capacitance (Note 11)	C _{obo}	—	15	—	pF	V _{CB} = 10V, f = 1MHz
Current Gain-Bandwidth Product (Note 11)	f _T	150	—	—	MHz	V _{CE} = 10V, I _C = 100mA f = 20MHz
Turn-On Time	t _{on}	—	0.5	—	μs	V _{CC} = 10V, I _C = 500mA
Turn-Off Time	t _{off}	—	1.6	—	μs	I _{B1} = -I _{B2} = 0.5mA

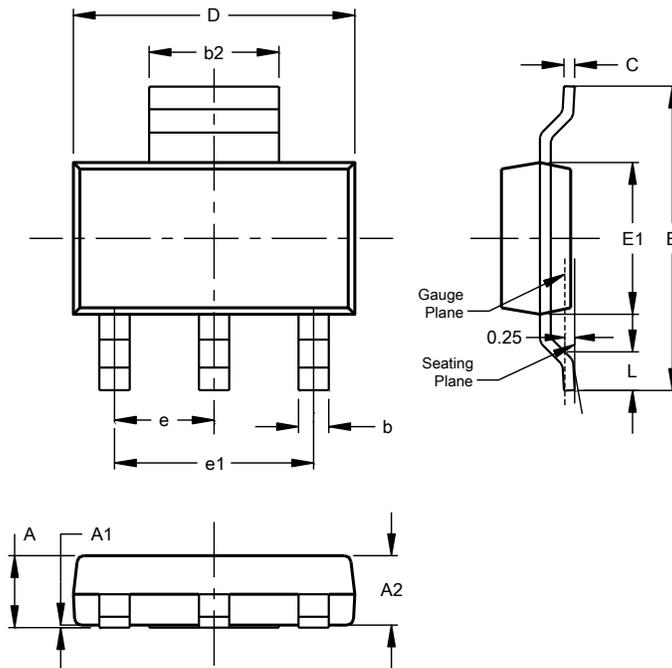
Note: 11. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

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



Package Outline Dimensions

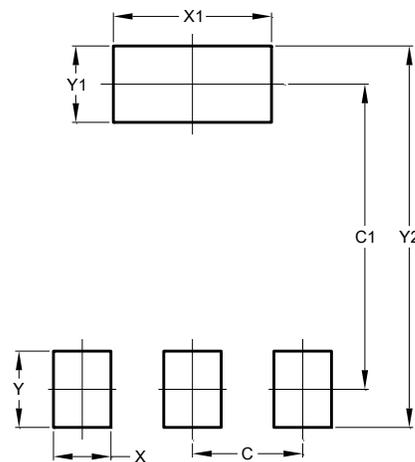
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Dim	Min	Max	Typ
A	--	1.70	--
A1	0.01	0.15	--
A2	1.50	1.68	1.60
b	0.60	0.80	0.70
b2	2.90	3.10	--
c	0.20	0.32	--
D	6.30	6.70	--
E	6.70	7.30	--
E1	3.30	3.70	--
e	--	--	2.30
e1	--	--	4.60
L	0.85	--	--
All Dimensions in mm			

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