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} > -100V
- I_C = -5A High Continuous Collector Current
- I_{CM} = -10A Peak Pulse Current
- Low Saturation Voltage $V_{CE(SAT)}$ < -90mV @ -1A
- R_{SAT} = 60mΩ for a Low Equivalent On-Resistance
- h_{FE} Specified Up to -10A for a High Gain Hold-Up

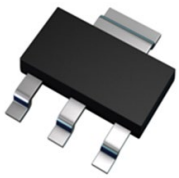
Mechanical Data

- 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 e3
- Weight: 0.112 grams (Approximate)

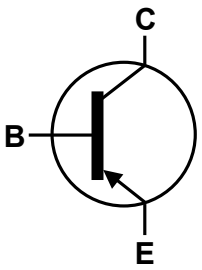
Application

- Motor Driving
- Line Switching
- High Side Switches
- Subscriber Line Interface Cards (SLIC)

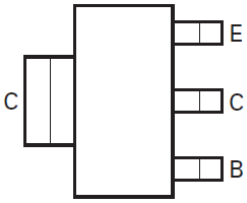
SOT223



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}	-140	V
Collector-Emitter Voltage	V_{CEO}	-100	V
Emitter-Base Voltage	V_{EBO}	-7	V
Continuous Collector Current	I_C	-5	A
Peak Pulse Current	I_{CM}	-10	A

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

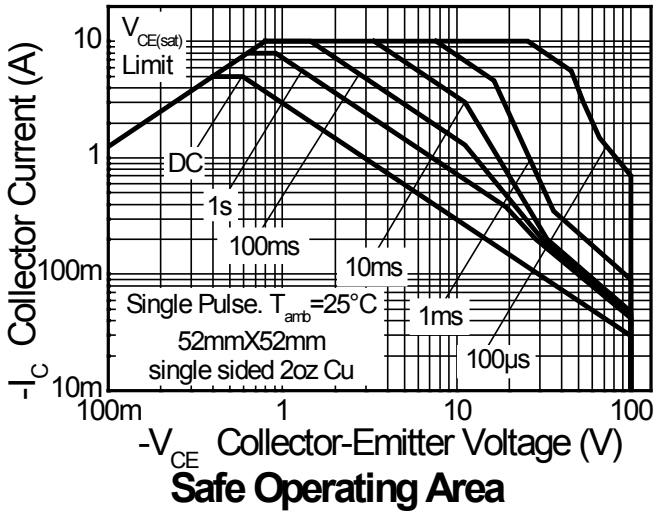
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5) Linear Derating Factor	P_D	3.0 24	W mW/°C
Power Dissipation (Note 6) Linear Derating Factor	P_D	1.6 12.8	W mW/°C
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	42	°C/W
Thermal Resistance, Junction to Ambient (Note 6)	$R_{\theta JA}$	78	°C/W
Thermal Resistance Junction to Lead (Note 7)	$R_{\theta JL}$	10.48	°C/W
Thermal Resistance Junction to Case (Note 8)	$R_{\theta JC}$	13.8	°C/W
Operating and Storage Temperature Range	T_J,T_{STG}	-55 to +150	°C

ESD Ratings (Note 9)

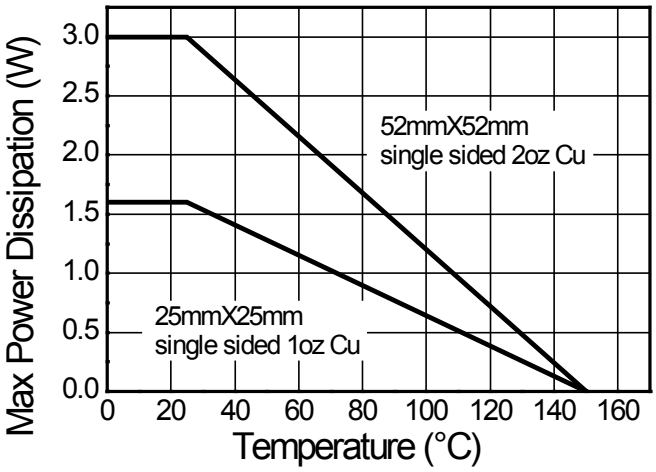
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

Notes:
5. For a device mounted with the collector lead on 52mm x 52mm 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 25mm x 25mm 1oz copper.
7. Thermal resistance from junction to solder-point (at the end of the collector lead).
8. Thermal resistance from junction to top of the case.
9. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

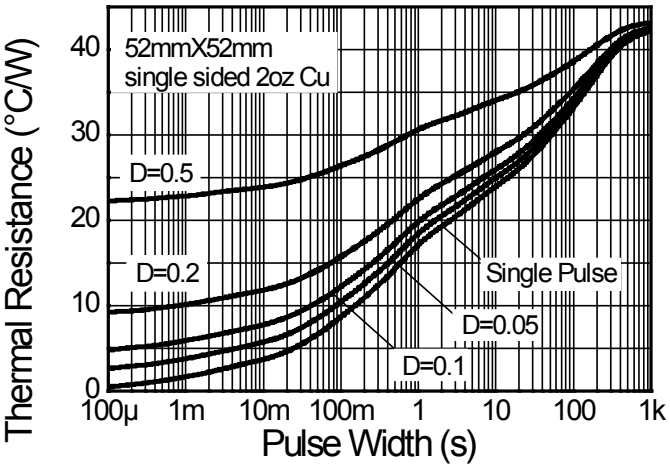
Thermal Characteristics and Derating Information



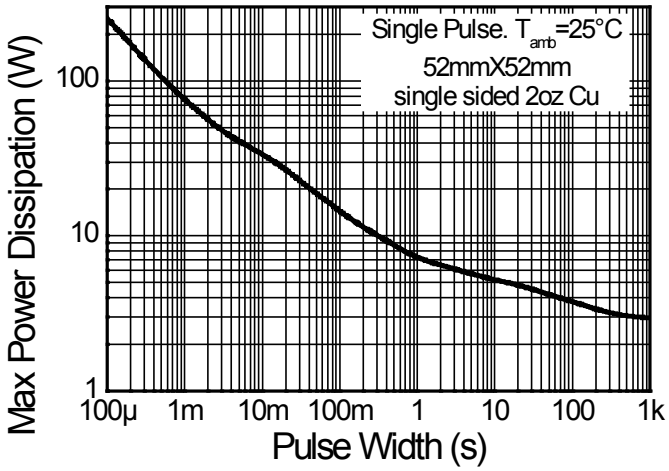
Safe Operating Area



Derating Curve



Transient Thermal Impedance



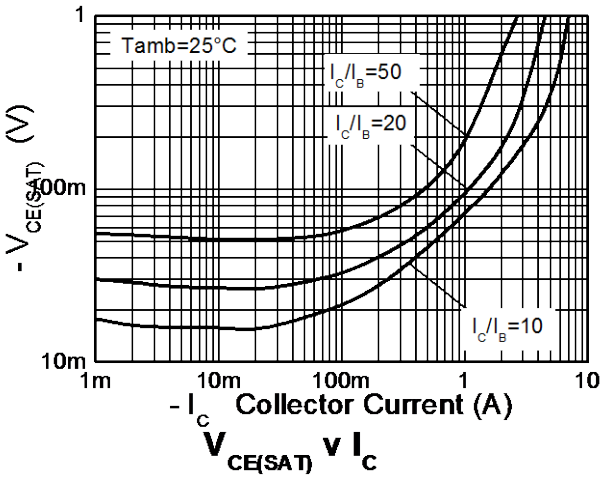
Pulse Power Dissipation

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

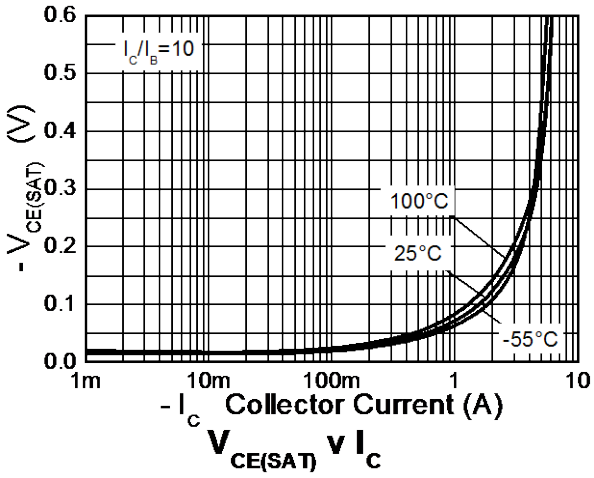
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	-140	-160	—	V	I_C = -100μA
Collector-Emitter Breakdown Voltage (Note 10)	BV_{CER}	-140	-160	—	V	I_C = -1μA, R_B ≤ 1kΩ
Collector-Emitter Breakdown Voltage (Note 10)	BV_{CEO}	-100	-115	—	V	I_C = -1mA
Emitter-Base Breakdown Voltage	BV_{EBO}	-7	-8.1	—	V	I_E = -100μA
Collector Cut-Off Current	I_{CBO}	— —	< 1 —	-20 -500	nA nA	V_{CB} = -100V V_{CB} = -100V, T_A = +100°C
Collector Cut-Off Current	I_{CER} R ≤1kΩ	— —	< 1 —	-20 -500	nA nA	V_{CB} = -100V V_{CB} = -100V, T_A = +100°C
Emitter Cut-Off Current	I_{EBO}	—	< 1	-10	nA	V_{EB} = -6V
DC Current Transfer Static Ratio (Note 10)	h_{FE}	100	250	—	—	I_C = -10mA, V_{CE} = -1V
		100	200	300		I_C = -1A, V_{CE} = -1V
		25	50	—		I_C = -3A, V_{CE} = -1V
		15	30	—		I_C = -4A, V_{CE} = -1V
		—	5	—		I_C = -10A, V_{CE} = -1V
Collector-Emitter Saturation Voltage (Note 10)	$V_{CE(sat)}$	—	-20	-30	mV	I_C = -100mA, I_B = -10mA
		—	-70	-90		I_C = -1A, I_B = -100mA
		—	-120	-150		I_C = -2A, I_B = -200mA
		—	-240	-340		I_C = -4A, I_B = -400mA
Base-Emitter Saturation Voltage (Note 10)	$V_{BE(sat)}$	—	-985	-1100	mV	I_C = -4A, I_B = -400mA
Base-Emitter Turn-On Voltage (Note 10)	$V_{BE(on)}$	—	-920	-1050	mV	I_C = -4A, V_{CE} = -1V
Transitional Frequency (Note 10)	f_T	—	125	—	MHz	I_C = -100mA, V_{CE} = -10V, f = 50MHz
Output Capacitance	C_{obo}	—	42	—	pF	V_{CB} = -10V, f = 1MHz
Switching Time	t_{on}	—	42	—	ns	V_{CC} = -50V, I_C = -1A, I_{B1} = -I_{B2} = -100mA
	t_{off}	—	540	—		

Note: 10. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

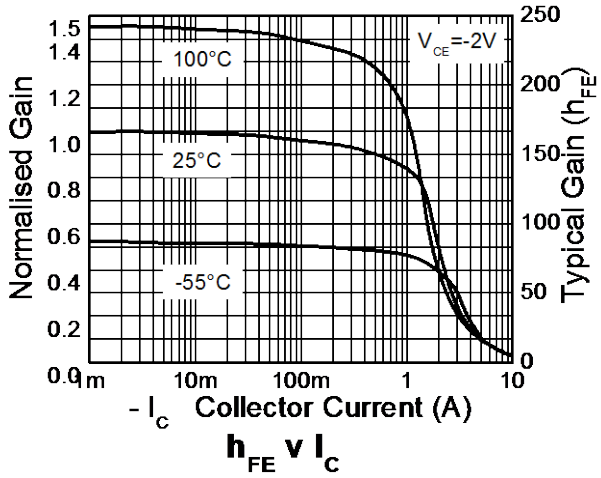
Typical Electrical Characteristics (@ T_A = +25°C, unless otherwise specified.)



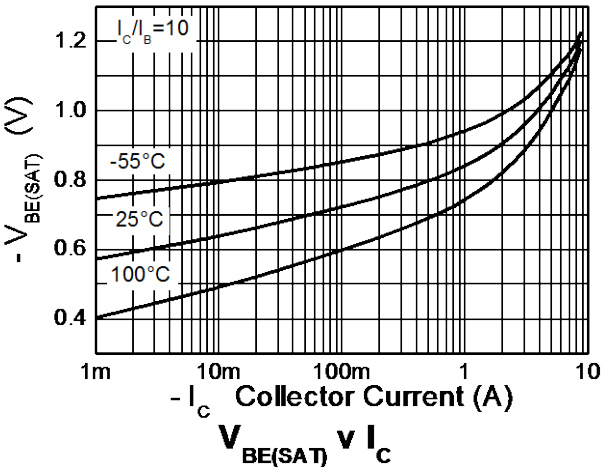
$V_{CE(SAT)}$ v I_C



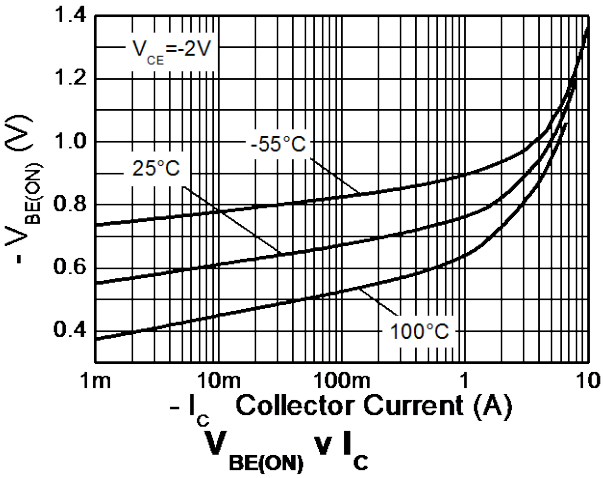
$V_{CE(SAT)}$ v I_C



h_{FE} v I_C



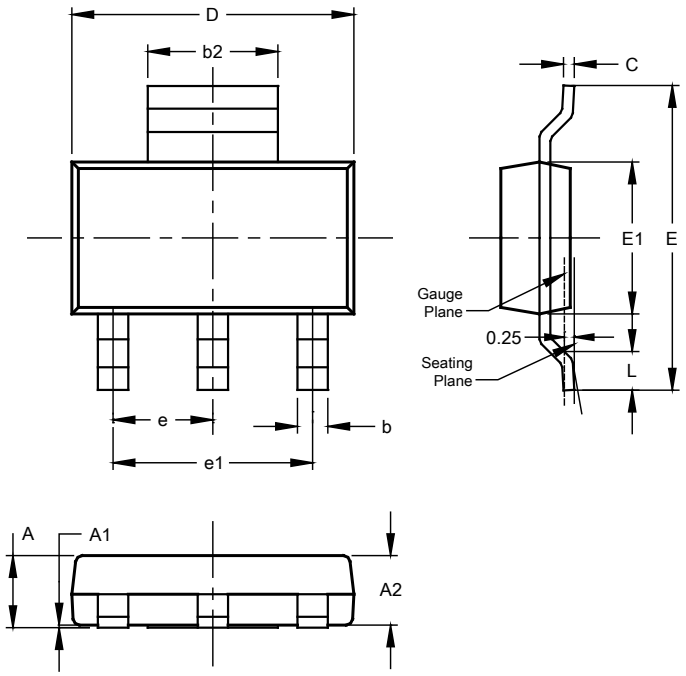
$V_{BE(SAT)}$ v I_C



$V_{BE(ON)}$ v I_C

Package Outline Dimensions

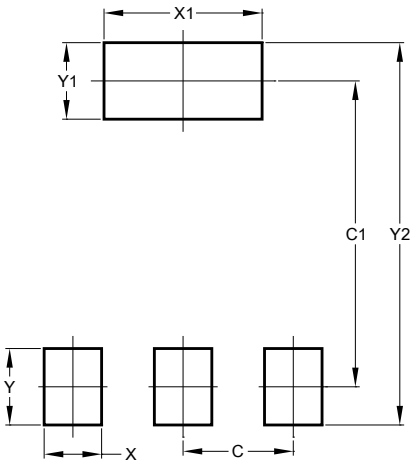
SOT223 (Type DN)



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