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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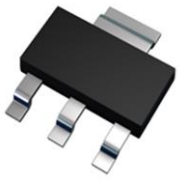
Features

- BV_{CEO} > -12V
- I_C = -6A High Continuous Collector Current
- I_{CM} = -20A Peak Pulse Current
- Low Saturation Voltage $V_{CE(sat)}$ < -170mV @ -2A
- h_{FE} Specified up to -10A for a High Gain Hold Up

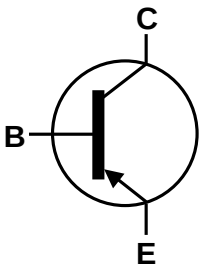
Mechanical Data

- 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 208e3
- Weight: 0.112 grams (Approximate)

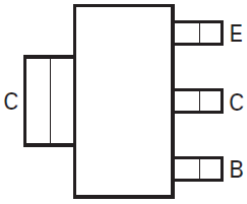
SOT223 (Type DN)



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}	-15	V
Collector-Emitter Voltage	V_{CEO}	-12	V
Emitter-Base Voltage	V_{EBO}	-6	V
Continuous Collector Current	I_C	-6	A
Peak Pulse Current	I_{CM}	-20	A

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

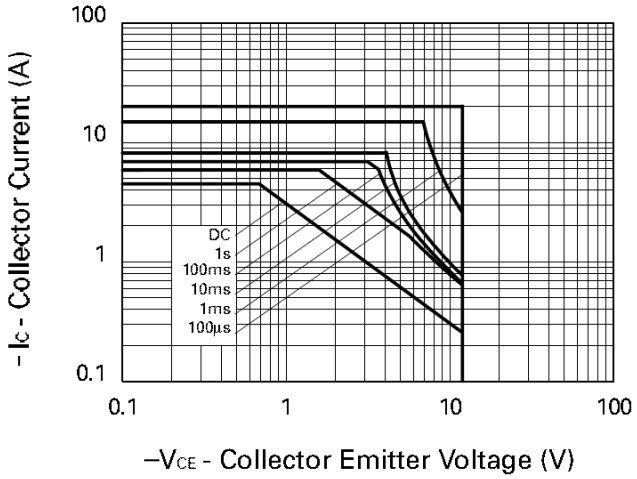
Characteristic		Symbol	Value	Unit
Power Dissipation Linear derating factor	(Note 5)	P_D	3.0 24	W mW /°C
	(Note 6)		1.6 12.8	
Thermal Resistance, Junction to Ambient	(Note 5)	$R_{\theta JA}$	42	°C/W
	(Note 6)	$R_{\theta JA}$	78	
Thermal Resistance Junction to Lead	(Note 7)	$R_{\theta JL}$	8.8	
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

ESD Ratings (Note 8)

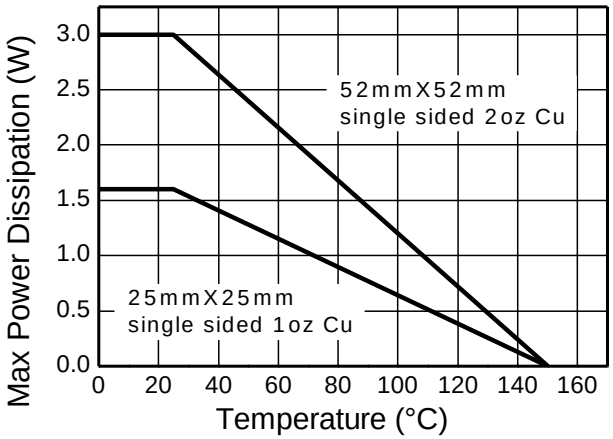
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

Notes:
5. For a device mounted with the collector lead on 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. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

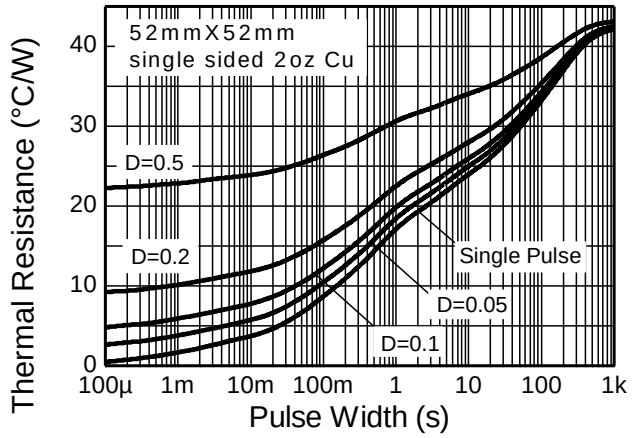
Thermal Characteristics and Derating Information



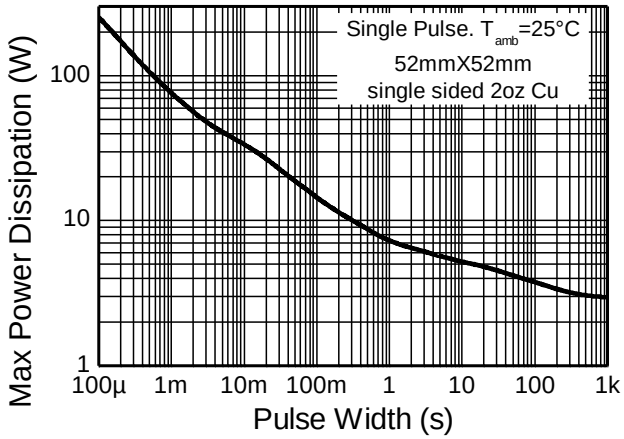
Safe Operating Area



Derating Curve



Transient Thermal Impedance



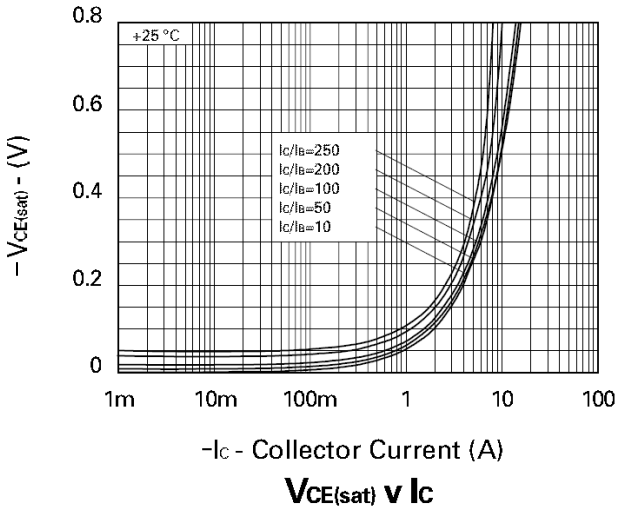
Pulse Power Dissipation

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

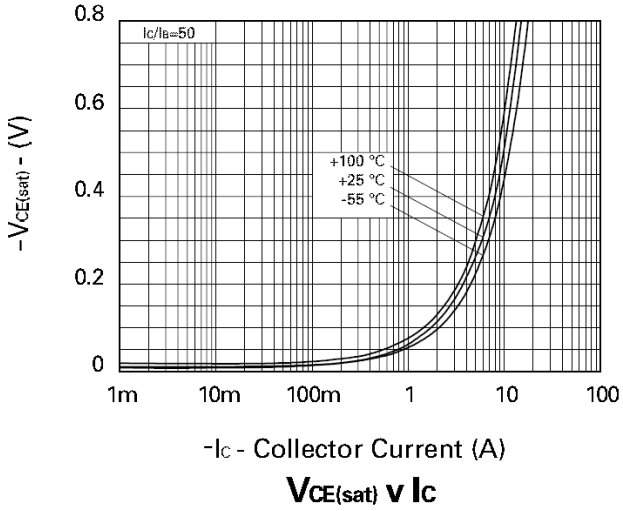
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	-15	-28	—	V	I_C = -100μA
Collector-Emitter Breakdown Voltage (Note 9)	BV_{CEO}	-12	-20	—	V	I_C = -10mA
Emitter-Base Breakdown Voltage	BV_{EBO}	-6	-8	—	V	I_E = -100μA
Collector Cutoff Current	I_{CBO}	— —	— —	-10 -1	nA μA	V_{CB} = -12V V_{CB} = -12V, T_A = +100°C
Emitter Cutoff Current	I_{EBO}	—	—	-10	nA	V_{EB} = -6V
DC current transfer Static ratio (Note 9)	h_{FE}	300	450	—	—	I_C = -10mA, V_{CE} = -1V
		300	450	1000		I_C = -500mA, V_{CE} = -1V
		200	300	—		I_C = -5A, V_{CE} = -1V
		150	240	—		I_C = -10A, V_{CE} = -1V
		—	50	—		I_C = -20A, V_{CE} = -1V
Collector-Emitter Saturation Voltage (Note 9)	$V_{CE(sat)}$	—	-65	-130	mV	I_C = -500mA, I_B = -5mA
		—	-132	-170		I_C = -2A, I_B = -50mA
		—	-360	-450		I_C = -6A, I_B = -250mA
Base-Emitter Saturation Voltage (Note 9)	$V_{BE(sat)}$	—	-1.05	-1.2	V	I_C = -6A, I_B = -250mA
Base-Emitter Turn-on Voltage (Note 9)	$V_{BE(on)}$	—	-0.87	-1.05	V	I_C = -6A, V_{CE} = -1V
Transitional Frequency (Note 9)	f_T	—	80	—	MHz	I_C = -100mA, V_{CE} = -10V, f = 50MHz
Output capacitance	C_{obo}	—	161	—	pF	V_{CB} = -20V, f = 1MHz
Switching Time	t_{on}	—	120	—	ns	V_{CC} = -10V, I_C = -4A, I_{B1} = -I_{B2} = -400mA
	t_{off}	—	116	—		

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

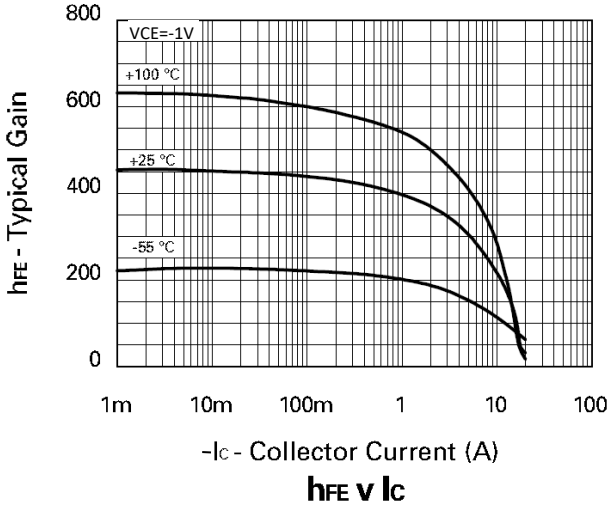
Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)



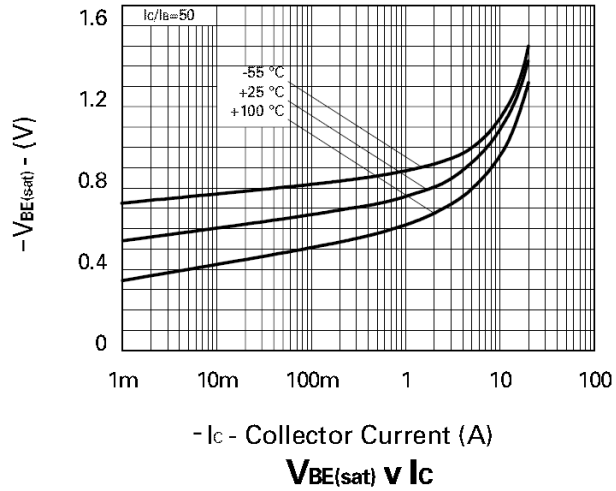
$V_{CE(sat)}$ v Ic



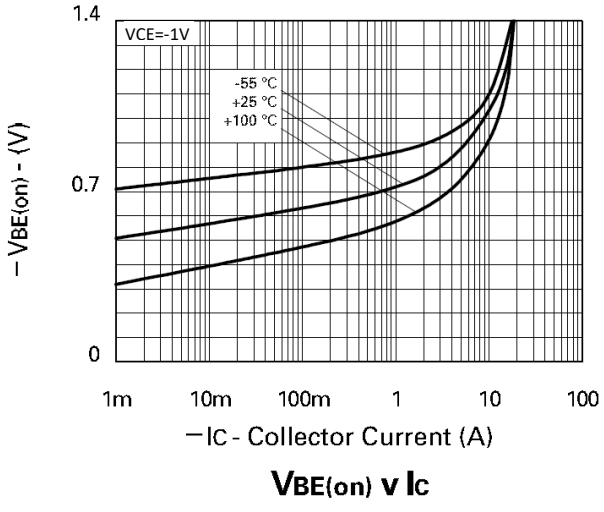
$V_{CE(sat)}$ v Ic



h_{FE} v Ic



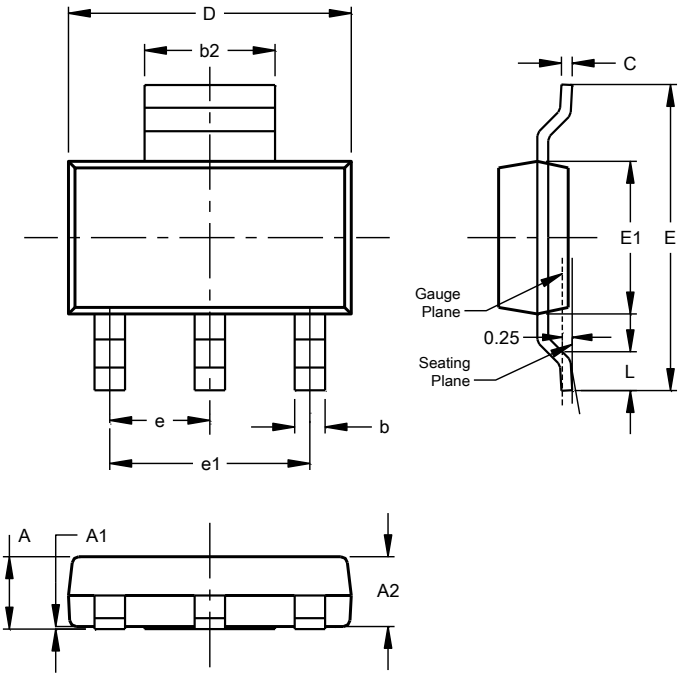
$V_{BE(sat)}$ v Ic



$V_{BE(on)}$ v Ic

Package Outline Dimensions

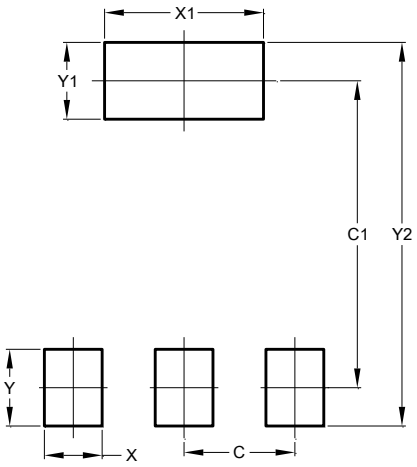
SOT223 (Type DN)



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