



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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企业微信二维码



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Features

- $BV_{CEO} > -100V$
- $I_C = -5A$ High Continuous Collector Current
- $I_{CM} = -10A$ Peak Pulse Current
- Low Saturation Voltage $V_{CE(sat)} < -90mV @ -1A$
- $R_{SAT} = 60m\Omega$ 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)

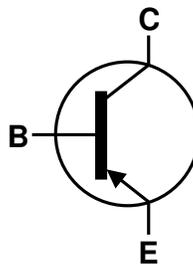
Applications

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

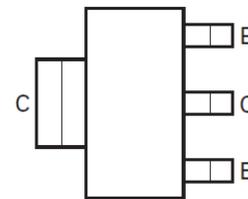
SOT223



Top View



Device Symbol



Top View
Pin-Out

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CB0}	-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 (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

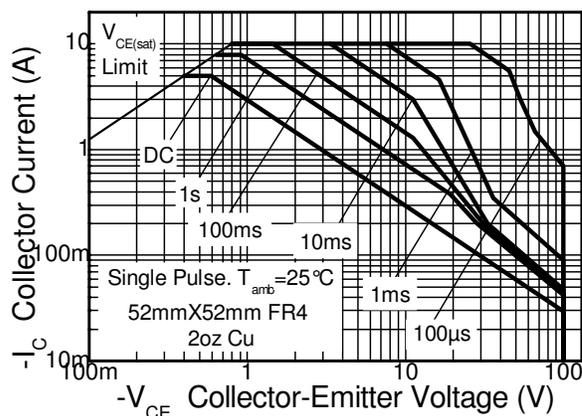
Characteristic	Symbol	Value	Unit
Power Dissipation	P_D	3.0	W
		24	
Linear Derating Factor		1.6	mW / $^\circ\text{C}$
		12.8	
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	42	$^\circ\text{C/W}$
	$R_{\theta JA}$	78	
Thermal Resistance Junction to Lead	$R_{\theta JL}$	10.4	
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

ESD Ratings (Note 9)

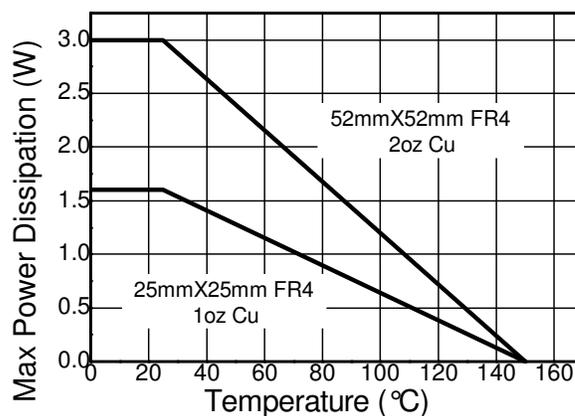
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

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

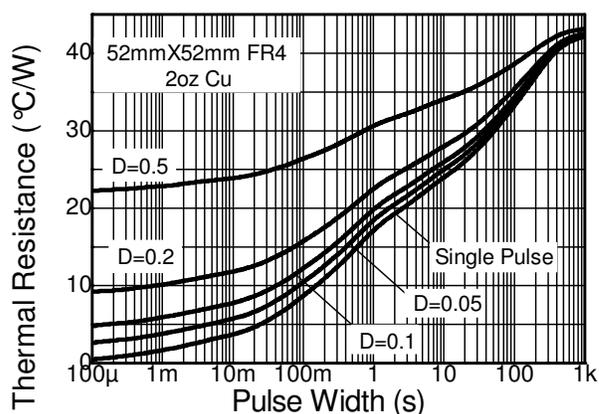
Thermal Characteristics and Derating Information



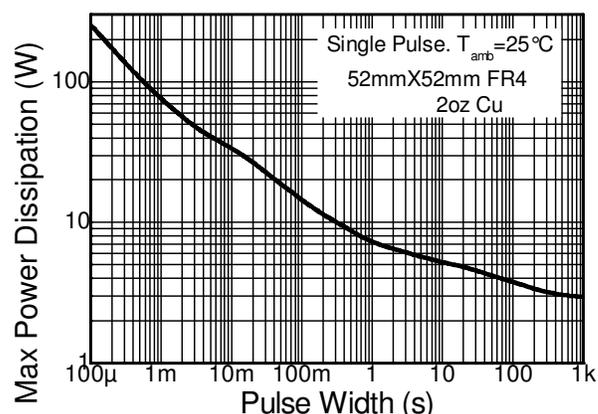
Safe Operating Area



Derating Curve



Transient Thermal Impedance



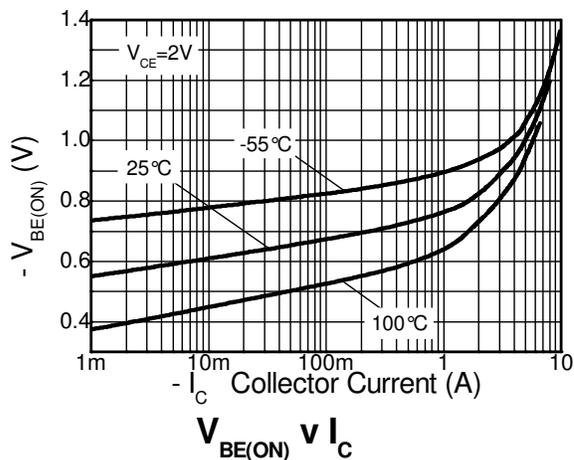
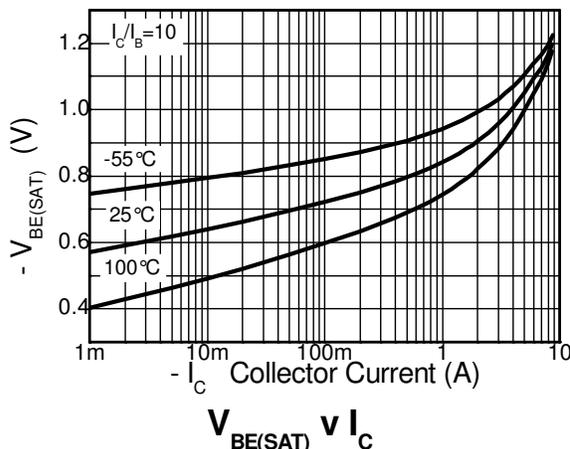
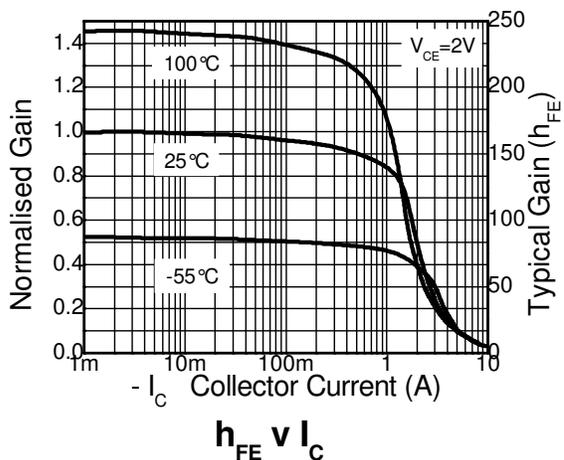
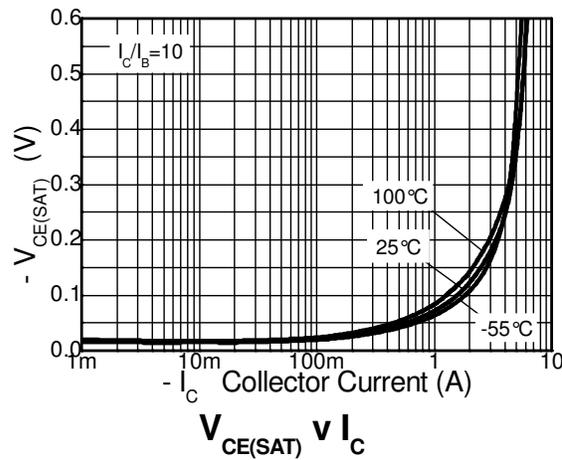
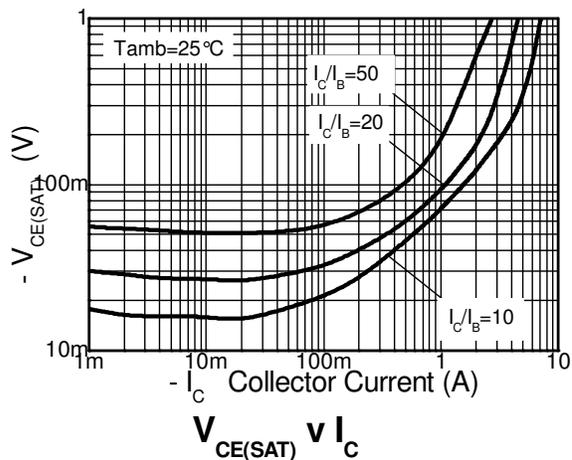
Pulse Power Dissipation

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

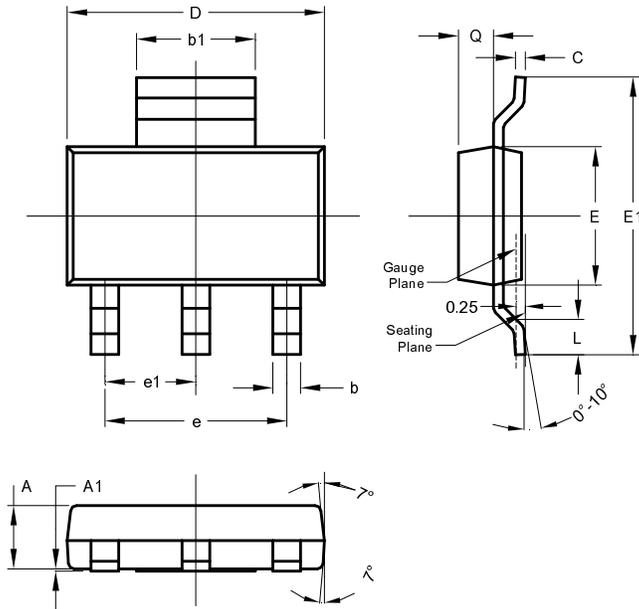
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	-140	-160	-	V	$I_C = -100\mu\text{A}$
Collector-Emitter Breakdown Voltage	BV_{CER}	-140	-160	-	V	$I_C = -1\mu\text{A}$, $R_B \leq 1\text{k}\Omega$
Collector-Emitter Breakdown Voltage (Note 10)	BV_{CEO}	-100	-115	-	V	$I_C = -1\text{mA}$
Emitter-Base Breakdown Voltage	BV_{EBO}	-7	-8.1	-	V	$I_E = -100\mu\text{A}$
Collector-Base Cut-Off Current	I_{CBO}	-	<1	-20	nA	$V_{CB} = -100\text{V}$
				-0.5	μA	$V_{CB} = -100\text{V}$, $T_A = +100^\circ\text{C}$
Collector-Emitter Cut-Off Current	I_{CER} $R \leq 1\text{k}\Omega$	-	<1	-20	nA	$V_{CB} = -100\text{V}$
				-0.5	μA	$V_{CB} = -100\text{V}$, $T_A = +100^\circ\text{C}$
Emitter Cut-Off Current	I_{EBO}	-	<1	-10	nA	$V_{EB} = -6\text{V}$
Static Forward Current Transfer Ratio (Note 10)	h_{FE}	100	250	-	-	$I_C = -10\text{mA}$, $V_{CE} = -1\text{V}$
		100	200	300		$I_C = -1\text{A}$, $V_{CE} = -1\text{V}$
		25	50	-		$I_C = -3\text{A}$, $V_{CE} = -1\text{V}$
		15	30	-		$I_C = -4\text{A}$, $V_{CE} = -1\text{V}$
		-	5	-		$I_C = -10\text{A}$, $V_{CE} = -1\text{V}$
Collector-Emitter Saturation Voltage (Note 10)	$V_{CE(sat)}$	-	-20	-30	mV	$I_C = -100\text{mA}$, $I_B = -10\text{mA}$
		-	-70	-90		$I_C = -1\text{A}$, $I_B = -100\text{mA}$
		-	-120	-150		$I_C = -2\text{A}$, $I_B = -200\text{mA}$
		-	-240	-340		$I_C = -4\text{A}$, $I_B = -400\text{mA}$
Base-Emitter Saturation Voltage (Note 10)	$V_{BE(sat)}$	-	-985	-1100	mV	$I_C = -4\text{A}$, $I_B = -400\text{mA}$
Base-Emitter Turn-On Voltage (Note 10)	$V_{BE(on)}$	-	-920	-1050	mV	$I_C = -4\text{A}$, $V_{CE} = -2\text{V}$
Output Capacitance (Note 10)	C_{obo}	-	42	-	pF	$V_{CB} = -10\text{V}$, $f = 1\text{MHz}$
Transition Frequency	f_T	-	125	-	MHz	$V_{CE} = -10\text{V}$, $I_C = -100\text{mA}$ $f = 50\text{MHz}$
Switching Time	t_{on}	-	42	-	ns	$V_{CC} = -10\text{V}$, $I_C = -1\text{A}$ $I_{B1} = I_{B2} = -100\text{mA}$
	t_{off}	-	540	-		

 Note: 10. 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.)

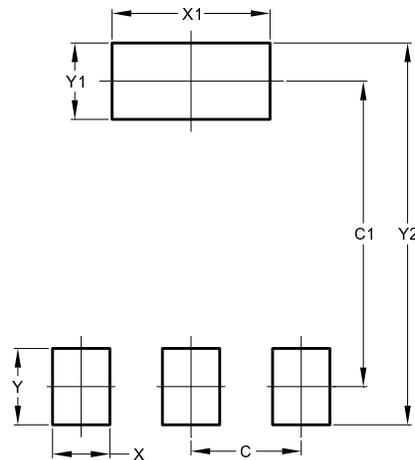


Package Outline Dimensions



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



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.