



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

0755-83047638

ysbdt@szyoushang.cn

www.szyoushang.cn



企业微信二维码



企业QQ二维码

Features

- $BV_{CEO} > -140V$
- $I_C = -4A$ High Continuous Collector Current
- $I_{CM} = -10A$ Peak Pulse Current
- Low Saturation Voltage $V_{CE(sat)} < -120mV @ I_C = -1A$
- $R_{SAT} = 92m\Omega$ for a Low Equivalent On-Resistance
- h_{FE} Specified up to $-10A$ for a High Gain Hold-Up

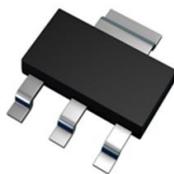
Mechanical Data

- 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 (g3)
- Weight: 0.112 grams (Approximate)

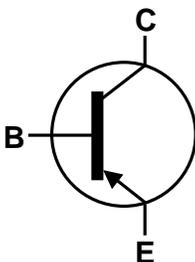
Application

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

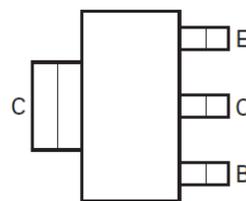
SOT223



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}		
Collector-Emitter Voltage	V _{CEO}	-140	V
Emitter-Base Voltage	V _{EBO}	-7	V
Continuous Collector Current	I _C	-4	A
Peak Pulse Current	I _{CM}	-10	A

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

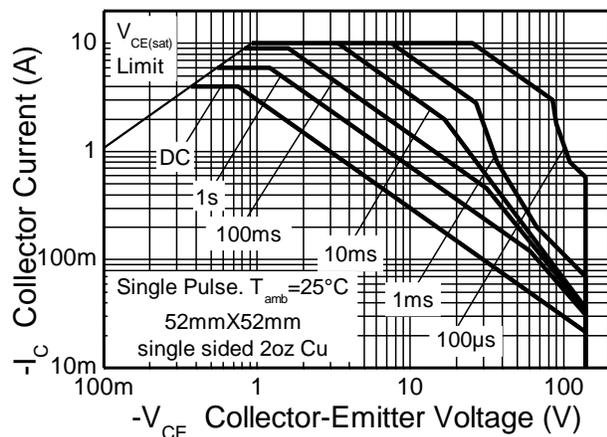
Characteristic	Symbol	Value	Unit
Power Dissipation	P _D	(Note 5)	3.0
		(Note 6)	2.0
		(Note 7)	1.6
		(Note 8)	1.2
Thermal Resistance, Junction to Ambient	R _{θJA}	(Note 5)	41.7
		(Note 6)	62.5
		(Note 7)	78.1
		(Note 8)	104
Thermal Resistance Junction to Lead	R _{θJL}	10.5	
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

ESD Ratings (Note 10)

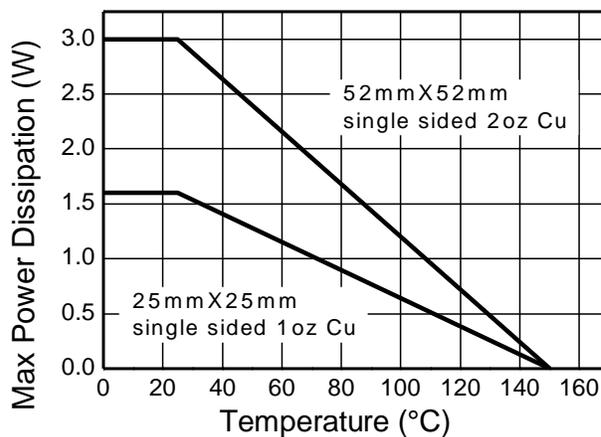
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	8,000	V	3B
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

- 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 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.

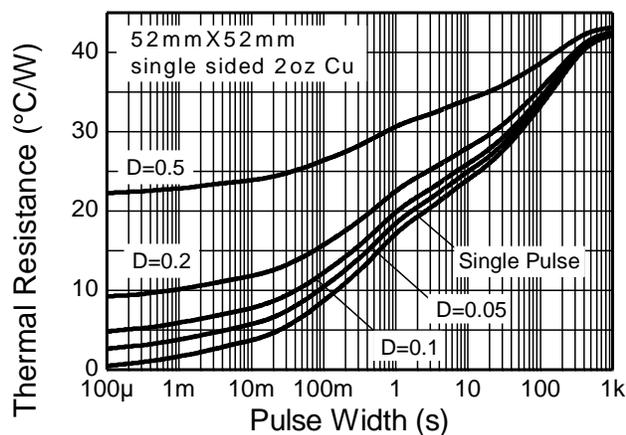
Thermal Characteristics and Derating Information



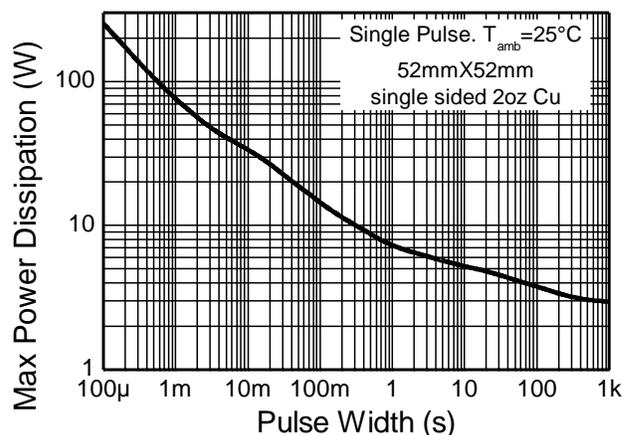
Safe Operating Area



Derating Curve



Transient Thermal Impedance



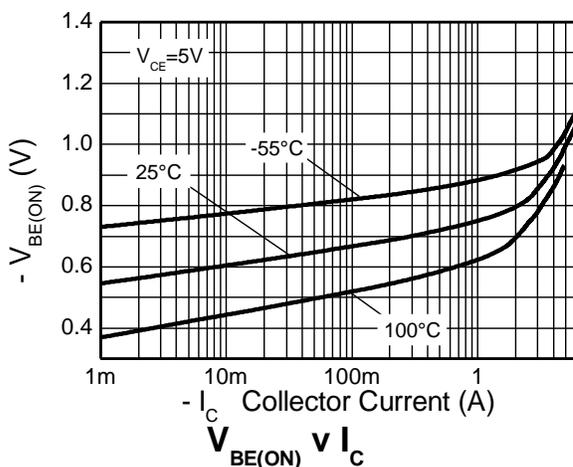
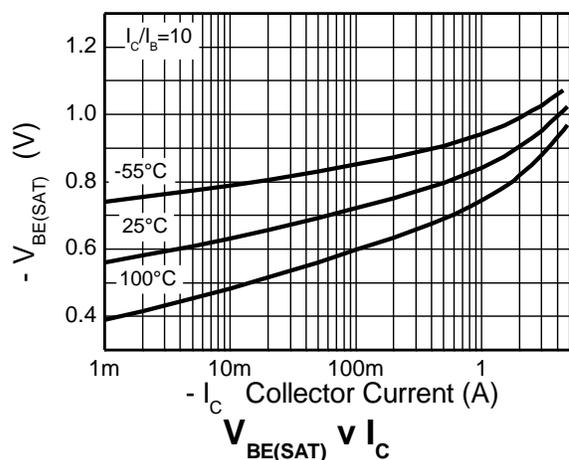
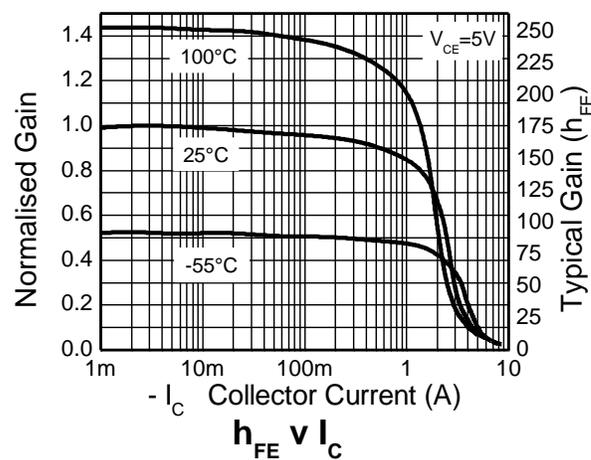
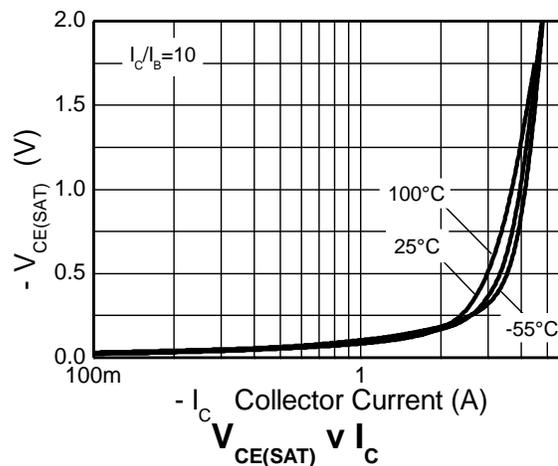
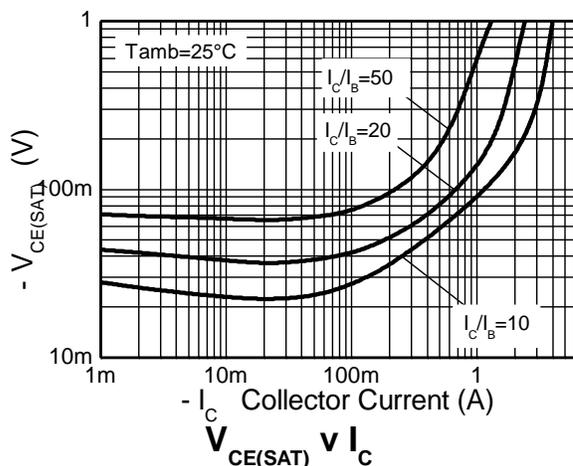
Pulse Power Dissipation

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

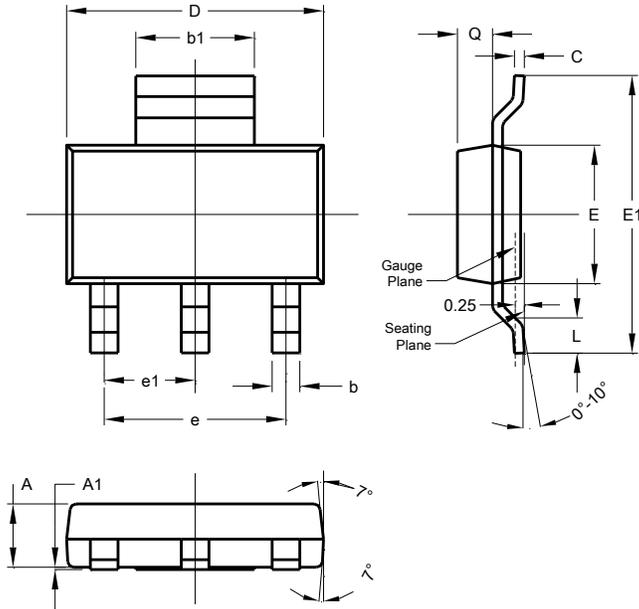
Characteristic	Symbol	Min	Typ.	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV _{CB0}	-180	-200	-	V	I _C = -100μA
Collector-Emitter Breakdown Voltage (Note 11)	BV _{CER}	-180	-200	-	V	I _C = -1μA, R _B ≤ 1kΩ
Collector-Emitter Breakdown Voltage (Note 11)	BV _{CEO}	-140	-160	-	V	I _C = -1mA
Emitter-Base Breakdown Voltage	BV _{EBO}	-7	-8.3	-	V	I _E = -100μA
Collector Cut-Off Current	I _{CBO}	-	< -1	-20	nA	V _{CB} = -150V
		-	-	-500	nA	V _{CB} = -150V, T _A = +100°C
Collector Cut-Off Current	I _{CER} R ≤ 1kΩ	-	< -1	-20	nA	V _{CB} = -150V
		-	-	-500	nA	V _{CB} = -150V, T _A = +100°C
Emitter Cut-Off Current	I _{EBO}	-	< -1	-10	nA	V _{EB} = -6V
DC Current Transfer Static Ratio (Note 11)	h _{FE}	100	225	-	-	I _C = -10mA, V _{CE} = -5V
		100	200	300		I _C = -1A, V _{CE} = -5V
		45	100	-		I _C = -3A, V _{CE} = -5V
		-	5	-		I _C = -10A, V _{CE} = -5V
Collector-Emitter Saturation Voltage (Note 11)	V _{CE(sat)}	-	-40	-60	mV	I _C = -100mA, I _B = -5mA
		-	-55	-80		I _C = -0.5A, I _B = -50mA
		-	-85	-120		I _C = -1A, I _B = -100mA
		-	-275	-360		I _C = -3A, I _B = -300mA
Base-Emitter Saturation Voltage (Note 11)	V _{BE(sat)}	-	-940	-1040	mV	I _C = -3A, I _B = -300mA
Base-Emitter Turn-On Voltage (Note 11)	V _{BE(on)}	-	-830	-930	mV	I _C = -3A, V _{CE} = -5V
Transitional Frequency (Note 11)	f _T	-	120	-	MHz	I _C = -100mA, V _{CE} = -10V, f = 50MHz
Output Capacitance	C _{obo}	-	33	-	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}	-	636	-		

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

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

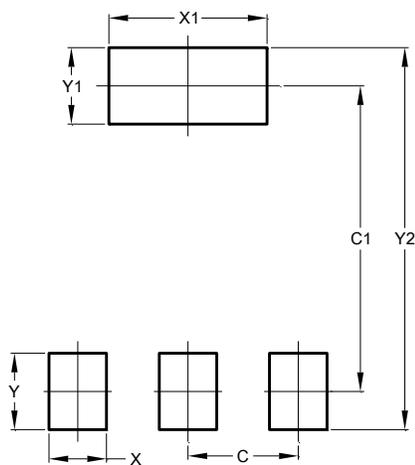


Package Outline Dimensions



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

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.