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

0755-83047638
ysbdt@szyoushang.cn
www.szyoushang.cn

企业微信二维码

企业QQ二维码

Features

- BV_{CEO} > 60V
- I_C = 7A Continuous Collector Current
- I_{CM} = 12A Peak Pulse Current
- Low Saturation Voltage $V_{CE(sat)}$ < 50mV @ 1A
- $R_{CE(sat)}$ = 30mΩ
- h_{FE} Specified up to 7A for High Gain Hold Up
- Complementary PNP Type: NK-ZXTP19060CG

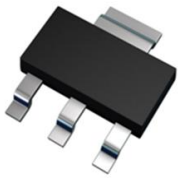
Mechanical Data

- 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)

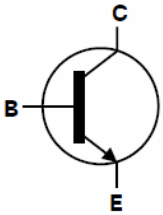
Applications

- Line Switching
- Motor Driving (including DC fans)
- High-Side Switches
- Lamp, Relay and Solenoid Drive

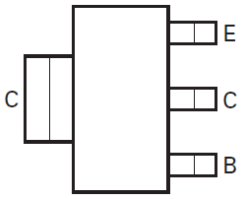
SOT223



Top View



Device Schematic



Pin-Out Top View

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	160	V
Collector-Emitter Voltage	V_{CEO}	60	V
Emitter-Base Voltage	V_{EBO}	7	V
Continuous Collector Current	I_C	7	A
Peak Pulse Current	I_{CM}	12	A

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

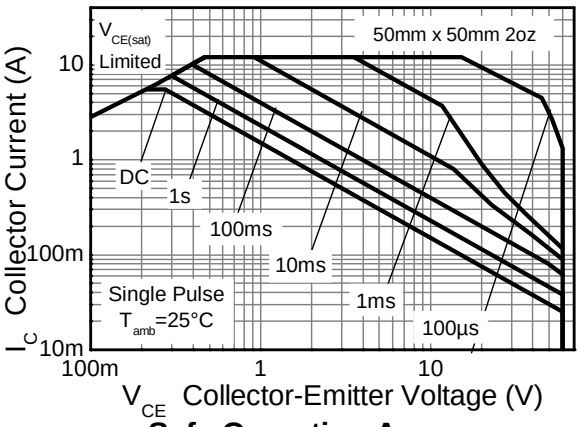
Characteristic		Symbol	Value	Unit
Power Dissipation Linear Derating Factor	(Note 5)	P_D	3.0 24	W mW/°C
	(Note 6)		1.6 12.8	
Thermal Resistance, Junction to Ambient	(Note 5)	$R_{\theta JA}$	42	°C/W
	(Note 6)	$R_{\theta JA}$	78	
Thermal Resistance, Junction to Lead	(Note 7)	$R_{\theta JL}$	8.8	
Operating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

ESD Ratings (Note 8)

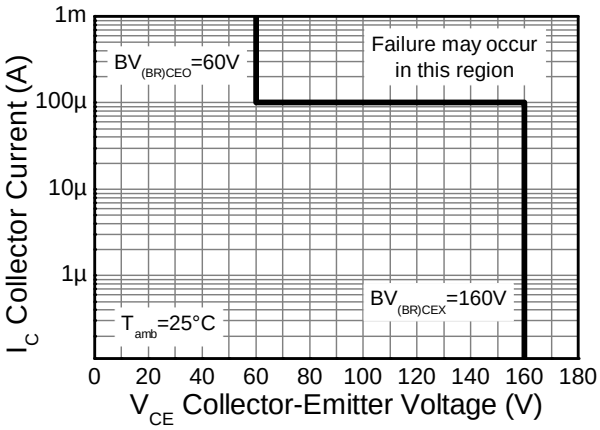
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

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.

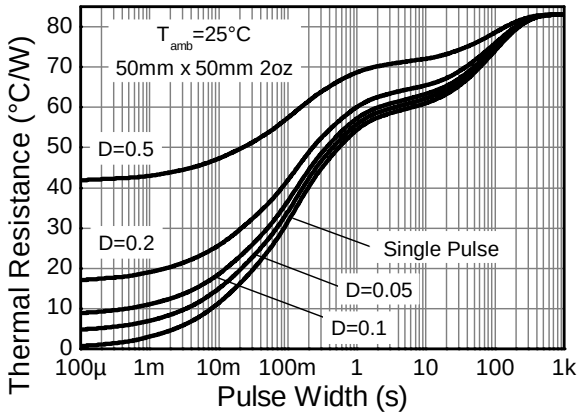
Thermal Characteristics and Derating Information



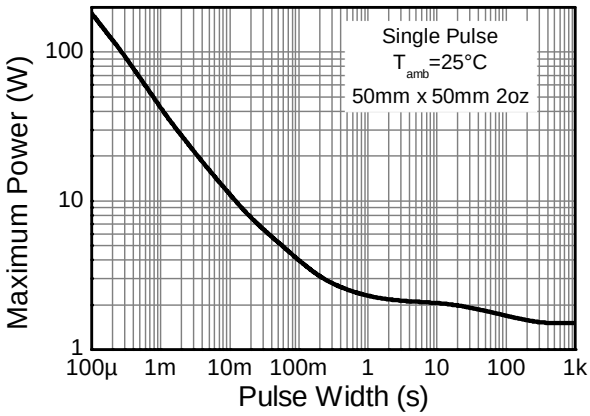
Safe Operating Area



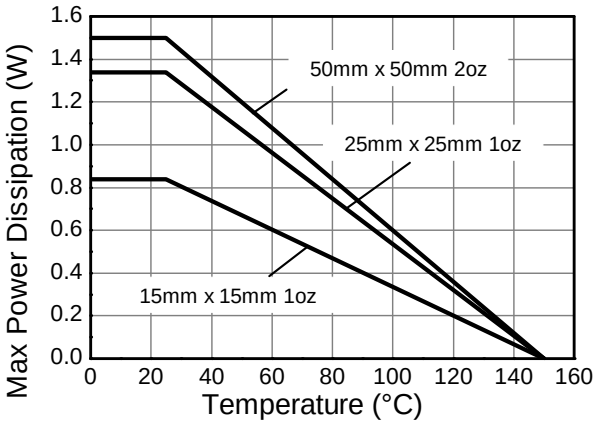
Safe Operating Area



Transient Thermal Impedance



Pulse Power Dissipation



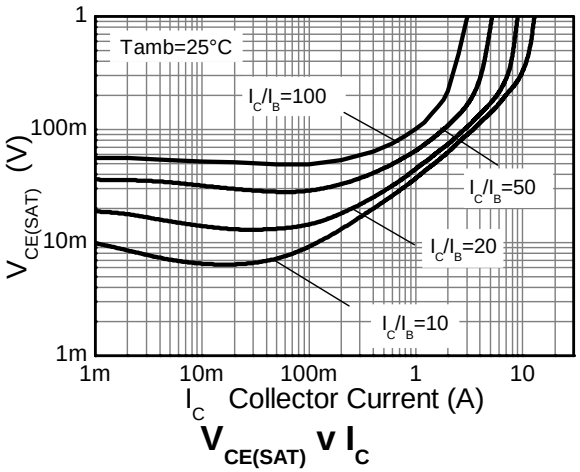
Derating Curve

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

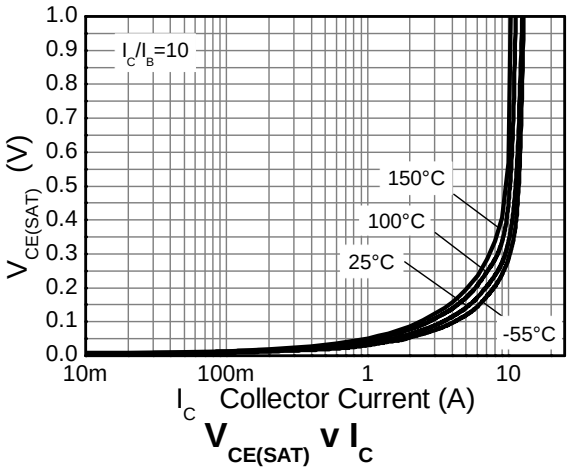
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	160	200	—	V	I_C = 100μA
Collector-Emitter Breakdown Voltage (Note 9)	BV_{CEO}	60	75	—	V	I_C = 10mA
Emitter-Base Breakdown Voltage	BV_{ECO}	6	7	—	V	I_E = 100μA
Emitter-Base Breakdown Voltage	BV_{EBO}	7	8.3	—	V	I_E = 100μA
Collector Cutoff Current	I_{CBO}	— —	<1 —	50 0.5	nA μA	V_{CB} = 160V V_{CB} = 160V, T_A = +100°C
Collector Cutoff Current	I_{CEX}	—	—	100	nA	V_{CB} = 160V, R_{BE} < 1kΩ
Emitter Cutoff Current	I_{EBO}	—	<1	50	nA	V_{EB} = 5.6V
Collector-Emitter Saturation Voltage (Note 9)	$V_{CE(sat)}$	— — —	37 105 110 200	50 155 150 300	mV	I_C = 1A, I_B = 100mA I_C = 1A, I_B = 10mA I_C = 2A, I_B = 40mA I_C = 7A, I_B = 700mA
Base-Emitter Saturation Voltage (Note 9)	$V_{BE(sat)}$	—	1,050	1,150	mV	I_C = 7A, I_B = 700mA
Base-Emitter Turn-on Voltage (Note 9)	$V_{BE(on)}$	—	960	1,050	mV	I_C = 7A, V_{CE} = 2V
DC Current Gain (Note 9)	h_{FE}	200 160 25	300 220 40	500		I_C = 100mA, V_{CE} = 2V I_C = 2A, V_{CE} = 2V I_C = 7A, V_{CE} = 2V
Transition Frequency	f_T	—	130	—	MHz	V_{CE} = 10V, I_C = 50mA, f = 100MHz
Input Capacitance	Ci_{bo}	—	310	400	pF	V_{EB} = 0.5V, f = 1MHz
Output Capacitance (Note 9)	C_{obo}	—	19.7	25	pF	V_{CB} = 10V, f = 1MHz
Switching Times	t_{ON}	—	40.5	—	ns	V_{CC} = 10V, I_C = 500mA, I_{B1} = -I_{B2} = 50mA
	t_{OFF}	—	772	—		

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

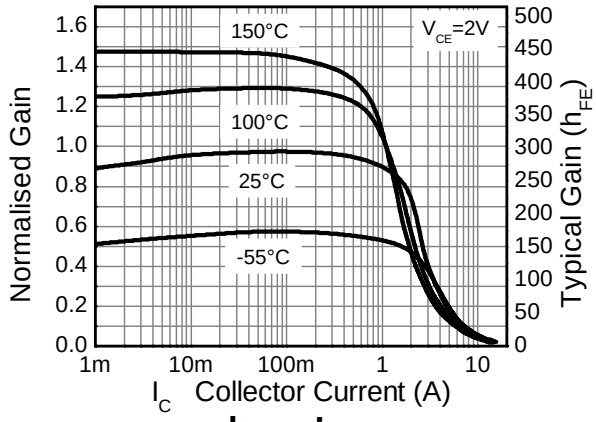
Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)



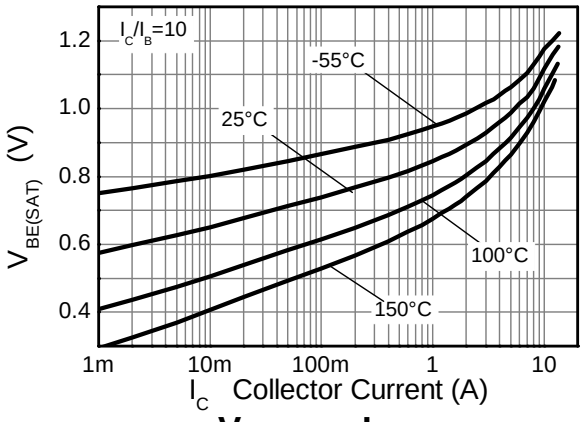
$V_{CE(SAT)}$ v I_C



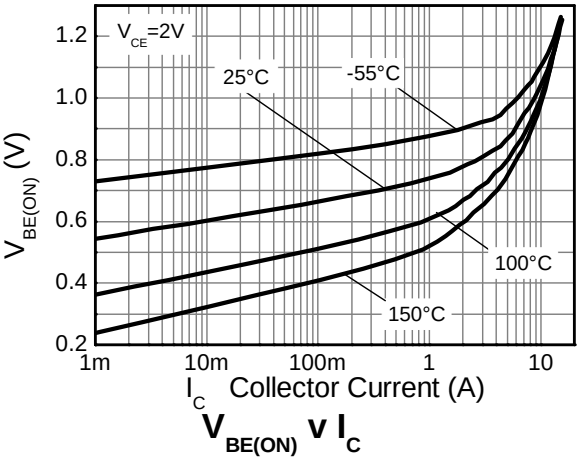
$V_{CE(SAT)}$ v I_C



h_{FE} v I_C

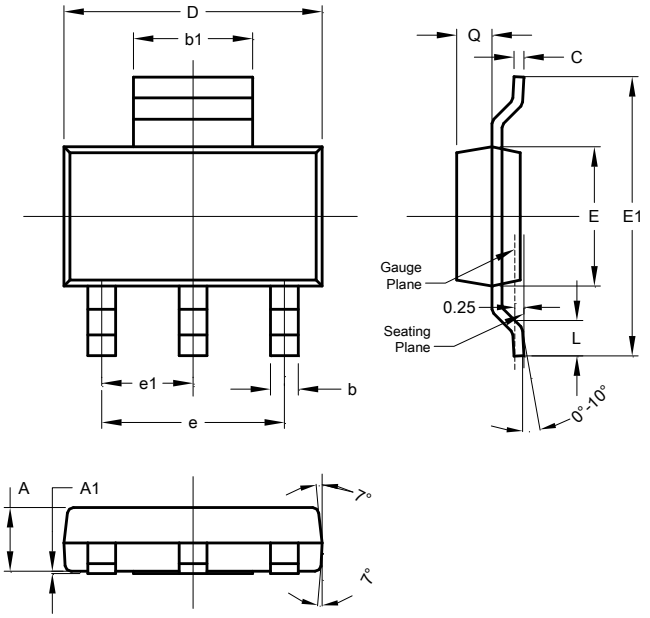


$V_{BE(SAT)}$ v I_C



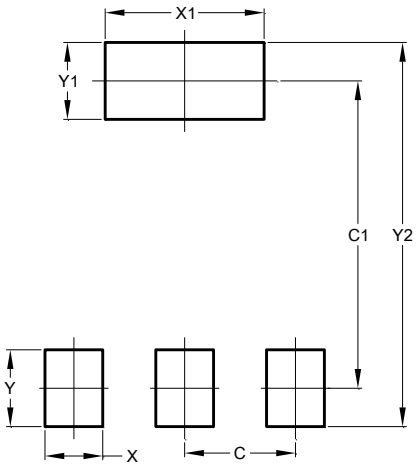
$V_{BE(ON)}$ v I_C

Package Outline Dimensions



SOT223			
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
C2	8.00