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

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Features

- BV_{CEO} > 100V
- BV_{CEX} > 170V Forward Blocking Voltage
- BV_{ECO} > 6V Reverse Blocking Voltage
- I_C = 3A high Continuous Collector Current
- Low Saturation Voltage, $V_{CE(SAT)}$ < 80mV @1A
- $R_{CE(SAT)}$ = 67mΩ for a Low Equivalent On-Resistance
- 1.25W Power Dissipation
- h_{FE} Specified up to 3A for High Current Gain Hold Up
- Complementary PNP Type: NK-ZXTP25100BFH

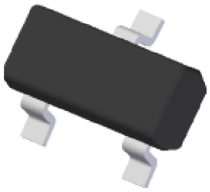
Mechanical Data

- Case: SOT23
- Case Material: molded plastic, “Green” Molding Compound; UL Flammability Classification 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 0.008 grams (Approximate)

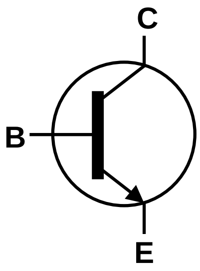
Applications

- Lamp Relay and Solenoid Drivers
- General Switching in Automotive and Industrial Applications
- Motor Drive and Control

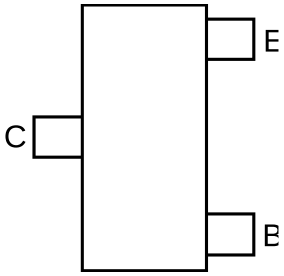
SOT23



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}	170	V
Collector-Emitter Voltage (Forward Blocking)	V_{CEX}	170	V
Collector-Emitter Voltage	V_{CEO}	100	V
Emitter-Base Voltage (Reverse Blocking)	V_{ECO}	6	V
Emitter-Base Voltage	V_{EBO}	7	V
Continuous Collector Current	I_C	3	A
Peak Pulse Current	I_{CM}	9	A

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

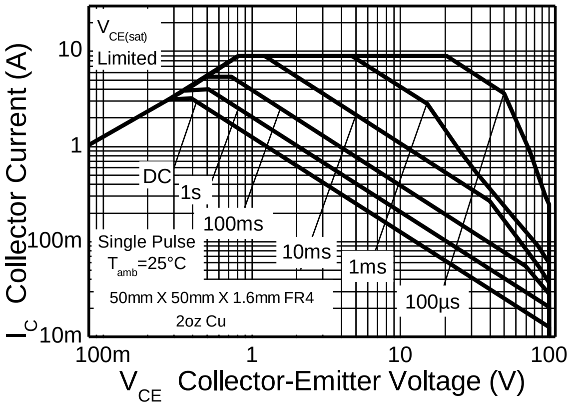
Characteristic		Symbol	Value	Unit
Power Dissipation Linear Derating Factor	(Note 5)	P_D	0.60 4.80	W mW
	(Note 6)		0.73 5.84	
	(Note 7)		1.05 8.4	
	(Note 8)		1.25 9.6	
	(Note 9)		1.81 14.5	
Thermal Resistance, Junction to Ambient	(Note 5)	$R_{\theta JA}$	209	°C/W
	(Note 6)		171	
	(Note 7)		119	
	(Note 8)		100	
	(Note 9)		69	
Thermal Resistance, Junction to Leads	(Note 10)	$R_{\theta JL}$	75	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

ESD Ratings (Note 11)

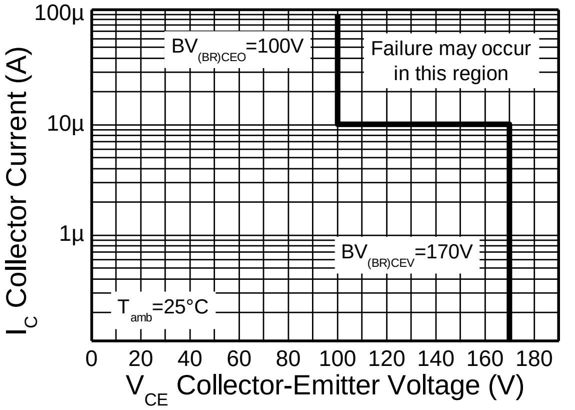
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	8,000	V	3B
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

Notes:
5. For a device mounted on minimum recommended pad layout with 1oz 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 mounted with the collector lead on 15mm x 15mm 1oz copper.
7. Same as Note 5, except mounted with the collector lead on 25mm x 25mm 2oz copper.
8. Same as Note 5, except mounted with the collector lead on 50mm x 50mm 2 oz copper.
9. Same as Note 8, except measured at t < 5 seconds.
10. Thermal resistance from junction to solder-point (at the end of collector lead).
11.Refer to JEDEC specification JESD22-A114 and JESD22-A115.

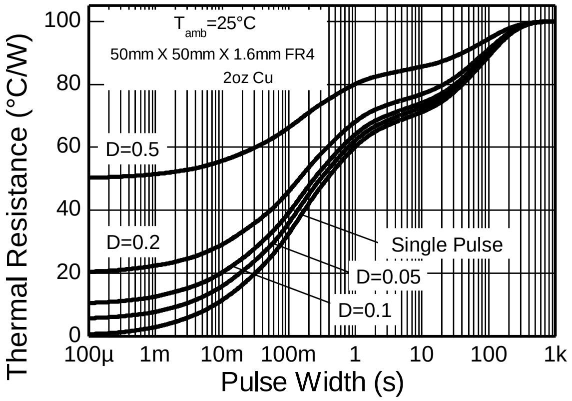
Thermal Characteristics and Derating information



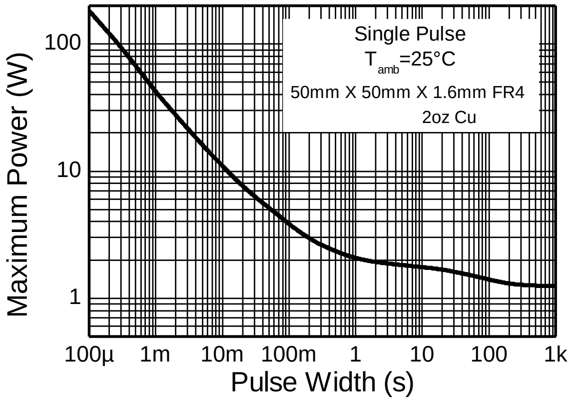
Safe Operating Area



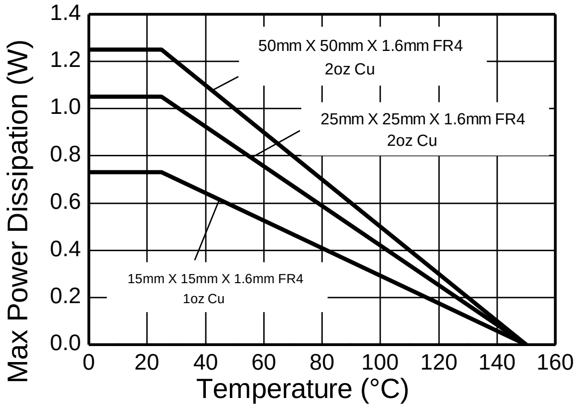
Safe Operating Area



Transient Thermal Impedance



Pulse Power Dissipation



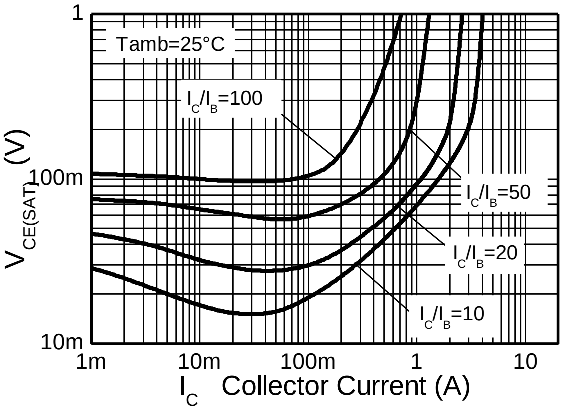
Derating Curve

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

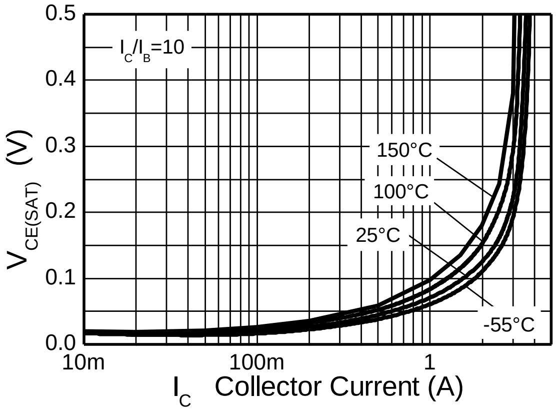
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	170	220	-	V	I_C = 100µA
Collector-Emitter Breakdown Voltage (Forward Blocking) (Note 12)	BV_{CEX}	170	210	-	V	I_C = 100µA, R_{BE} < 1kΩ or -1V < V_{BE} < 0.25V
Collector-Emitter Breakdown Voltage (Note 12)	BV_{CEO}	100	120	-	V	I_C = 1mA
Emitter-Collector Breakdown Voltage (Reverse Blocking) (Note 12)	BV_{ECX}	6	7	-	V	I_E = 100µA, R_{BC} < 1kΩ or 0.25V > V_{BC} > -0.25V
Emitter-Collector Breakdown Voltage	BV_{ECO}	6	8.4	-	V	I_E = 100µA
Emitter-Base Breakdown Voltage	BV_{EBO}	7	8	-	V	I_E = 100µA
Collector Cut-Off Current	I_{CBO}	-	<1	50 20	nA	V_{CB} = 136V V_{CB} = 136V, T_A = +100°C
Collector Emitter Cut-Off Current	I_{CEX}	-	-	100	nA	V_{CE} = 136V, R_{BE} < 1kΩ or -1V < V_{BE} < 0.25V
Emitter Cut-Off Current	I_{EBO}	-	<1	50	nA	V_{EB} = 5.6V
Static Forward Current Transfer Ratio (Note 12)	h_{FE}	100 50 -	200 85 20	300 - -	-	I_C = 10mA, V_{CE} = 2V I_C = 1A, V_{CE} = 2V I_C = 3A, V_{CE} = 2V
Collector-Emitter Saturation Voltage (Note 12)	$V_{CE(sat)}$	- - - -	40 100 70 200	55 135 80 250	mV	I_C = 0.5A, I_B = 50mA I_C = 0.5A, I_B = 10mA I_C = 1A, I_B = 100mA I_C = 3A, I_B = 300mA
Base-Emitter Saturation Voltage (Note 12)	$V_{BE(sat)}$	-	940	1050	mV	I_C = 3A, I_B = 300mA
Base-Emitter Saturation Voltage (Note 12)	$V_{BE(on)}$	-	890	1000	mV	I_C = 3A, V_{CE} = 2V
Transition Frequency	f_T	-	160	-	MHz	I_C = 100mA, V_{CE} = 5V, f = 100MHz
Collector Output Capacitance	C_{obo}	-	9.4	20	pF	V_{CB} = 10V, f = 1MHz
Delay Time	$t_{(d)}$	-	16	-	ns	V_{CC} = 10V, I_C = 0.5A, I_{B1} = $-I_{B2}$ = 50mA
Rise Time	$t_{(r)}$	-	55	-	ns	
Storage Time	$t_{(s)}$	-	677	-	ns	
Fall Time	$t_{(f)}$	-	95	-	ns	

Note: 12. Measured under pulsed conditions. Pulse width ≤ 300µs. Duty cycle ≤ 2%

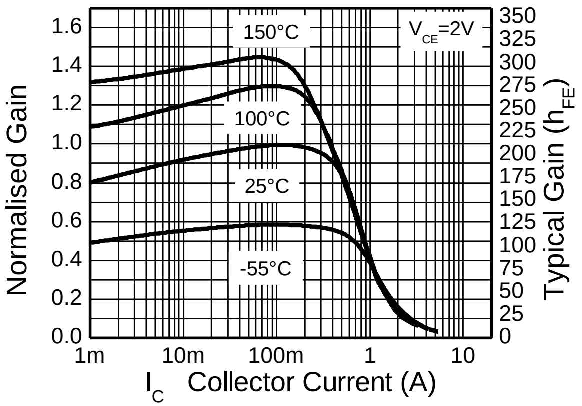
Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)



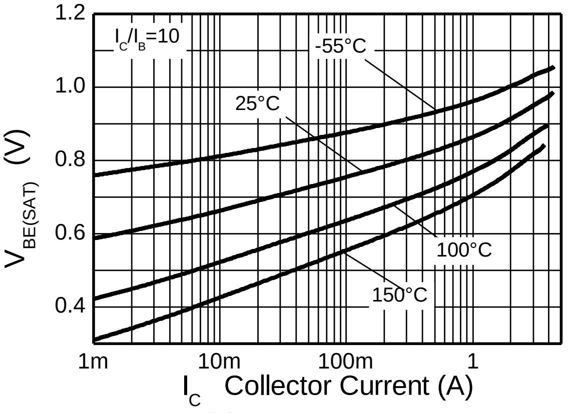
$V_{CE(SAT)}$ v I_C



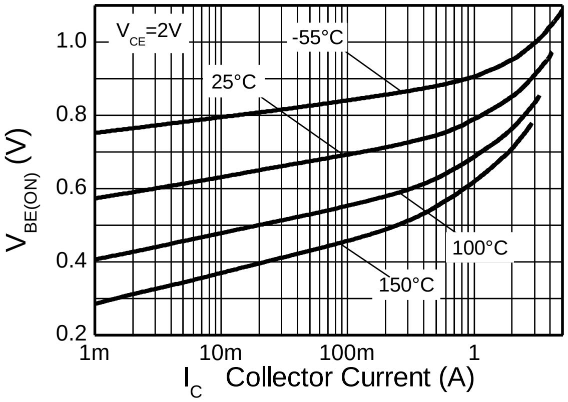
$V_{CE(SAT)}$ v I_C



h_{FE} v I_C

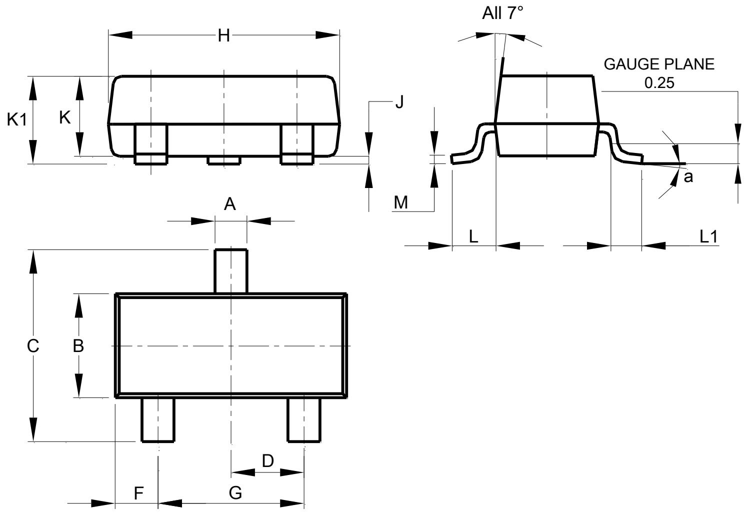


$V_{BE(SAT)}$ v I_C



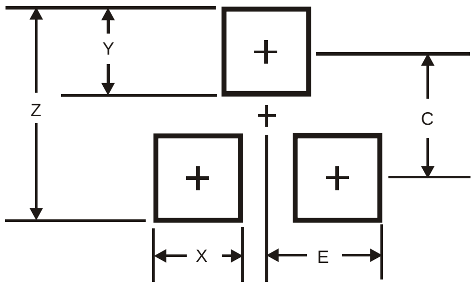
$V_{BE(ON)}$ v I_C

Package Outline Dimensions



SOT23			
Dim	**Min**	**Max**	**Typ**
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	8°		
All Dimensions in mm			

Suggested Pad Layout



Dimensions	Value (in mm)
Z	2.9
X	0.8
Y	0.9
C	2.0
E	1.35

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.