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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企业微信二维码

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Features

- BV_{CEO} > -20V
- BV_{ECO} > -4V
- I_C = 8A High Continuous Current
- Low Saturation Voltage $V_{CE(sat)}$ < -47mV @ 1A
- $R_{CE(sat)}$ = 28mΩ
- Complementary PNP Type: NK-ZXTN19020DG

Mechanical Data

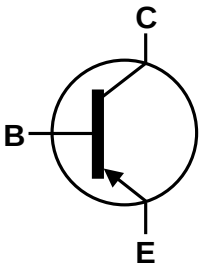
- Case: SOT223
- Case Material: Molded Plastic, “Green” Molding Compound;
- UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Plated Leads; Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.112 grams (Approximate)

Applications

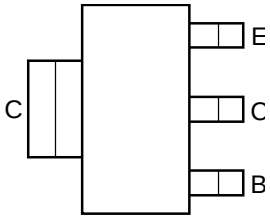
- Motor Drive
- Relay, Lamp and Solenoid Drive

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}	-25	V
Collector-Emitter Voltage	V_{CEO}	-20	V
Emitter-Collector Voltage (reverse blocking)	V_{ECO}	-4	V
Emitter-Base Voltage	V_{EBO}	-7	V
Continuous Collector Current	I_C	-8	A
Base Current	I_B	-1	A
Peak Pulse Current	I_{CM}	-15	A

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

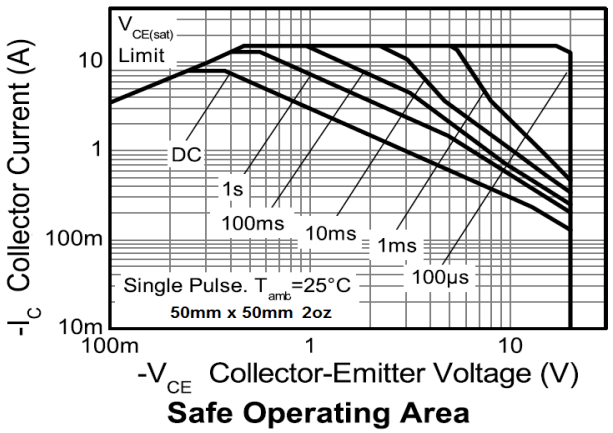
Characteristic		Symbol	Value	Unit
Power Dissipation Linear Derating Factor	(Note 5)	P_D	1.2 9.6	W mW/°C
	(Note 6)		1.6 12.8	
	(Note 7)		3 24	
	(Note 8)		5.3 42	
Thermal Resistance, Junction to Ambient	(Note 5)	$R_{\theta JA}$	104	°C/W
	(Note 6)		78	
	(Note 7)		42	
	(Note 8)		23.5	
Thermal Resistance, Junction to Lead	(Note 9)	$R_{\theta JL}$	16	
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

ESD Ratings (Note 10)

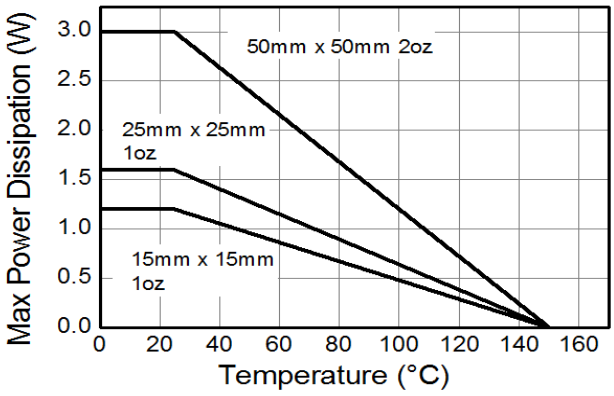
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

Notes:
5. For a device mounted with the collector lead on 15mm x 15mm 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 6, except the device is mounted on 25mm x 25mm 1oz copper.
7. Same as Note 6, except the device is mounted on 50mm x 50mm 2oz copper.
8. Same as Note 8 measured at t<5 seconds.
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.

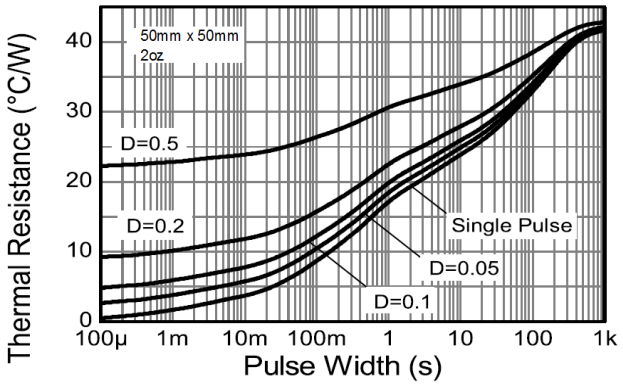
Thermal Characteristics and Derating Information (@T_A = +25°C, unless otherwise specified.)



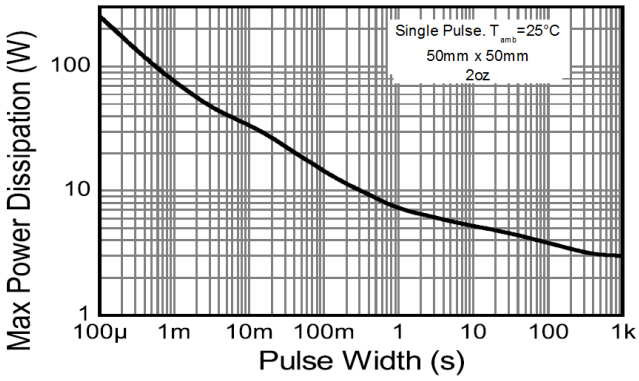
Safe Operating Area



Derating Curve



Transient Thermal Impedance



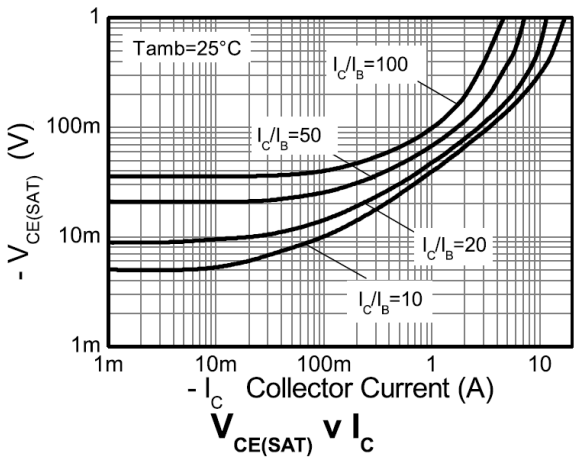
Pulse Power Dissipation

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

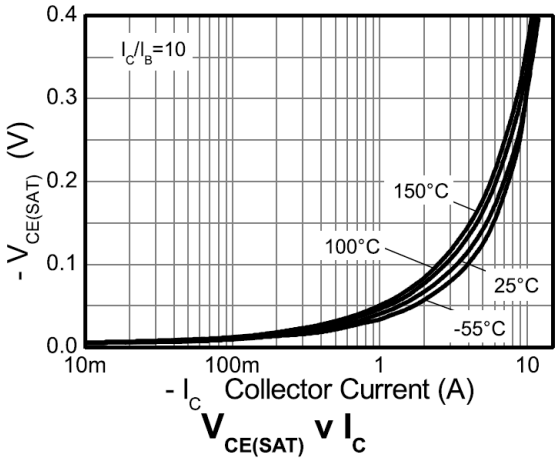
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	-25	-55	–	V	I_C = -100μA
Collector-Emitter Breakdown Voltage (Note 11)	BV_{CEO}	-20	-50	–	V	I_C = -10mA
Emitter-Collector Breakdown Voltage (reverse blocking)	BV_{ECX}	-4	-8.6	–	V	I_C = -100μA, R_{BC} <1kΩor 0.25V< V_{BC} > -0.25V
Emitter-Collector Breakdown Voltage (reverse blocking)	BV_{ECO}	-4	-8.6	–	V	I_E = -100μA
Emitter-Base Breakdown Voltage	BV_{EBO}	-7	-8.2	–	V	I_E = -100μA
Collector Cut-Off Current	I_{CBO}	–	< 1	-50	nA	V_{CB} = -25V
		–	–	-0.5	μA	V_{CB} = -25V, T_A = +100°C
Emitter Cut-Off Current	I_{EBO}	–	< 1	-50	nA	V_{EB} = -5.6V
Collector-Emitter Saturation Voltage (Note 11)	$V_{CE(sat)}$	–	-40	-47	mV	I_C = -1A, I_B = -100mA
		–	-97	-130	mV	I_C = -1A, I_B = -10mA
		–	-115	-145	mV	I_C = -2A, I_B = -40mA
		–	-220	-275	mV	I_C = -8A, I_B = -800mA
Base-Emitter Saturation Voltage (Note 11)	$V_{BE(sat)}$	–	-1050	-1150	mV	I_C = -8A, I_B = -800mA
Base-Emitter Turn-On Voltage (Note 11)	$V_{BE(on)}$	–	-930	-1000	mV	I_C = -8A, V_{CE} = -2V
DC Current Gain (Note 11)	h_{FE}	300	450	900	–	I_C = -100mA, V_{CE} = -2V
		200	290	–	–	I_C = -2A, V_{CE} = -2V
		45	70	–	–	I_C = -8A, V_{CE} = -2V
		–	25	–	–	I_C = -15A, V_{CE} = -2V
Current Gain-Bandwidth Product (Note 11)	f_T	–	176	–	MHz	V_{CE} = -10V, I_C = -50mA, f = 50MHz
Input Capacitance (Note 11)	C_{ibo}	–	–	400	pF	V_{EB} = -0.5V, f = 1MHz
Output Capacitance (Note 11)	C_{obo}	–	36	45	pF	V_{CB} = -10V, f = 1MHz
Delay Time	t_d	–	23	–	ns	I_C = -1A, V_{CC} = -10V, I_{B1} = -I_{B2} = -50mA
Rise Time	t_r	–	18.4	–	ns	
Storage Time	t_s	–	266	–	ns	
Fall Time	t_f	–	49.6	–	ns	

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

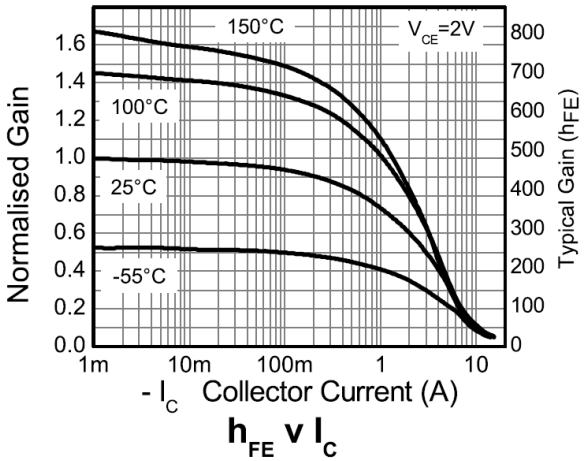
Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)



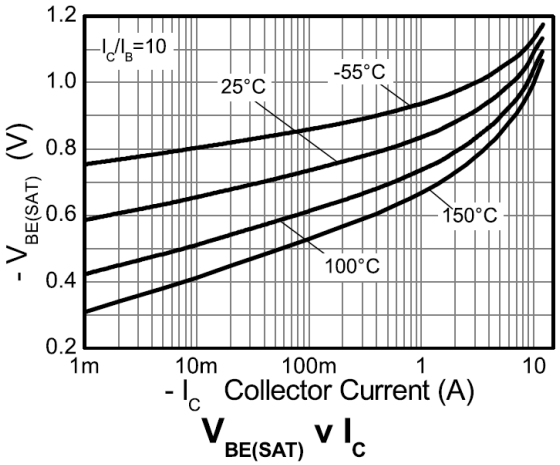
$V_{CE(SAT)}$ v I_C



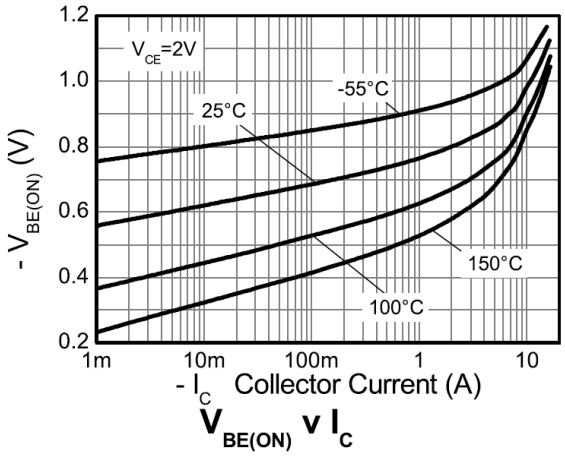
$V_{CE(SAT)}$ v I_C



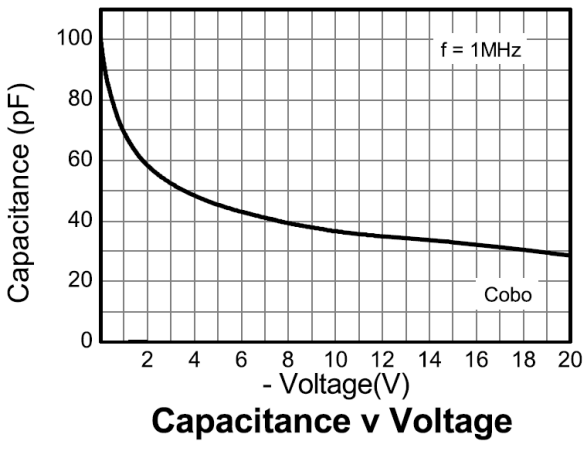
h_{FE} v I_C



$V_{BE(SAT)}$ v I_C

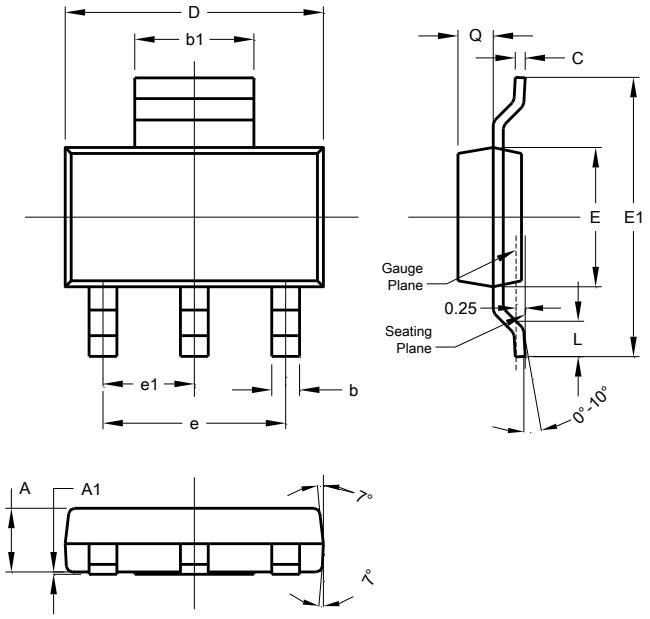


$V_{BE(ON)}$ v I_C



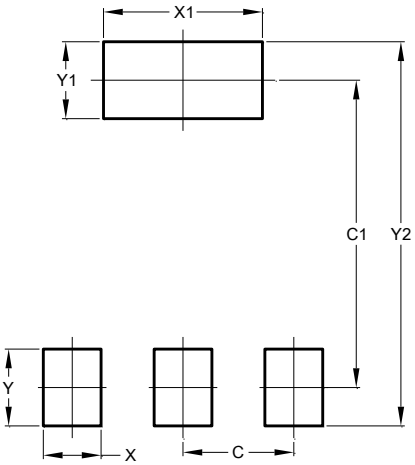
Capacitance v Voltage

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