



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



企业QQ二维码

## Features

- $BV_{CEO} > -100V$
- $BV_{ECO} > -7V$
- $I_C = -2A$  High Continuous Current
- Low Saturation Voltage  $V_{CE(sat)} < -130mV @ -1A$
- $R_{CE(sat)} = 100m\Omega$
- Complementary NPN Type: NK-ZXTN19100CG

## 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 ③
- Weight: 0.112 grams (Approximate)

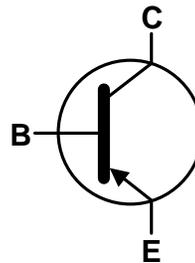
## Applications

- Motor Drive
- High Side Driver

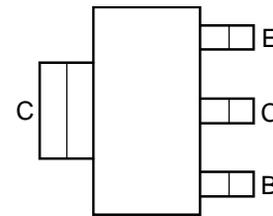
SOT223



Top View



Device Symbol



Top View  
Pin-Out

**Absolute Maximum Ratings** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CBO</sub>	-110	V
Collector-Emitter Voltage (forward blocking)	V <sub>CEX</sub>	-110	V
Collector-Emitter Voltage	V <sub>CEO</sub>	-100	V
Emitter-Collector Voltage (reverse blocking)	V <sub>ECO</sub>	-7	V
Emitter-Base Voltage	V <sub>EBO</sub>	-7	V
Continuous Collector Current	I <sub>C</sub>	-2	A
Base Current	I <sub>B</sub>	-1	A
Peak Pulse Current	I <sub>CM</sub>	-3	A

**Thermal Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

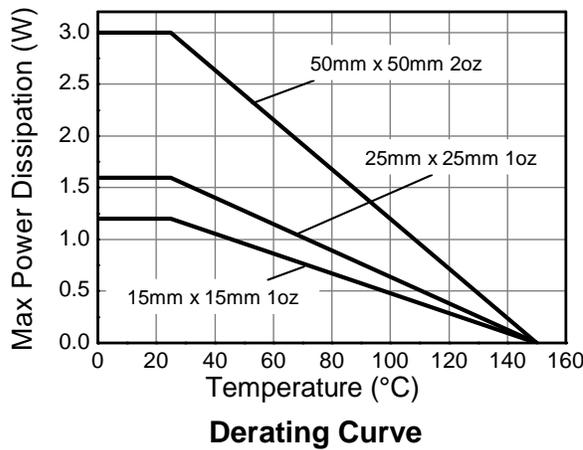
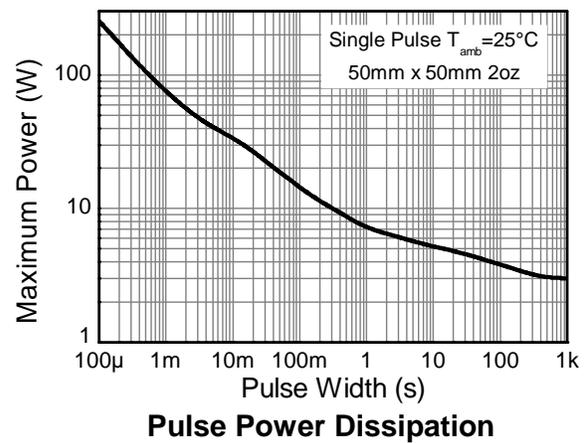
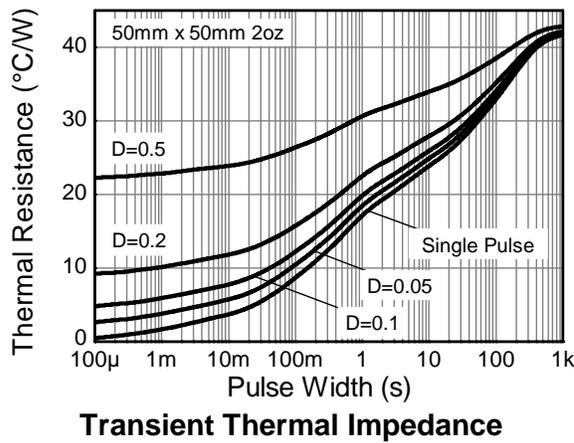
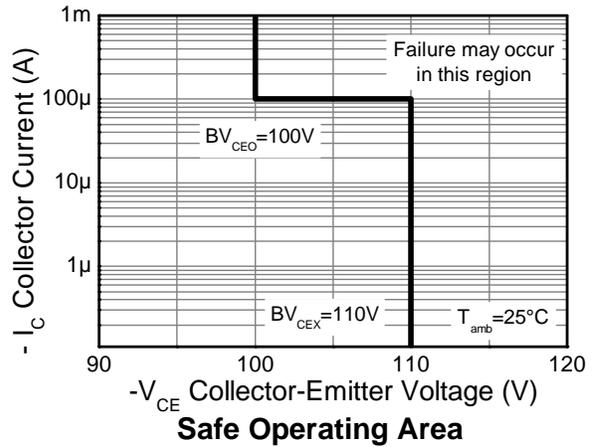
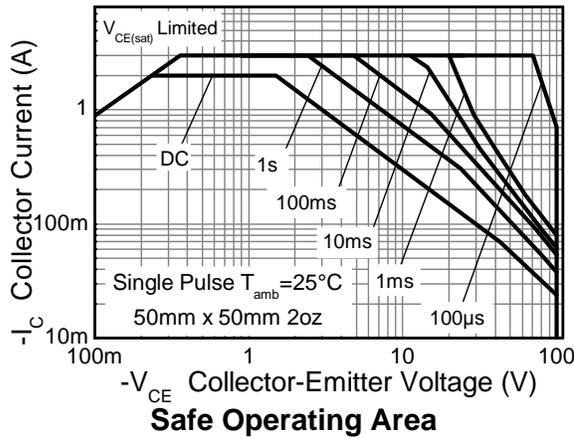
Characteristic	Symbol	Value	Unit
Power Dissipation Linear Derating Factor	P <sub>D</sub>	1.2	W
		9.6	
		1.6	
		12.8	
		3	
Thermal Resistance, Junction to Ambient	R <sub>θJA</sub>	24	°C/W
		5.3	
		42	
		104	
		78	
Thermal Resistance, Junction to Lead	R <sub>θJL</sub>	42	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-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** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

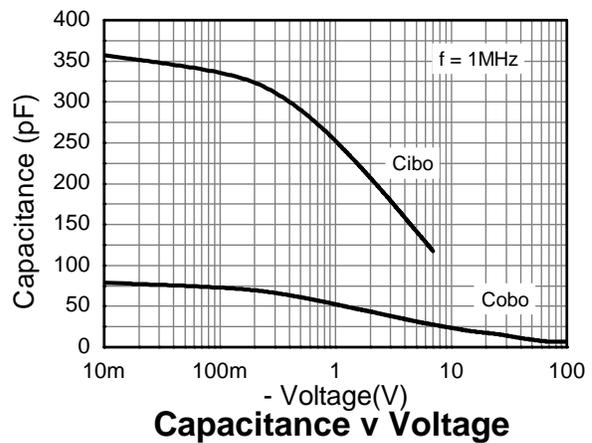
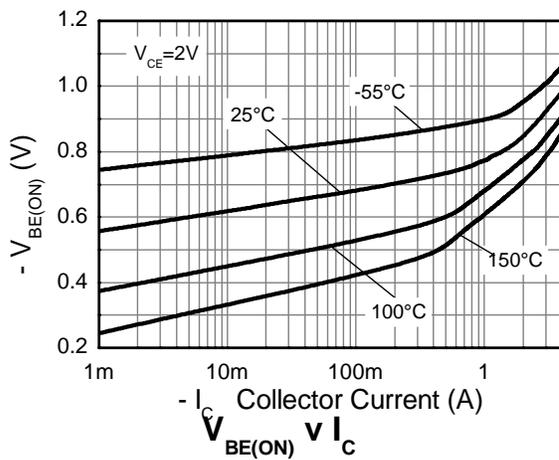
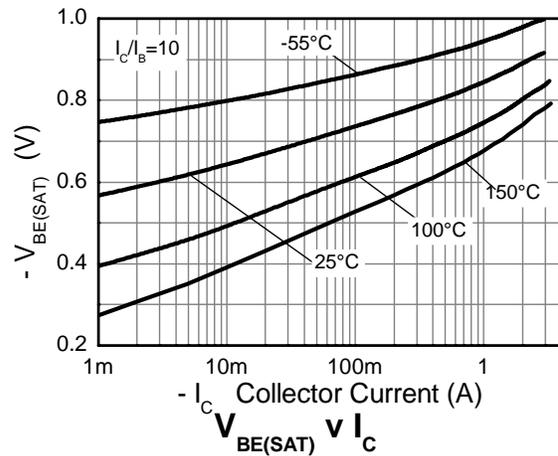
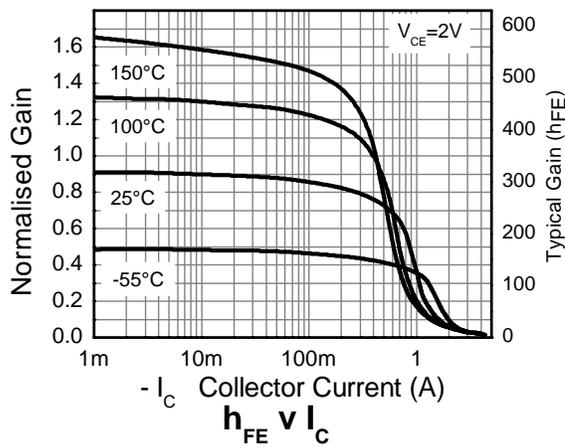
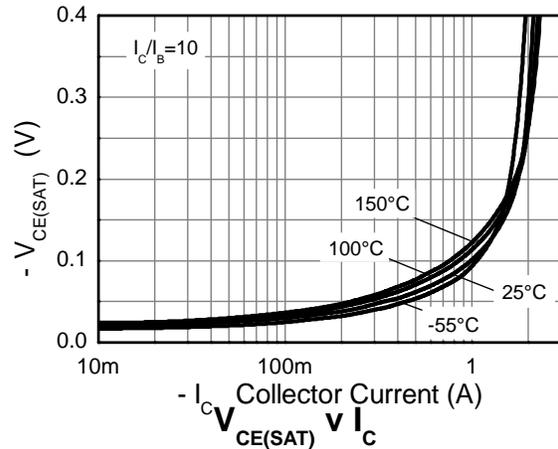
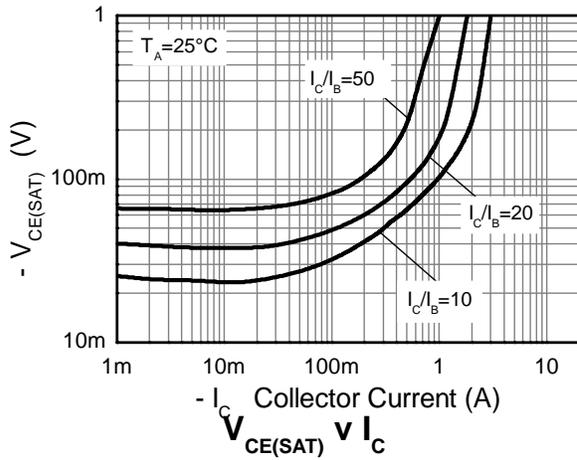


**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

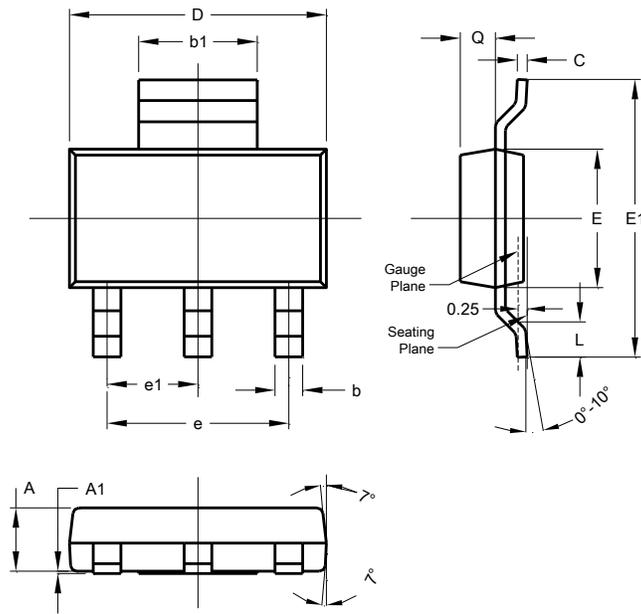
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV <sub>CBO</sub>	-110	-135	-	V	I <sub>C</sub> = -100μA
Collector-Emitter Breakdown Voltage (Note 11)	BV <sub>CEO</sub>	-100	-135	-	V	I <sub>C</sub> = -10mA
Collector-Base Breakdown Voltage (forward blocking)	BV <sub>CEX</sub>	-110	-130	-		I <sub>C</sub> = -100μA
Emitter-Collector Breakdown Voltage (reverse blocking)	BV <sub>ECX</sub>	-7	-8.3	-	V	I <sub>C</sub> = -100μA, R <sub>BC</sub> < 1kΩ or 0.25V < V <sub>BC</sub> < -0.25V
Emitter-Collector Breakdown Voltage (reverse blocking)	BV <sub>ECO</sub>	-7	-8.7	-	V	I <sub>E</sub> = -100μA
Emitter-Base Breakdown Voltage	BV <sub>EBO</sub>	-7	-8.3	-	V	I <sub>E</sub> = -100μA
Collector Cut-Off Current	I <sub>CBO</sub>	-	< 1	-50	nA	V <sub>CB</sub> = -110V
Emitter Cut-Off Current	I <sub>EBO</sub>	-	< 1	-50	nA	V <sub>CB</sub> = -110V, T <sub>A</sub> = +100°C
Collector-Emitter Saturation Voltage (Note 11)	V <sub>CE(sat)</sub>	-	-100	-130	mV	I <sub>C</sub> = -500mA, I <sub>B</sub> = -20mA
		-	-100	-125	mV	I <sub>C</sub> = -1A, I <sub>B</sub> = -100mA
		-	-180	-230	mV	I <sub>C</sub> = -1A, I <sub>B</sub> = -50mA
		-	-220	-295	mV	I <sub>C</sub> = -2A, I <sub>B</sub> = -200mA
Base-Emitter Saturation Voltage (Note 11)	V <sub>BE(sat)</sub>	-	-890	-1,000	mV	I <sub>C</sub> = -2A, I <sub>B</sub> = -200mA
Base-Emitter Turn-On Voltage (Note 11)	V <sub>BE(on)</sub>	-	-840	-950	mV	I <sub>C</sub> = -2A, V <sub>CE</sub> = -2V
DC Current Gain (Note 11)	h <sub>FE</sub>	200	300	500	-	I <sub>C</sub> = -100mA, V <sub>CE</sub> = -2V
		70	130	-	-	I <sub>C</sub> = -1A, V <sub>CE</sub> = -2V
		20	28	-	-	I <sub>C</sub> = -2A, V <sub>CE</sub> = -2V
Current Gain-Bandwidth Product (Note 11)	f <sub>T</sub>	-	142	-	MHz	V <sub>CE</sub> = -10V, I <sub>C</sub> = -100mA, f = 50MHz
Input Capacitance (Note 11)	C <sub>ibo</sub>	-	291	400	pF	V <sub>EB</sub> = -0.5V, f = 1MHz
Output Capacitance (Note 11)	C <sub>obo</sub>	-	23.5	40	pF	V <sub>CB</sub> = -10V, f = 1MHz
Delay Time	t <sub>d</sub>	-	24.7	-	ns	I <sub>C</sub> = -500mA, V <sub>CC</sub> = -10V, I <sub>B1</sub> = -I <sub>B2</sub> = -50mA, R <sub>b</sub> = 100W, R <sub>c</sub> = 20W
Rise Time	t <sub>r</sub>	-	22.4	-	ns	
Storage Time	t <sub>s</sub>	-	660	-	ns	
Fall Time	t <sub>f</sub>	-	107	-	ns	

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

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

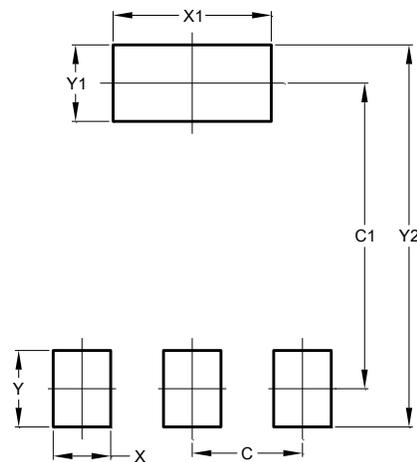


### Package Outline Dimensions



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