



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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Description

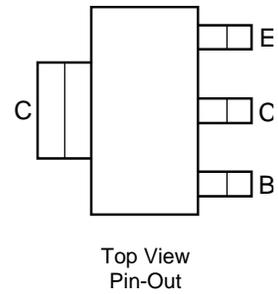
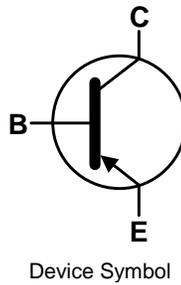
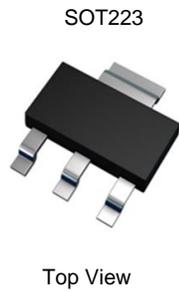
This Bipolar Junction Transistor (BJT) is designed to meet the stringent requirements of automotive applications.

Features

- $BV_{CE0} > -60V$
- $I_C = -3A$ High Continuous Current
- $I_{CM} = -6A$ Peak Pulse Current
- Low Saturation Voltage $V_{CE(sat)} < -300mV @ -1A$
- Complementary NPN Type: DIODES™ NK-FZT651Q

Mechanical Data

- Package: SOT223
- Package 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 
- Weight: 0.112 grams (Approximate)



Absolute Maximum Ratings (@ $T_A = +25^{\circ}\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CB0}	-80	V
Collector-Emitter Voltage	V_{CEO}	-60	V
Emitter-Base Voltage	V_{EBO}	-7	V
Continuous Collector Current	I_C	-3	A
Peak Pulse Current	I_{CM}	-6	A

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

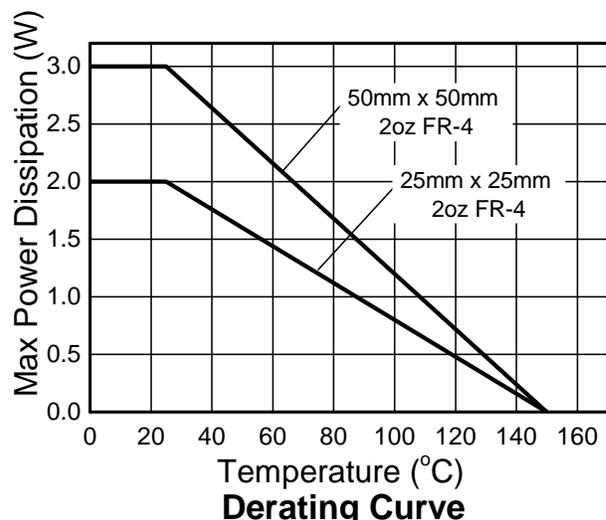
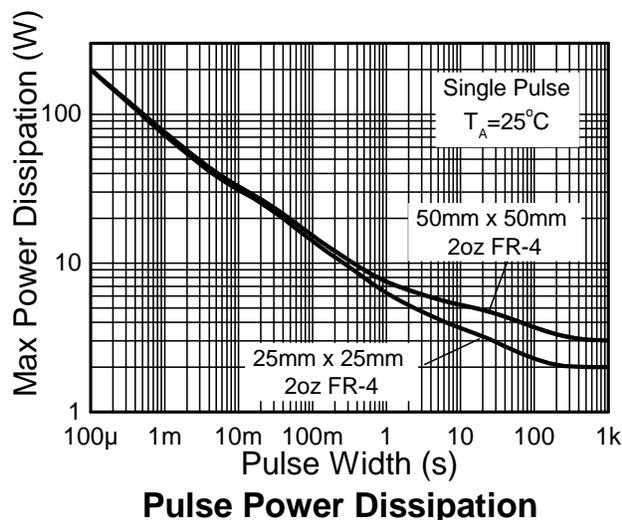
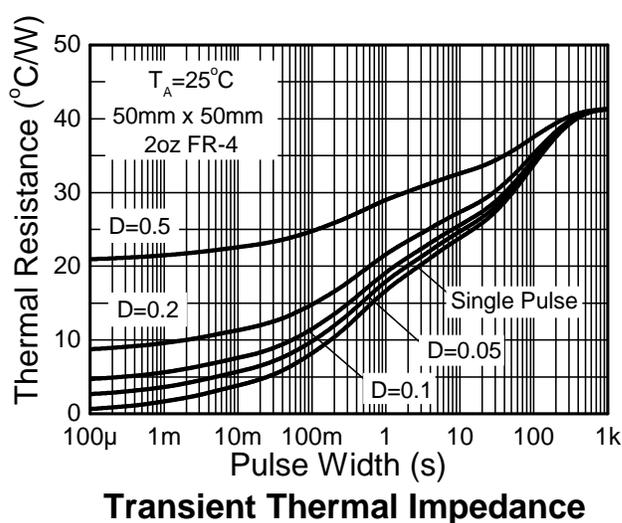
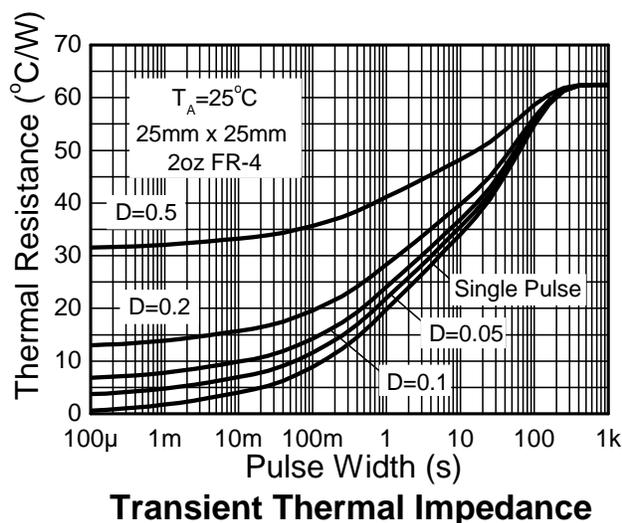
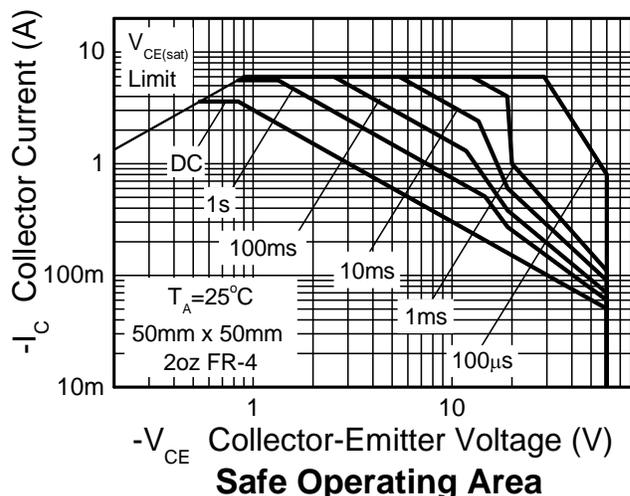
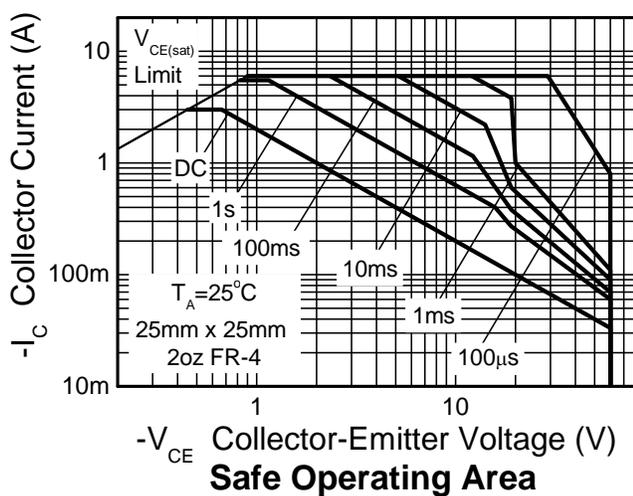
Characteristic	Symbol	Value	Unit
Power Dissipation	P_D	2	W
		3	W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	62.5	$^{\circ}\text{C/W}$
		41.7	$^{\circ}\text{C/W}$
Thermal Resistance, Junction to Leads	$R_{\theta JL}$	12.9	$^{\circ}\text{C/W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^{\circ}\text{C}$

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 25mm x 25mm 2oz copper that is on a single-sided 1.6mm FR-4 PCB; device is measured under still air conditions whilst operating in steady-state.
 6. Same as Note 5, except the device is mounted on 50mm x 50mm 2oz 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

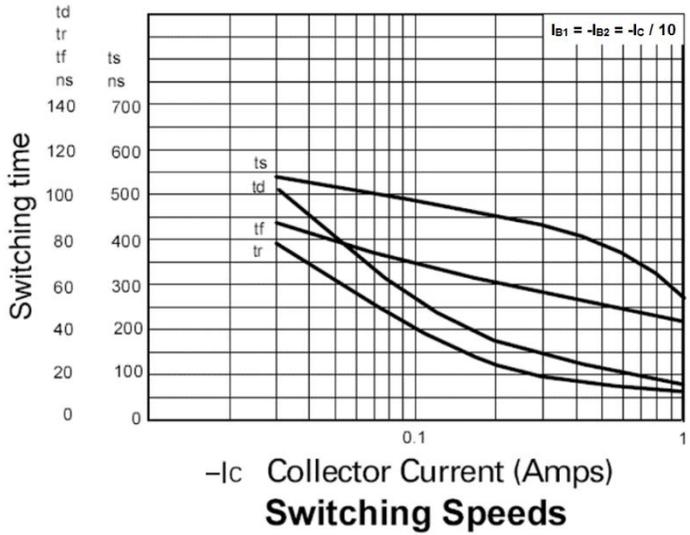
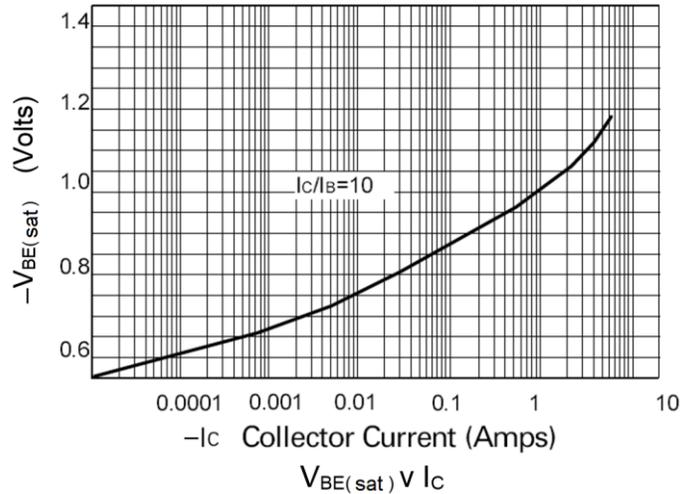
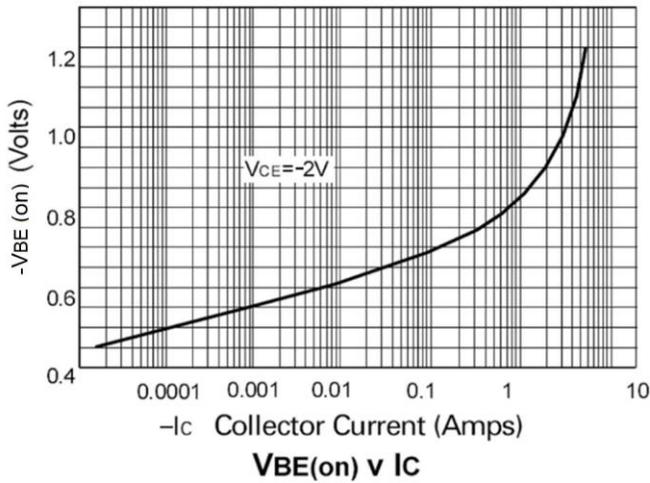
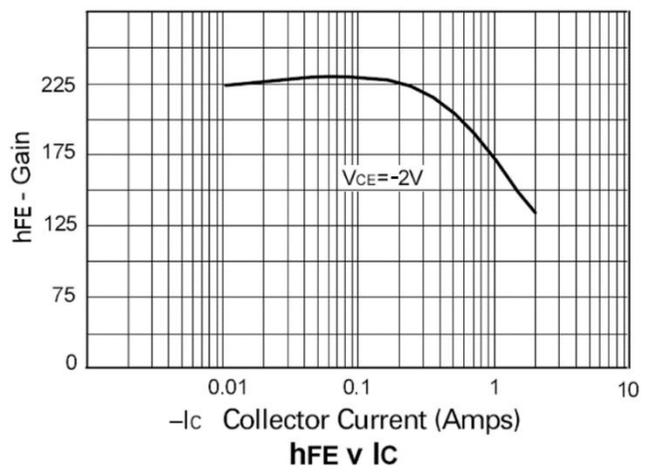
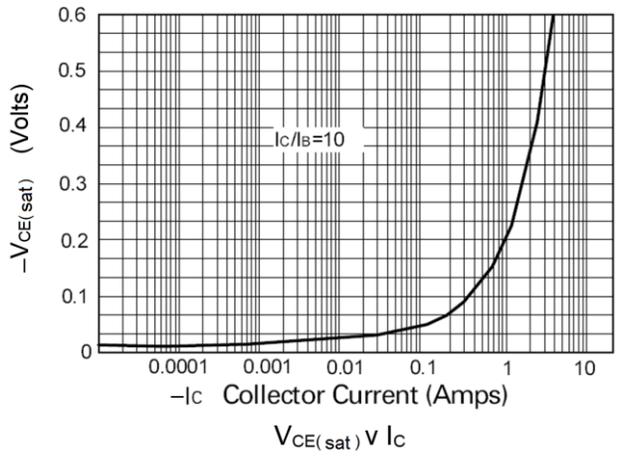


Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV _{CBO}	-80	—	—	V	I _C = -100μA
Collector-Emitter Breakdown Voltage (Note 9)	BV _{CEO}	-60	—	—	V	I _C = -10mA
Emitter-Base Breakdown Voltage	BV _{EBO}	-7	—	—	V	I _E = -100μA
Collector Cut-Off Current	I _{CBO}	—	-1	-100	nA	V _{CB} = -60V
		—	—	-10	μA	V _{CB} = -60V, T _A = +100°C
Emitter Cut-Off Current	I _{EBO}	—	-1	-20	nA	V _{EB} = -6V
Collector-Emitter Saturation Voltage (Note 9)	V _{CE(sat)}	—	-0.15	-0.3	V	I _C = -1A, I _B = -100mA
		—	-0.45	-0.6		I _C = -3A, I _B = -300mA
Base-Emitter Saturation Voltage (Note 9)	V _{BE(sat)}	—	-0.9	-1.25	V	I _C = -1A, I _B = -100mA
Base-Emitter Turn-On Voltage (Note 9)	V _{BE(on)}	—	-0.8	-1.0	V	I _C = -1A, V _{CE} = -2V
DC Current Gain (Note 9)	h _{FE}	70	200	—	—	I _C = -50mA, V _{CE} = -2V
		100	200	300		I _C = -500mA, V _{CE} = -2V
		80	170	—		I _C = -1A, V _{CE} = -2V
		40	150	—		I _C = -2A, V _{CE} = -2V
Current Gain-Bandwidth Product	f _T	100	140	—	MHz	V _{CE} = -5V, I _C = -100mA f = 100MHz
Turn-On Time	t _{on}	—	40	—	ns	V _{CC} = -10V, I _C = -500mA
Turn-Off Time	t _{off}	—	450	—	ns	I _{B1} = -I _{B2} = -50mA
Output Capacitance	C _{obo}	—	—	30	pF	V _{CB} = -10V, f = 1MHz

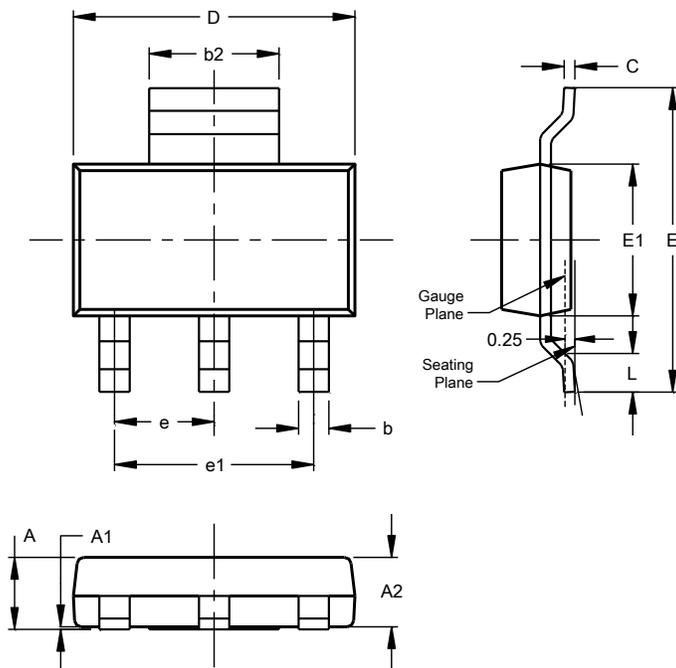
Note: 9. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

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



Package Outline Dimensions

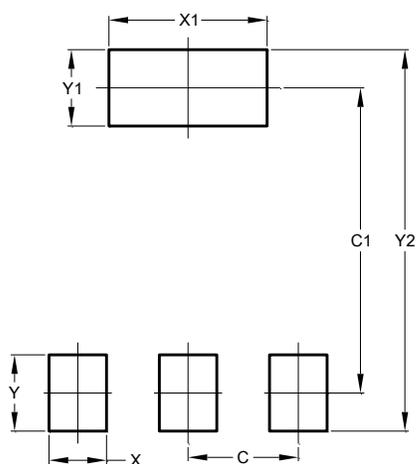
SOT223 (Type DN)



SOT223 (Type DN)			
Dim	Min	Max	Typ
A	--	1.70	--
A1	0.01	0.15	--
A2	1.50	1.68	1.60
b	0.60	0.80	0.70
b2	2.90	3.10	--
c	0.20	0.32	--
D	6.30	6.70	--
E	6.70	7.30	--
E1	3.30	3.70	--
e	--	--	2.30
e1	--	--	4.60
L	0.85	--	--
All Dimensions in mm			

Suggested Pad Layout

SOT223 (Type DN)



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