



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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Description

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

Features

- $BV_{CEO} > -25V$
- $I_C = -3A$ High Continuous Current
- Low Saturation Voltage $V_{CE(sat)} < -250mV @ -1A$
- $R_{CE(sat)} = 93m\Omega$ for a Low Equivalent On-Resistance
- h_{FE} Specified up to $-6A$ for a High Gain Hold-Up
- Complementary NPN Type: DIODES™ NK-FZT689B

Mechanical Data

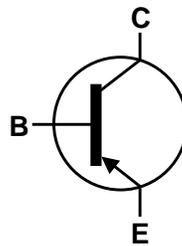
- Package: SOT223
- Package Material: Molded Plastic. "Green" Molding Compound; UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 ③
- Weight: 0.112 grams (Approximate)

Applications

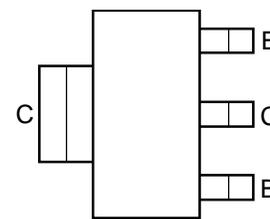
- Power MOSFET & IGBT Gate Driving
- Battery Powered Circuits
- Fast Charge Converters
- Low Loss Power Switching



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}	-30	V
Collector-Emitter Voltage	V _{CEO}	-25	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°C, unless otherwise specified.)

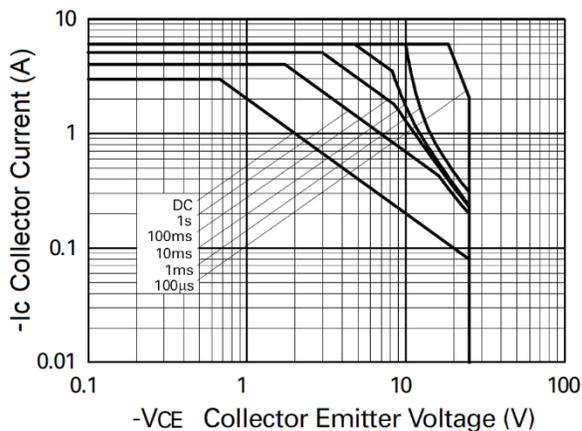
Characteristic	Symbol	Value	Unit
Power Dissipation	P _D	(Note 5)	3.0
		(Note 6)	2.0
		(Note 7)	1.6
		(Note 8)	1.2
Thermal Resistance, Junction to Ambient	R _{θJA}	(Note 5)	41.7
		(Note 6)	62.5
		(Note 7)	78.1
		(Note 8)	104
Thermal Resistance Junction to Lead	R _{θJL}	12.9	
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

ESD Ratings (Note 10)

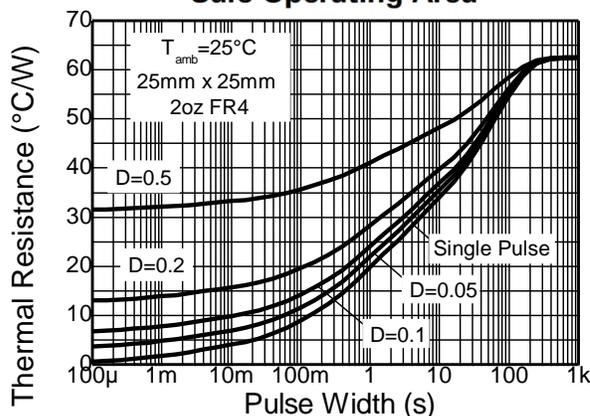
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

- Notes:
- For a device mounted with the collector lead on 50mm x 50mm 2oz copper that is on a single-sided 1.6mm FR4 PCB; device is measured under still air conditions whilst operating in a steady-state.
 - Same as Note 5, except the device is mounted on 25mm x 25mm 2oz copper.
 - Same as Note 5, except the device is mounted on 25mm x 25mm 1oz copper.
 - Same as Note 5, except the device is mounted on minimum recommended pad layout.
 - Thermal resistance from junction to solder-point (at the end of the collector lead).
 - Refer to JEDEC specification JESD22-A114 and JESD22-A115.

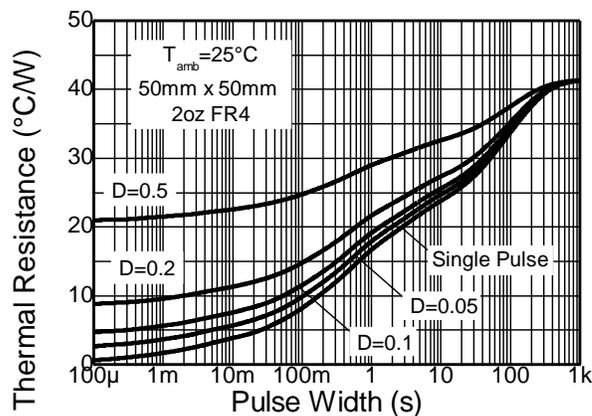
Thermal Characteristics and Derating Information



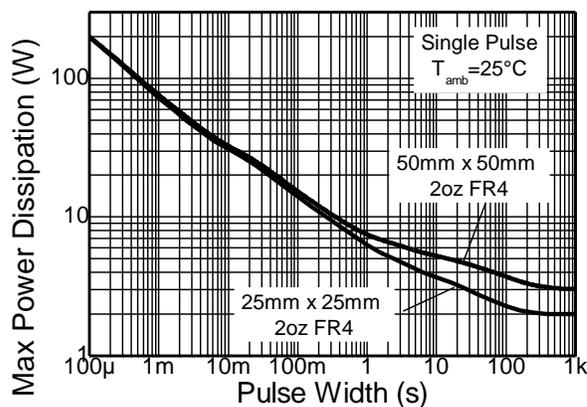
Safe Operating Area



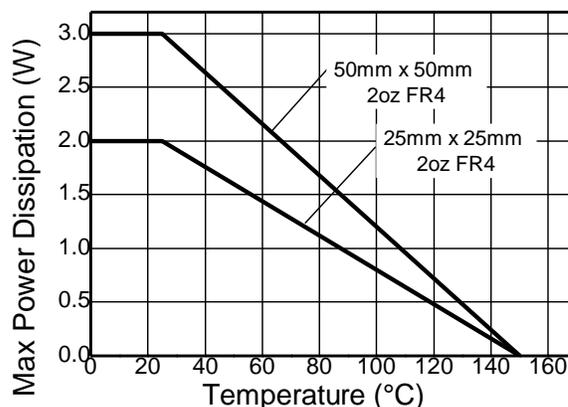
Transient Thermal Impedance



Transient Thermal Impedance



Pulse Power Dissipation



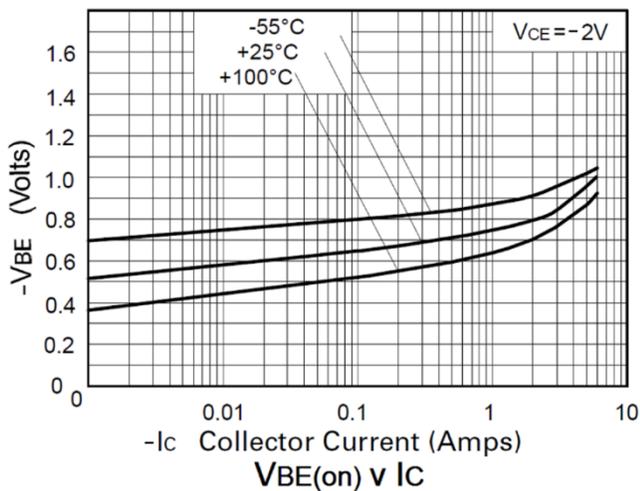
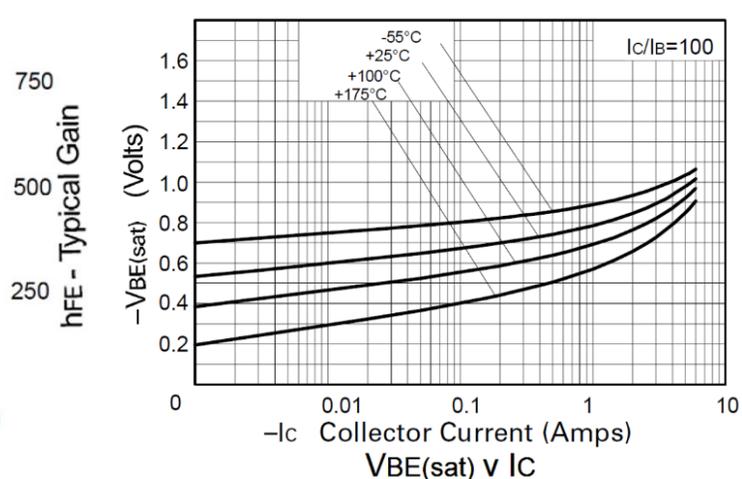
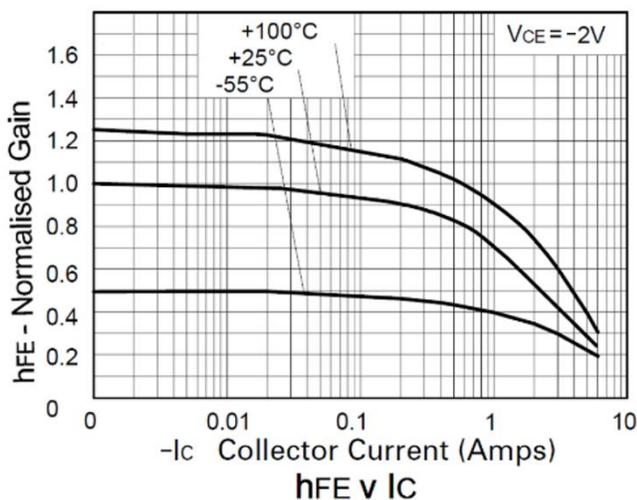
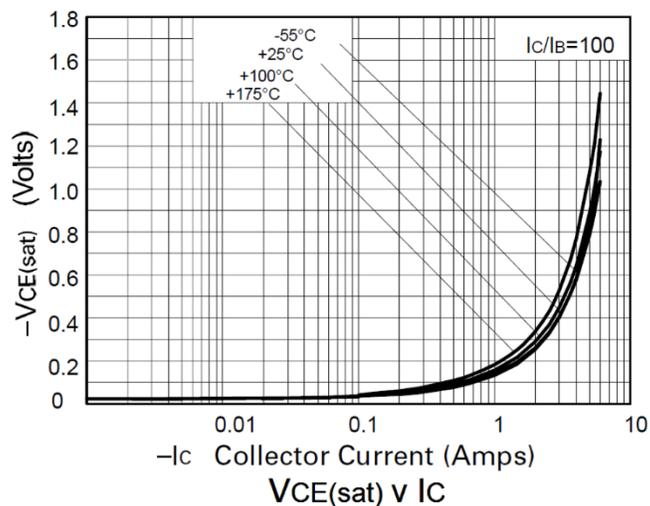
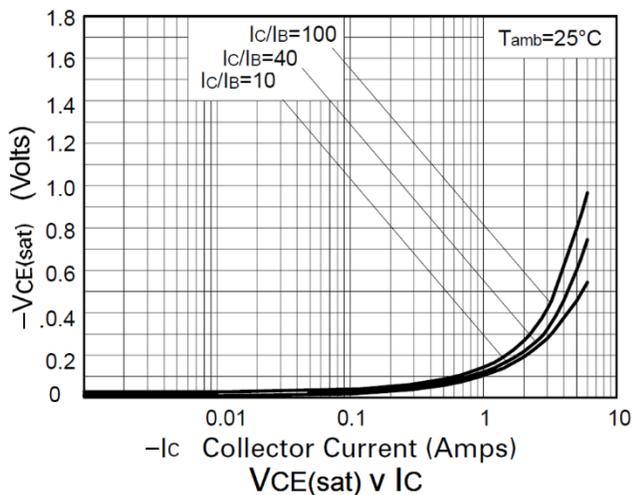
Derating Curve

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV _{CBO}	-30	-40	-	V	I _C = -100μA
Collector-Emitter Breakdown Voltage (Note 11)	BV _{CEO}	-25	-35	-	V	I _C = -10mA
Emitter-Base Breakdown Voltage	BV _{EBO}	-7	-8.5	-	V	I _E = -100μA
Collector Cut-Off Current	I _{CBO}	-	-1	-50	nA	V _{CB} = -15V
		-	-	-10	μA	V _{CB} = -15V, T _{amb} = +100°C
Collector Cut-Off Current	I _{CES}	-	-1	-100	nA	V _{CE} = -15V
Emitter Cut-Off Current	I _{EBO}	-	-1	-20	nA	V _{EB} = -6V
Collector-Emitter Saturation Voltage (Note 11)	V _{CE(sat)}	-	-0.15	-0.25	V	I _C = -1A, I _B = -10mA
		-	-0.30	-0.45		I _C = -2A, I _B = -20mA
		-	-0.30	-0.50		I _C = -3A, I _B = -100mA
Base-Emitter Saturation Voltage (Note 11)	V _{BE(sat)}	-	-0.80	-1.0	V	I _C = -1A, I _B = -10mA
Base-Emitter Turn-On Voltage (Note 11)	V _{BE(on)}	-	-0.75	-1.1	V	I _C = -1A, V _{CE} = -2V
DC Current Gain (Note 11)	h _{FE}	300	-	800	-	I _C = -10mA, V _{CE} = -2V
		250	-	-		I _C = -1A, V _{CE} = -2V
		200	-	-		I _C = -2A, V _{CE} = -2V
		100	-	-		I _C = -6A, V _{CE} = -2V
Current Gain-Bandwidth Product	f _T	100	-	-	MHz	V _{CE} = -5V, I _C = -50mA f = 50MHz
Turn-On Time	t _{on}	-	35	-	ns	V _{CC} = -10V, I _C = -500mA
Turn-Off Time	t _{off}	-	400	-	ns	I _{B1} = -I _{B2} = -50mA
Input Capacitance	C _{ibo}	-	225	-	pF	V _{EB} = -0.5V, f = 1MHz
Output Capacitance	C _{obo}	-	25	-	pF	V _{CB} = -10V, f = 1MHz

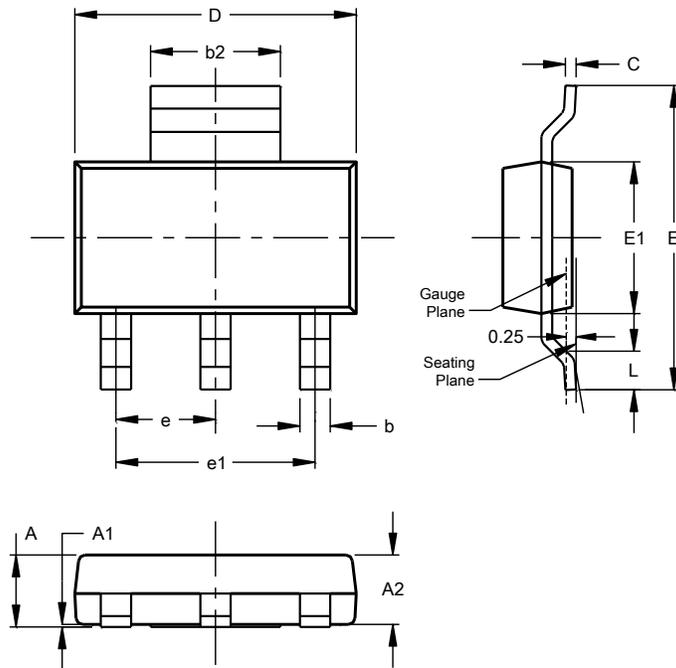
Note: 11. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

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



Package Outline Dimensions

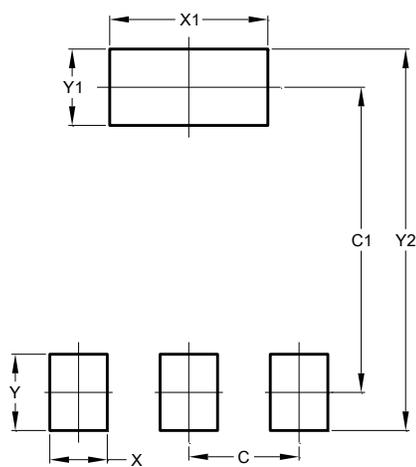
SOT223 (Type DN)



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