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

Mechanical Data

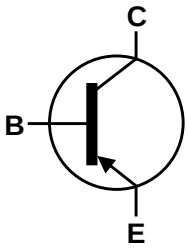
- Case: SOT223
- Case Material: Molded Plastic. “Green” Molding Compound; UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 (e3)
- Weight: 0.112 grams (Approximate)

Applications

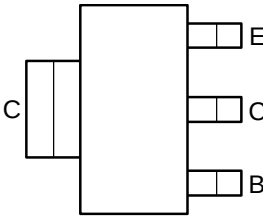
- Power MOSFET & IGBT Gate Driving
- Battery Powered Circuits
- Fast Charge Converters
- Low Loss Power Switching

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}	-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.)

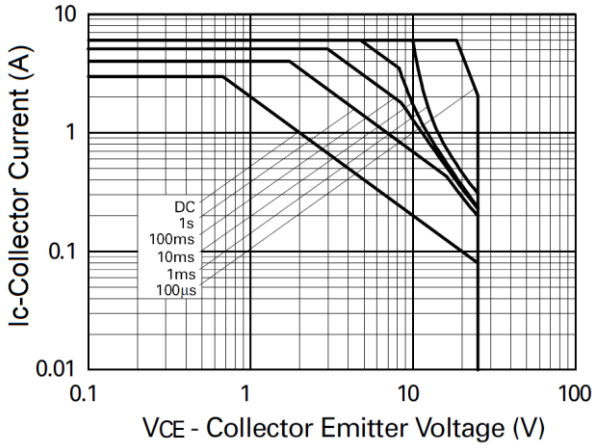
Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 6)	P_D	3.0	W
	(Note 7)		2.0	
	(Note 8)		1.6	
	(Note 9)		1.2	
Thermal Resistance, Junction to Ambient	(Note 6)	$R_{\theta JA}$	41.7	°C/W
	(Note 7)		62.5	
	(Note 8)		78.1	
	(Note 9)		104	
Thermal Resistance Junction to Lead	(Note 10)	$R_{\theta JL}$	12.9	
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

ESD Ratings (Note 11)

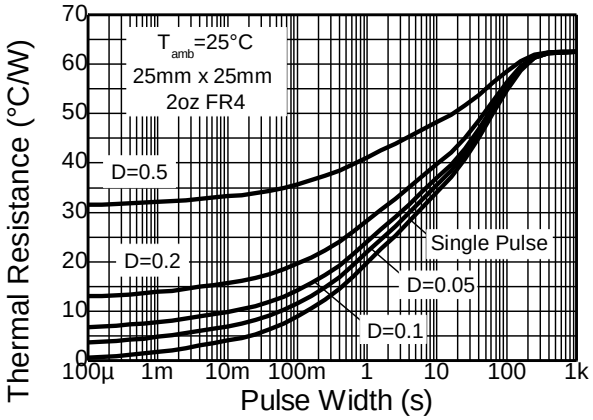
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

Notes:
6. 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.
7. Same as Note 6, except the device is mounted on 25mm x 25mm 2oz copper.
8. Same as Note 6, except the device is mounted on 25mm x 25mm 1oz copper.
9. Same as Note 6, except the device is mounted on minimum recommended pad layout.
10. Thermal resistance from junction to solder-point (at the end of the collector lead).
11. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

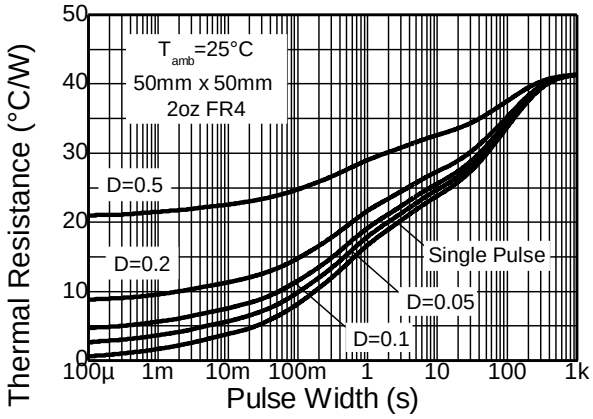
Thermal Characteristics and Derating Information



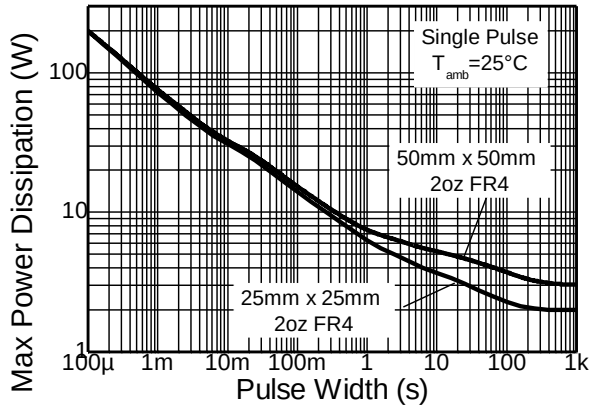
Safe Operating Area



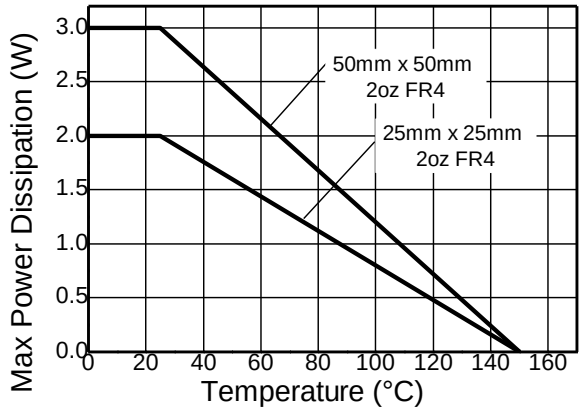
Transient Thermal Impedance



Transient Thermal Impedance



Pulse Power Dissipation



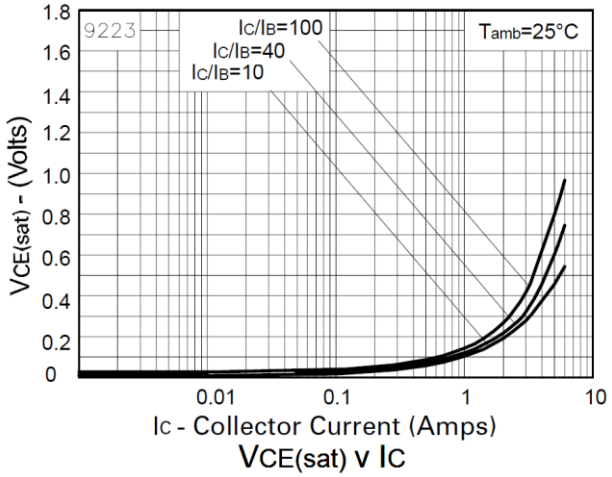
Derating Curve

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

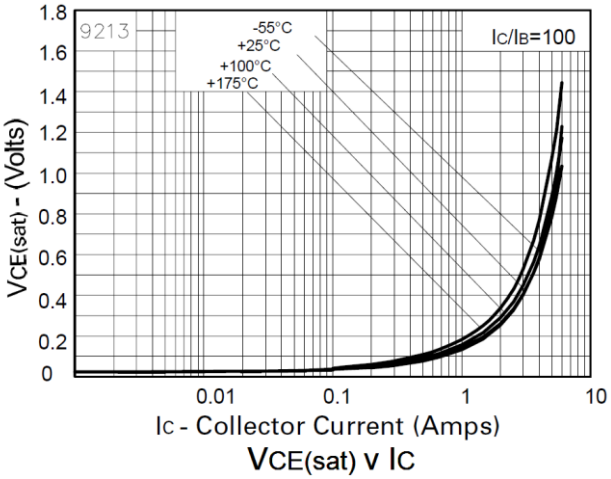
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	-30	-40	–	V	I_C = -100μA
Collector-Emitter Breakdown Voltage (Note 12)	BV_{CEO}	-25	-35	–	V	I_C = -10mA
Emitter-Base Breakdown Voltage	BV_{EBO}	-7	-8.5	–	V	I_E = -100μA
Collector Cut-Off Current	I_{CBO}	–	<1	-100	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	-100	nA	V_{EB} = -5.6V
Collector-Emitter Saturation Voltage (Note 12)	$V_{CE(sat)}$	–	-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 12)	$V_{BE(sat)}$	–	-0.80	-1.0	V	I_C = -1A, I_B = -10mA
Base-Emitter Turn-On Voltage (Note 12)	$V_{BE(on)}$	–	-0.75	-1.1	V	I_C = -1A, V_{CE} = -2V
DC Current Gain (Note 12)	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: 12. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

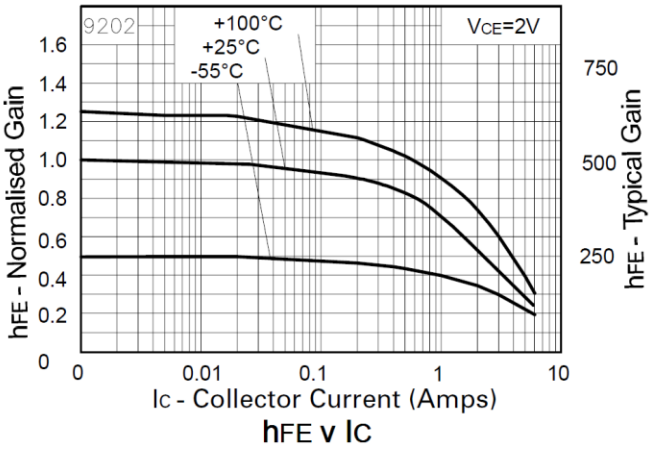
Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)



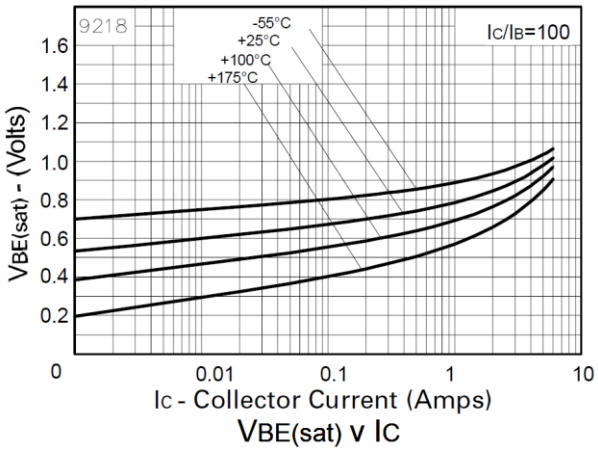
VCE(sat) v IC



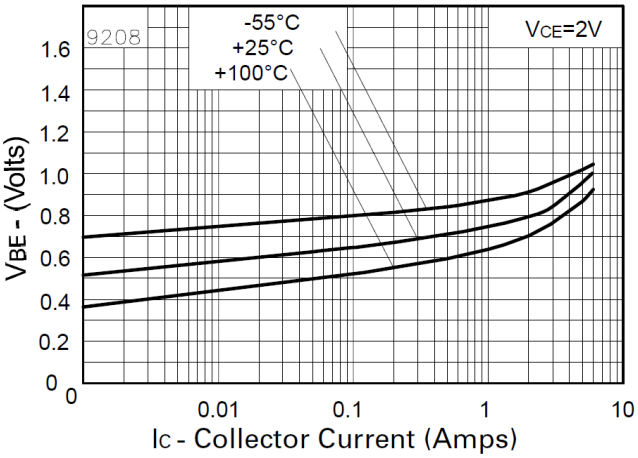
VCE(sat) v IC



hFE v IC

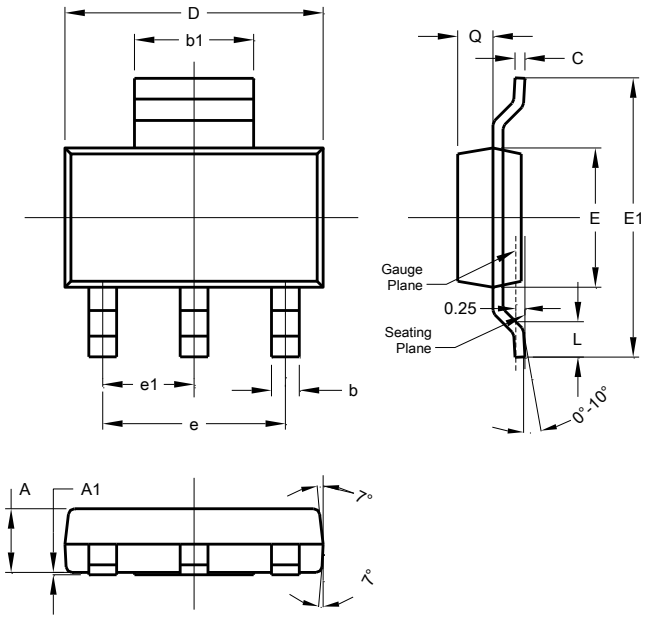


VBE(sat) v IC



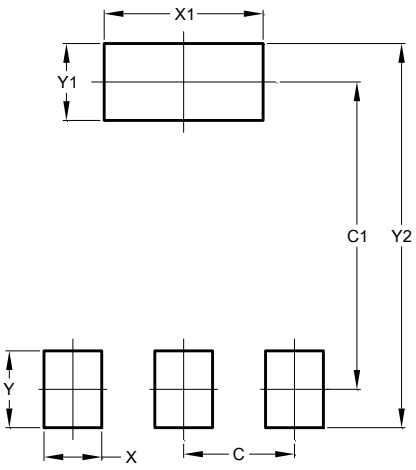
VBE(on) v IC

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