PNP SILICON PLANAR HIGH PERFORMANCE TRANSISTOR IN SOT223

Features

- BV_{CEO} > -25V
- Maximum continuous current $I_{C(cont)}$ = -3A
- Very Low Saturation Voltage
- High gain holds up; Minimum gain of 200 at I_C = 2A
- Low On-resistance; $R_{CE(sat)}$ = 93mΩ at 3A
- Complementary Type – FZT689B
- **Lead-Free Finish; RoHS compliant (Note 1)**
- **Halogen and Antimony Free. "Green" Device (Note 2)**
- **Qualified to AEC-Q101 Standards for High Reliability**

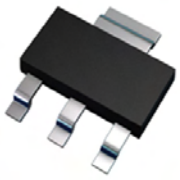
Mechanical Data

- Case: SOT223
- UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish
- Weight: 0.112 grams (approximate)

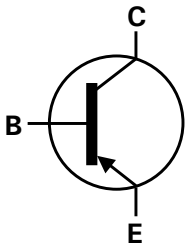
Applications

- Battery powered circuits
- Fast charge converters

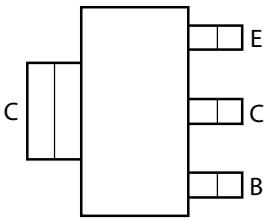
SOT223



Top View



Device Symbol



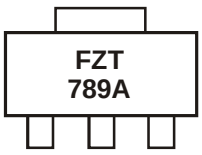
Top View
Pin-Out

Ordering Information (Note 3 & 4)

Product	Grade	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
FZT789ATA	Commercial	FZT789A	7	12	1,000
FZT789AQTA	Automotive	FZT789A	7	12	1,000

Notes:
1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
2. Halogen and Antimony free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
3. For packaging details, go to our website at http://www.diodes.com.
4. Products with Q-suffix are automotive grade. Automotive products are electrical and thermal the same as the commercial, except where specified.

Marking Information



FZT789A = Product Type Marking

Maximum Ratings @T_A = 25°C unless otherwise specified

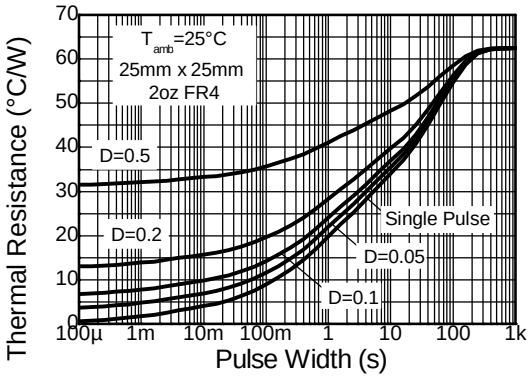
Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	-25	V
Collector-Emitter Voltage	V_{CEO}	-25	V
Emitter-Base Voltage	V_{EBO}	-5	V
Continuous Collector Current	I_C	-3	A
Peak Pulse Current	I_{CM}	-6	A

Thermal Characteristics @T_A = 25°C unless otherwise specified

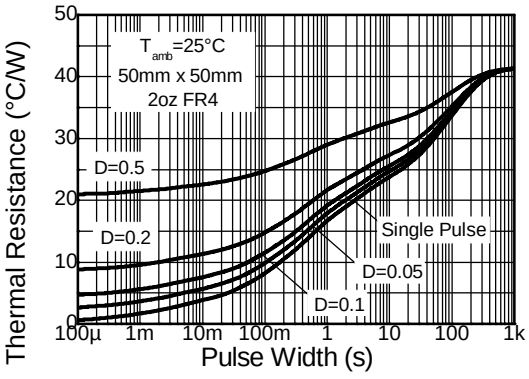
Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 5)	P_D	2	W
	(Note 6)		3	W
Thermal Resistance, Junction to Ambient	(Note 5)	$R_{\theta JA}$	62.5	°C/W
	(Note 6)		41.7	°C/W
Thermal Resistance, Junction to Leads	(Note 7)	$R_{\theta JL}$	12.93	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

Notes:
5. For devices mounted on 25mm x 25mm single sided 2oz weight copper, in still air conditions.
6. For devices mounted on 50mm x 50mm single sided 2oz weight copper, in still air conditions.
7. Thermal resistance from junction to solder-point (at the end of the collector lead)

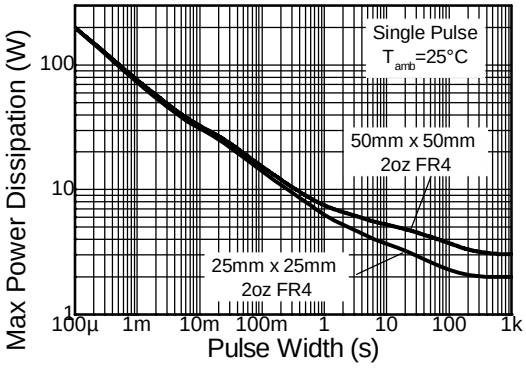
Thermal Characteristics



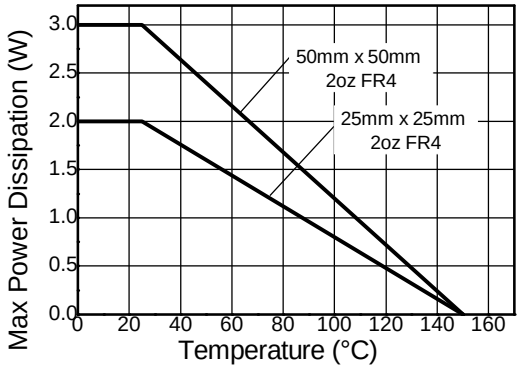
Transient Thermal Impedance



Transient Thermal Impedance



Pulse Power Dissipation



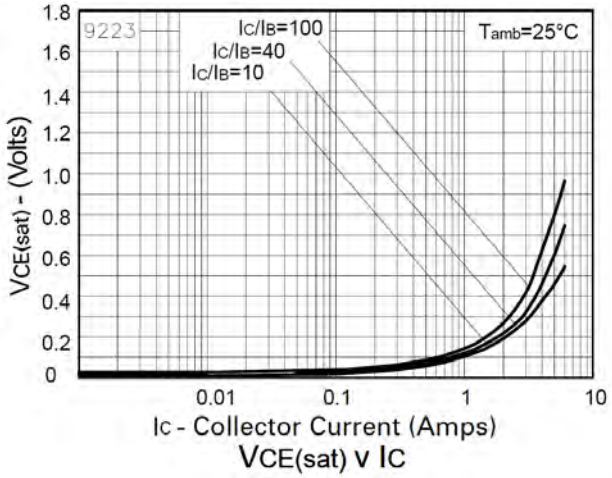
Derating Curve

Electrical Characteristics @T_A = 25°C unless otherwise specified

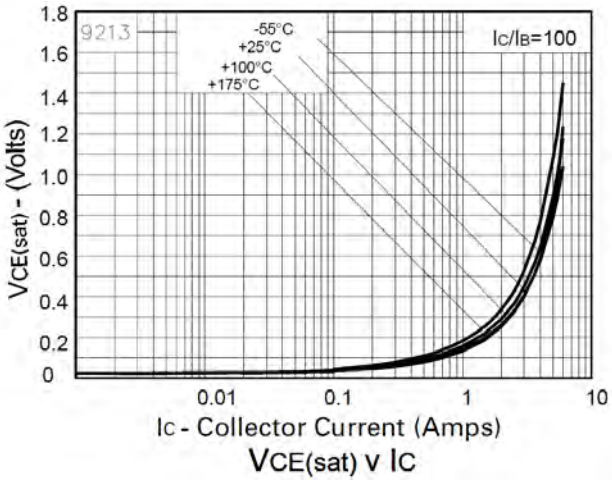
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	-25	-40	–	V	I_C = -100µA
Collector-Emitter Breakdown Voltage (Note 8)	BV_{CEO}	-25	-35	–	V	I_C = -10mA
Emitter-Base Breakdown Voltage	BV_{EBO}	-5	-8.5	–	V	I_E = -100µA
Collector Cut-off Current	I_{CBO}	–	–	-0.1	µA	V_{CB} = -15V
		–	–	-10		V_{CB} = -15V, T_{amb} = 100°C
Emitter Cut-off Current	I_{EBO}	–	–	-0.1	µA	V_{EB} = -4V
Collector-Emitter Saturation Voltage (Note 8)	$V_{CE(sat)}$	–	-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 8)	$V_{BE(sat)}$	–	-0.80	-1.0	V	I_C = -1A, I_B = -10mA
Base-Emitter Turn-On Voltage (Note 8)	$V_{BE(on)}$	–	-0.8	–	V	I_C = -1A, V_{CE} = -2V
DC Current Gain (Note 8)	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 (Note 8)	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 (Note 8)	C_{ibo}	–	225	–	pF	V_{EB} = -0.5V, f = 1MHz
Output Capacitance (Note 8)	C_{obo}	–	25	–	pF	V_{CB} = -10V, f = 1MHz

Notes: 8. Measured under pulsed conditions. Pulse width ≤ 300µs. Duty cycle ≤ 2%

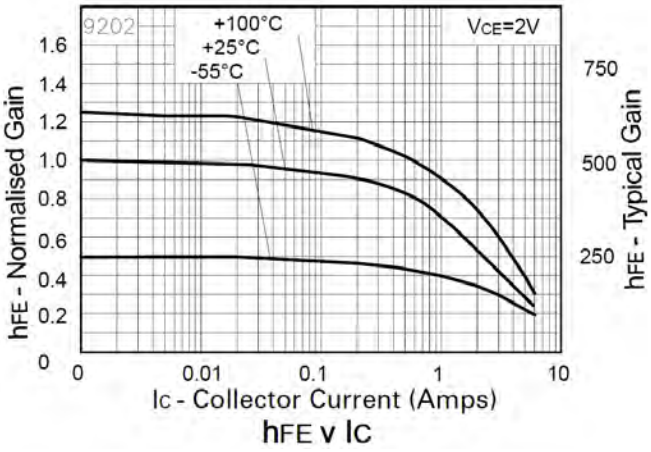
Typical Characteristics



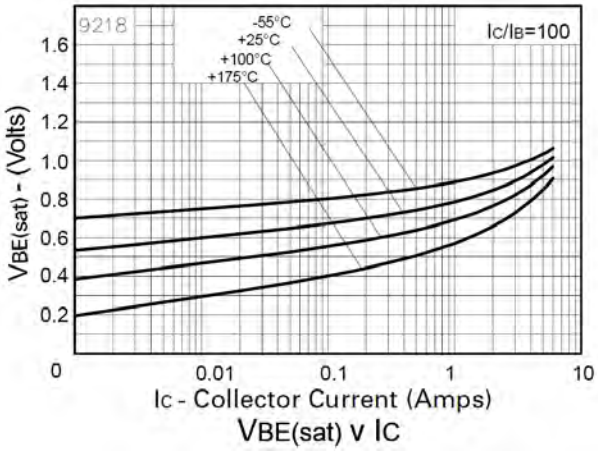
VCE(sat) v IC



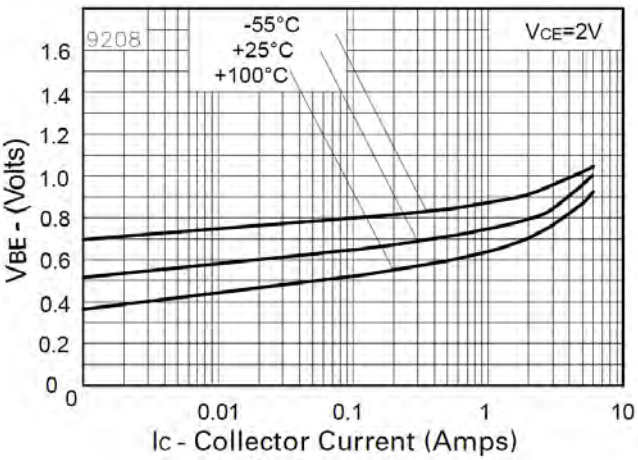
VCE(sat) v IC



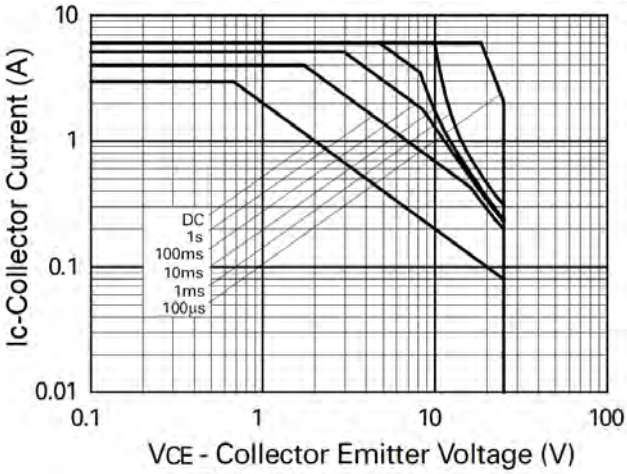
hFE v IC



VBE(sat) v IC

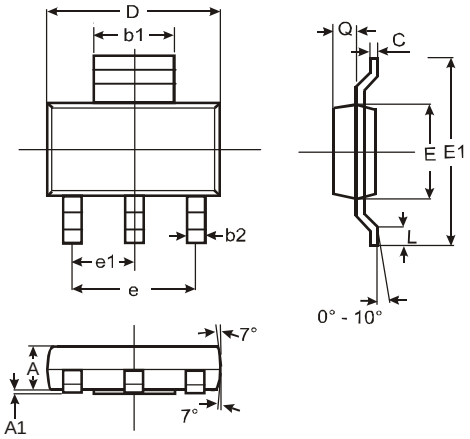


VBE(on) v IC



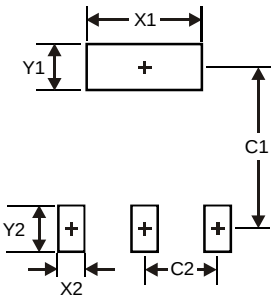
Safe Operating Area

Package Outline Dimensions



SOT223			
Dim	**Min**	**Max**	**Typ**
A	1.55	1.65	1.60
A1	0.010	0.15	0.05
b1	2.90	3.10	3.00
b2	0.60	0.80	0.70
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)
X1	3.3
X2	1.2
Y1	1.6
Y2	1.6
C1	6.4
C2	2.3

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