70V NPN MEDIUM POWER HIGH GAIN TRANSISTOR IN SOT223

Features

- BV_{CEO} > 70V
- BV_{CBO} > 70V
- I_C = 2.0A High Continuous current
- hFE > 400 for High Gain @ 0.5A
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **PPAP capable (Note 4)**

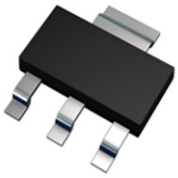
Mechanical Data

- 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)

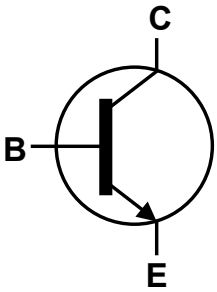
Applications

- Darlington replacement
- Relay and Solenoid drivers
- DC-DC converters

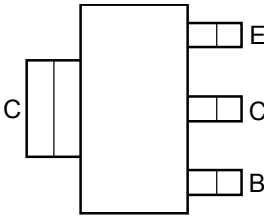
SOT223



Top View



Device Symbol



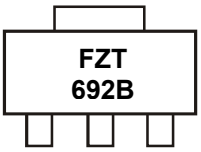
Top View
Pin-Out

Ordering Information (Notes 4 & 5)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
FZT692BTA	FZT692B	7	12	1,000
FZT692BQTA	FZT692B	7	12	1,000

Notes:
1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
2. See http://www.diodes.com/quality/lead_free.html for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
4. Automotive products are AEC-Q101 qualified and are PPAP capable. Automotive, AEC-Q101 and standard products are electrically and thermally the same, except where specified. For more information, please refer to http://www.diodes.com/quality/product_compliance_definitions/.
5. For packaging details, go to our website at http://www.diodes.com/products/packages.html

Marking Information



FZT692B= Product Type Marking Code

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Absolute Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	70	V
Collector-Emitter Voltage	V_{CEO}	70	V
Emitter-Base Voltage	V_{EBO}	7	V
Continuous Collector Current	I_C	2	A
Peak Pulse Current	I_{CM}	5	A

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

Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 6)	P_D	2	W
	(Note 7)		3	W
Thermal Resistance, Junction to Ambient	(Note 6)	$R_{\theta JA}$	62.5	°C/W
	(Note 7)		41.7	°C/W
Thermal Resistance, Junction to Leads	(Note 8)	$R_{\theta JL}$	12.9	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

ESD Ratings (Note 9)

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 25mm x 25mm 1oz copper that is on a single-sided 1.6mm FR4 PCB; device is measured under still air conditions whilst operating in steady-state.
7. Same as note (6), except the device is mounted on 50mm x 50mm 2oz copper.
8. Thermal resistance from junction to solder-point (at the end of the collector lead).
9. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

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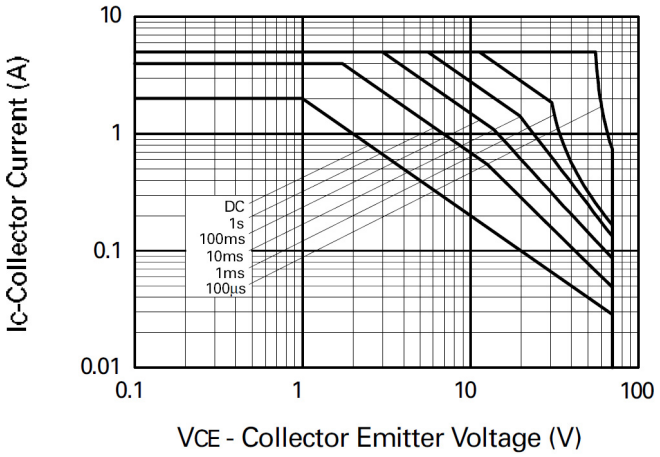
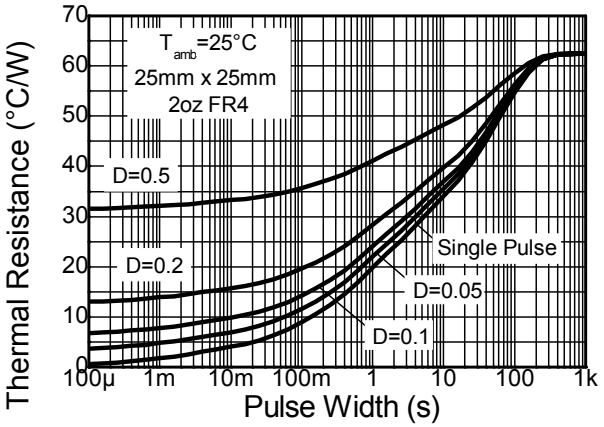
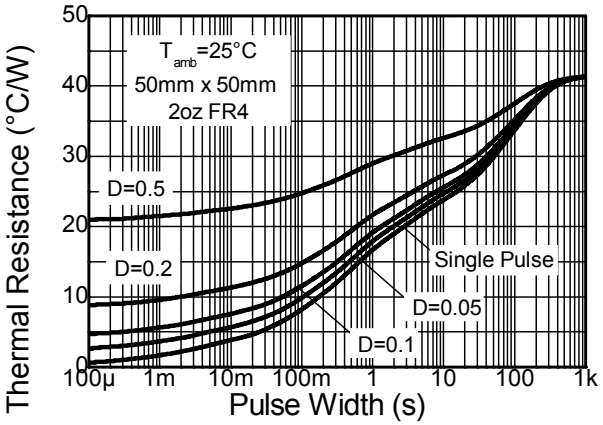
Thermal Characteristics and Derating Information



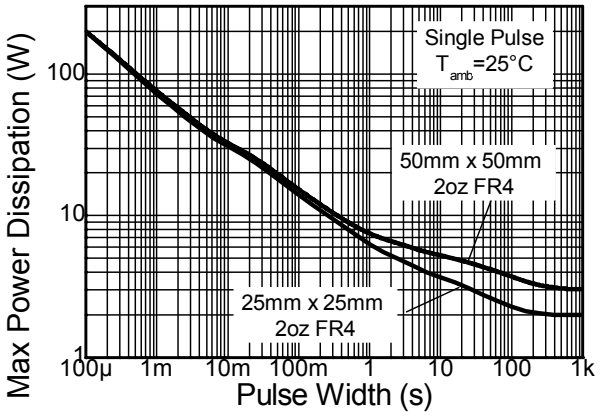
Safe Operating Area



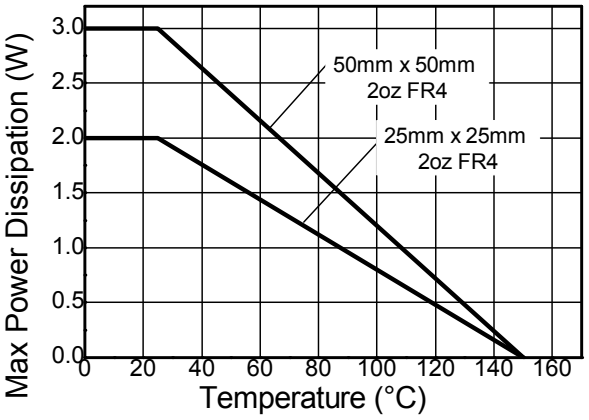
Transient Thermal Impedance



Transient Thermal Impedance



Pulse Power Dissipation



Derating Curve

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	70	—	—	V	I_C = 100μA
Collector-Emitter Breakdown Voltage (Note 10)	BV_{CEO}	70	—	—	V	I_C = 10mA
Emitter-Base Breakdown Voltage	BV_{EBO}	7	—	—	V	I_E = 100μA
Collector-Base Cutoff Current	I_{CBO}	—	—	100	nA	V_{CB} = 55V
Collector-Emitter Cutoff Current	I_{CES}	—	—	100	nA	V_{CE} = 55V
Emitter Cutoff Current	I_{EBO}	—	—	100	nA	V_{EB} = 5.6V
DC Current Gain (Note 10)	h_{FE}	500 400 150	— — —	— — —	—	I_C = 100mA, V_{CE} = 2V I_C = 500mA, V_{CE} = 2V I_C = 1A, V_{CE} = 2V
Collector-Emitter Saturation Voltage (Note 10)	$V_{CE(sat)}$	— — —	— — —	0.15 0.5 0.5	V	I_C = 0.1A, I_B = 0.5mA I_C = 1A, I_B = 10mA I_C = 2A, I_B = 200mA
Base-Emitter Saturation Voltage (Note 10)	$V_{BE(sat)}$	—	—	0.9	V	I_C = 1A, I_B = 10mA
Base-Emitter Turn-On Voltage (Note 10)	$V_{BE(on)}$	—	—	0.9	V	I_C = 1A, V_{CE} = 2V
Input Capacitance	C_{ibo}	—	200	—	pF	V_{EB} = 0.5V, f = 1MHz
Output Capacitance	C_{obo}	—	12	—	pF	V_{CB} = 10V, f = 1MHz
Current Gain-Bandwidth Product	f_T	150	—	—	MHz	V_{CE} = 5V, I_C = 50mA, f=50MHz
Turn-On Time	t_{on}	—	46	—	ns	V_{CC} = 10V, I_C = 500mA
Turn-Off Time	t_{off}	—	1440	—	ns	I_{B1} = -I_{B2} = 50mA

Note:10. Measured under pulsed conditions. Pulse width ≤ 300 μs. Duty cycle ≤ 2%.

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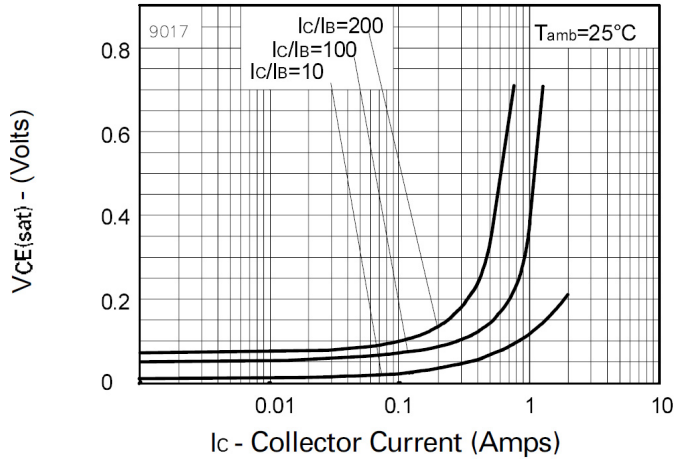
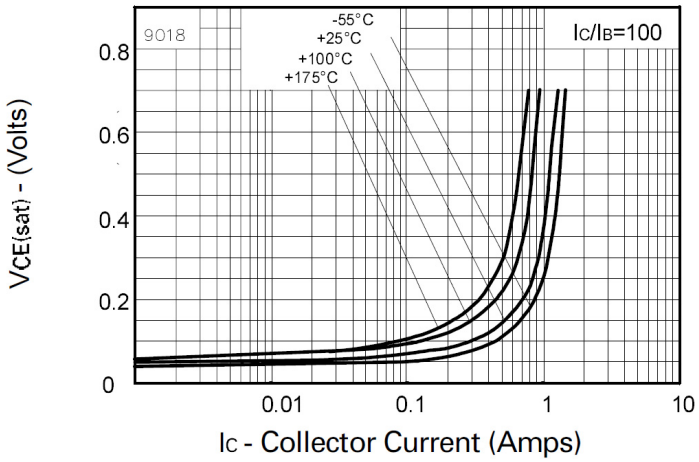
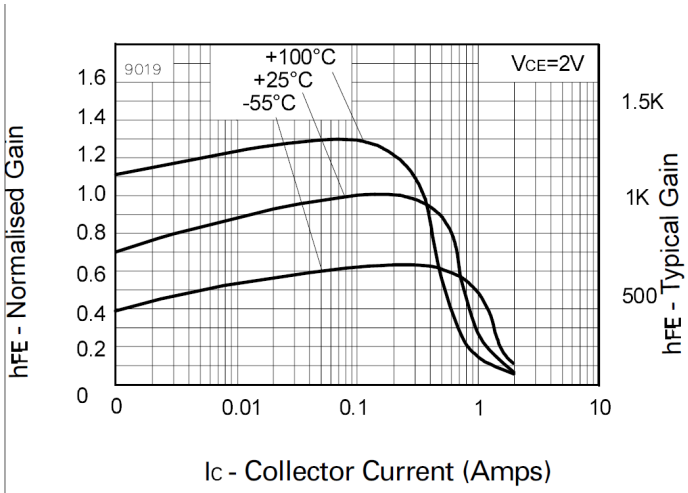
Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)



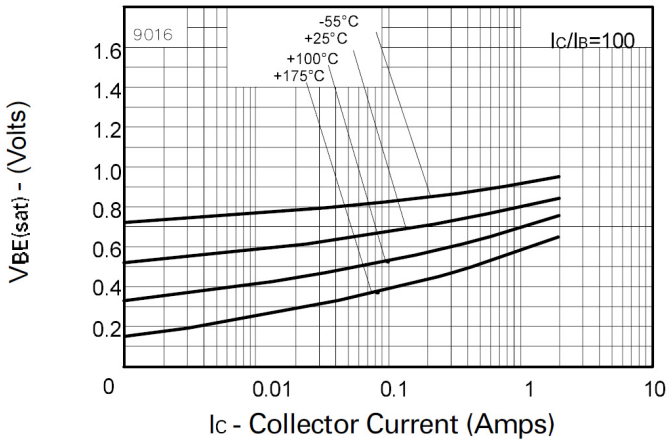
VCE(sat) v IC



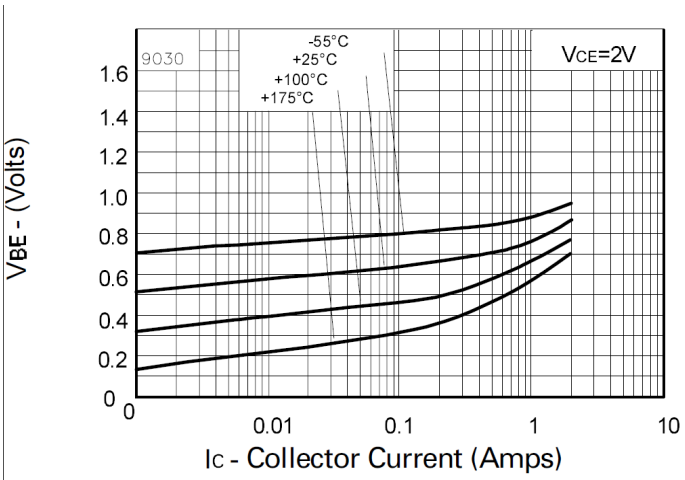
VCE(sat) v IC



hFE v IC



VBE(sat) v IC



VBE(on) v IC

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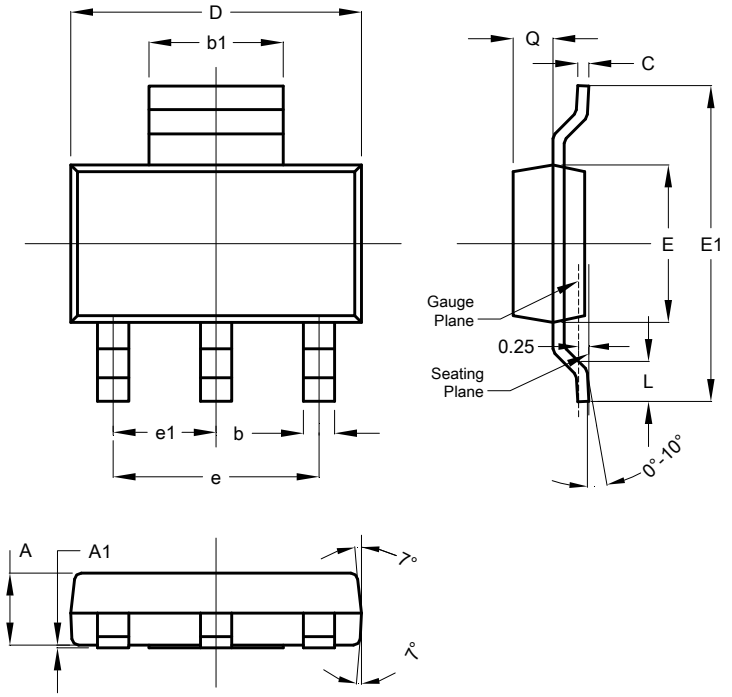
Package Outline Dimensions

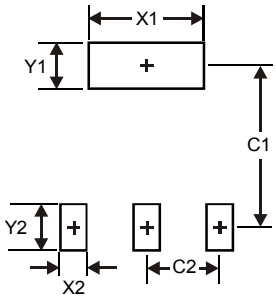
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for latest version.



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

Please see AP02001 at http://www.diodes.com/datasheets/ap02001.pdf for the latest version.



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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