



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 (3)
- Weight: 0.112 grams (Approximate)

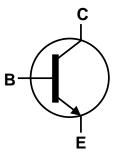
Applications

- Darlington Replacement
- Relay and Solenoid Drivers
- DC-DC Converters

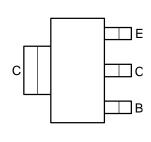




Top View



Device Symbol



Top View Pin-Out

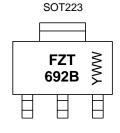
Ordering Information (Notes 4 & 5)

Product	Compliance	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
FZT692BTA	AEC-Q101	FZT692B	7	12	1,000
FZT692BQTA	Automotive	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



FZT 692B = Product Type Marking Code YWW = Date Code Marking Y or \overline{Y} = Last Digit of Year (ex: 5= 2015) WW or $\overline{W}W$ = Week Code (01~53)





FZT692B

Absolute Maximum Ratings (@TA = +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	lc	2	Α
Peak Pulse Current	I _{CM}	5	Α

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

Characteristic	Symbol	Value	Unit		
	(Note 6)		3.0		
Power Dissipation	(Note 7)	Б	2.0	W	
Power Dissipation	(Note 8)	P_{D}	1.6		
	(Note 9)		1.2		
	(Note 6)		41.7		
Thermal Resistance, Junction to Ambient	(Note 7)	D	62.5		
Thermal Resistance, Junction to Ambient	(Note 8)	$R_{ hetaJA}$	78.1	°C/W	
	(Note 9)		104		
Thermal Resistance Junction to Lead (Note 10)		$R_{ hetaJL}$	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	С

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.

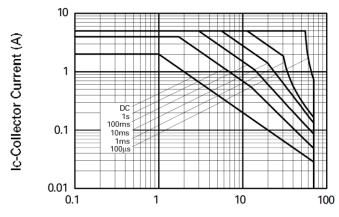
 9. Same as Note 6, except the device is mounted on minimum recommended pad layout.

 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.

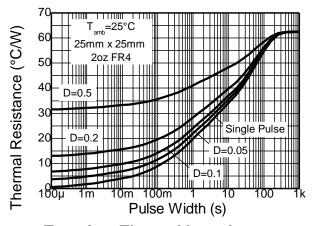


Thermal Characteristics and Derating Information

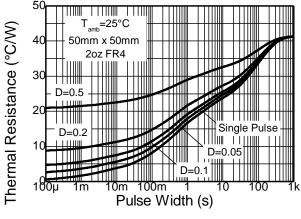


VCE - Collector Emitter Voltage (V)

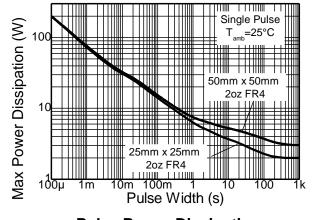
Safe Operating Area



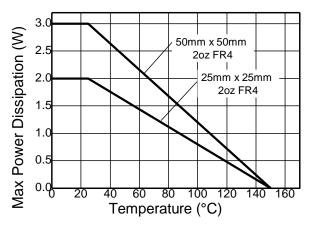
Transient Thermal Impedance



Transient Thermal Impedance



Pulse Power Dissipation



Derating Curve





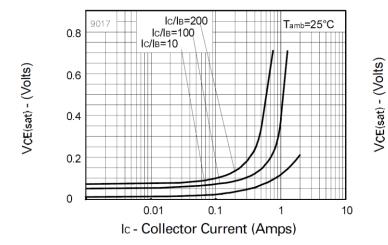
Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

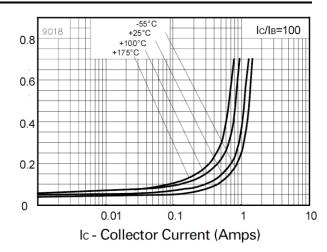
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV _{CBO}	70	_	_	V	$I_C = 100\mu A$
Collector-Emitter Breakdown Voltage (Note 12)	BV _{CEO}	70	_	_	V	I _C = 10mA
Emitter-Base Breakdown Voltage	BV _{EBO}	7	_	_	V	I _E = 100μA
Collector-Base Cut-Off Current	I _{CBO}	_	_	100	nA	V _{CB} = 55V
Collector-Emitter Cut-Off Current	I _{CES}	1	_	100	nA	V _{CE} = 55V
Emitter Cut-Off Current	I _{EBO}	_	_	100	nA	V _{EB} = 5.6V
DC Current Gain (Note 12)	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 12)	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 12)	V _{BE(sat)}	_	_	0.9	V	$I_C = 1A, I_B = 10mA$
Base-Emitter Turn-On Voltage (Note 12)	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	$I_{B1} = -I_{B2} = 50 \text{mA}$

Note: 12. Measured under pulsed conditions. Pulse width \leq 300 μ s. Duty cycle \leq 2%.



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

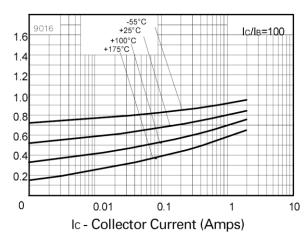




VCE(sat) v IC

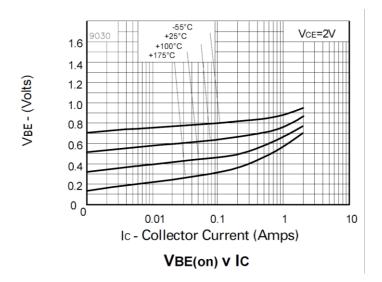
+100°C Vce=2V 1.6 +25°C -55°C 1.5K 1.4 hFE - Normalised Gain 1.2 1.0 0.8 0.6 0.4 0.2 0 0 0.01 0.1 10

VCE(sat) v IC



Ic - Collector Current (Amps)

hFE v IC



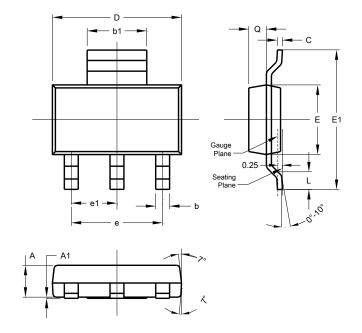
VBE(sat) v IC

VBE(sat) - (Volts)



Package Outline Dimensions

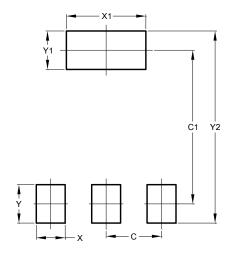
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.



SOT223					
Dim	Min	Max	Тур		
Α	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		
С	0.20	0.30	0.25		
D	6.45	6.55	6.50		
Е	3.45	3.55	3.50		
E1	6.90	7.10	7.00		
е	-	-	4.60		
e1	-	-	2.30		
L	0.85	1.05	0.95		
Ø	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)
С	2.30
C1	6.40
Х	1.20
X1	3.30
Υ	1.60
Y1	1.60
Y2	8.00





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