FZT788B

15V PNP MEDIUM POWER HIGH GAIN TRANSISTOR IN SOT223

Features

- BV_{CEO} > -15V
- BV_{CBO} > -15V
- I_C = -3A High Continuous Current
- h_{FE} > 300 @ -2A and Low Saturation Voltage
- Extremely Low Equivalent On-Resistance $R_{CE(sat)}$ 93mΩ at -3A
- Complementary NPN Type: FZT688B
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

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)

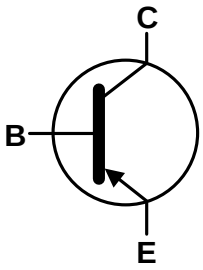
Applications

- Flash Gun Convertors
- Battery Powered Circuits

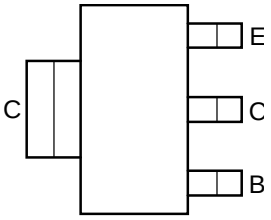
SOT223



Top View



Device Symbol



Top View
Pin-Out

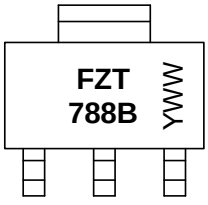
Ordering Information (Note 4)

Product	Compliance	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
FZT788BTA	AEC-Q101	FZT788B	7	12	1,000
FZT788BTC	AEC-Q101	FZT788B	13	12	2,500

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. For packaging details, go to our website at http://www.diodes.com/products/packages.html.

Marking Information

SOT223



FZT 788B = Product Type Marking Code
YWW = Date Code Marking
Y or $\overline{Y}$ = Last Digit of Year (ex: 5= 2015)
WW or $\overline{WW}$ = Week Code (01~53)

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	-15	V
Collector-Emitter Voltage	V_{CEO}	-15	V
Emitter-Base Voltage	V_{EBO}	-7	V
Continuous Collector Current	I_C	-3	A
Peak Pulse Current	I_{CM}	-8	A

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

Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 5)	P_D	3	W
	(Note 6)		2	
	(Note 7)		1.6	
	(Note 8)		1.2	
Thermal Resistance, Junction to Ambient	(Note 5)	$R_{\theta JA}$	41.7	°C/W
	(Note 6)		62.5	
	(Note 7)		78.1	
	(Note 8)		104	
Thermal Resistance Junction to Lead	(Note 9)	$R_{\theta JL}$	12.9	
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

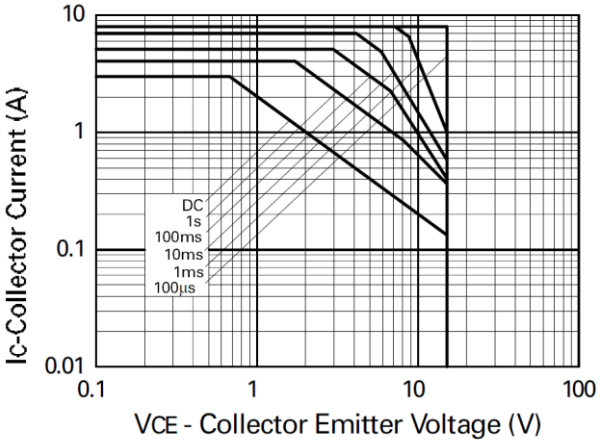
ESD Ratings (Note 10)

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

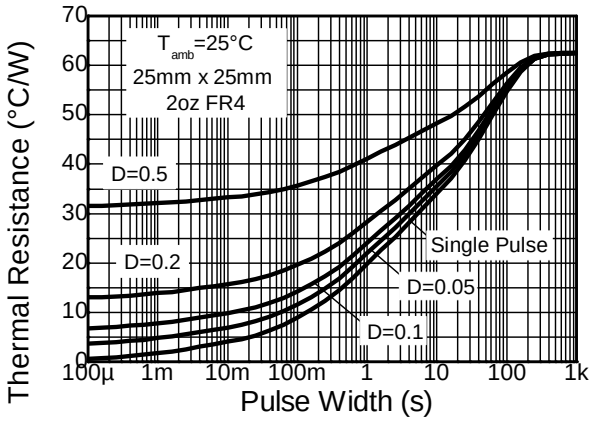
Notes:
5. For a device mounted with the collector lead on 50mm x 50mm 2oz copper that is on a single-sided 1.6mm FR4 PCB; device is measured under still air conditions whilst operating in a steady-state.
6. Same as Note 6, except the device is mounted on 25mm x 25mm 2oz copper.
7. Same as Note 6, except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

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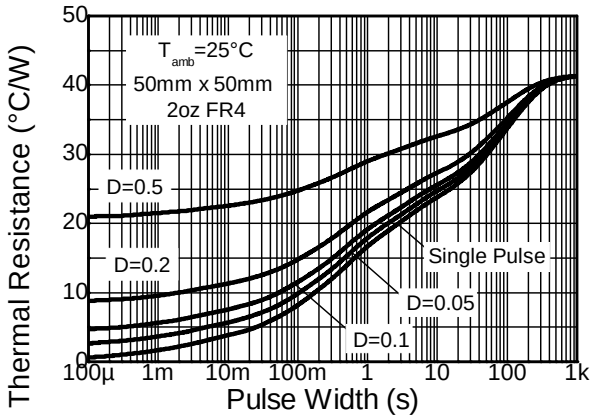
Thermal Characteristics and Derating Information



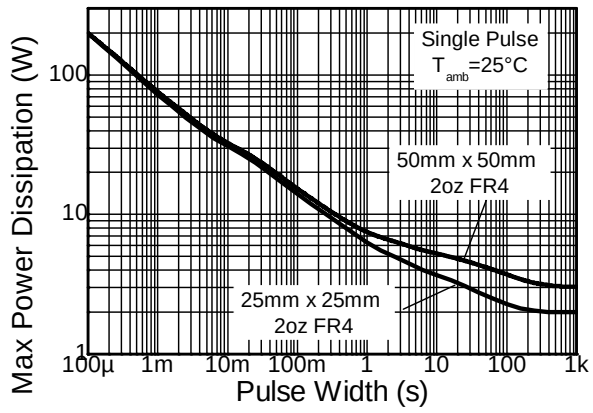
Safe Operating Area



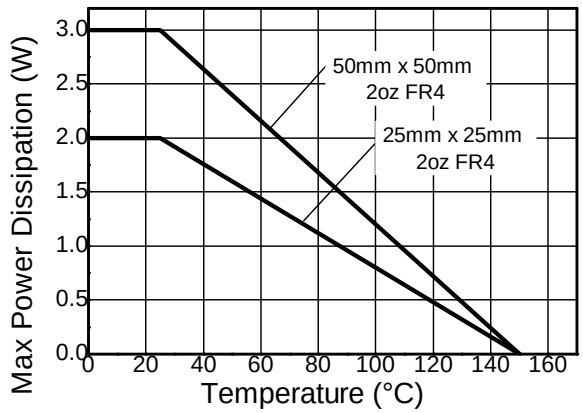
Transient Thermal Impedance



Transient Thermal Impedance



Pulse Power Dissipation



Derating Curve

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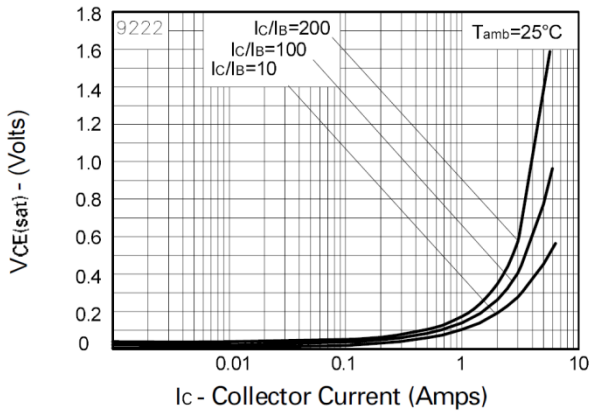
Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	-15	—	—	V	I_C = -100µA
Collector-Emitter Breakdown Voltage (Note 11)	BV_{CEO}	-15	—	—	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} = -10V
Emitter Cut-Off Current	I_{EBO}	—	—	-100	nA	V_{EB} = -4V
DC Current Gain (Note 11)	h_{FE}	500 400 300 150	— — — —	— — — —	—	I_C = -10mA, V_{CE} = -2V I_C = -1A, V_{CE} = -2V I_C = -2A, V_{CE} = -2V I_C = -6A, V_{CE} = -2V
Collector-Emitter Saturation Voltage (Note 11)	$V_{CE(sat)}$	— — — —	— — — —	-0.15 -0.25 -0.45 -0.5	V	I_C = -0.5A, I_B = -2.5mA I_C = -1A, I_B = -5mA I_C = -2A, I_B = -10mA I_C =- 3A, I_B = -50mA
Base-Emitter Saturation Voltage (Note 11)	$V_{BE(sat)}$	—	—	-0.9	V	I_C = -1A, I_B = -5mA
Base-Emitter Turn-On Voltage (Note 11)	$V_{BE(on)}$	—	-0.75	—	V	I_C = -1A, V_{CE} = -2V
Input Capacitance	C_{ibo}	—	225	—	pF	V_{EB} = -0.5V, f = 1MHz
Output Capacitance	C_{obo}	—	25	—	pF	V_{CB} = -10V, f = 1MHz
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

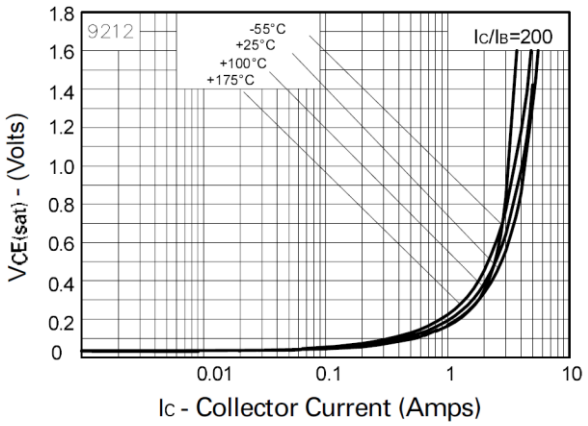
Note: 11. Measured under pulsed conditions. Pulse width ≤ 300 µs. Duty cycle ≤ 2%.

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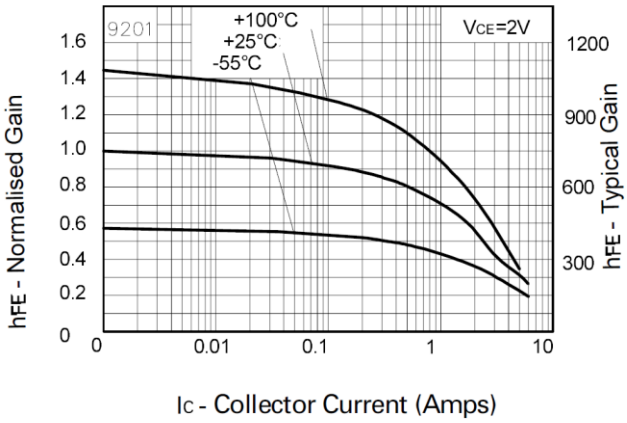
Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)



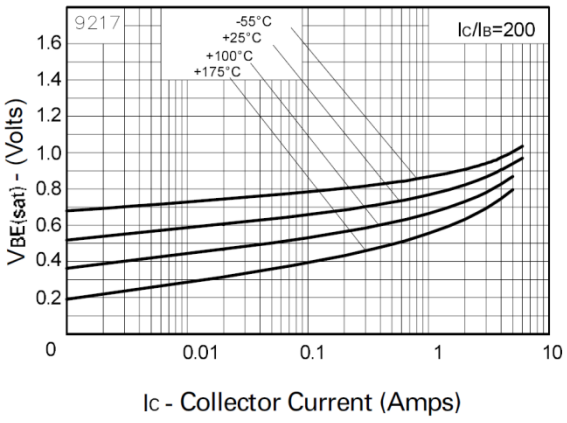
VCE(sat) v IC



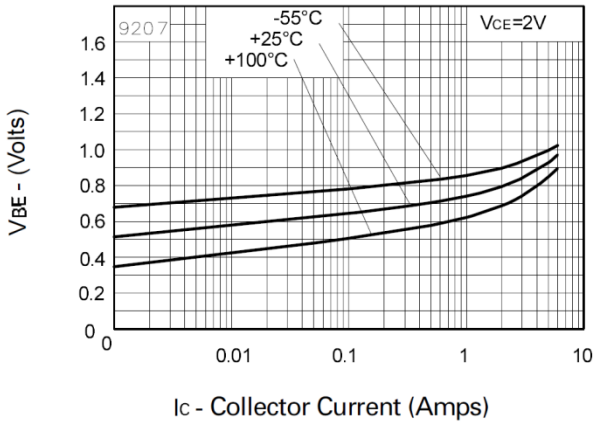
VCE(sat) v IC



hFE v IC



VBE(sat) v IC

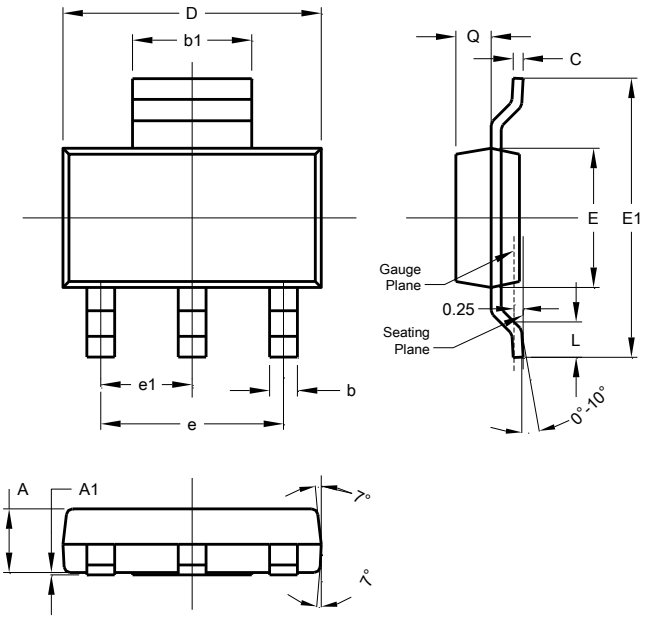


VBE(on) v IC

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Package Outline Dimensions

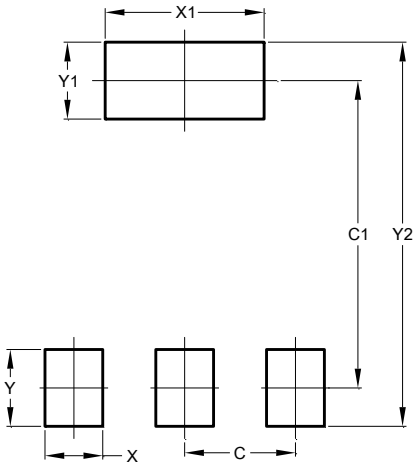
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.



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

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



Dimensions	Value (in mm)
C	2.30
C1	6.40
X	1.20
X1	3.30
Y	1.60
Y1	1.60
C2	8.00

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