

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: DIODES™ FZT688B
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please [contact us](mailto:contact@diodes.com) or your local Diodes representative. <https://www.diodes.com/quality/product-definitions/>**

Mechanical Data

- Package: SOT223
- Package 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)

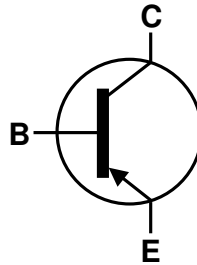
Applications

- Flash Gun Convertors
- Battery Powered Circuits

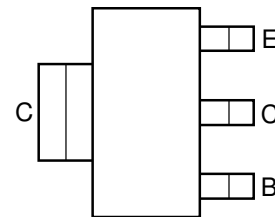


SOT223

Top View



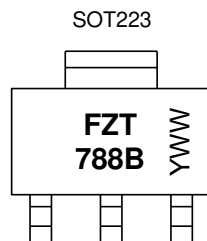
Device Symbol


 Top View
Pin-Out

Ordering Information (Note 4)

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

- Notes:
1. EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied.
 2. See <https://www.diodes.com/quality/lead-free/> 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 <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information


SOT223

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

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.)

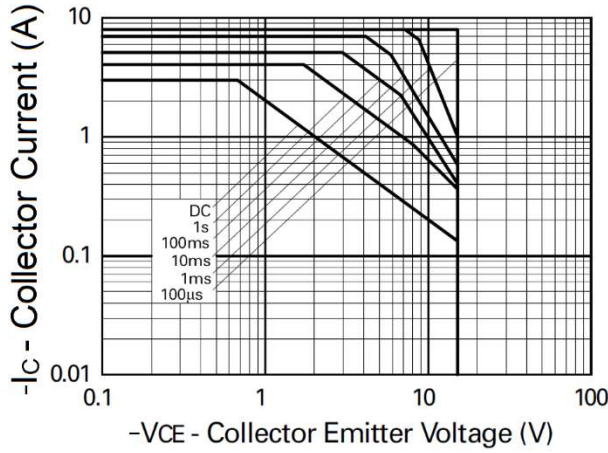
Characteristic	Symbol	Value	Unit	
Power Dissipation	P _D	(Note 5)	3	W
		(Note 6)	2	
		(Note 7)	1.6	
		(Note 8)	1.2	
Thermal Resistance, Junction to Ambient	R _{θJA}	(Note 5)	41.7	°C/W
		(Note 6)	62.5	
		(Note 7)	78.1	
		(Note 8)	104	
Thermal Resistance Junction to Lead	R _{θJL}	12.9		
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C	

ESD Ratings (Note 10)

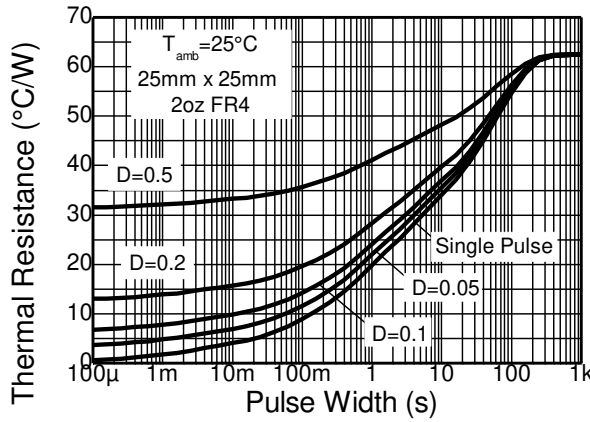
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

- 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 5, except the device is mounted on 25mm x 25mm 2oz copper.
 7. Same as Note 5, except the device is mounted on 25mm x 25mm 1oz copper.
 8. Same as Note 5, 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.

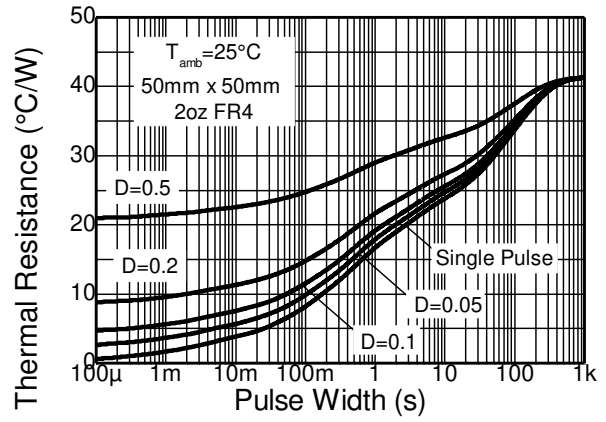
Thermal Characteristics and Derating Information



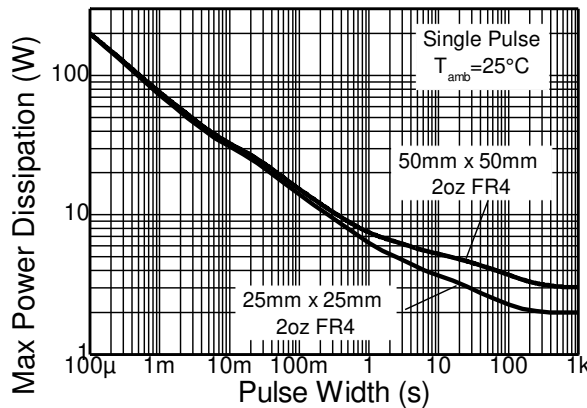
Safe Operating Area



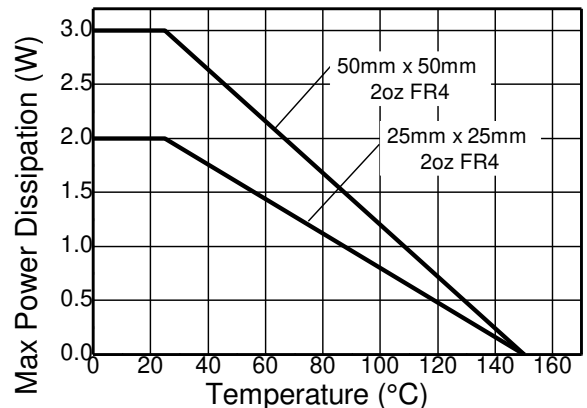
Transient Thermal Impedance



Transient Thermal Impedance



Pulse Power Dissipation



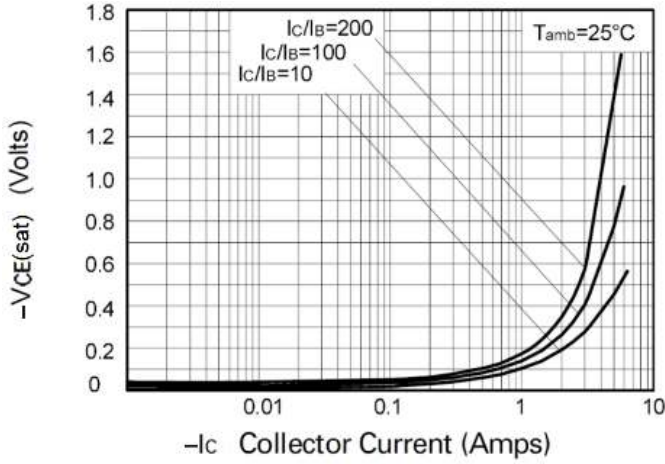
Derating Curve

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

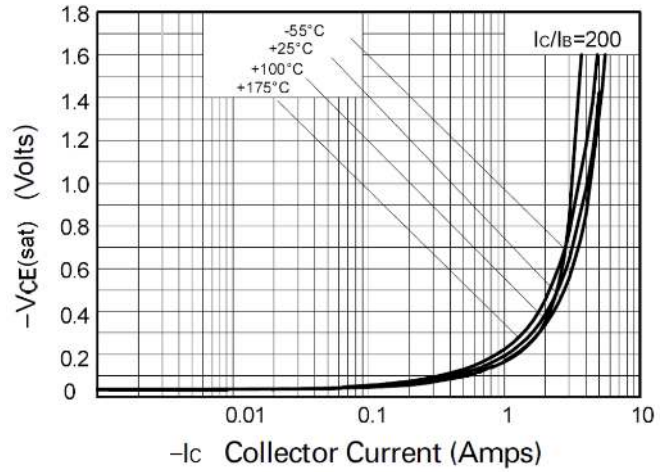
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	-15	—	—	V	$I_C = -100\mu A$
Collector-Emitter Breakdown Voltage (Note 11)	BV_{CEO}	-15	—	—	V	$I_C = -10mA$
Emitter-Base Breakdown Voltage	BV_{EBO}	-7	—	—	V	$I_E = -100\mu A$
Collector-Base Cut-Off Current	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 $\leq 300 \mu s$. Duty cycle $\leq 2\%$.

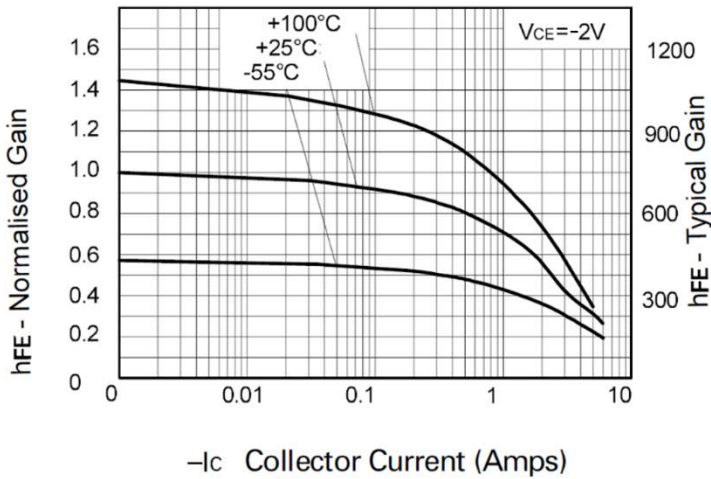
Typical Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)



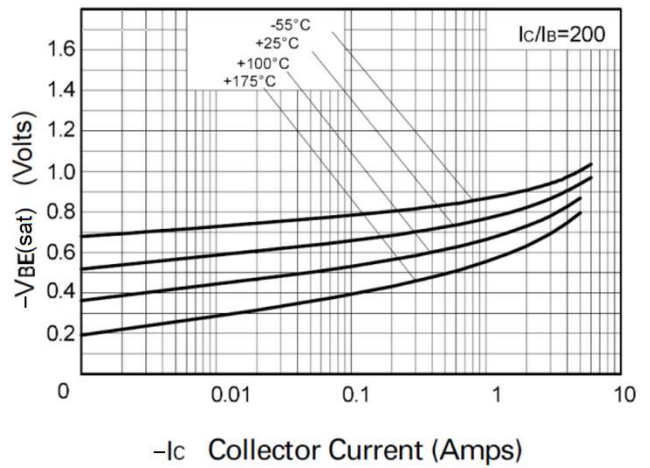
$V_{CE(sat)}$ v I_C



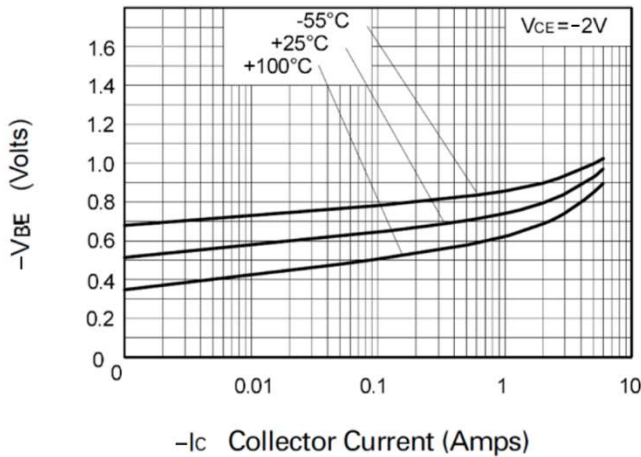
$V_{CE(sat)}$ v I_C



h_{FE} v I_C



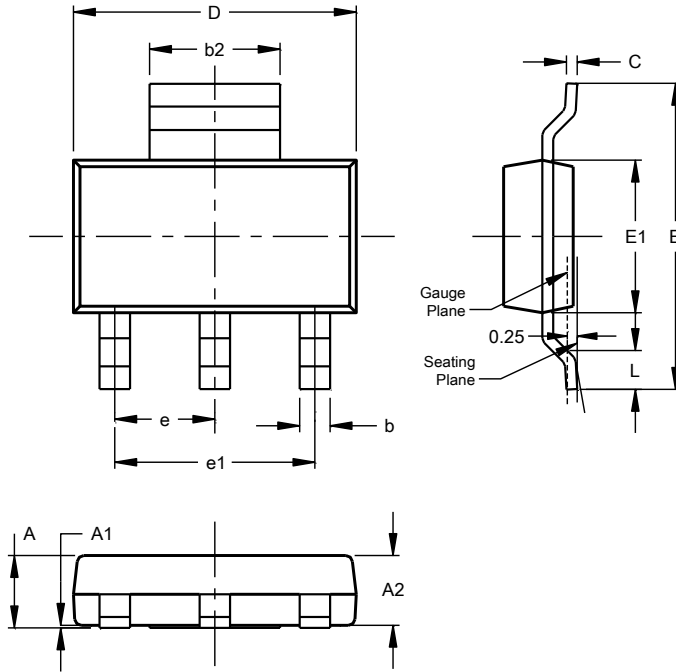
$V_{BE(sat)}$ v I_C



$V_{BE(on)}$ v I_C

Package Outline Dimensions

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

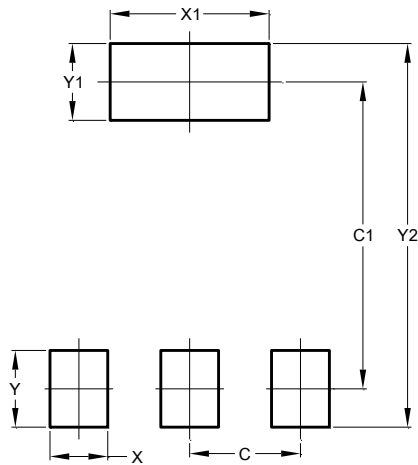


SOT223 (Type DN)			
Dim	Min	Max	Typ
A	--	1.70	--
A1	0.01	0.15	--
A2	1.50	1.68	1.60
b	0.60	0.80	0.70
b2	2.90	3.10	--
c	0.20	0.32	--
D	6.30	6.70	--
E	6.70	7.30	--
E1	3.30	3.70	--
e	--	--	2.30
e1	--	--	4.60
L	0.85	--	--
All Dimensions in mm			

Suggested Pad Layout

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

SOT223 (Type DN)



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

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