

25V PNP MEDIUM POWER TRANSISTOR IN SOT223
Features

- $BVCEO > -25V$
- $I_C = -3A$ high Continuous Current
- Low saturation voltage $V_{CE(sat)} < -250mV @ -1A$
- $R_{CE(sat)} = 93m\Omega$ for a low equivalent On-Resistance
- h_{FE} specified up to $-6A$ for a high gain hold up
- Complementary NPN Type: FZT689B
- **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)

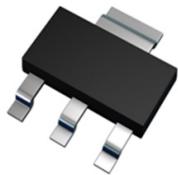
Mechanical Data

- 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)

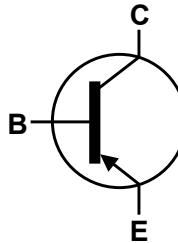
Applications

- Power MOSFET & IGBT gate driving
- Battery powered circuits
- Fast charge converters
- Low loss power switching

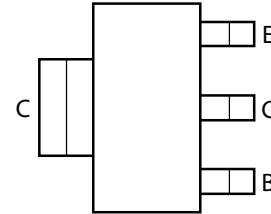
SOT223



Top View



Device Symbol

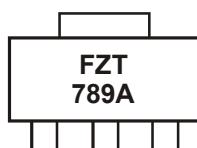

 Top View
 Pin-Out

Ordering Information (Notes 4 & 5)

Product	Compliance	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
FZT789ATA	AEC-Q101	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. See <http://www.diodes.com> 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.
5. For packaging details, go to our website at <http://www.diodes.com>

Marking Information


FZT789A = Product Type Marking

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	-30	V
Collector-Emitter Voltage	V_{CEO}	-25	V
Emitter-Base Voltage	V_{EBO}	-7	V
Continuous Collector Current	I_C	-3	A
Peak Pulse Current	I_{CM}	-6	A

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

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

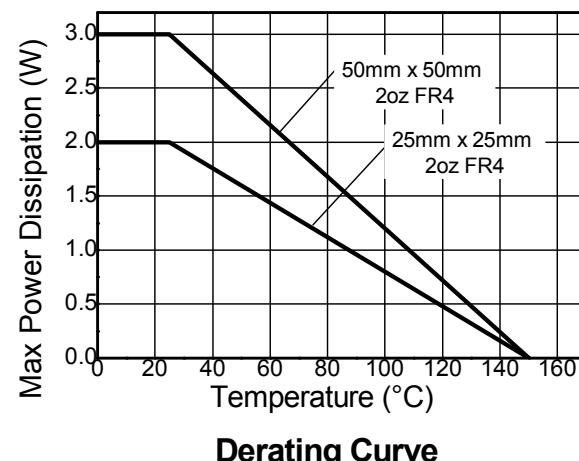
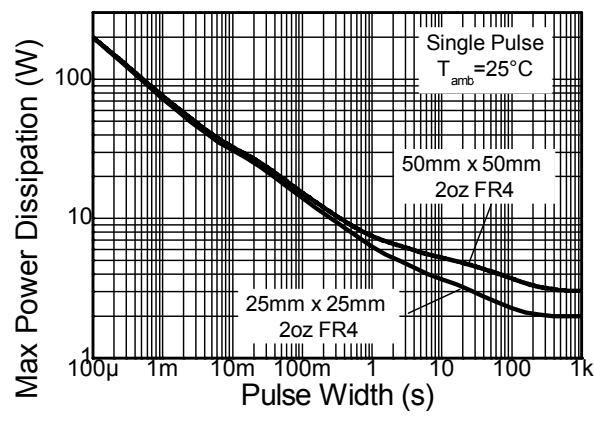
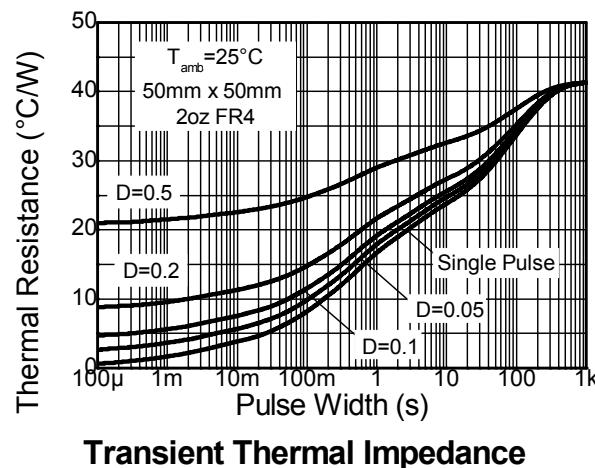
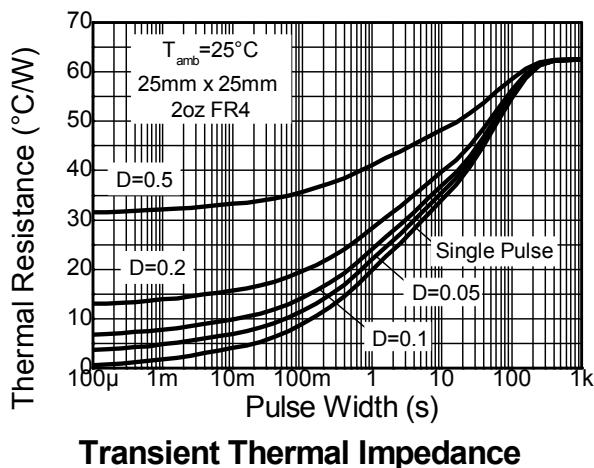
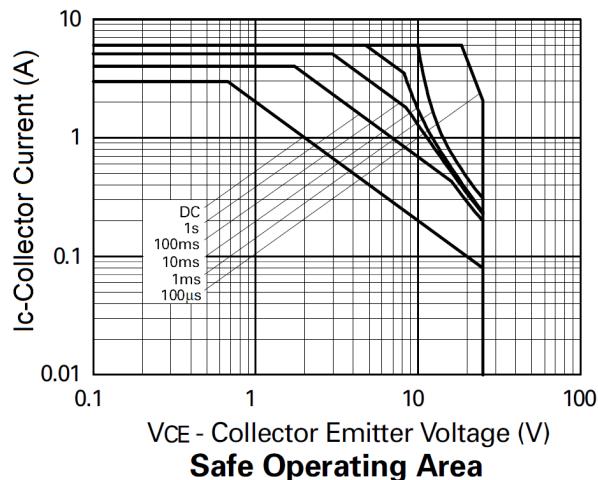
ESD Ratings (Note 9)

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 surface mounted on 25mm X 25mm FR4 PCB with high coverage of single sided 1 oz copper, in still air conditions; device measured when operating in steady state condition.
- 7. Same as note (6), except the device is mounted on 50mm X 50mm single sided 2oz weight 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.

Thermal Characteristics and Derating Information

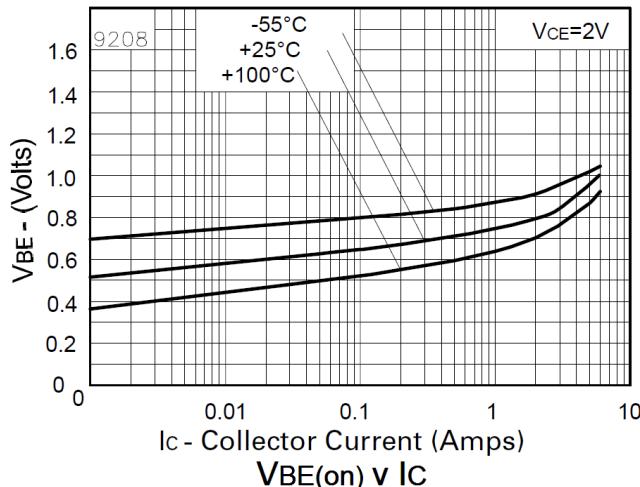
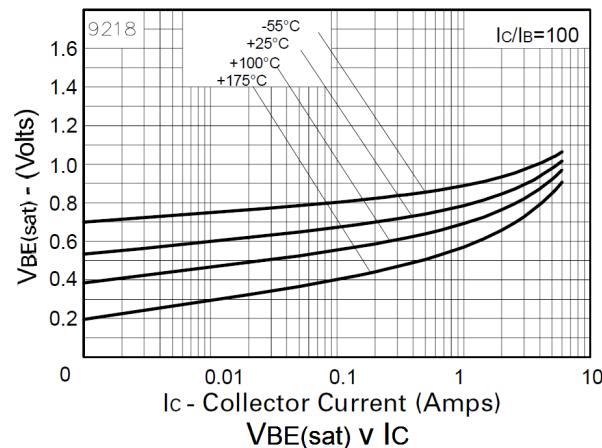
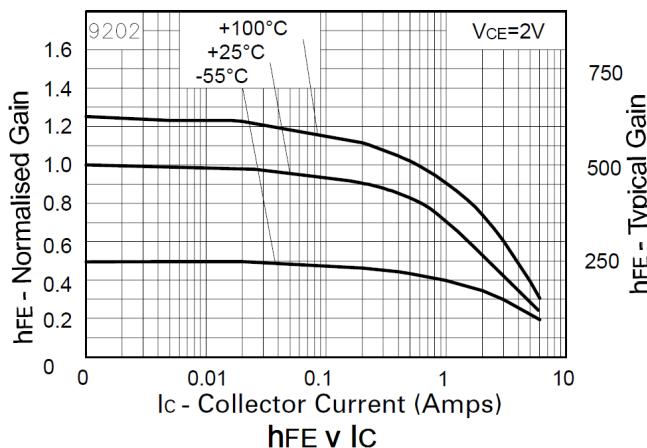
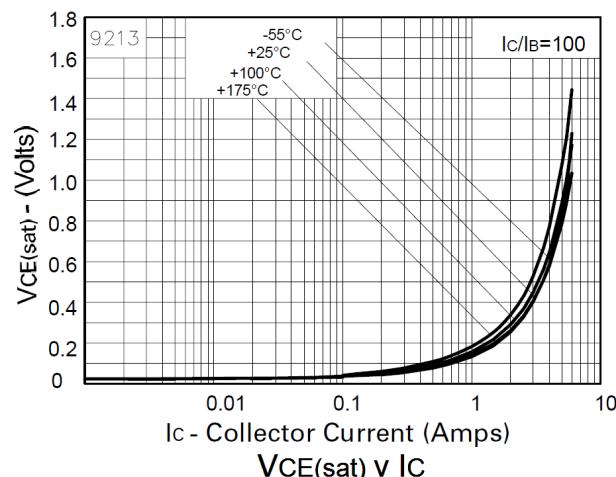
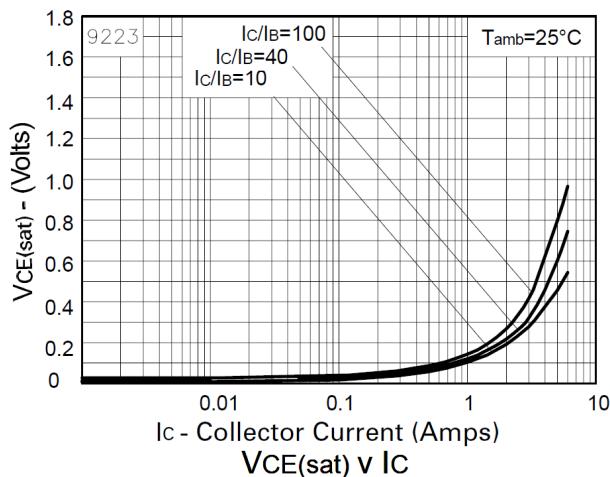


Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	-30	-40	—	V	$I_C = -100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Note 8)	BV_{CEO}	-25	-35	—	V	$I_C = -10\text{mA}$
Emitter-Base Breakdown Voltage	BV_{EBO}	-7	-8.5	—	V	$I_E = -100\mu\text{A}$
Collector Cut-off Current	I_{CBO}	—	<1	-100	nA	$V_{\text{CB}} = -15\text{V}$
		—	—	-10	μA	$V_{\text{CB}} = -15\text{V}, T_{\text{amb}} = 100^\circ\text{C}$
Collector Cut-off Current	I_{CES}	—	<1	-100	nA	$V_{\text{CE}} = -15\text{V}$
Emitter Cut-off Current	I_{EBO}	—	<1	-100	nA	$V_{\text{EB}} = -5.6\text{V}$
Collector-Emitter Saturation Voltage (Note 8)	$V_{\text{CE}(\text{sat})}$	—	-0.15	-0.25	V	$I_C = -1\text{A}, I_B = -10\text{mA}$
		—	-0.30	-0.45		$I_C = -2\text{A}, I_B = -20\text{mA}$
		—	-0.30	-0.50		$I_C = -3\text{A}, I_B = -100\text{mA}$
Base-Emitter Saturation Voltage (Note 8)	$V_{\text{BE}(\text{sat})}$	—	-0.80	-1.0	V	$I_C = -1\text{A}, I_B = -10\text{mA}$
Base-Emitter Turn-On Voltage (Note 8)	$V_{\text{BE}(\text{on})}$	—	-0.75	-1.1	V	$I_C = -1\text{A}, V_{\text{CE}} = -2\text{V}$
DC Current Gain (Note 8)	h_{FE}	300	—	800	—	$I_C = -10\text{mA}, V_{\text{CE}} = -2\text{V}$
		250	—	—		$I_C = -1\text{A}, V_{\text{CE}} = -2\text{V}$
		200	—	—		$I_C = -2\text{A}, V_{\text{CE}} = -2\text{V}$
		100	—	—		$I_C = -6\text{A}, V_{\text{CE}} = -2\text{V}$
Current Gain-Bandwidth Product (Note 8)	f_T	100	—	—	MHz	$V_{\text{CE}} = -5\text{V}, I_C = -50\text{mA}$ $f = 50\text{MHz}$
Turn-On Time	t_{on}	—	35	—	ns	$V_{\text{CC}} = -10\text{V}, I_C = -500\text{mA}$
Turn-Off Time	t_{off}	—	400	—	ns	$I_{\text{B1}} = I_{\text{B2}} = -50\text{mA}$
Input Capacitance (Note 8)	$C_{\text{ib}}_{\text{bo}}$	—	225	—	pF	$V_{\text{EB}} = -0.5\text{V}, f = 1\text{MHz}$
Output Capacitance (Note 8)	C_{obo}	—	25	—	pF	$V_{\text{CB}} = -10\text{V}, f = 1\text{MHz}$

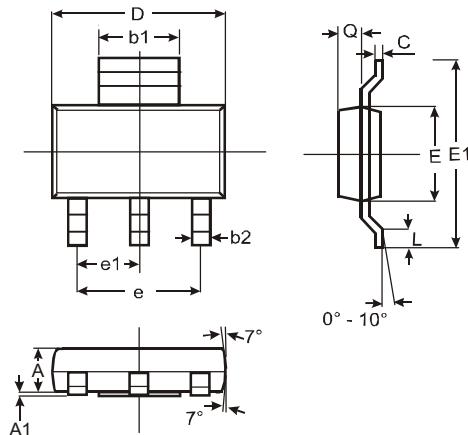
Notes: 8. Measured under pulsed conditions. Pulse width $\leq 300\mu\text{s}$. Duty cycle $\leq 2\%$

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



Package Outline Dimensions

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

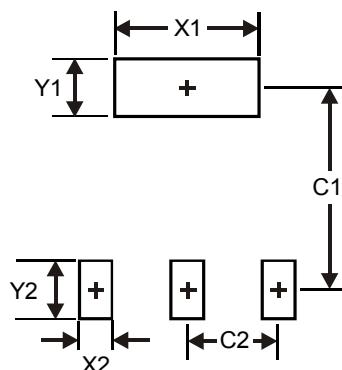


SOT223			
Dim	Min	Max	Typ
A	1.55	1.65	1.60
A1	0.010	0.15	0.05
b1	2.90	3.10	3.00
b2	0.60	0.80	0.70
C	0.20	0.30	0.25
D	6.45	6.55	6.50
E	3.45	3.55	3.50
E1	6.90	7.10	7.00
e	—	—	4.60
e1	—	—	2.30
L	0.85	1.05	0.95
Q	0.84	0.94	0.89

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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Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: info@moschip.ru

Skype отдела продаж:

moschip.ru
moschip.ru_4

moschip.ru_6
moschip.ru_9