

25V PNP MEDIUM POWER TRANSISTOR IN SOT223

Features

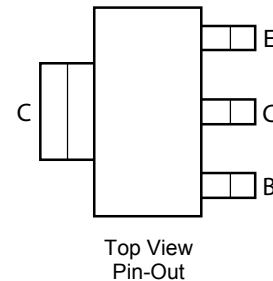
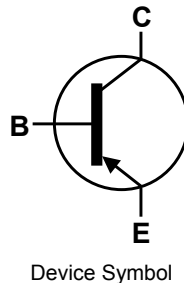
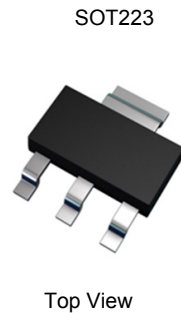
- $BV_{CEO} > -25V$
- $I_C = -3A$ high Continuous Current
- Low saturation voltage $V_{CE(sat)} < -250mV @ -1A$
- $R_{CE(sat)} = 93m\Omega$ for a low equivalent On-Resistance
- h_{FE} specified up to -6A for a high gain hold up
- Complementary NPN Type: FZT689B
- **Lead-Free Finish; RoHS compliant (Notes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

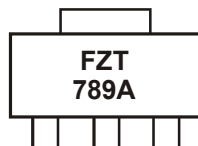


Ordering Information (Notes 4 & 5)

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.)

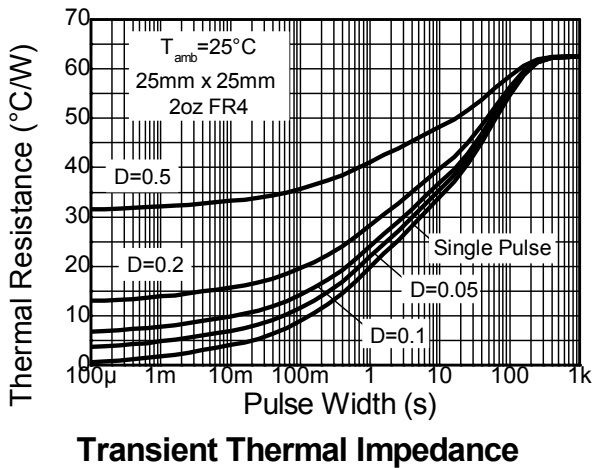
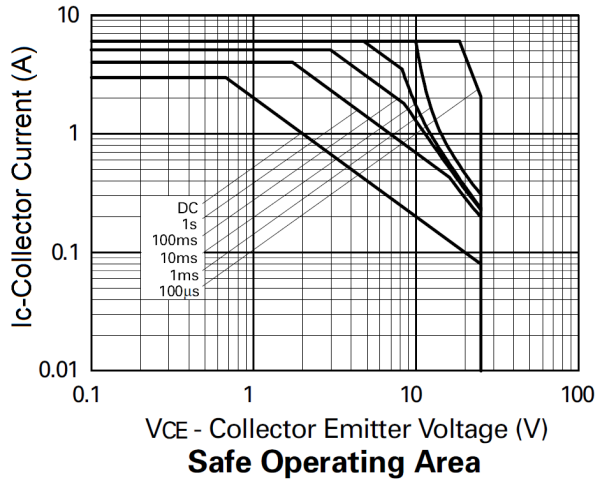
Characteristic	Symbol	Value	Unit
Power Dissipation	P_D	2	W
		3	W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	62.5	$^\circ\text{C/W}$
		41.7	$^\circ\text{C/W}$
Thermal Resistance, Junction to Leads	$R_{\theta JL}$	12.93	$^\circ\text{C/W}$
Operating and Storage Temperature Range	T_J, T_{STG}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

ESD Ratings (Note 9)

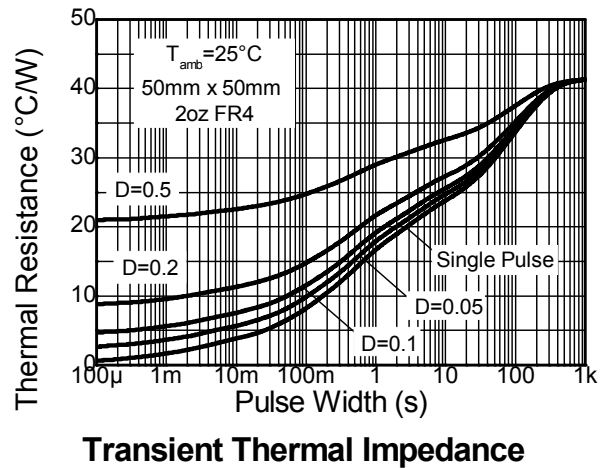
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	≥ 400	V	C

- 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.

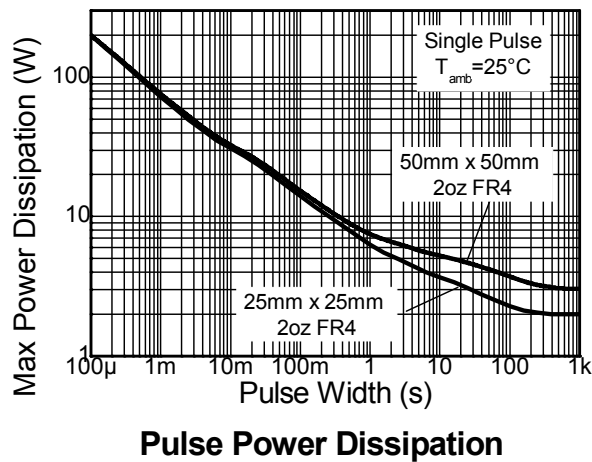
Thermal Characteristics and Derating Information



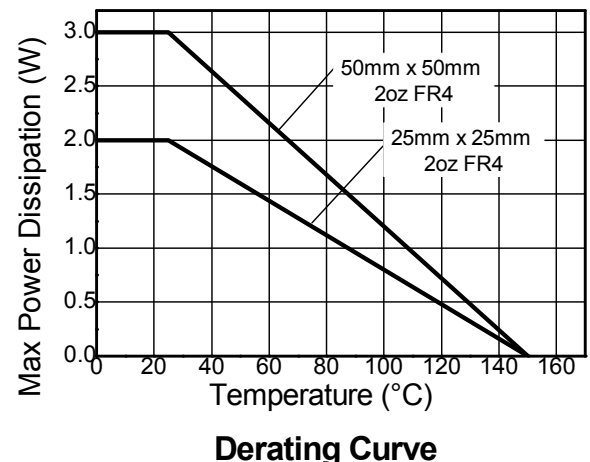
Transient Thermal Impedance



Transient Thermal Impedance



Pulse Power Dissipation



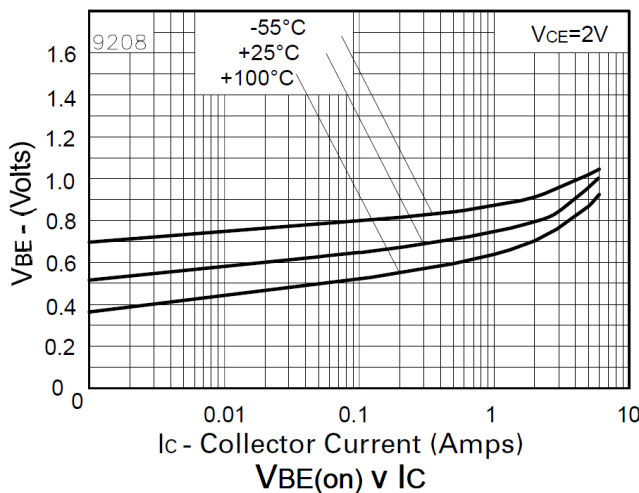
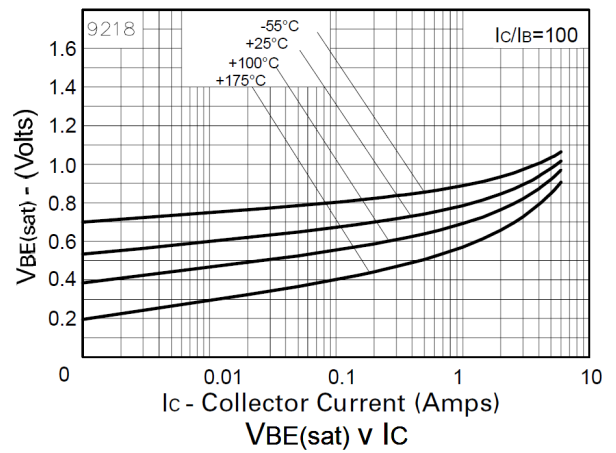
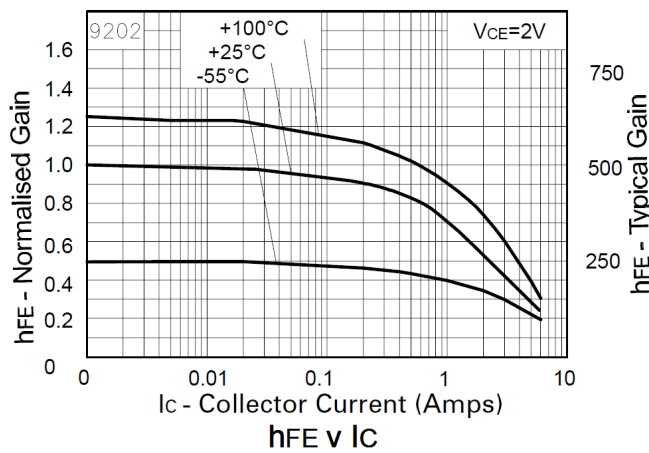
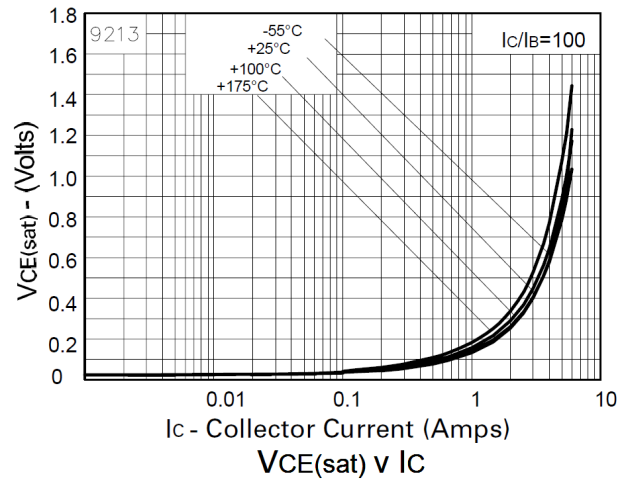
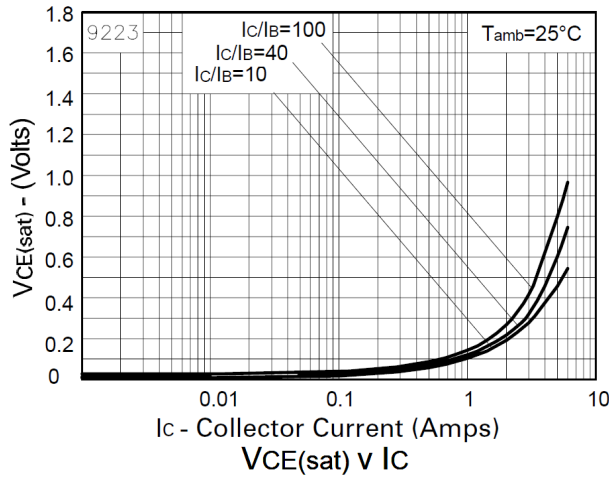
Derating Curve

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	$V_{CB} = -15\text{V}$
		-	-	-10	μA	$V_{CB} = -15\text{V}$, $T_{amb} = 100^\circ\text{C}$
Collector Cut-off Current	I_{CES}	-	<1	-100	nA	$V_{CE} = -15\text{V}$
Emitter Cut-off Current	I_{EBO}	-	<1	-100	nA	$V_{EB} = -5.6\text{V}$
Collector-Emitter Saturation Voltage (Note 8)	$V_{CE(sat)}$	-	-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)	$V_{BE(sat)}$	-	-0.80	-1.0	V	$I_C = -1\text{A}$, $I_B = -10\text{mA}$
Base-Emitter Turn-On Voltage (Note 8)	$V_{BE(on)}$	-	-0.75	-1.1	V	$I_C = -1\text{A}$, $V_{CE} = -2\text{V}$
DC Current Gain (Note 8)	h_{FE}	300	-	800	-	$I_C = -10\text{mA}$, $V_{CE} = -2\text{V}$
		250	-	-		$I_C = -1\text{A}$, $V_{CE} = -2\text{V}$
		200	-	-		$I_C = -2\text{A}$, $V_{CE} = -2\text{V}$
		100	-	-		$I_C = -6\text{A}$, $V_{CE} = -2\text{V}$
Current Gain-Bandwidth Product (Note 8)	f_T	100	-	-	MHz	$V_{CE} = -5\text{V}$, $I_C = -50\text{mA}$ $f = 50\text{MHz}$
Turn-On Time	t_{on}	-	35	-	ns	$V_{CC} = -10\text{V}$, $I_C = -500\text{mA}$
Turn-Off Time	t_{off}	-	400	-	ns	$I_{B1} = I_{B2} = -50\text{mA}$
Input Capacitance (Note 8)	C_{ibo}	-	225	-	pF	$V_{EB} = -0.5\text{V}$, $f = 1\text{MHz}$
Output Capacitance (Note 8)	C_{obo}	-	25	-	pF	$V_{CB} = -10\text{V}$, $f = 1\text{MHz}$

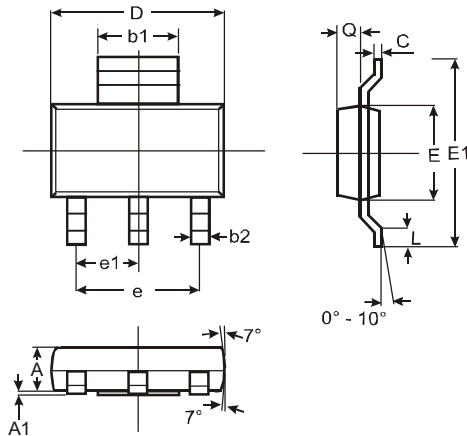
Notes: 8. Measured under pulsed conditions. Pulse width $\leq 300\mu\text{s}$. Duty cycle $\leq 2\%$

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



Package Outline Dimensions

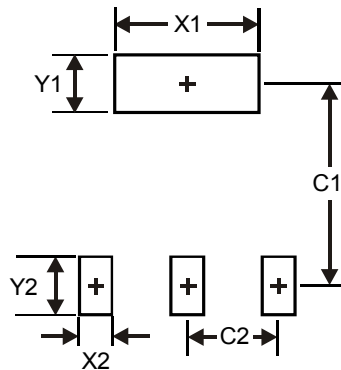
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



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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