

**100V NPN MEDIUM POWER TRANSISTOR IN SOT223**

**Features**

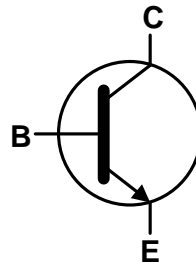
- $BV_{CEO} > 100V$
- $I_C = 1A$  High Continuous Current
- $I_{CM} = 2A$  Peak Pulse Current
- Low Saturation Voltage
- Complementary PNP Type: FZT593
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **PPAP Capable (Note 4)**

**Mechanical Data**

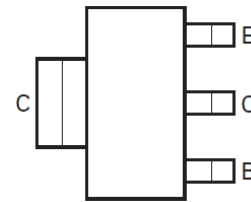
- Case: SOT223
- Case Material: Molded Plastic. "Green" Molding Compound; UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208@3
- Weight: 0.112 grams (Approximate)



Top View



Device Symbol



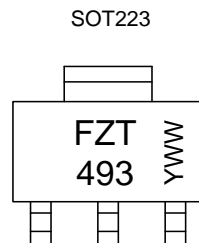
Top View  
Pin-Out

**Ordering Information** (Notes 4 & 5)

Product	Compliance	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
FZT493TA	AEC-Q101	FZT493	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/products/packages.html>.

**Marking Information**



FZT 493 = 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<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CBO</sub>	120	V
Collector-Emitter Voltage	V <sub>CEO</sub>	100	V
Emitter-Base Voltage	V <sub>EBO</sub>	7	V
Continuous Collector Current	I <sub>C</sub>	1	A
Base Current	I <sub>B</sub>	200	mA
Peak Pulse Current	I <sub>CM</sub>	2	A

**Thermal Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

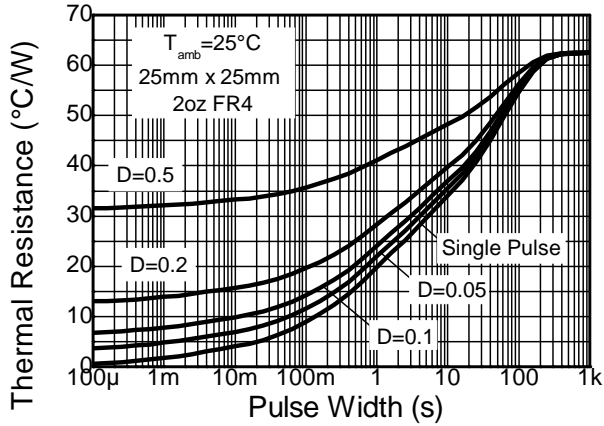
Characteristic	Symbol	Value	Unit
Power Dissipation	P <sub>D</sub>	(Note 6)	3.0
		(Note 7)	2.0
		(Note 8)	1.6
		(Note 9)	1.2
Thermal Resistance, Junction to Ambient	R <sub>θJA</sub>	(Note 6)	41.7
		(Note 7)	62.5
		(Note 8)	78.1
		(Note 9)	104
Thermal Resistance Junction to Lead	R <sub>θJL</sub>	19.4	
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

**ESD Ratings** (Note 11)

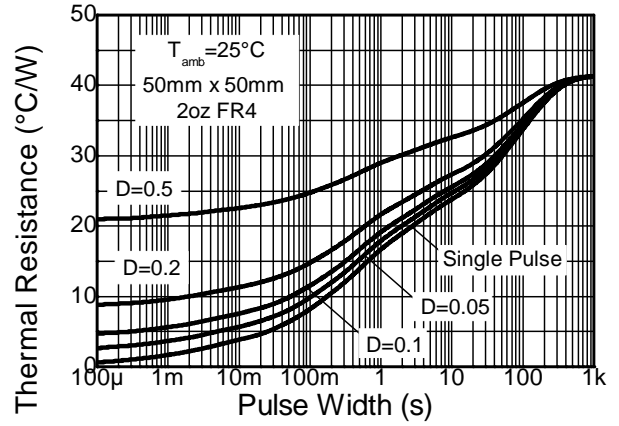
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

- 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.

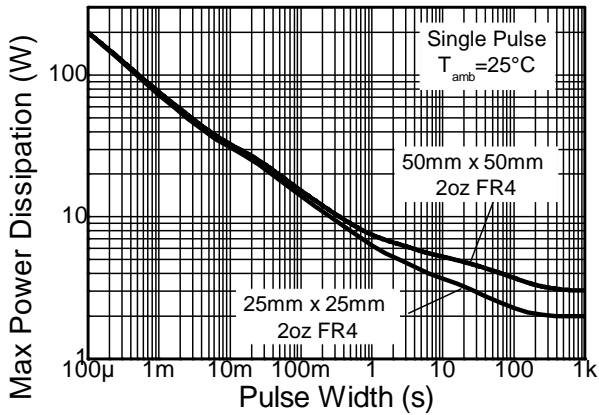
**Thermal Characteristics and Derating Characteristics**



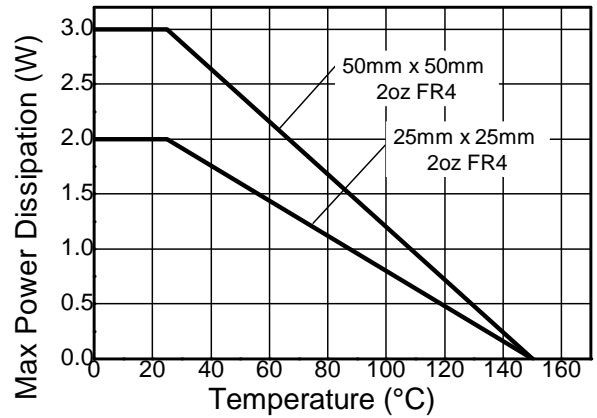
**Transient Thermal Impedance**



**Transient Thermal Impedance**



**Pulse Power Dissipation**



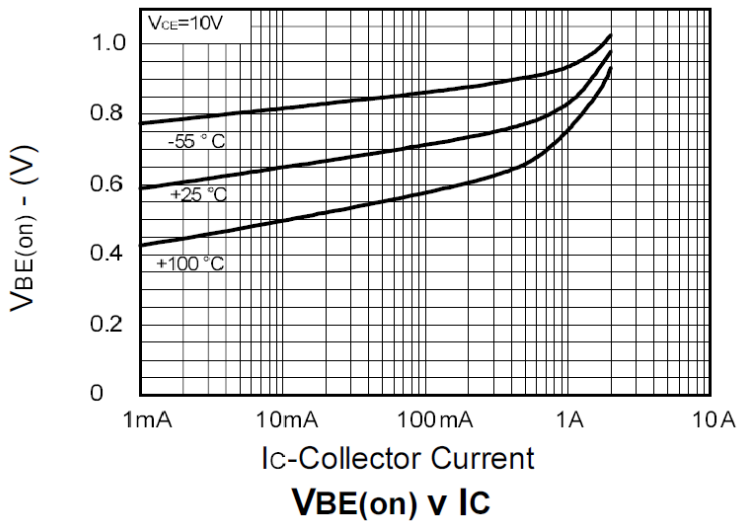
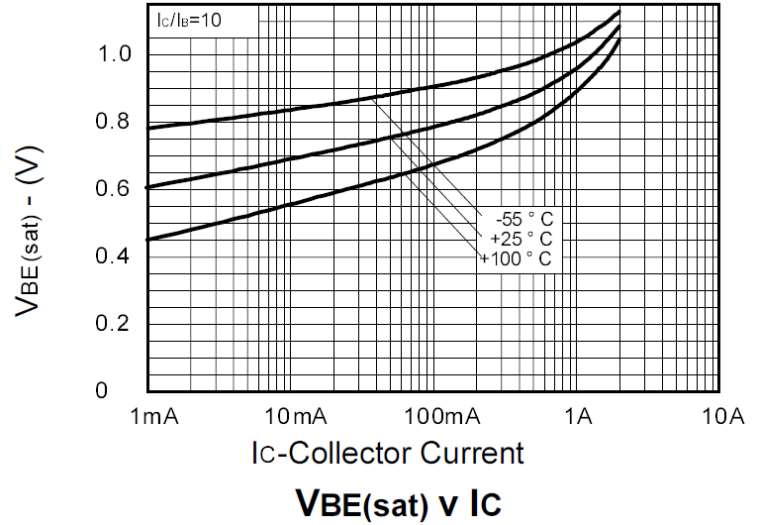
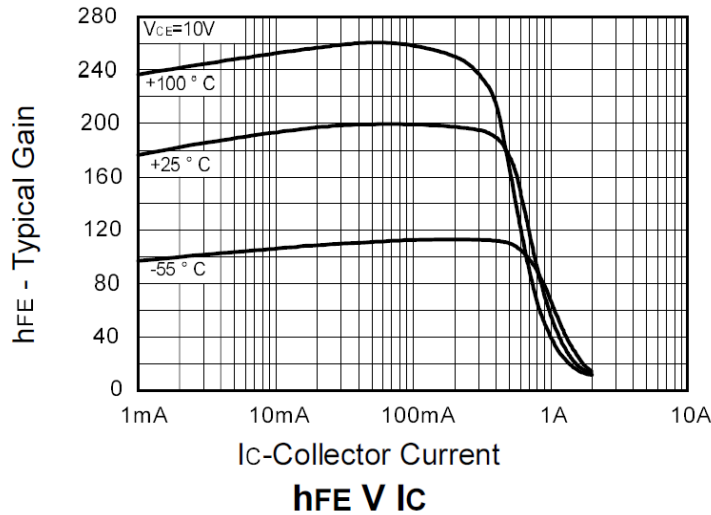
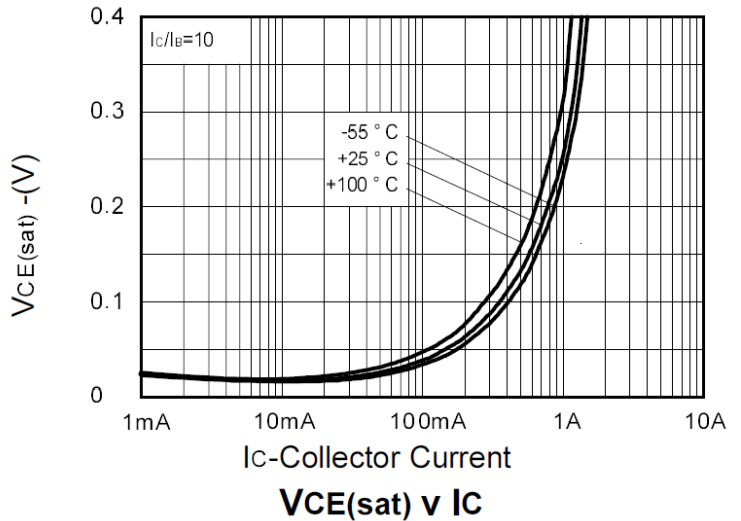
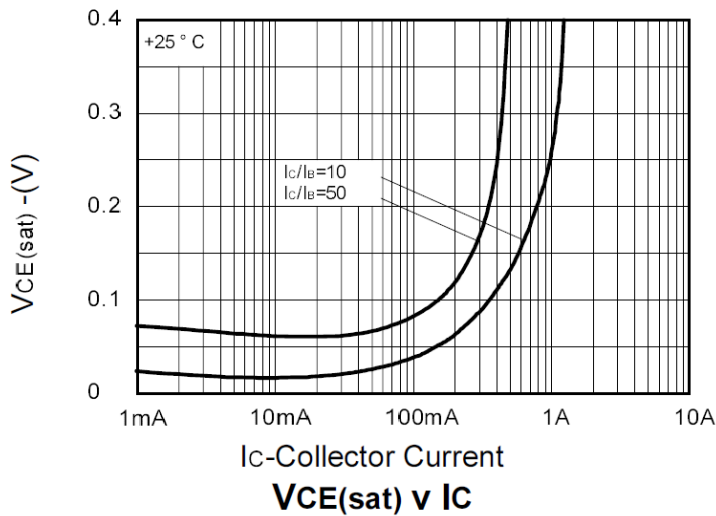
**Derating Curve**

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	$BV_{CBO}$	120	–	–	V	$I_C = 100\mu A$
Collector-Emitter Breakdown Voltage (Note 12)	$BV_{CEO}$	100	–	–	V	$I_C = 10mA$
Emitter-Base Breakdown Voltage	$BV_{EBO}$	5	–	–	V	$I_E = 100\mu A$
Collector Cut-Off Current	$I_{CBO}$	–	–	100	nA	$V_{CB} = 100V$
Collector Cut-Off Current	$I_{CES}$	–	–	100	nA	$V_{CE} = 100V$
Emitter Cut-Off Current	$I_{EBO}$	–	–	100	nA	$V_{EB} = 4V$
Collector-Emitter Saturation Voltage (Note 12)	$V_{CE(sat)}$	–	–	0.3 0.6	V	$I_C = 500mA, I_B = 50mA$ $I_C = 1A, I_B = 100mA$
Base-Emitter Saturation Voltage (Note 12)	$V_{BE(sat)}$	–	–	1.15	V	$I_C = 1A, I_B = 100mA$
Base-Emitter Turn-On Voltage (Note 12)	$V_{BE(on)}$	–	–	1.0	V	$I_C = 1A, V_{CE} = 10V$
DC Current Gain (Note 12)	$h_{FE}$	100 100 80 30	– – – –	– 300 – –	–	$I_C = 1mA, V_{CE} = 10V$ $I_C = 250mA, V_{CE} = 10V$ $I_C = 500mA, V_{CE} = 10V$ $I_C = 1A, V_{CE} = 10V$
Current Gain-Bandwidth Product	$f_T$	150	–	–	MHz	$V_{CE} = 10V, I_C = 50mA$ $f = 100MHz$
Output Capacitance	$C_{obo}$	–	–	10	pF	$V_{CB} = 10V, f = 1MHz$

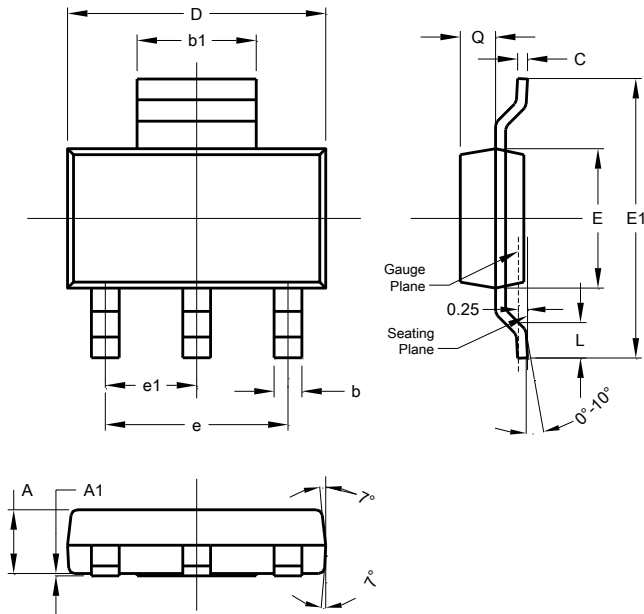
Note: 12. Measured under pulsed conditions. Pulse width  $\leq 300\mu s$ . Duty cycle  $\leq 2\%$ .

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



## Package Outline Dimensions

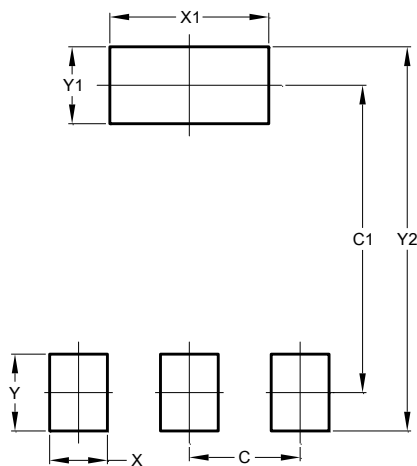
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



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
Y2	8.00

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