

60V NPN MEDIUM POWER HIGH GAIN TRANSISTOR IN SOT223

Features

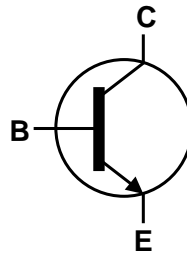
- $BV_{CEO} > 60V$
- $I_C = 1A$ High Continuous Collector Current
- $I_{CM} = 2A$ Peak Pulse Current
- High Gain Device > 500 at $I_C = 150mA$
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

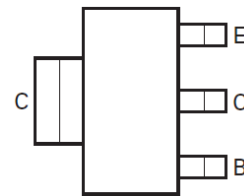
- Case: SOT223
- Case Material: Molded Plastic. "Green" Molding Compound; UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 (B3)
- Weight: 0.112 grams (Approximate)



Top View



Equivalent Circuit



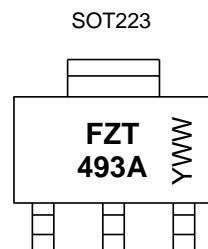
Top View
Pin-Out

Ordering Information (Note 4)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
FZT493ATA	FZT493A	7	12mm	1,000

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
 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



FZT 493A = Product Type Marking Code
 YWW = Date Code Marking
 Y or Y = Last Digit of Year (ex: 5= 2015)
 WW or WW = Week Code (01~53)

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V _{CBO}	120	V
Collector-Emitter Voltage	V _{CEO}	60	V
Emitter-Base Voltage	V _{EBO}	7	V
Continuous Collector Current	I _C	1	A
Peak Pulse Current	I _{CM}	2	A

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

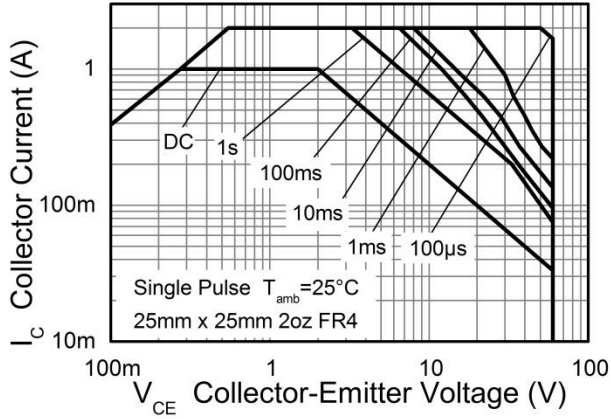
Characteristic	Symbol	Value	Unit
Power Dissipation	P _D	2	W
		3	W
Thermal Resistance, Junction to Ambient	R _{θJA}	62.5	°C/W
		41.7	°C/W
Thermal Resistance, Junction to Leads (Note 7)	R _{θJL}	39	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

ESD Ratings (Note 8)

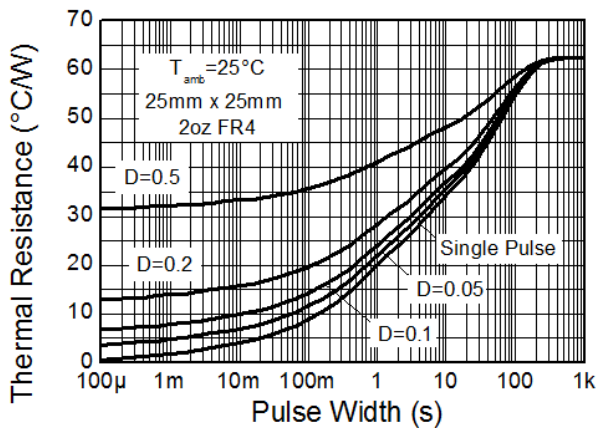
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

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

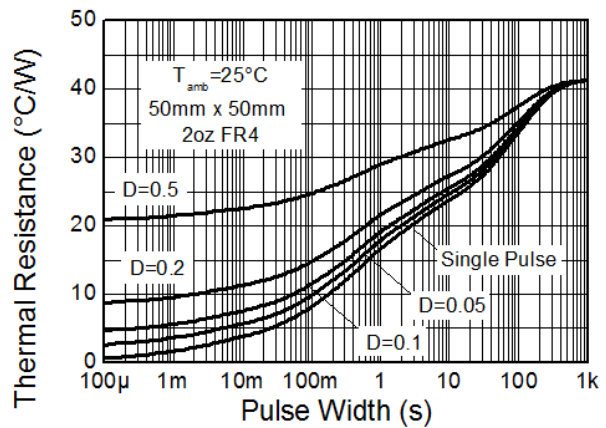
Thermal Characteristics and Derating Information



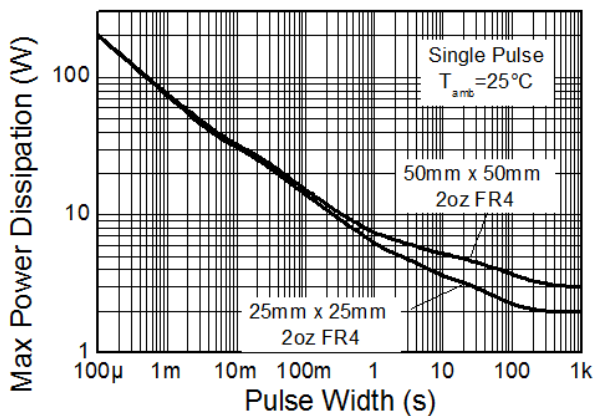
Safe Operating Area



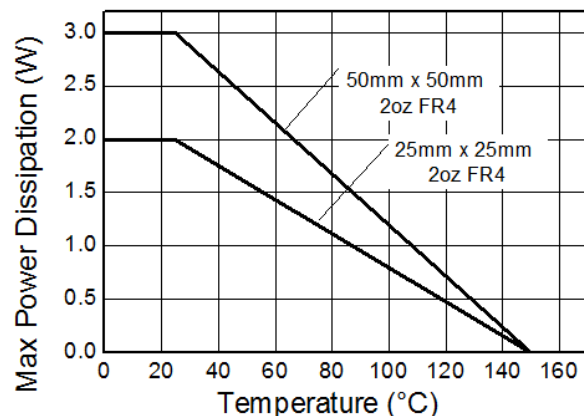
Transient Thermal Impedance



Transient Thermal Impedance



Pulse Power Dissipation



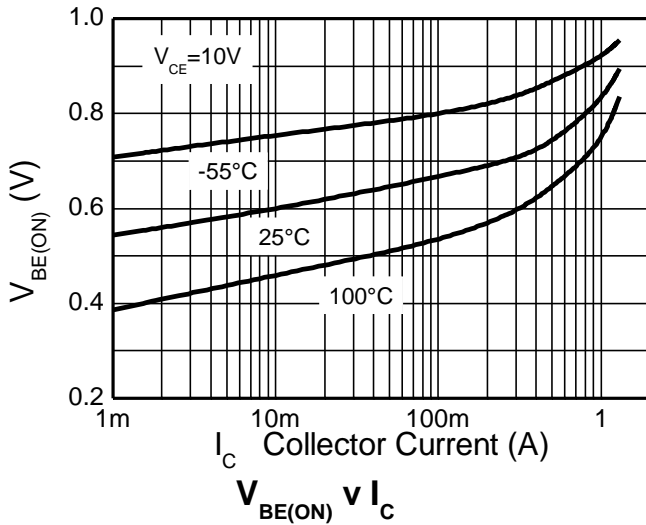
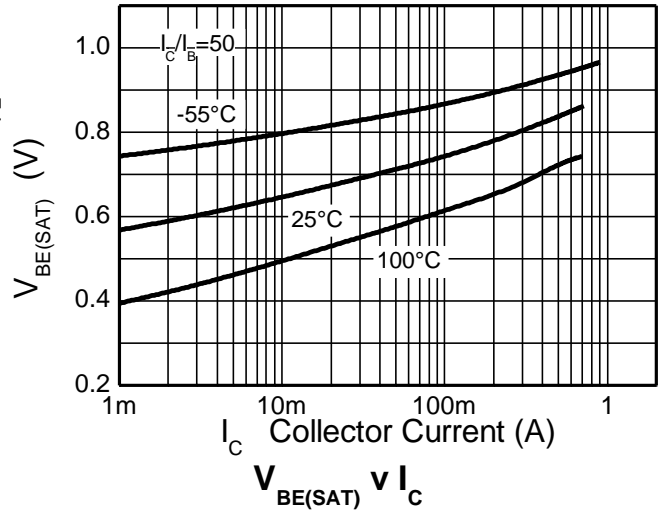
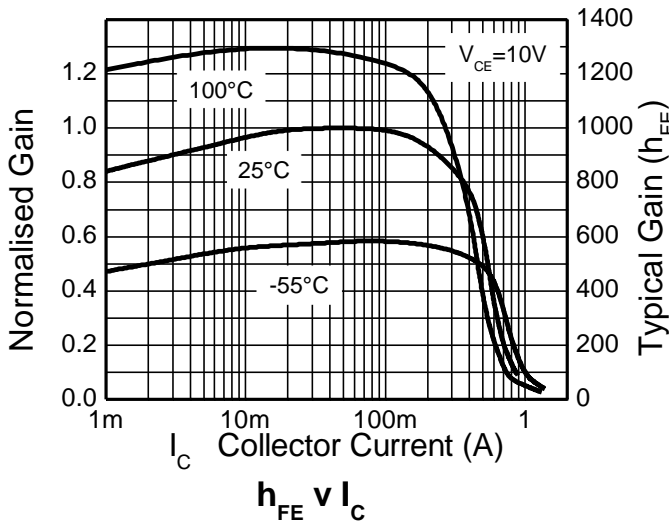
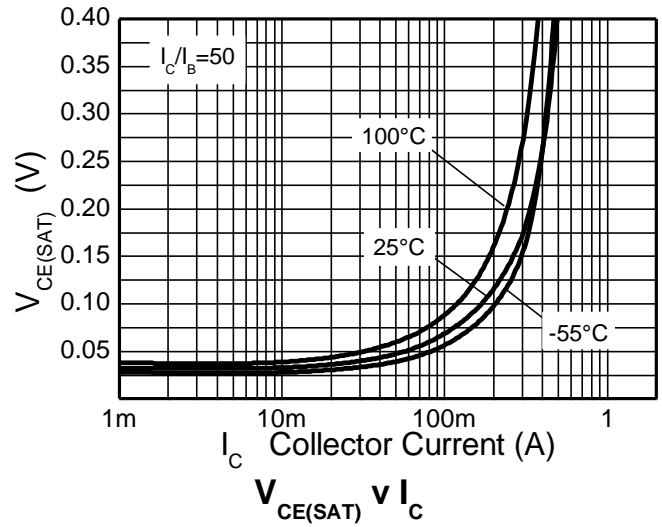
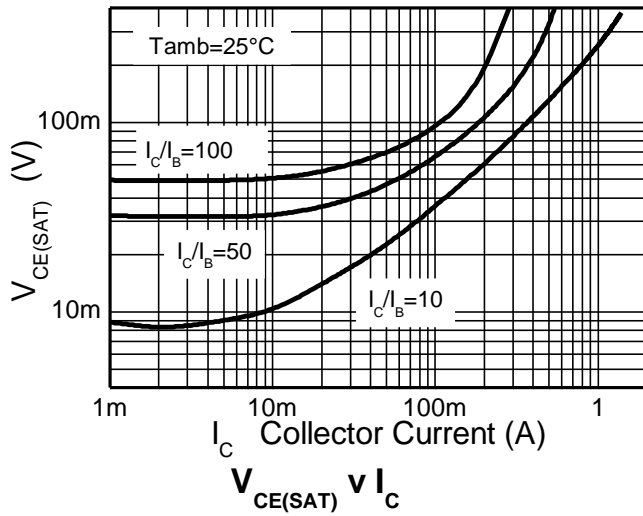
Derating Curve

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV _{CBO}	120	—	—	V	I _C = 100 μA
Collector-Emitter Breakdown Voltage (Note 9)	BV _{CEO}	60	—	—	V	I _C = 10mA
Emitter-Base Breakdown Voltage	BV _{EBO}	7	—	—	V	I _E = 100 μA
Collector-Base Cut-Off Current	I _{CBO}	—	—	100	nA	V _{CB} = 45V
Collector Cut-Off Current	I _{CES}	—	—	100	nA	V _{CES} = 45V
Emitter Cut-Off Current	I _{EBO}	—	—	100	nA	V _{EB} = 5V
Collector-Emitter Saturation Voltage (Note 9)	V _{CE(sat)}	—	—	250 500	mV	I _C = 500mA, I _B = 50mA I _C = 1A, I _B = 100mA
Base-Emitter Saturation Voltage (Note 9)	V _{BE(sat)}	—	—	1.15	V	I _C = 1A, I _B = 100mA
Base-Emitter Turn-On Voltage (Note 9)	V _{BE(on)}	—	—	1.0	V	I _C = 1A, V _{CE} = 10V
DC Current Gain (Note 9)	h _{FE}	300 500 300 100 20	—	1200	—	I _C = 1mA, V _{CE} = 10V I _C = 150mA, V _{CE} = 10V I _C = 250mA, V _{CE} = 10V I _C = 500mA, V _{CE} = 10V I _C = 1A, V _{CE} = 10V
Transitional Frequency	f _T	150	—	—	MHz	I _C = 50mA, V _{CE} = 10V f=100MHz
Output Capacitance	C _{obo}	—	10	—	pF	V _{CB} = 10V, f=1MHz

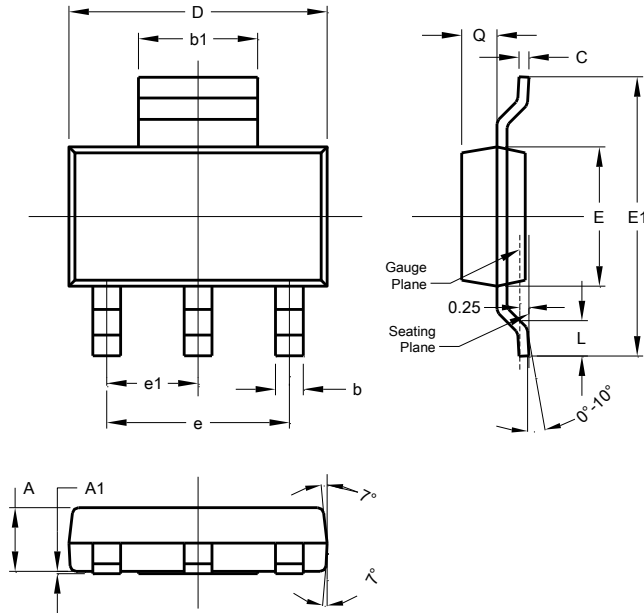
Note: 9. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

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



Package Outline Dimensions

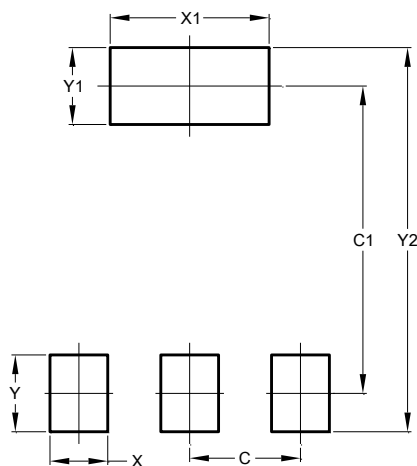
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



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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