

60V NPN MEDIUM POWER TRANSISTOR IN SOT223

Features

- $BV_{CE0} > 60V$
- $I_C = 1A$ high Continuous Current
- Low saturation voltage $V_{CE(sat)} < 500mV @ 1A$
- Complementary PNP Type: FZT591
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

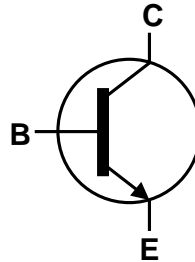
- Case: SOT223
- Case material: molded plastic. "Green" molding compound.
- UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208
- Weight: 0.112 grams (approximate)

Applications

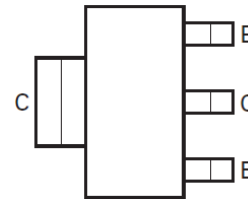
- Power MOSFET gate driving
- Low loss power switching



Top View



Device Symbol



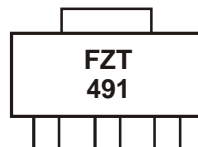
Top View
Pin-Out

Ordering Information (Notes 4)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
FZT491TA	FZT491	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. For packaging details, go to our website at <http://www.diodes.com>

Marking Information



FZT491 = Product Type Marking Code

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V _{CBO}	80	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
Base Current	I _B	200	mA

Thermal Characteristics

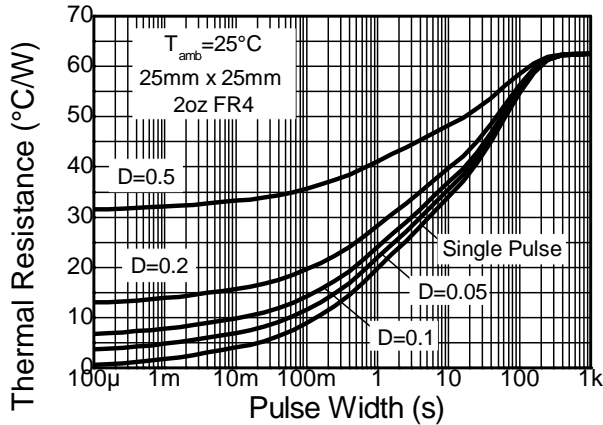
Characteristic	Symbol	Value	Unit
Power Dissipation	P _D	(Note 5) 2	W
		(Note 6) 3	W
Thermal Resistance, Junction to Ambient	R _{θJA}	(Note 5) 62.5	°C/W
		(Note 6) 41.7	°C/W
Thermal Resistance, Junction to Leads (Note 7)	R _{θJL}	19.41	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

ESD Ratings (Note 8)

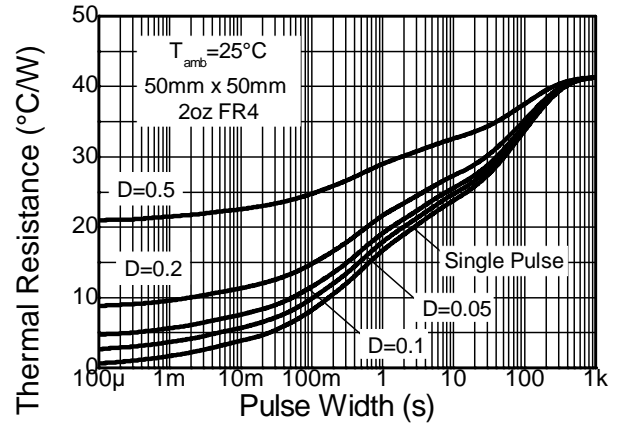
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	≥ 8,000	V	3B
Electrostatic Discharge - Machine Model	ESD MM	≥ 400	V	C

- Notes:
5. 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.
 6. Same as note (5), except the device is mounted on 50mm X 50mm single sided 2oz weight 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.

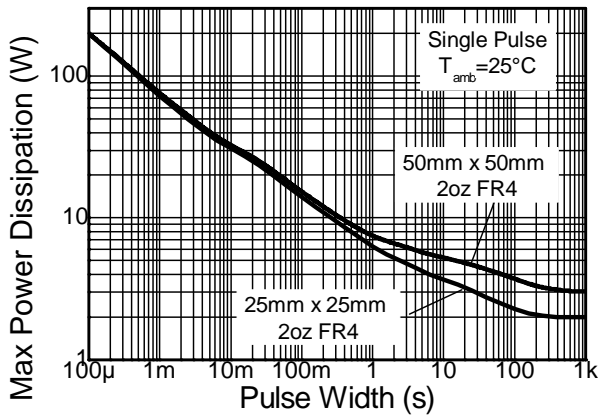
Thermal Characteristics and Derating Information



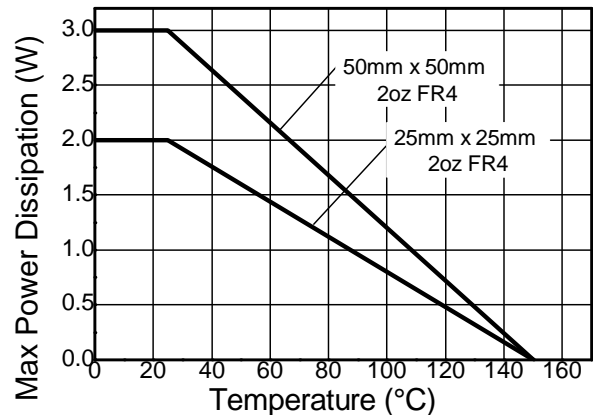
Transient Thermal Impedance



Transient Thermal Impedance



Pulse Power Dissipation



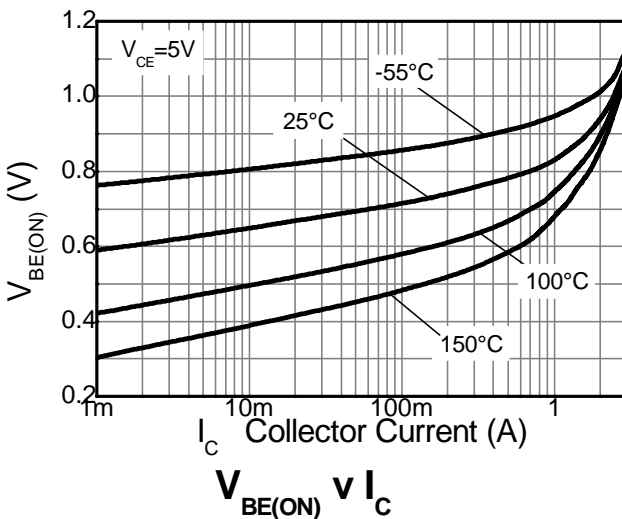
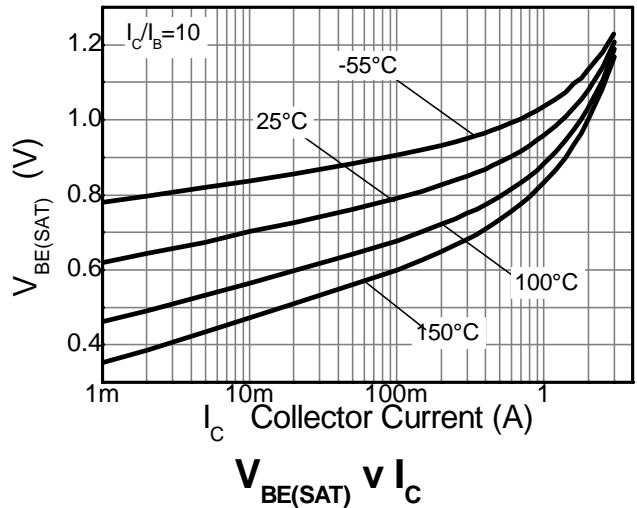
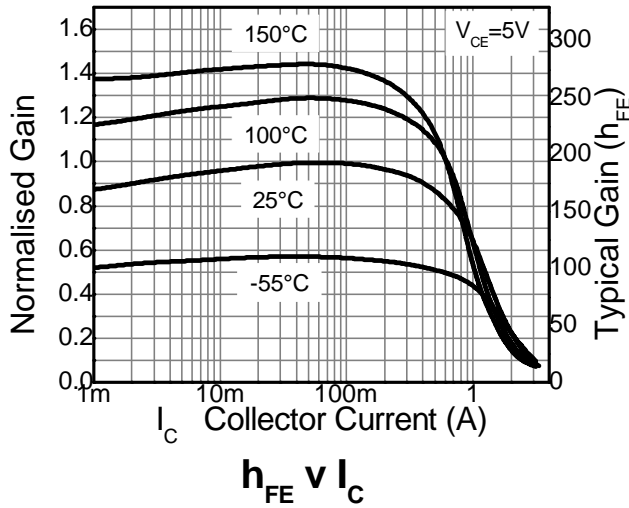
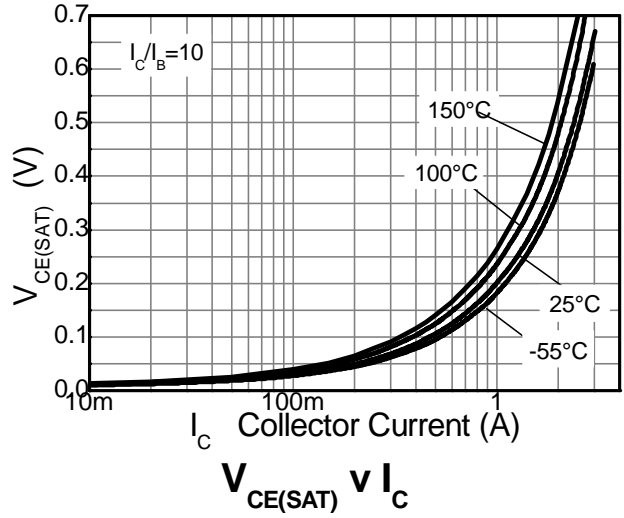
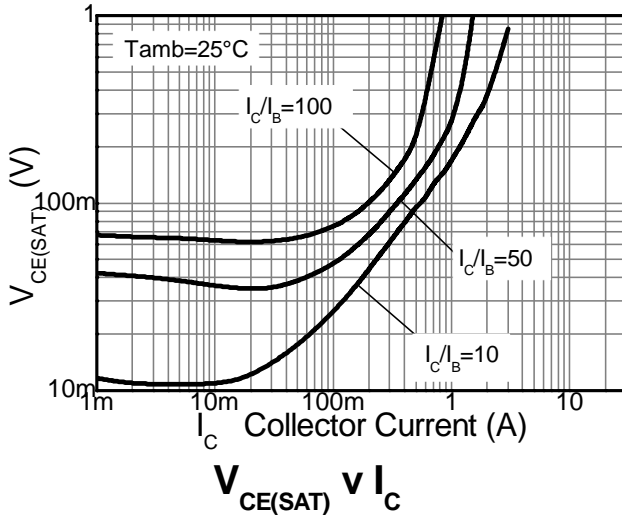
Derating Curve

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}	80	–	–	V	$I_C = 100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Note 9)	BV_{CEO}	60	–	–	V	$I_C = 10\text{mA}$
Emitter-Base Breakdown Voltage	BV_{EBO}	7	8.1	–	V	$I_E = 100\mu\text{A}$
Collector Cut-off Current	I_{CBO}	–	<1	100	nA	$V_{CB} = 60\text{V}$
Collector Cut-off Current	I_{CES}	–	<1	100	nA	$V_{CES} = 60\text{V}$
Emitter Cut-off Current	I_{EBO}	–	<1	100	nA	$V_{EB} = 5.6\text{V}$
Collector-Emitter Saturation Voltage (Note 9)	$V_{CE(sat)}$	–	100 160	250 500	mV	$I_C = 500\text{mA}, I_B = 50\text{mA}$ $I_C = 1\text{A}, I_B = 100\text{mA}$
DC Current Gain (Note 9)	h_{FE}	100 100 80 30	140 150 120 40	– 300 – –		$I_C = 1\text{mA}, V_{CE} = 5\text{V}$ $I_C = 500\text{mA}, V_{CE} = 5\text{V}$ $I_C = 1\text{A}, V_{CE} = 5\text{V}$ $I_C = 2\text{A}, V_{CE} = 5\text{V}$
Base-Emitter Turn-On Voltage (Note 9)	$V_{BE(on)}$	–	830	1000	mV	$I_C = 1\text{A}, V_{CE} = 5\text{V}$
Base-Emitter Saturation Voltage (Note 9)	$V_{BE(sat)}$	–	965	1100	mV	$I_C = 1\text{A}, I_B = 100\text{mA}$
Output Capacitance	C_{obo}	–	–	10	pF	$V_{CB} = 10\text{V}, f = 1\text{MHz}$
Current Gain-Bandwidth Product	f_T	150	–	–	MHz	$V_{CE} = 10\text{V}, I_C = 50\text{mA}$ $f = 100\text{MHz}$

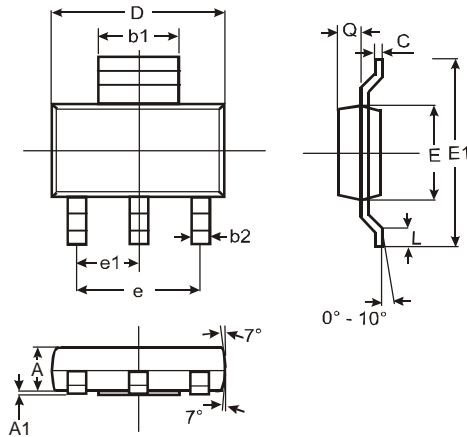
Notes: 9. Measured under pulsed conditions. Pulse width $\leq 300\mu\text{s}$. Duty cycle $\leq 2\%$

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



Package Outline Dimensions

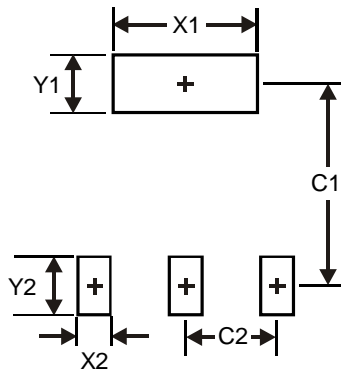
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



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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