

NPN SILICON PLANAR MEDIUM POWER TRANSISTOR IN SOT223

Features

- $BV_{CEO} > 40V$
- Max Continuous Current $I_C = 1A$
- Low saturation voltage $V_{CE(sat)} < 500mV @ 1A$
- Complementary PNP Type: FZT591A
- 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

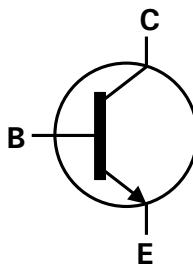
- Case: SOT223
- Case material: molded plastic. "Green" molding compound.
- UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 (3)
- Weight: 0.112 grams (approximate)

Applications

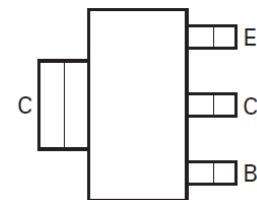
- Power MOSFET gate driving
- Low loss power switching



Top View



Device Symbol


Top View
Pin-Out

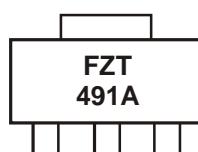
Ordering Information (Notes 4 & 5)

Product	Compliance	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
FZT491ATA	AEC-Q101	FZT491A	7	12	1,000
FZT491AQTA	Automotive	FZT491A	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



FZT491A = Product Type Marking Code

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V _{CBO}	40	V
Collector-Emitter Voltage	V _{CEO}	40	V
Emitter-Base Voltage	V _{EBO}	7	V
Continuous Collector Current	I _C	1	A
Base Current	I _B	200	mA
Peak Pulse Current	I _{CM}	2	A

Thermal Characteristics

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 8)	R _{θJL}	19.41	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

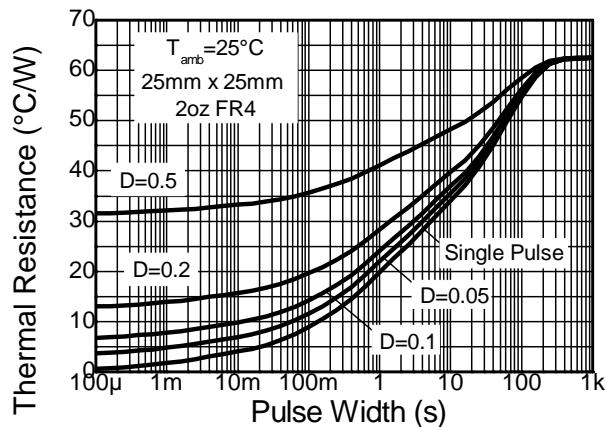
ESD Ratings (Note 9)

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

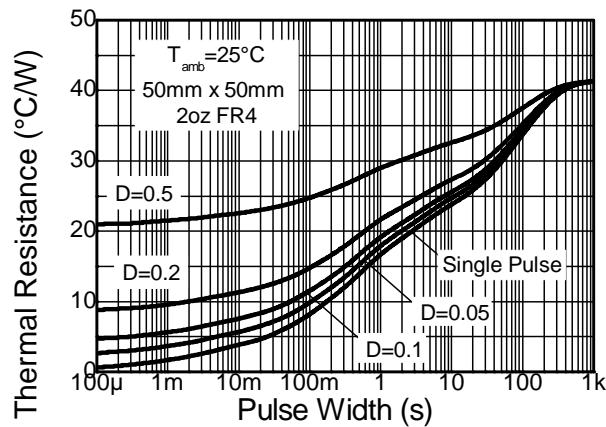
Notes:

- 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.

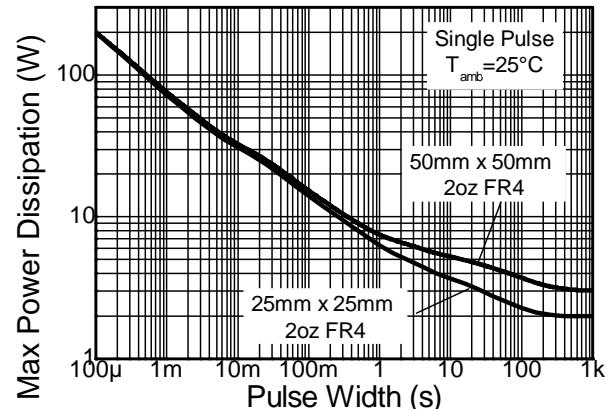
Thermal Characteristics and Derating Information



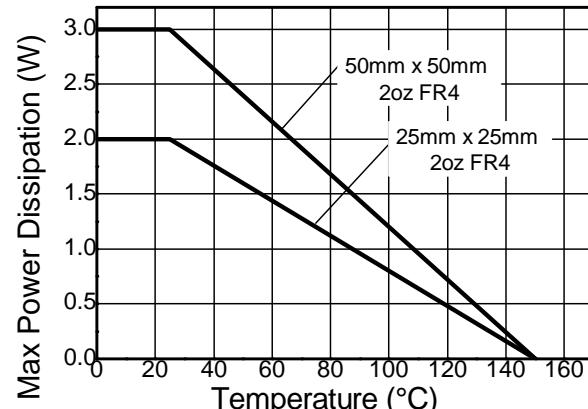
Transient Thermal Impedance



Transient Thermal Impedance



Pulse Power Dissipation



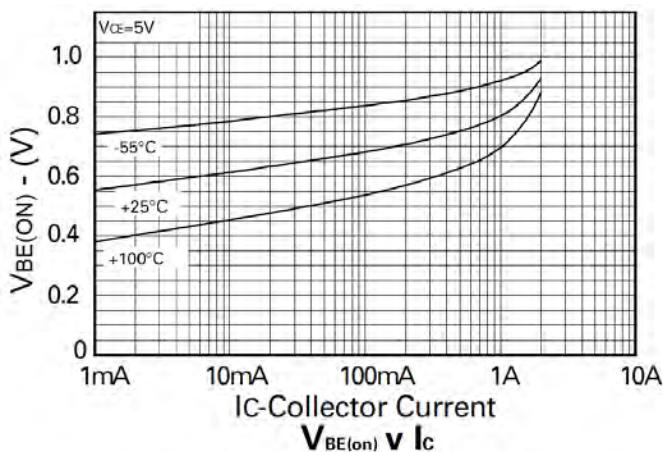
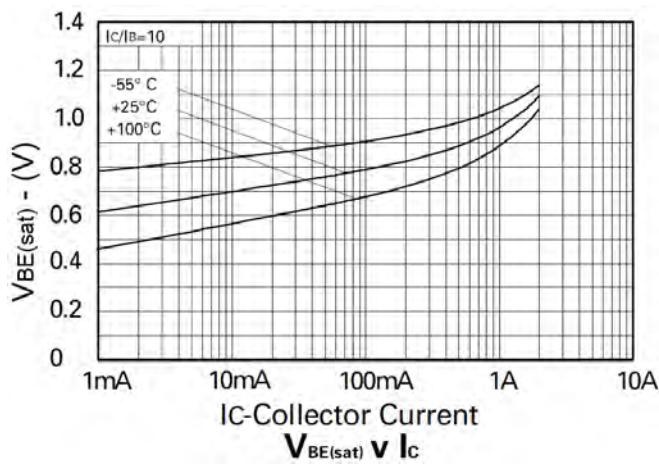
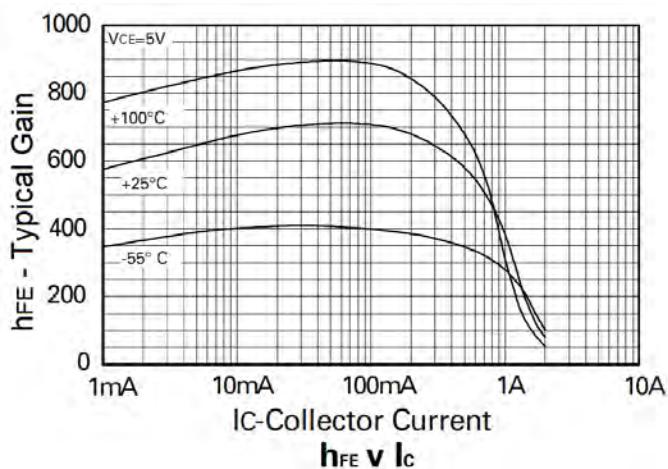
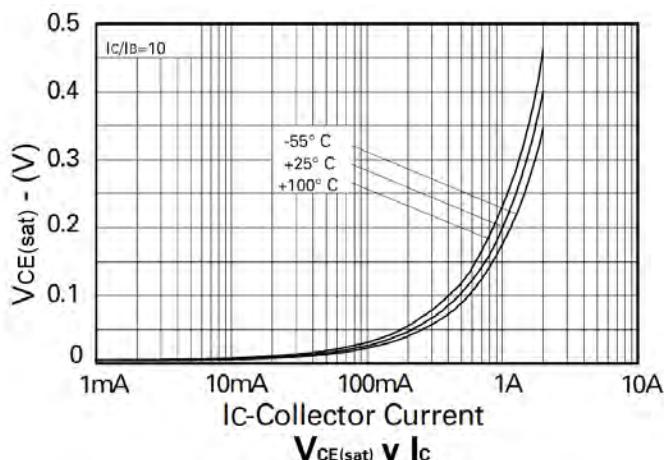
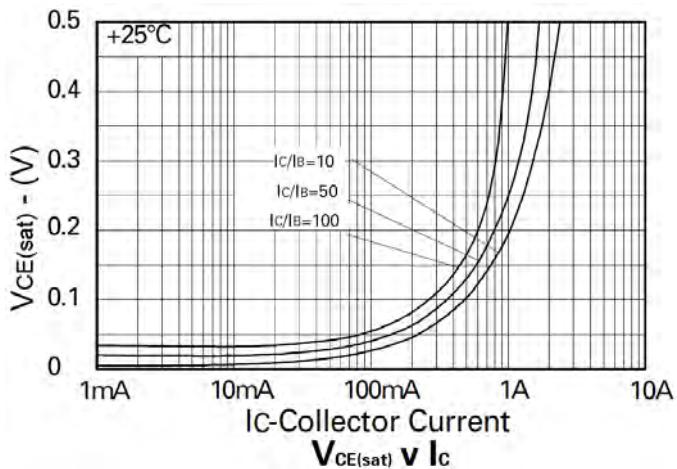
Derating Curve

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}	40	—	—	V	$I_C = 100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Note 10)	BV_{CEO}	40	—	—	V	$I_C = 10\text{mA}$
Emitter-Base Breakdown Voltage	BV_{EBO}	7	—	—	V	$I_E = 100\mu\text{A}$
Collector Cut-off Current	I_{CBO}	—	—	100	nA	$V_{\text{CB}} = 30\text{V}$
Collector Cut-off Current	I_{CES}	—	—	100	nA	$V_{\text{CES}} = 30\text{V}$
Emitter Cut-off Current	I_{EBO}	—	—	100	nA	$V_{\text{EB}} = 4\text{V}$
Collector-Emitter Saturation Voltage (Note 10)	$V_{\text{CE}(\text{sat})}$	—	—	0.3 0.5	V	$I_C = 500\text{mA}, I_B = 50\text{mA}$ $I_C = 1\text{A}, I_B = 100\text{mA}$
Base-Emitter Saturation Voltage (Note 10)	$V_{\text{BE}(\text{sat})}$	—	—	1.1	V	$I_C = 1\text{A}, I_B = 100\text{mA}$
Base-Emitter Turn-On Voltage (Note 10)	$V_{\text{BE}(\text{on})}$	—	—	1.0	V	$I_C = 1\text{A}, V_{\text{CE}} = 5\text{V}$
DC Current Gain (Note 10)	h_{FE}	300 300 200 35	— — — —	900 — — —		$I_C = 1\text{mA}, V_{\text{CE}} = 5\text{V}$ $I_C = 500\text{mA}, V_{\text{CE}} = 5\text{V}$ $I_C = 1\text{A}, V_{\text{CE}} = 5\text{V}$ $I_C = 2\text{A}, V_{\text{CE}} = 5\text{V}$
Current Gain-Bandwidth Product (Note 10)	f_T	150	—	—	MHz	$V_{\text{CE}} = 10\text{V}, I_C = 50\text{mA}$ $f = 100\text{MHz}$
Output Capacitance (Note 10)	C_{obo}	—	—	10	pF	$V_{\text{CB}} = 10\text{V}, f = 1\text{MHz}$

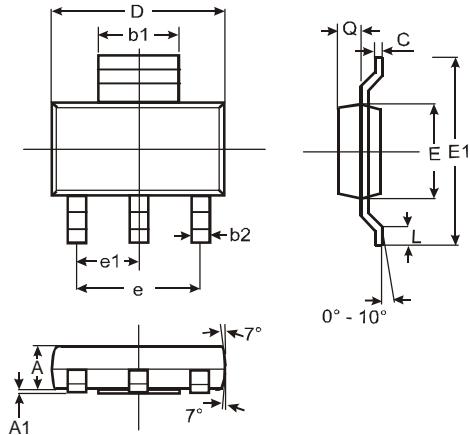
Notes: 10. Measured under pulsed conditions. Pulse width $\leq 300\mu\text{s}$. Duty cycle $\leq 2\%$

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.

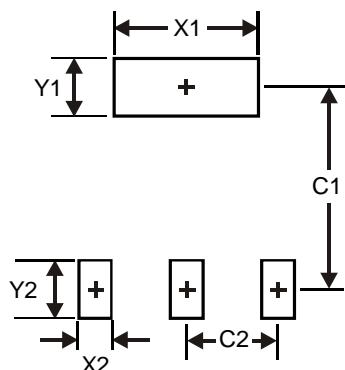


SOT223			
Dim	Min	Max	Typ
A	1.55	1.65	1.60
A1	0.010	0.15	0.05
b1	2.90	3.10	3.00
b2	0.60	0.80	0.70
C	0.20	0.30	0.25
D	6.45	6.55	6.50
E	3.45	3.55	3.50
E1	6.90	7.10	7.00
e	—	—	4.60
e1	—	—	2.30
L	0.85	1.05	0.95
Q	0.84	0.94	0.89

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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