40V PNP MEDIUM POWER TRANSISTOR IN SOT223

Features

- BV_{CEO} > -40V
- I_C = -1A High Continuous Current
- Low Saturation Voltage $V_{CE(SAT)}$ < -500mV @ -1A
- Complementary NPN Type: FZT491A
- **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

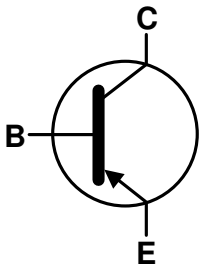
- Case: SOT223
- Case Material: Molded Plastic. "Green" Molding Compound; UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Plated Leads; Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.112 grams (Approximate)

Applications

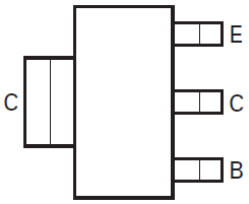
- Power MOSFET & IGBT Gate Driving
- Low Loss Power Switching

SOT223 (Type DN)

Top View



Device Symbol



Top View
Pin-Out

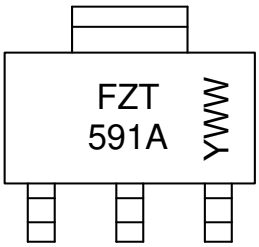
Ordering Information (Notes 4 & 5)

Part Number	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
FZT591ATA	AEC-Q101	FZT591A	7	12	1,000
FZT591AQTA	Automotive	FZT591A	7	12	1,000

Notes:
1. EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied.
2. See https://www.diodes.com/quality/lead-free/ 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. For more information, please refer to https://www.diodes.com/quality/.
5. For packaging details, go to our website at https://www.diodes.com/design/support/packaging/diodes-packaging/.

Marking Information

SOT223 (Type DN)



FZT 591A = Product Type Marking Code
YWW = Date Code Marking
Y or $\overline{Y}$ = Last Digit of Year (ex: 9 = 2019)
WW or $\overline{WW}$ = Week Code (01 to 53)

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

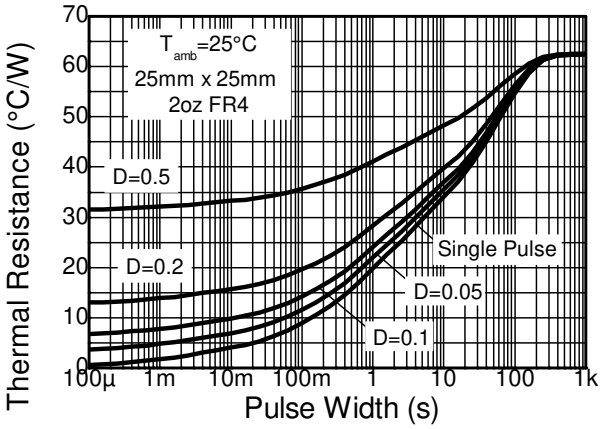
Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 6)	P_D	2	W
	(Note 7)		3	W
Thermal Resistance, Junction to Ambient	(Note 6)	$R_{\theta JA}$	62.5	°C/W
	(Note 7)		41.7	°C/W
Thermal Resistance, Junction to Leads (Note 8)		$R_{\theta JL}$	19.4	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

ESD Ratings (Note 9)

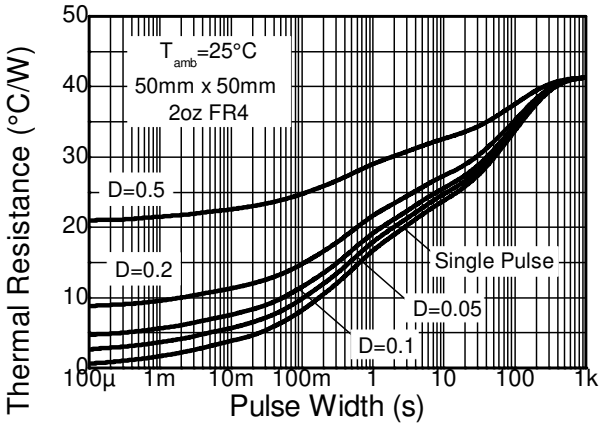
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	8,000	V	3B
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

Notes:
6. For a device 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 a steady-state.
7. Same as Note 6, except mounted on 50mm x 50mm 2oz 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.

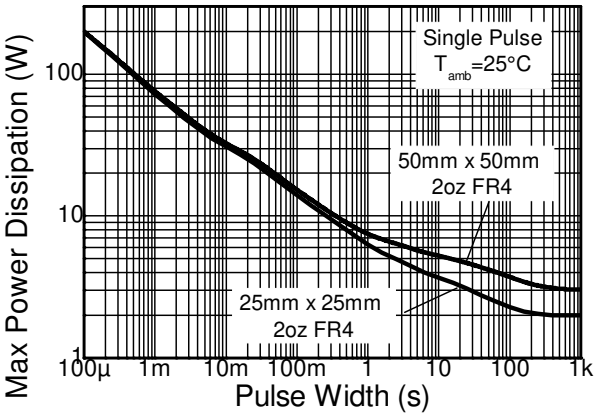
Thermal Characteristics and Derating Information



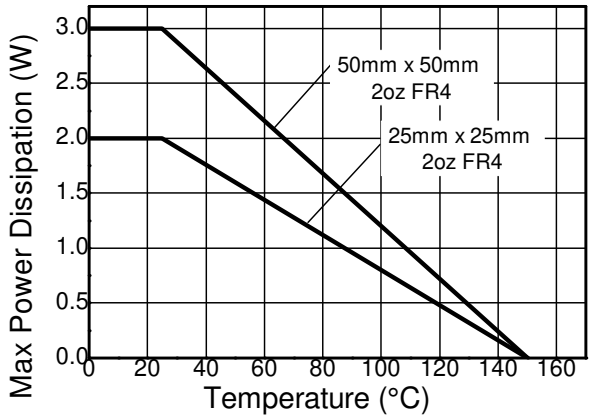
Transient Thermal Impedance



Transient Thermal Impedance



Pulse Power Dissipation



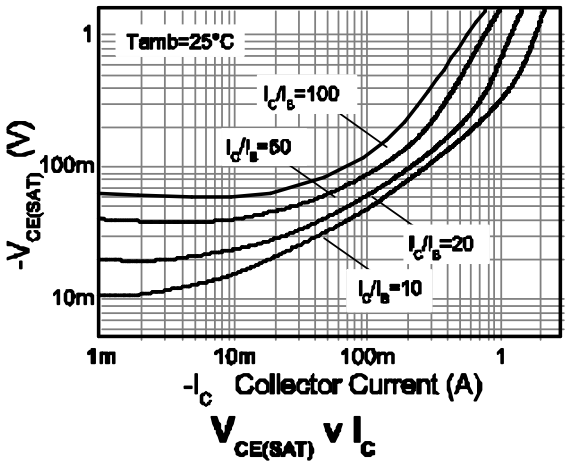
Derating Curve

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

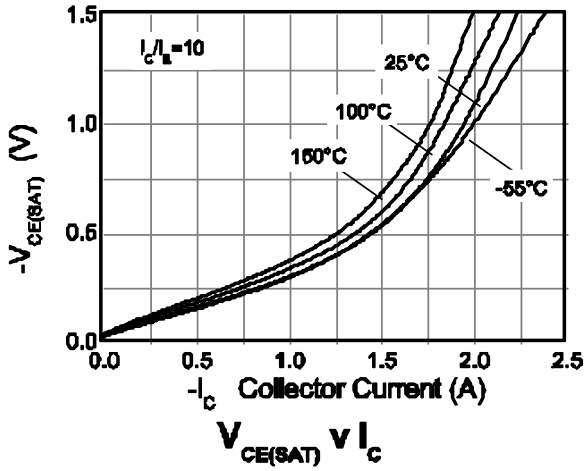
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	-40	–	–	V	I_C = -100µA
Collector-Emitter Breakdown Voltage (Note 10)	BV_{CEO}	-40	–	–	V	I_C = -10mA
Emitter-Base Breakdown Voltage	BV_{EBO}	-7	–	–	V	I_E = -100µA
Collector Cut-Off Current	I_{CBO}	–	–	-100	nA	V_{CB} = -30V
Collector Cut-Off Current	I_{CES}	–	–	-100	nA	V_{CES} = -30V
Emitter Cut-Off Current	I_{EBO}	–	–	-100	nA	V_{EB} = -4V
Collector-Emitter Saturation Voltage (Note 10)	$V_{CE(SAT)}$	– –	– –	-0.2 -0.35 -0.5	V	I_C = -100mA, I_B = -1mA I_C = -500mA, I_B = -20mA I_C = -1A, I_B = -100mA
Base-Emitter Saturation Voltage (Note 10)	$V_{BE(SAT)}$	–	–	-1.1	V	I_C = -1A, I_B = -50mA
Base-Emitter Turn-On Voltage (Note 10)	$V_{BE(ON)}$	–	–	-1.0	V	I_C = -1A, V_{CE} = -5V
DC Current Transfer Static Ratio (Note 10)	h_{FE}	300 300 250 160 30	– – – – –	– 800 – – –	–	I_C = -1mA, V_{CE} = -5V I_C = -100mA, V_{CE} = -5V I_C = -500mA, V_{CE} = -5V I_C = -1A, V_{CE} = -5V I_C = -2A, V_{CE} = -5V
Transitional Frequency (Note 10)	f_T	150	–	–	MHz	V_{CE} = -10V, I_C = -50mA f = 100MHz
Output Capacitance (Note 10)	C_{obo}	–	–	10	pF	V_{CB} = -10V, f = 1MHz

Note: 10. Measured under pulsed conditions. Pulse width ≤ 300µs. Duty cycle ≤ 2%.

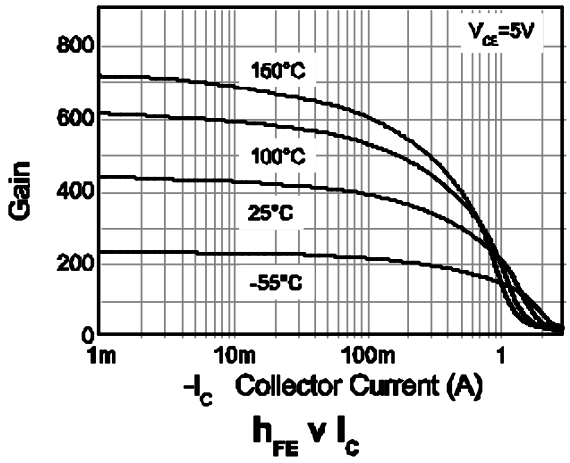
Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)



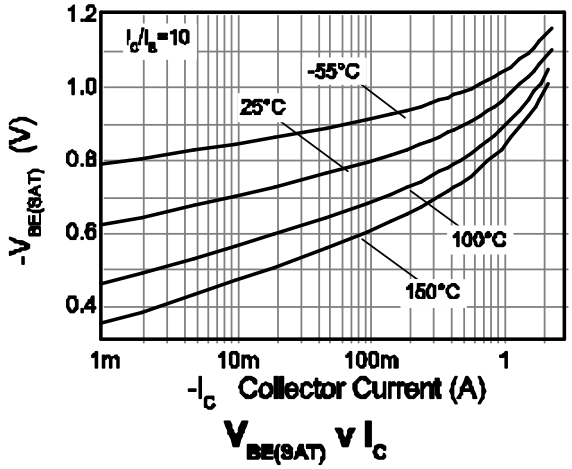
$V_{CE(SAT)}$ v I_C



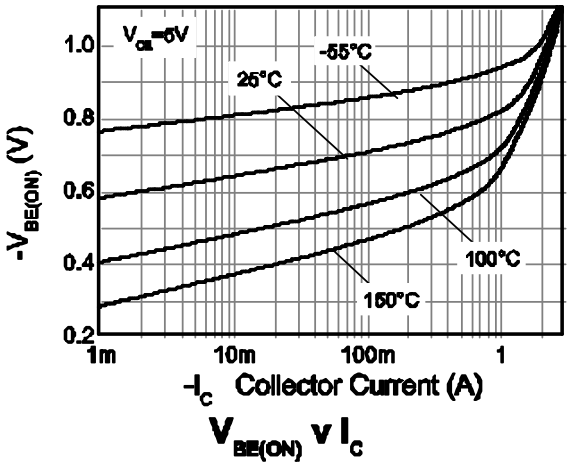
$V_{CE(SAT)}$ v I_C



h_{FE} v I_C



$V_{BE(SAT)}$ v I_C

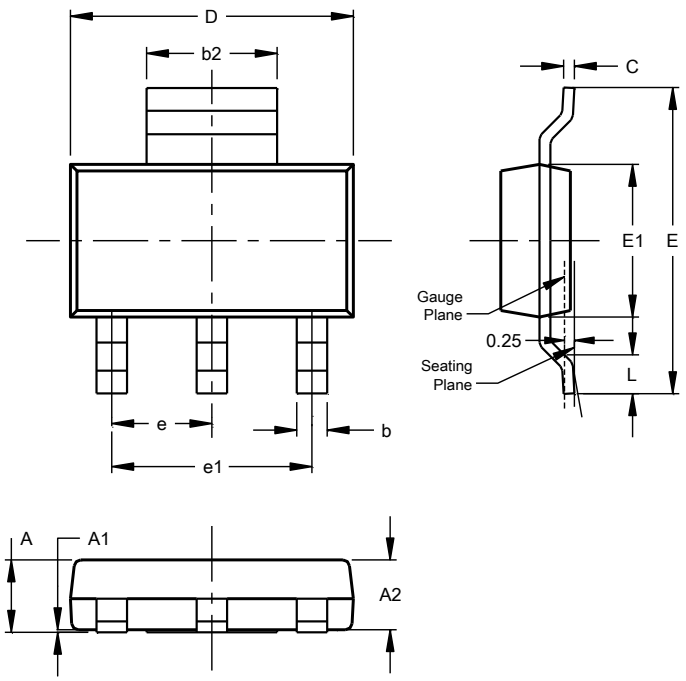


$V_{BE(ON)}$ v I_C

Package Outline Dimensions

Please see http://www.diodes.com/package-outlines.html for the latest version.

SOT223 (Type DN)

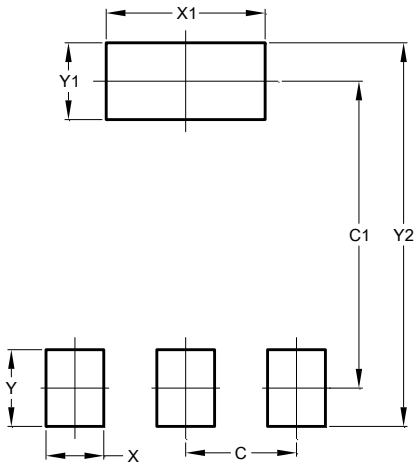


SOT223 (Type DN)			
Dim	**Min**	**Max**	**Typ**
A	--	1.70	--
A1	0.01	0.15	--
A2	1.50	1.68	1.60
b	0.60	0.80	0.70
b2	2.90	3.10	--
c	0.20	0.32	--
D	6.30	6.70	--
E	6.70	7.30	--
E1	3.30	3.70	--
e	--	--	2.30
e1	--	--	4.60
L	0.85	--	--
All Dimensions in mm			

Suggested Pad Layout

Please see http://www.diodes.com/package-outlines.html for the latest version.

SOT223 (Type DN)



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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