

75V NPN SILICON PLANAR HIGH VOLTAGE TRANSISTOR IN SOT-223

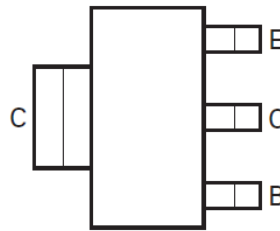
Features and Benefits

- $BV_{CE0} > 75V$
- Maximum continuous current $I_C = 4.5A$
- 10A pulse current
- High gain holds up $h_{FE} > 300 @ I_C = 1A$
- Very low equivalent on-resistance; $R_{CE(sat)} = 78m\Omega$ at 4.5A
- **“Green” component, Lead Free Finish / RoHS compliant (Note 1)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

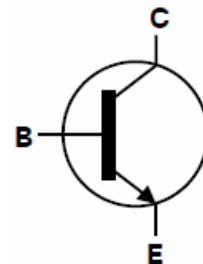
- Case: SOT223
- Case Material: Molded Plastic, “Green” Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish
- Weight: 0.112 grams (approximate)

SOT223



Top View

Top View
Pin Out



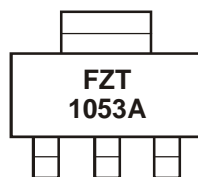
Equivalent Circuit

Ordering Information (Note 1)

Part Number	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
FZT1053ATA	FZT1053A	7	12	1,000

Notes: 1. Diodes, Inc. defines “Green” products as those which are RoHS compliant and contain no halogens or antimony compounds. All applicable RoHS exemptions applied. Further information about Diodes Inc.’s “Green” Policy can be found on our website at <http://www.diodes.com>

Marking Information



FZT1053A = Product Type Marking Code

Maximum Ratings @ $T_A = 25^\circ\text{C}$ unless otherwise specified

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	150	V
Collector-Emitter Voltage	V_{CEO}	75	V
Emitter-Base Voltage	V_{EBO}	7.5	V
Continuous Collector Current	I_C	4.5	A
Base Current	I_B	500	mA
Peak Pulse Current (Note 2)	I_{CM}	10	A

Thermal Characteristics @ $T_A = 25^\circ\text{C}$ unless otherwise specified

Characteristic	Symbol	Value	Unit
Collector Power Dissipation (Note 2)	P_D	2.5	W
Thermal Resistance, Junction to Ambient (Note 2)	$R_{\theta JA}$	50	$^\circ\text{C/W}$
Thermal Resistance, Junction to Leads (Note 3)	$R_{\theta JL}$	10.88	$^\circ\text{C/W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

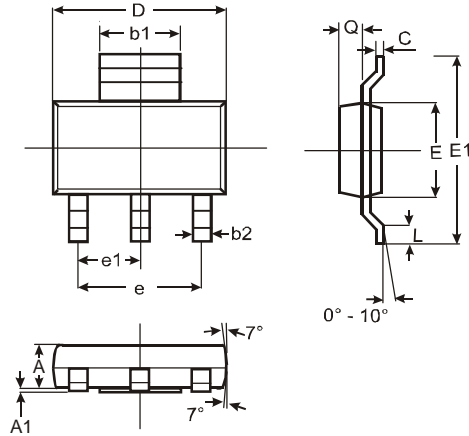
Electrical Characteristics @ $T_A = 25^\circ\text{C}$ unless otherwise specified

Characteristic	Symbol	Min	Typ.	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	150	250	-	V	$I_C = 100\mu\text{A}$
Collector-Emitter Breakdown Voltage	BV_{CES}	150	250	-	V	$I_C = 100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Note 4)	BV_{CEO}	75	100	-	V	$I_C = 10\text{mA}$
Collector-Emitter Breakdown Voltage	BV_{CEV}	150	250	-	V	$I_C = 100\mu\text{A}, V_{EB} = 1\text{V}$
Emitter-Base Breakdown Voltage	BV_{EBO}	7.5	8.8	-	V	$I_E = 100\mu\text{A}$
Collector Cutoff Current	I_{CBO}	-	0.9	10	nA	$V_{CB} = 120\text{V}$
Collector Cutoff Current	I_{CES}	-	1.5	10	nA	$V_{CES} = 120\text{V}$
Emitter Cutoff Current	I_{EBO}	-	0.3	10	nA	$V_{EB} = 4\text{V}$
DC current transfer Static ratio (Note 4)	h_{FE}	270	440	-	-	$I_C = 10\text{mA}, V_{CE} = 2\text{V}$
		300	450	1200	-	$I_C = 0.5\text{A}, V_{CE} = 2\text{V}$
		300	450	-	-	$I_C = 1\text{A}, V_{CE} = 2\text{V}$
		40	60	-	-	$I_C = 4.5\text{A}, V_{CE} = 2\text{V}$
		-	20	-	-	$I_C = 10\text{A}, V_{CE} = 2\text{V}$
Collector-Emitter Saturation Voltage (Note 4)	$V_{CE(sat)}$	-	21	30	mV	$I_C = 0.2\text{A}, I_B = 20\text{mA}$
		-	55	75	mV	$I_C = 0.5\text{A}, I_B = 20\text{mA}$
		-	150	200	mV	$I_C = 1\text{A}, I_B = 10\text{mA}$
		-	160	210	mV	$I_C = 2\text{A}, I_B = 100\text{mA}$
		-	350	440	mV	$I_C = 4.5\text{A}, I_B = 200\text{mA}$
Base-Emitter Saturation Voltage (Note 4)	$V_{BE(sat)}$	-	900	1000	mV	$I_C = 3\text{A}, I_B = 100\text{mA}$
Base-Emitter Turn-on Voltage (Note 4)	$V_{BE(on)}$	-	825	950	mV	$I_C = 3\text{A}, V_{CE} = 2\text{V}$
Transitional Frequency (Note 4)	f_T	-	140	-	MHz	$I_C = 50\text{mA}, V_{CE} = 10\text{V}, f = 100\text{MHz}$
Output capacitance	C_{obo}	-	21	30	pF	$V_{CB} = 10\text{V}, f = 1\text{MHz}$
Switching Time	t_{on}	-	162	-	ns	$V_{CC} = 50\text{V}, I_C = 2\text{A}, I_{B1} = I_{B2} = \pm 20\text{mA}$
	t_{off}	-	900	-	ns	

- Notes:
- For the device mounted on 50mm x 50mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions.
 - Thermal resistance from junction to solder-point (at the end of the drain lead)
 - Measured under pulsed conditions. Pulse width = 300 μs . Duty cycle $\leq 2\%$.

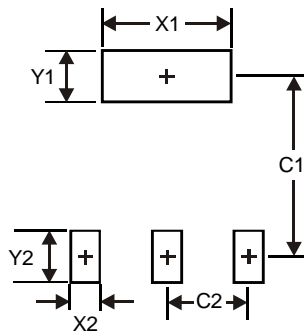
Electrical Characteristics

Package Outline Dimensions



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



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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