

75V NPN MEDIUM POWER HIGH GAIN TRANSISTOR IN SOT223

Features

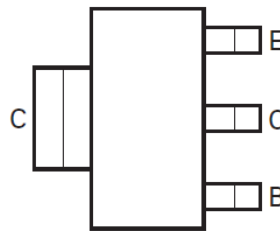
- $BV_{CE0} > 75V$
- $I_C = 4.5A$ High Continuous Collector Current
- $I_{CM} = 10A$ Peak Pulse Current
- Low Saturation Voltage $V_{CE(sat)} < 120mV @ 1A$
- $h_{FE} > 300 @ I_C=1A$ for a High Gain Hold-Up
- $R_{CE(sat)} = 78m\Omega$ at 4.5A for a Low Equivalent On-Resistance
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

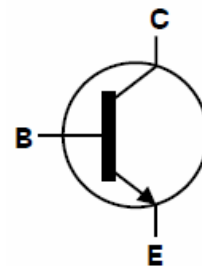
- Case: SOT223
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Plated Leads. Solderable per MIL-STD-202, Method 208 ③
- Weight: 0.112 grams (Approximate)



Top View



Top View
Pin Out



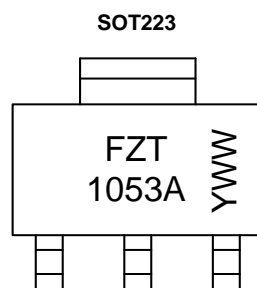
Equivalent Circuit

Ordering Information (Note 4)

Part Number	Compliance	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
FZT1053ATA	AEC-Q101	FZT1053A	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/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 1053A = Product Type Marking Code
 YWW = Date Code Marking
 Y or \bar{Y} = Last Digit of Year (ex: 5= 2015)
 WW or $\bar{W}W$ = Week Code (01~53)

Absolute 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}	7.0	V
Continuous Collector Current	I_C	4.5	A
Base Current	I_B	500	mA
Peak Pulse Current	I_{CM}	10	A

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

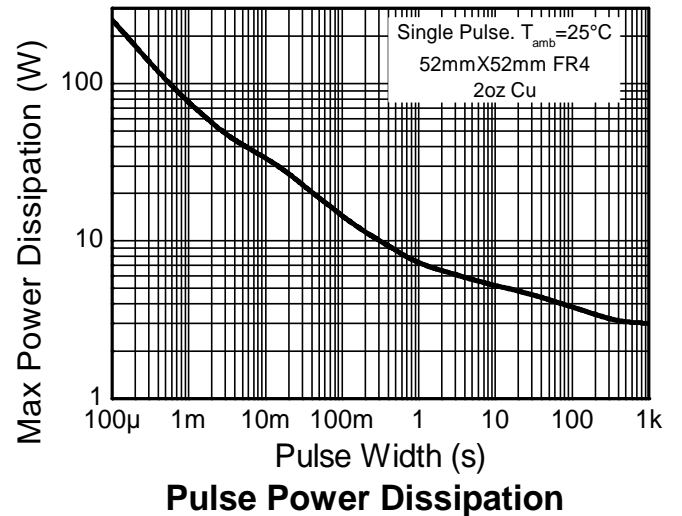
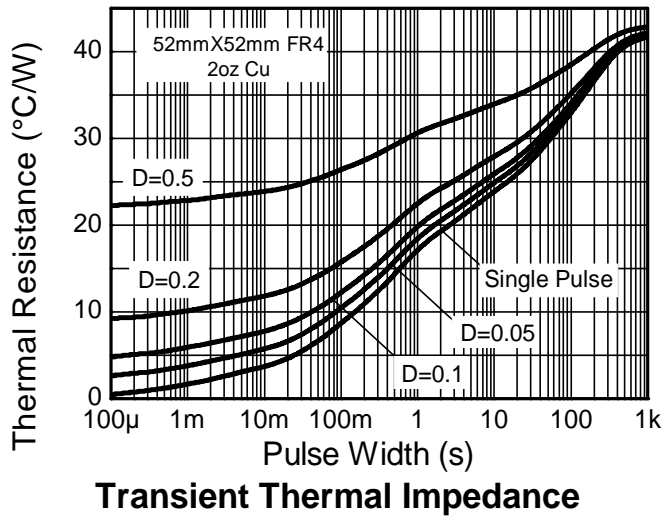
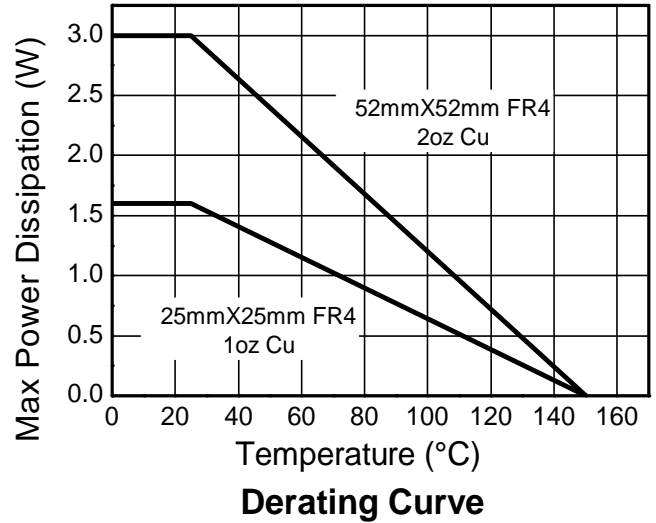
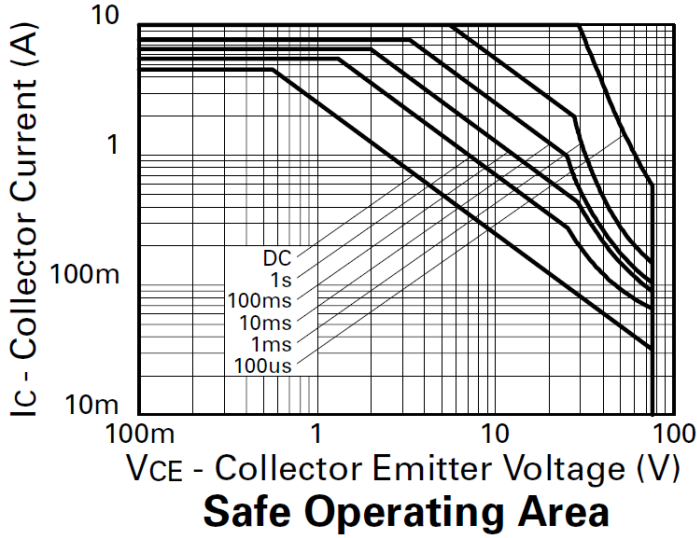
Characteristic	Symbol	Value	Unit
Power Dissipation	P_D	(Note 5)	3.0
		(Note 6)	2.0
		(Note 7)	1.6
		(Note 8)	1.2
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	(Note 5)	41.7
		(Note 6)	62.5
		(Note 7)	78.1
		(Note 8)	104
Thermal Resistance Junction to Lead	$R_{\theta JL}$	10.9	
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

ESD Ratings (Note 7)

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:
- For a device mounted with the collector lead on 52mm x 52mm 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.
 - Same as Note 5, except the device is mounted on 25mm x 25mm 2oz copper.
 - Same as Note 5, except the device is mounted on 25mm x 25mm 1oz copper.
 - Same as Note 5, except the device is mounted on minimum recommended pad layout.
 - Thermal resistance from junction to solder-point (at the end of the collector lead).
 - Refer to JEDEC specification JESD22-A114 and JESD22-A115.

Thermal Characteristics and Derating Information

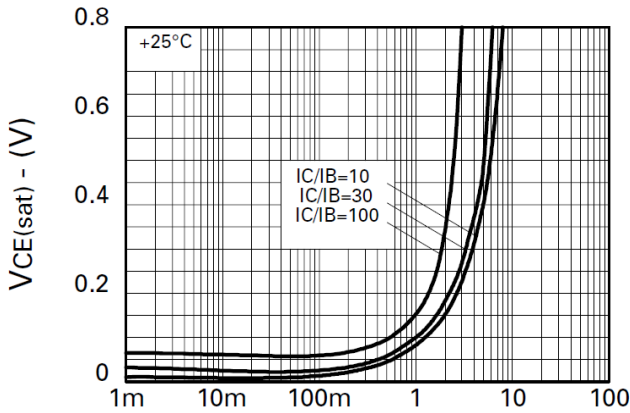


Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

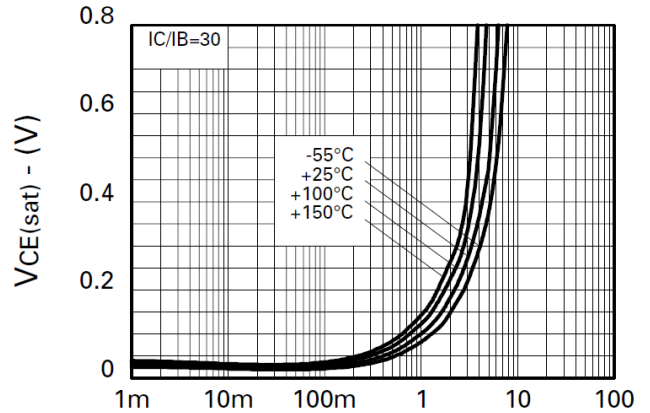
Characteristic	Symbol	Min	Typ.	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV _{CB0}	150	250	-	V	I _C = 100μA
Collector-Emitter Breakdown Voltage	BV _{CES}	150	250	-	V	I _C = 100μA
Collector-Emitter Breakdown Voltage (Note 11)	BV _{CEO}	75	100	-	V	I _C = 10mA
Collector-Emitter Breakdown Voltage	BV _{CEV}	150	250	-	V	I _C = 100μA, V _{EB} = 1V
Emitter-Base Breakdown Voltage	BV _{EBO}	7.0	8.8	-	V	I _E = 100μA
Collector Cutoff Current	I _{CB0}	-	0.9	10	nA	V _{CB} = 120V
Collector Cutoff Current	I _{CES}	-	1.5	10	nA	V _{CES} = 120V
Emitter Cutoff Current	I _{EBO}	-	0.3	10	nA	V _{EB} = 4V
DC current transfer Static Ratio (Note 11)	h _{FE}	270	440	-	-	I _C = 10mA, V _{CE} = 2V
		300	450	1,200		I _C = 0.5A, V _{CE} = 2V
		300	450	-		I _C = 1A, V _{CE} = 2V
		40	60	-		I _C = 4.5A, V _{CE} = 2V
		-	20	-		I _C = 10A, V _{CE} = 2V
Collector-Emitter Saturation Voltage (Note 11)	V _{CE(sat)}	-	21	30	mV	I _C = 0.2A, I _B = 20mA
		-	55	75		I _C = 0.5A, I _B = 20mA
		-	150	200		I _C = 1A, I _B = 10mA
		-	160	210		I _C = 2A, I _B = 100mA
		-	350	440		I _C = 4.5A, I _B = 200mA
Base-Emitter Saturation Voltage (Note 11)	V _{BE(sat)}	-	900	1,000	mV	I _C = 3A, I _B = 100mA
Base-Emitter Turn-On Voltage (Note 11)	V _{BE(on)}	-	825	950	mV	I _C = 3A, V _{CE} = 2V
Transitional Frequency (Note 11)	f _T	-	140	-	MHz	I _C = 50mA, V _{CE} = 10V, f = 100MHz
Output Capacitance	C _{obo}	-	21	30	pF	V _{CB} = 10V, f = 1MHz,
Switching Time	t _{on}	-	162	-	ns	V _{CC} = 50V, I _C = 2A,
	t _{off}	-	900	-	ns	I _{B1} = I _{B2} = ±20mA

Note: 11. Measured under pulsed conditions. Pulse width = 300μs. Duty cycle ≤2%.

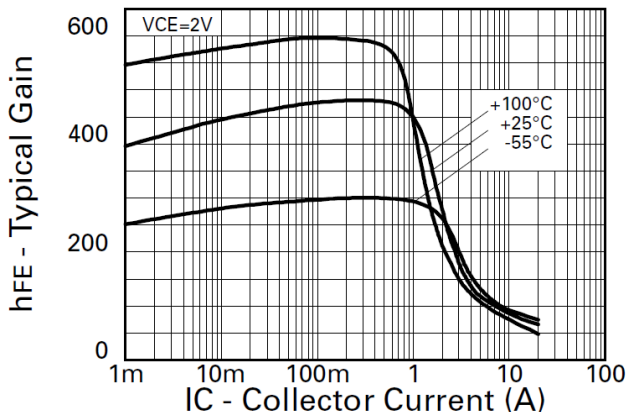
Typical Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)



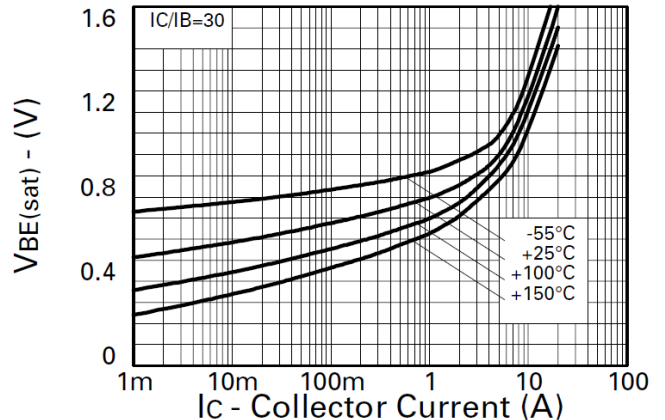
$V_{CE(sat)}$ v I_C



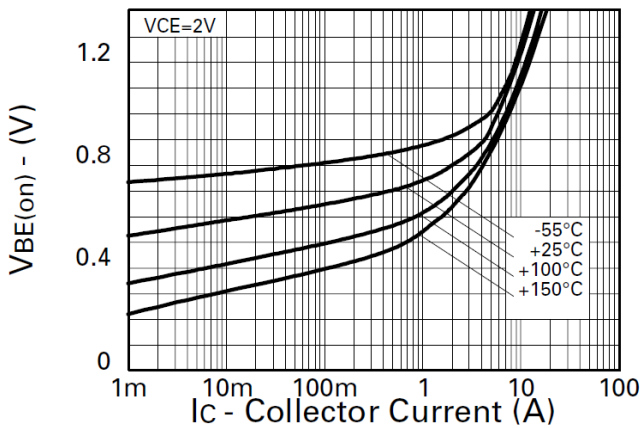
$V_{CE(sat)}$ v I_C



h_{FE} v I_C



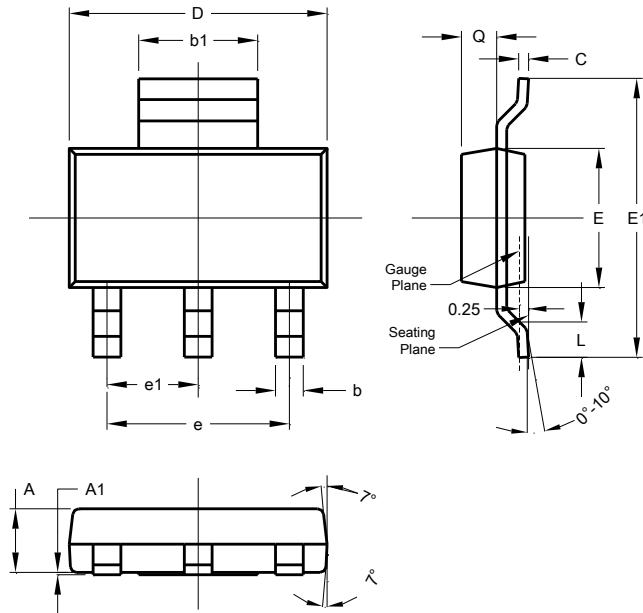
$V_{BE(sat)}$ v I_C



$V_{BE(on)}$ v I_C

Package Outline Dimensions

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

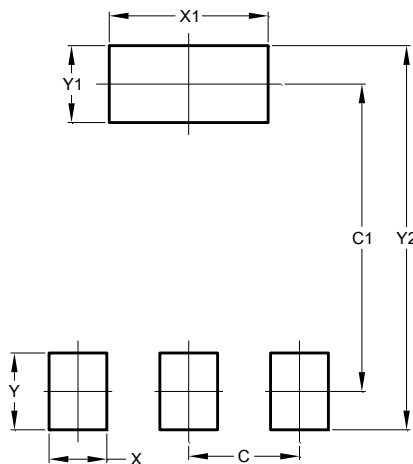


SOT223			
Dim	Min	Max	Typ
A	1.55	1.65	1.60
A1	0.010	0.15	0.05
b	0.60	0.80	0.70
b1	2.90	3.10	3.00
C	0.20	0.30	0.25
D	6.45	6.55	6.50
E	3.45	3.55	3.50
E1	6.90	7.10	7.00
e	-	-	4.60
e1	-	-	2.30
L	0.85	1.05	0.95
Q	0.84	0.94	0.89
All Dimensions in mm			

Suggested Pad Layout

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.

SOT223



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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