75V NPN MEDIUM POWER HIGH GAIN TRANSISTOR IN SOT223

Features

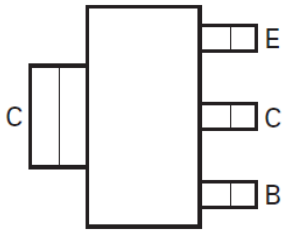
- BV_{CEO} > 75V
- I_C= 4.5A High Continuous Collector Current
- I_{CM} = 10A Peak Pulse Current
- Low Saturation Voltage $V_{CE(sat)}$ < 120mV @ 1A
- h_{FE} > 300 @ I_C=1A for a High Gain Hold-Up
- $R_{CE(sat)}$ = 78mΩ at 4.5A for a Low Equivalent On-Resistance
- **Lead-Free Finish; RoHS Compliant (Notes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

Mechanical Data

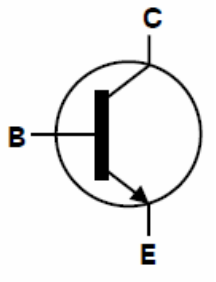
- Case: SOT223
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Plated Leads. Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.112 grams (Approximate)

SOT223

Top View



Top View
Pin Out



Equivalent Circuit

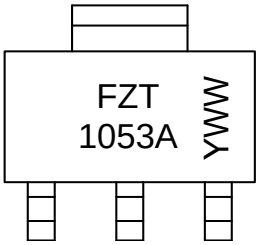
Ordering Information (Note 4)

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

SOT223



FZT 1053A = Product Type Marking Code
YWW = Date Code Marking
Y or $\overline{Y}$ = Last Digit of Year (ex: 5= 2015)
WW or $\overline{WW}$ = Week Code (01~53)

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

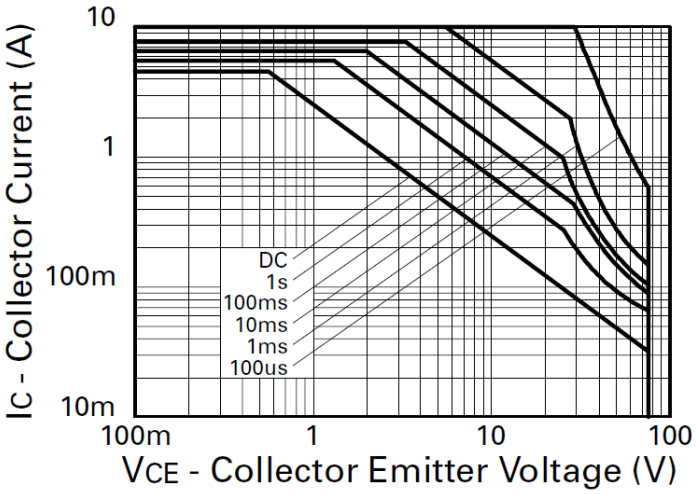
Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 5)	P_D	3.0	W
	(Note 6)		2.0	
	(Note 7)		1.6	
	(Note 8)		1.2	
Thermal Resistance, Junction to Ambient	(Note 5)	$R_{\theta JA}$	41.7	°C/W
	(Note 6)		62.5	
	(Note 7)		78.1	
	(Note 8)		104	
Thermal Resistance Junction to Lead	(Note 9)	$R_{\theta JL}$	10.9	
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

ESD Ratings (Note 7)

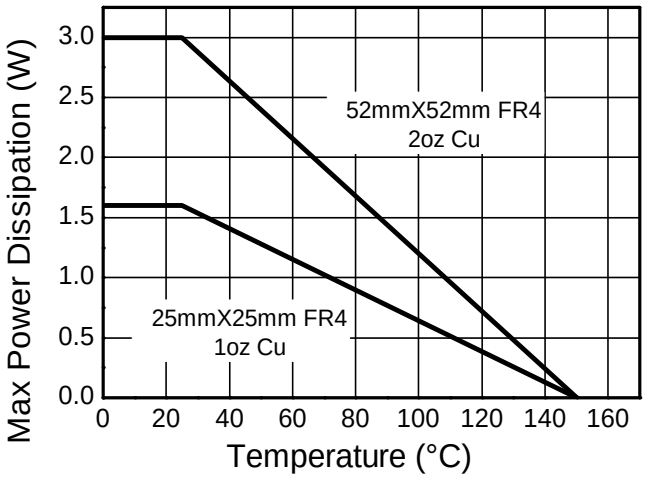
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

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

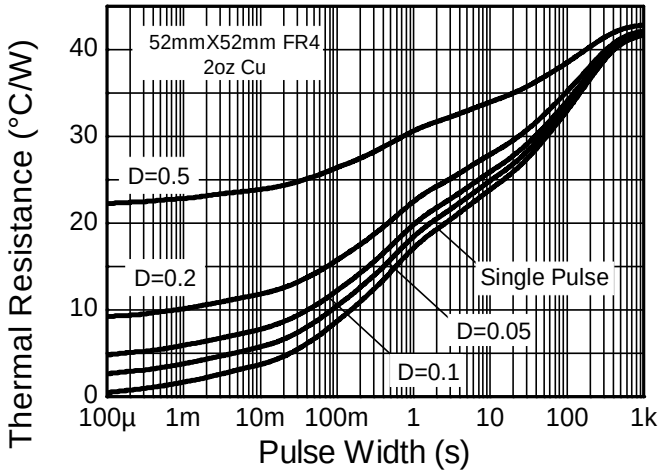
Thermal Characteristics and Derating Information



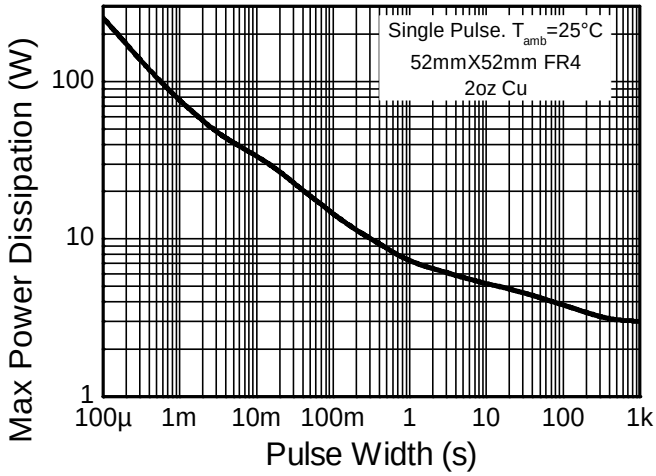
Safe Operating Area



Derating Curve



Transient Thermal Impedance



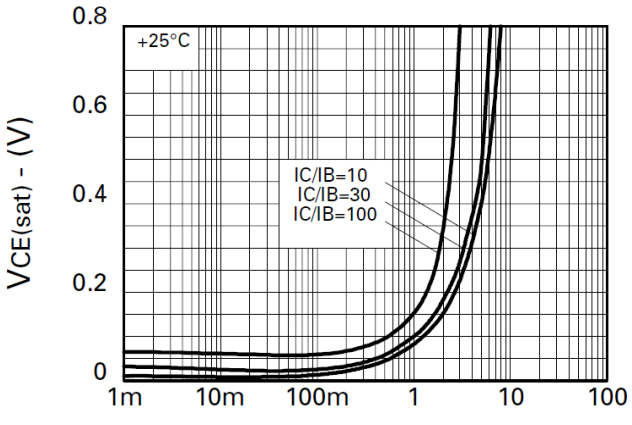
Pulse Power Dissipation

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

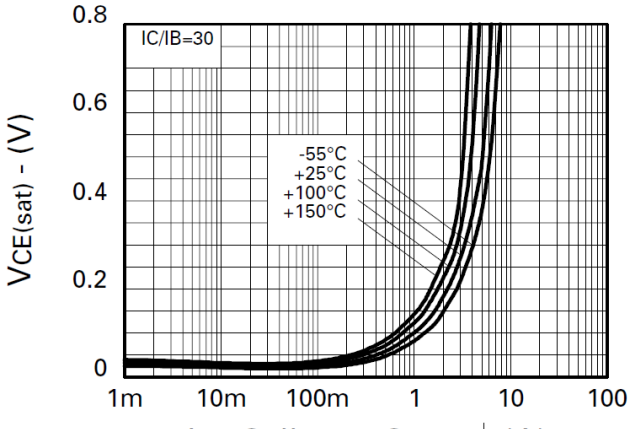
Characteristic	Symbol	Min	Typ.	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	150	250	-	V	I_C = 100µA
Collector-Emitter Breakdown Voltage	BV_{CES}	150	250	-	V	I_C = 100µA
Collector-Emitter Breakdown Voltage (Note 11)	BV_{CEO}	75	100	-	V	I_C = 10mA
Collector-Emitter Breakdown Voltage	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_{CBO}	-	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, I_{B1} = I_{B2} = ±20mA
	t_{off}	-	900	-	ns	

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

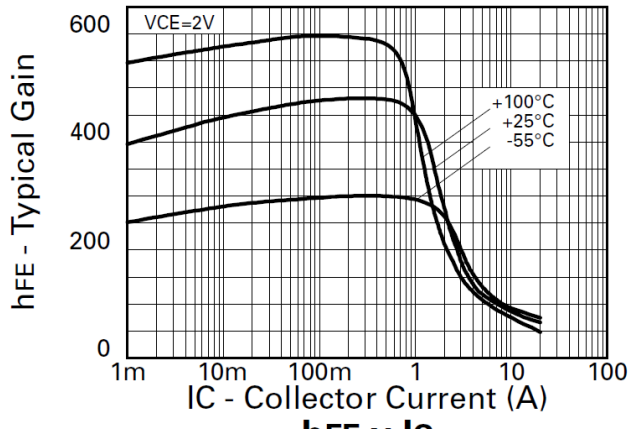
Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)



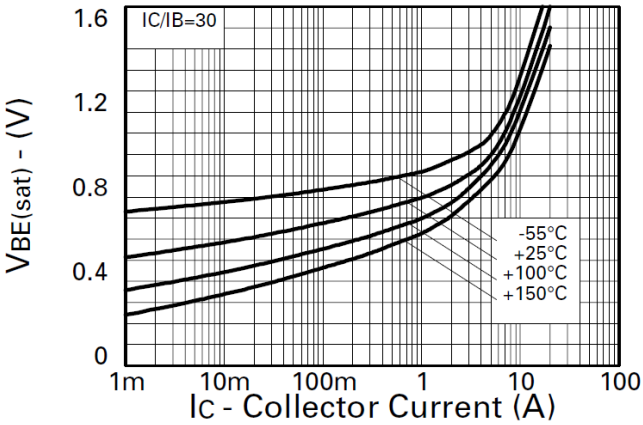
VCE(sat) v IC



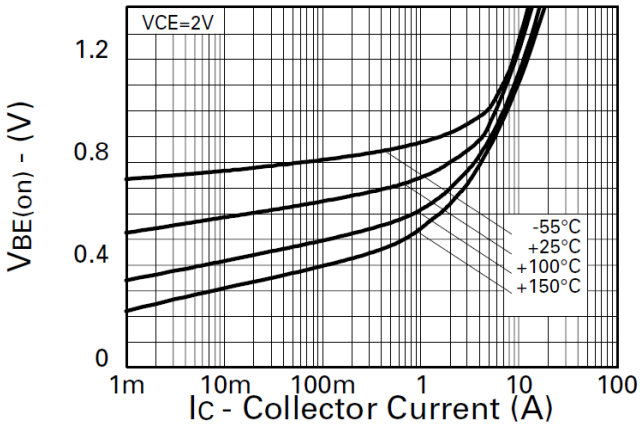
VCE(sat) v IC



hFE v IC



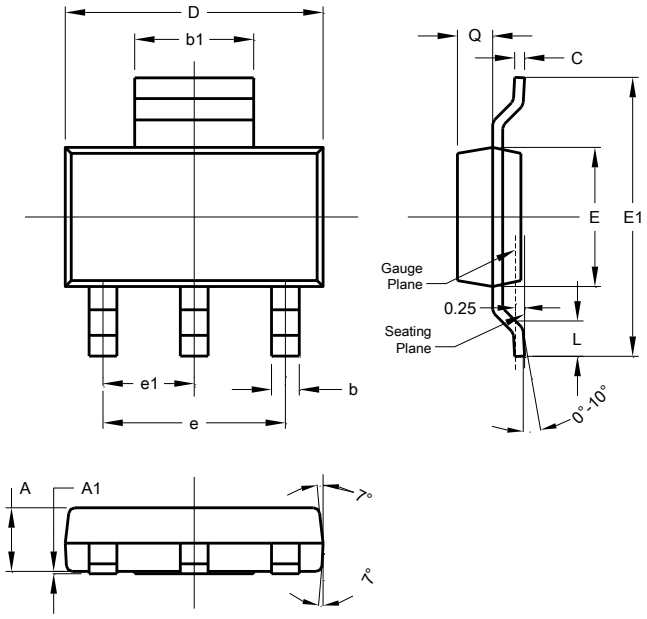
VBE(sat) v IC



VBE(on) v IC

Package Outline Dimensions

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

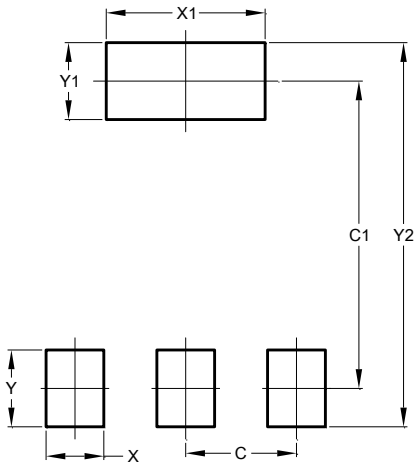


SOT223			
Dim	**Min**	**Max**	**Typ**
A	1.55	1.65	1.60
A1	0.010	0.15	0.05
b	0.60	0.80	0.70
b1	2.90	3.10	3.00
C	0.20	0.30	0.25
D	6.45	6.55	6.50
E	3.45	3.55	3.50
E1	6.90	7.10	7.00
e	-	-	4.60
e1	-	-	2.30
L	0.85	1.05	0.95
Q	0.84	0.94	0.89
All Dimensions in mm			

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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