FZT853

100V NPN MEDIUM POWER TRANSISTOR IN SOT223

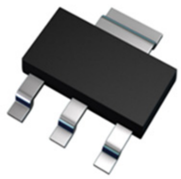
Features

- BV_{CEO} > 100V
- I_C = 6A high Continuous Collector Current
- I_{CM} = 10A Peak Pulse Current
- Low Saturation Voltage $V_{CE(sat)}$ < 150mV @ 2A
- $R_{CE(sat)}$ = 50mΩ for a Low Equivalent On-Resistance
- h_{FE} Specified Up to 10A for a High Gain Hold Up
- Complementary PNP Type: FZT953
- **Lead-Free Finish; RoHS compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. “Green” Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

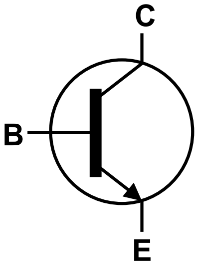
Mechanical Data

- Case: SOT223
- Case Material: Molded Plastic. “Green” Molding Compound.
- UL Flammability 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)

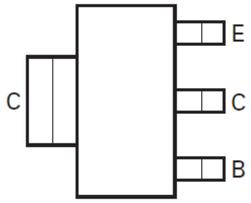
SOT223



Top View



Device Symbol



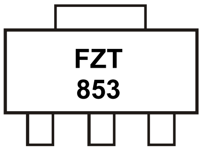
Top View
Pin-Out

Ordering Information (Note 4)

Product	Compliance	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
FZT853TA	AEC-Q101	FZT853	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. For packaging details, go to our website at http://www.diodes.com

Marking Information



FZT853 = Product Type Marking Code

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	200	V
Collector-Emitter Voltage	V_{CEO}	100	V
Emitter-Base Voltage	V_{EBO}	7	V
Continuous Collector Current	I_C	6	A
Peak Pulse Current	I_{CM}	10	A

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

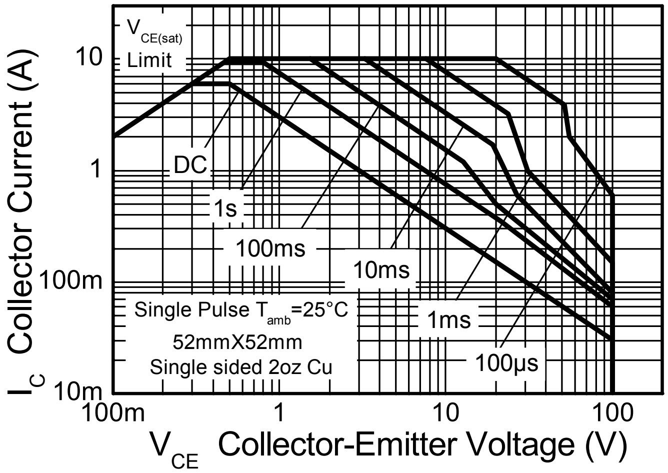
Characteristic		Symbol	Value	Unit
Power Dissipation Linear derating factor	(Note 5)	P_D	3.0 24	W mW/°C
	(Note 6)		1.6 12.8	
Thermal Resistance, Junction to Ambient	(Note 5)	$R_{\theta JA}$	42	°C/W
	(Note 6)	$R_{\theta JA}$	78	
Thermal Resistance Junction to Lead	(Note 7)	$R_{\theta JL}$	8.84	
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

ESD Ratings (Note 8)

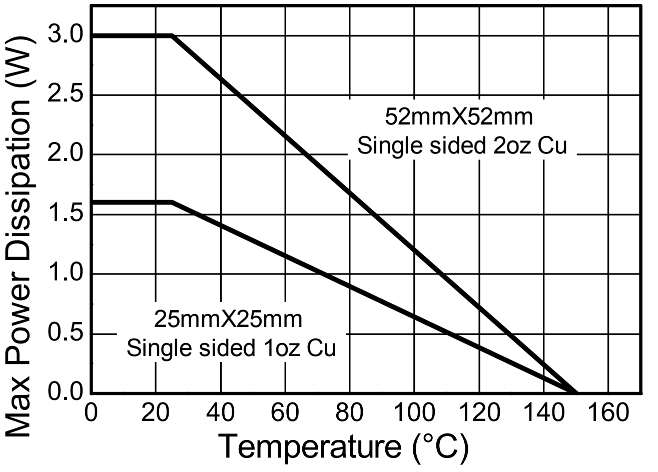
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	≥ 8,000	V	3B
Electrostatic Discharge - Machine Model	ESD MM	≥ 400	V	C

Notes:
5. 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.
6. Same as note (5), except the device is mounted on 50mm X 50mm single sided 2oz weight copper.
7. Thermal resistance from junction to solder-point (at the end of the collector lead).
8. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

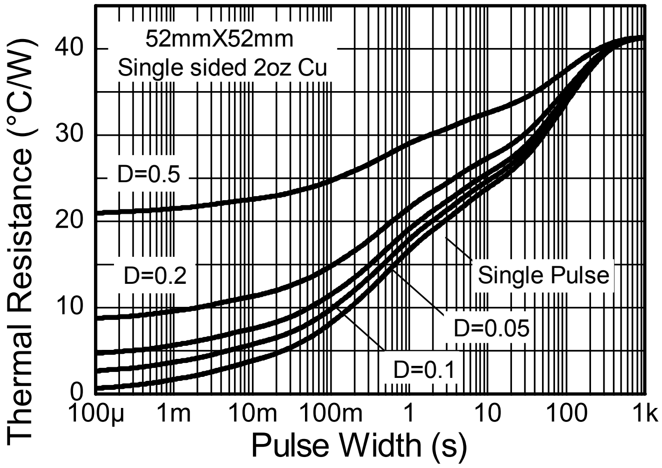
Thermal Characteristics and Derating Information



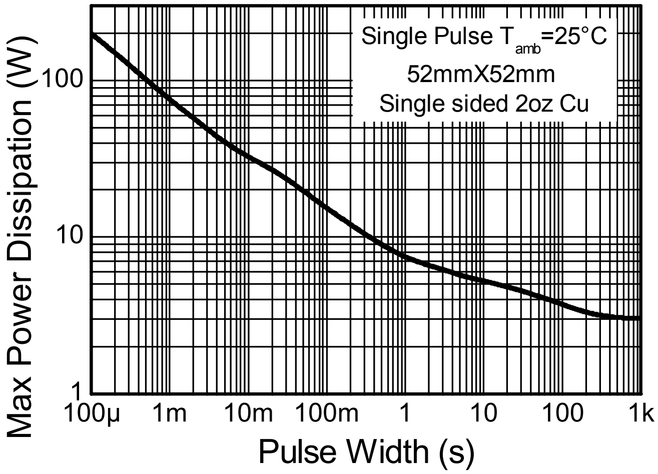
Safe Operating Area



Derating Curve



Transient Thermal Impedance



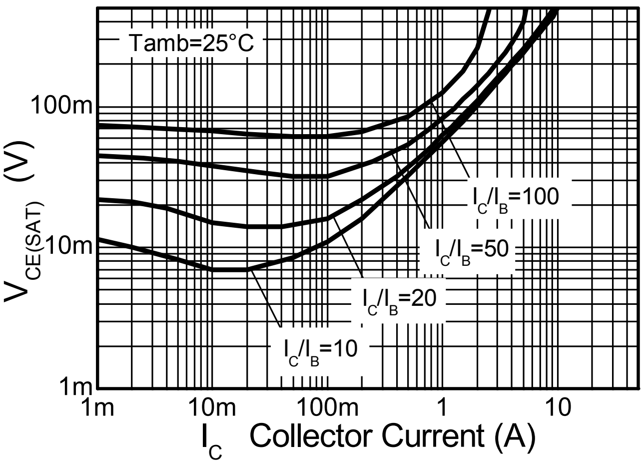
Pulse Power Dissipation

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

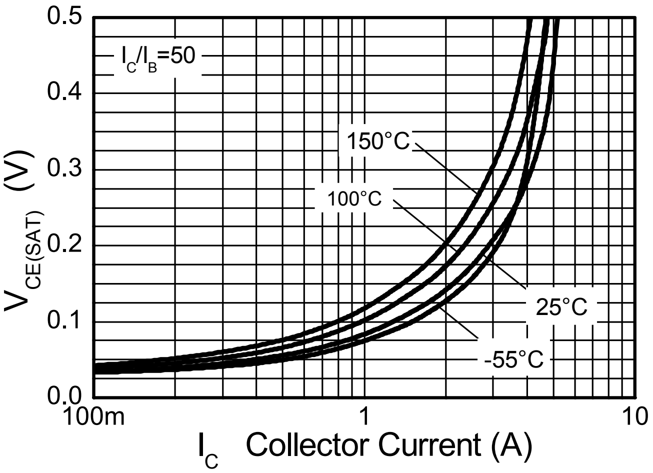
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	200	300	–	V	I_C = 100µA
Collector-Emitter Breakdown Voltage	BV_{CER}	200	300	–	V	I_C = 1µA, R_B ≤ 1kΩ
Collector-Emitter Breakdown Voltage (Note 9)	BV_{CEO}	100	120	–	V	I_C = 1mA
Emitter-Base Breakdown Voltage	BV_{EBO}	7	8.1	–	V	I_E = 100µA
Collector Cut-off Current	I_{CBO}	– –	<1 –	10 1	nA µA	V_{CB} = 150V V_{CB} = 150V, T_A = +100°C
Collector Cut-off Current	I_{CER}	– –	<1 –	10 1	nA µA	V_{CB} = 150V, R_B ≤ 1kΩ V_{CB} = 150V, T_A = +100°C
Emitter Cut-off Current	I_{EBO}	–	<1	10	nA	V_{EB} = 6V
DC Current Gain (Note 9)	h_{FE}	100	200	–	–	I_C = 10mA, V_{CE} = 2V
		100	200	300		I_C = 2A, V_{CE} = 2V
		50	100	–		I_C = 4A, V_{CE} = 2V
		20	30	–		I_C = 10A, V_{CE} = 2V
Collector-Emitter Saturation Voltage (Note 9)	$V_{CE(sat)}$	–	14	50	mV	I_C = 100mA, I_B = 5mA
		–	100	150		I_C = 2A, I_B = 100mA
		–	250	340		I_C = 5A, I_B = 500mA
Base-Emitter Saturation Voltage (Note 9)	$V_{BE(sat)}$	–	1050	1250	mV	I_C = 5A, I_B = 500mA
Base-Emitter Turn-On Voltage (Note 9)	$V_{BE(on)}$	–	900	1100	mV	I_C = 5A, V_{CE} = 2V
Current Gain-Bandwidth Product (Note 9)	f_T	–	130	–	MHz	I_C = 100mA, V_{CE} = 10V, f = 50MHz
Output Capacitance (Note 9)	C_{obo}	–	35	–	pF	V_{CB} = 10V, f = 1MHz
Switching Times	t_{on}	–	50	–	ns	I_C = 1A, V_{CC} = 10V, I_{B1} = -I_{B2} = 100mA
	t_{off}	–	1650	–		

Notes: 9. Measured under pulsed conditions. Pulse width ≤ 300µs. Duty cycle ≤ 2%

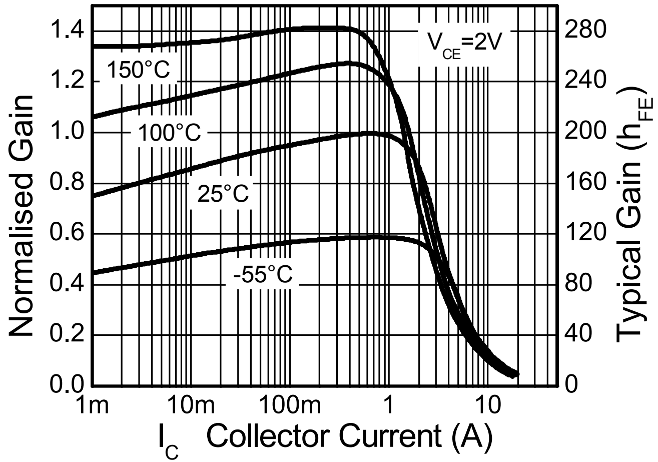
Typical Electrical Characteristics (@T$_A$ = +25°C, unless otherwise specified.)



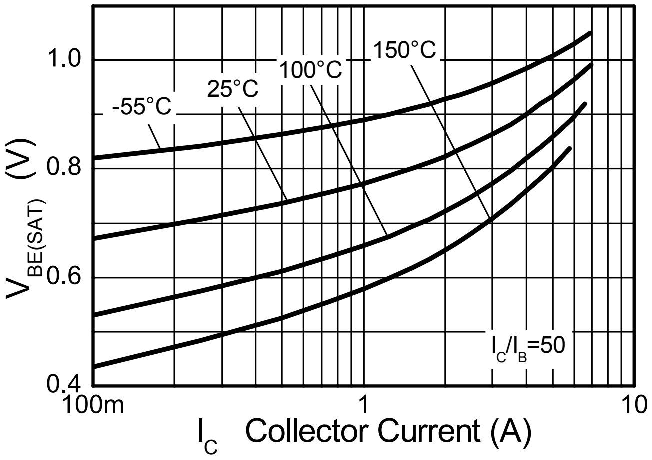
$V_{CE(SAT)}$ v I_C



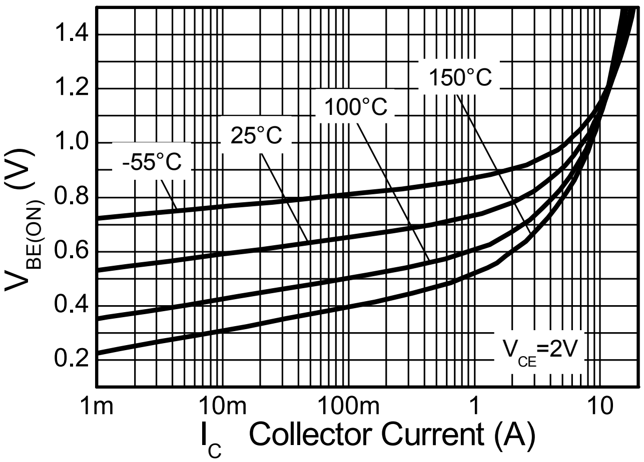
$V_{CE(SAT)}$ v I_C



h_{FE} v I_C



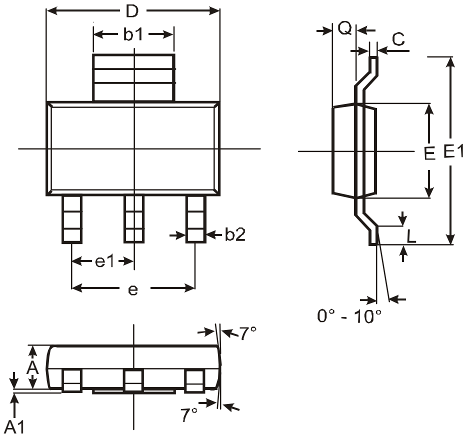
$V_{BE(SAT)}$ v I_C



$V_{BE(ON)}$ v I_C

Package Outline Dimensions

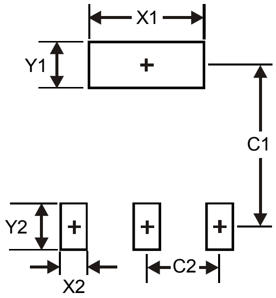
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for latest version.



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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