

100V NPN DARLINGTON TRANSISTOR IN SOT223

Features

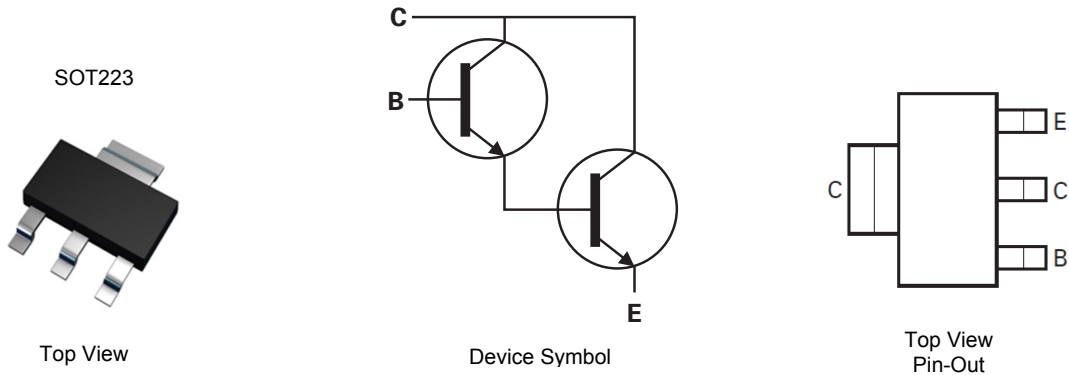
- $BV_{CEO} > 100V$
- $BV_{CBO} > 100V$
- $I_C = 1.5A$ high Continuous current
- $h_{FE} > 10k$ for very high gain @ 100mA
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

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 [Ⓔ]
- Weight: 0.112 grams (approximate)

Applications

- Lamp
- Relay
- Solenoid driving

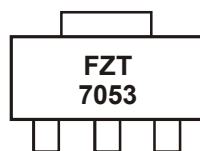


Ordering Information (Note 4)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
FZT7053TA	FZT7053	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



FZT7053 = Product Type Marking Code

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

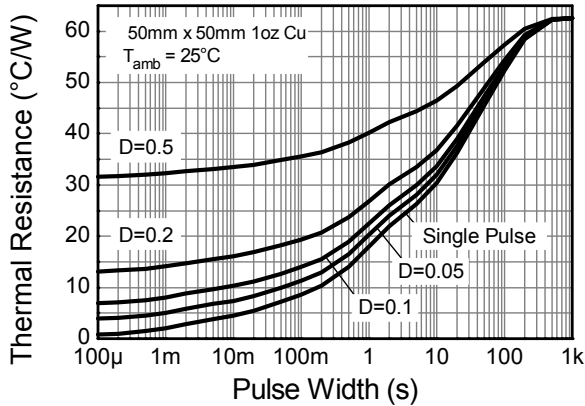
Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CB0}	100	V
Collector-Emitter Voltage	V_{CEO}	100	V
Emitter-Base Voltage	V_{EBO}	12	V
Continuous Collector Current	I_C	1.5	A
Peak Pulse Current	I_{CM}	2	A

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

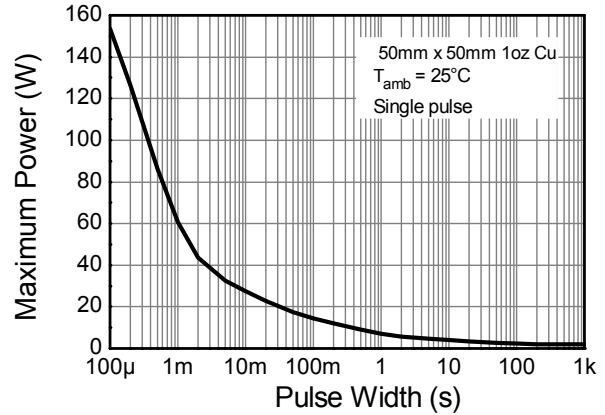
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P_D	1	W
Power Dissipation (Note 6)	P_D	1.25	W
Power Dissipation (Note 7)	P_D	2	W
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	125	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction to Ambient (Note 6)	$R_{\theta JA}$	100	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction to Ambient (Note 7)	$R_{\theta JA}$	62	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction to Lead (Note 8)	$R_{\theta JL}$	19.4	$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

- Notes:
5. For a device surface mounted on 15mm x 14mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions; the device is measured when operating in a steady-state condition.
 6. Same as note (5), except the device is surface mounted on 25mm x 25mm with 1oz copper.
 7. Same as note (5), except the device is surface mounted on 50mm x 50mm with 1oz copper.
 8. Thermal resistance from junction to solder-point (at the end of the collector lead).

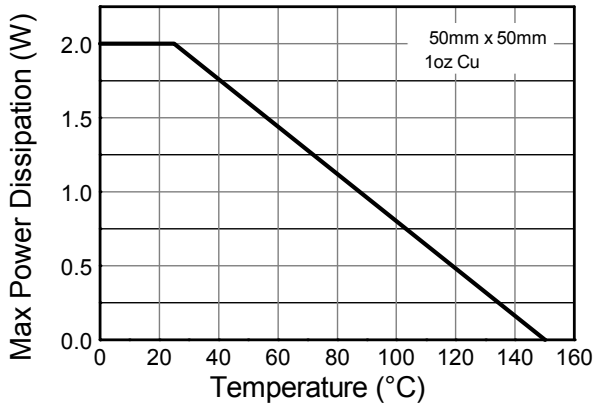
Thermal Characteristics and Derating Information



Transient Thermal Impedance



Pulse Power Dissipation



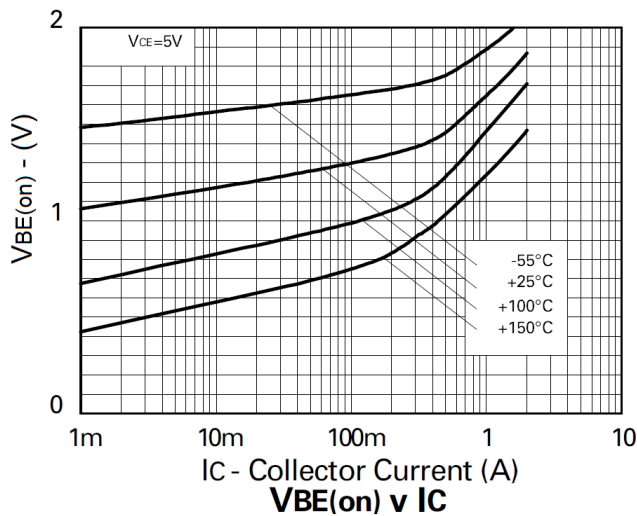
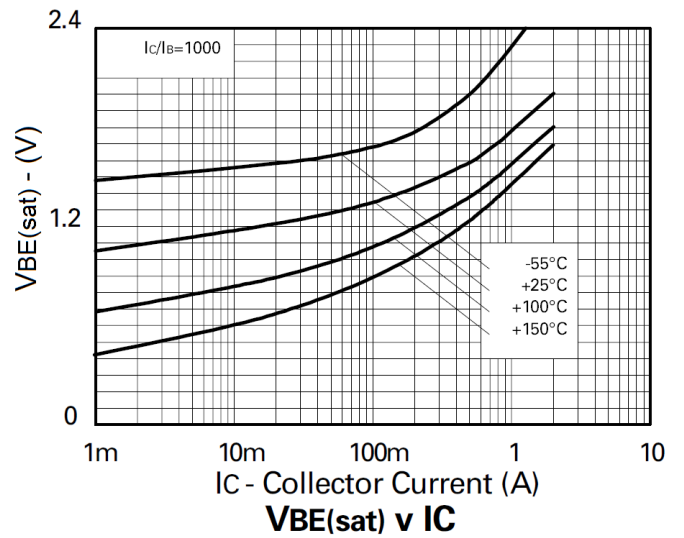
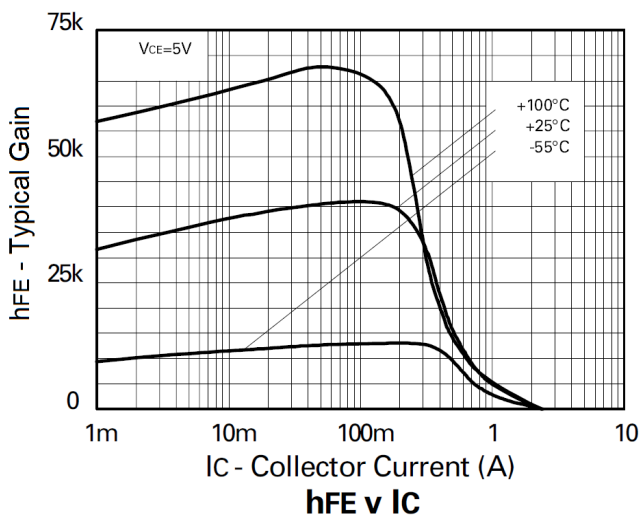
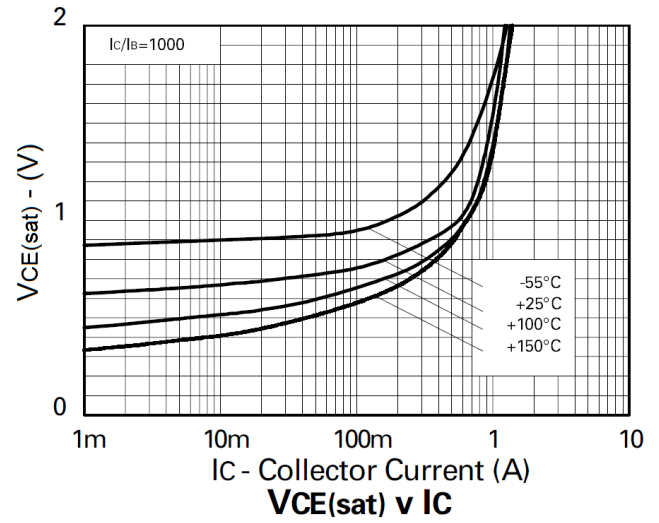
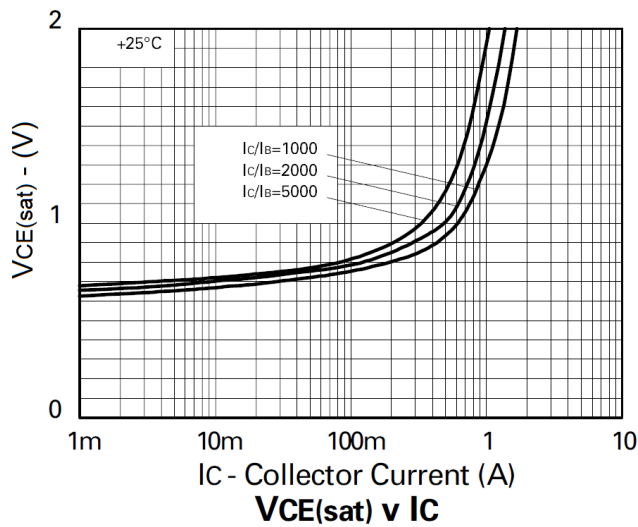
Derating Curve

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}	100	300	-	V	$I_C = 100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Note 9)	BV_{CEO}	100	130	-	V	$I_C = 1\text{mA}$
Emitter-Base Breakdown Voltage	BV_{EBO}	12	14	-	V	$I_E = 100\mu\text{A}$
Collector-Base Cutoff Current	I_{CBO}	-	<10	100	nA	$V_{CB} = 80\text{V}$
Collector-Emitter Cutoff Current	I_{CES}	-	<10	200	nA	$V_{CE} = 80\text{V}$
Emitter Cutoff Current	I_{EBO}	-	<10	100	nA	$V_{EB} = 7\text{V}$
DC Current Gain (Note 9)	h_{FE}	10,000 1,000	-	-	-	$I_C = 100\text{mA}$, $V_{CE} = 5\text{V}$ $I_C = 1\text{A}$, $V_{CE} = 5\text{V}$
Collector-Emitter Saturation Voltage (Note 9)	$V_{CE(sat)}$	-	-	1.5	V	$I_C = 100\text{mA}$, $I_B = 0.1\text{mA}$
Base-Emitter Turn-On Voltage (Note 9)	$V_{BE(on)}$	-	-	2.0	V	$I_C = 100\text{mA}$, $V_{CE} = 5\text{V}$
Output Capacitance (Note 9)	C_{obo}	-	6.0	8.0	pF	$V_{CB} = 10\text{V}$, $f = 1\text{MHz}$
Current Gain-Bandwidth Product (Note 9)	f_T	200	-	-	MHz	$V_{CE} = 5\text{V}$, $I_C = 100\text{mA}$
Turn-On Time	t_{on}	-	0.7	-	μs	$V_{CC} = 10\text{V}$, $I_C = 100\mu\text{A}$
Turn-Off Time	t_{off}	-	2.5	-	μs	$I_{B1} = -I_{B2} = 0.1\text{mA}$

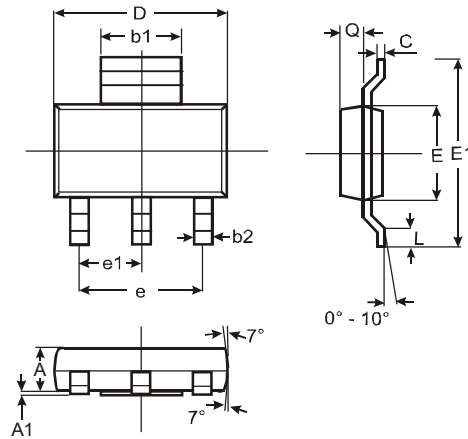
Notes: 9. Measured under pulsed conditions. Pulse width $\leq 300\mu\text{s}$. Duty cycle $\leq 2\%$.

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



Package Outline Dimensions

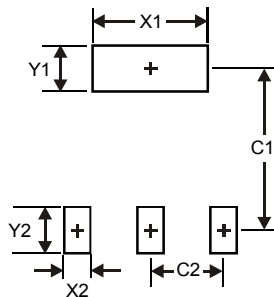
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



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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