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**100V NPN DARLINGTON TRANSISTOR IN SOT223**
**Features**

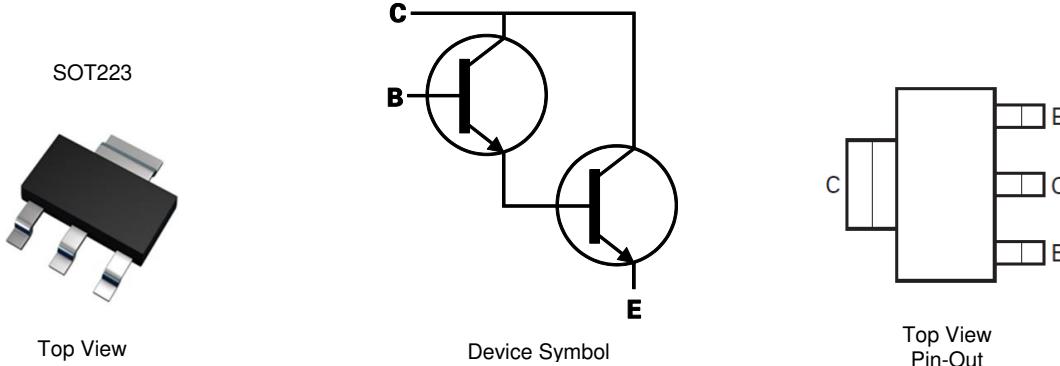
- $BV_{CEO} > 100V$
- $BV_{CBO} > 100V$
- $I_C = 1.5A$  High Continuous Current
- $hFE > 10k$  for very High Gain @100mA
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

**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 (e3)
- Weight: 0.112 grams (Approximate)

**Applications**

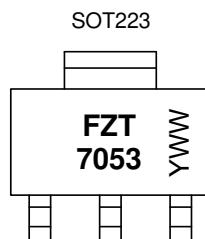
- Lamp
- Relay
- Solenoid Driving


**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/quality/lead\\_free.html](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 7053 = Product Type Marking Code  
 YWW = Date Code Marking  
 Y or  $\bar{Y}$  = Last Digit of Year (ex: 5= 2015)  
 WW or  $\bar{WW}$  = Week Code (01~53)

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	$V_{CBO}$	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

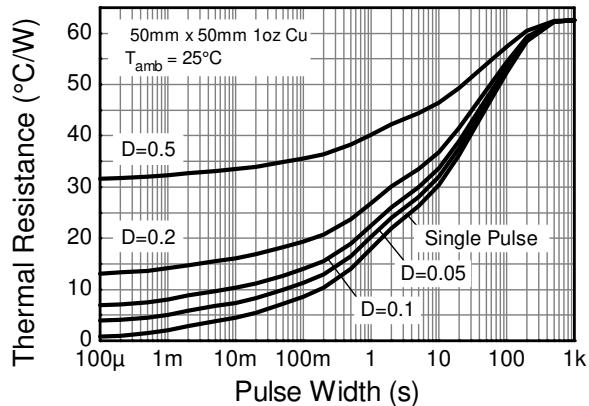
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**Thermal Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

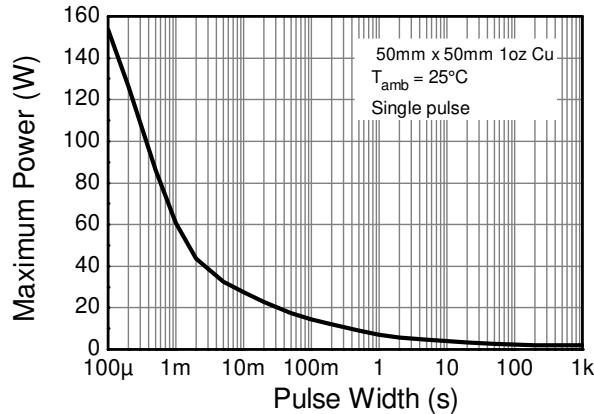
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	$P_D$	1	W
Power Dissipation (Note 6)	$P_D$	1.25	W
Power Dissipation (Note 7)	$P_D$	2	W
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	125	°C/W
Thermal Resistance, Junction to Ambient (Note 6)	$R_{\theta JA}$	100	°C/W
Thermal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

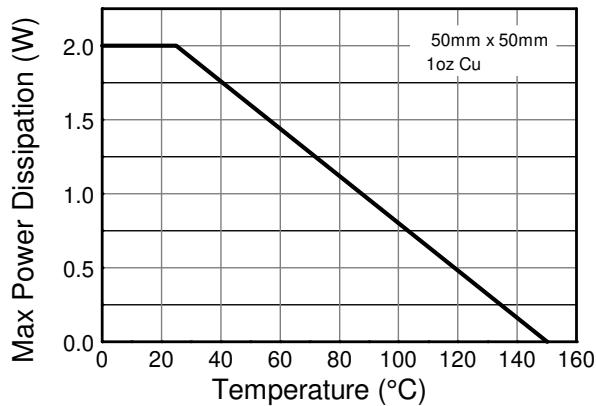
## Thermal Characteristics and Derating Information



**Transient Thermal Impedance**



**Pulse Power Dissipation**



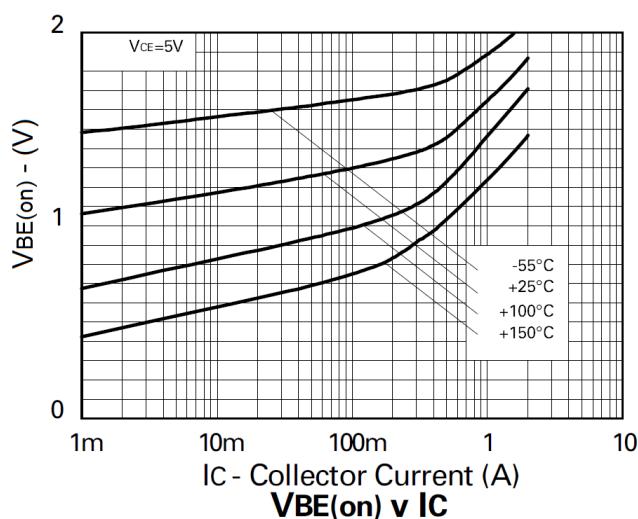
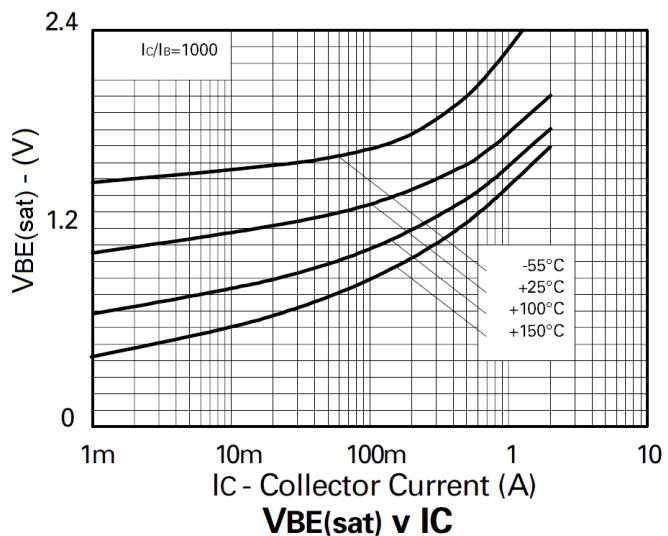
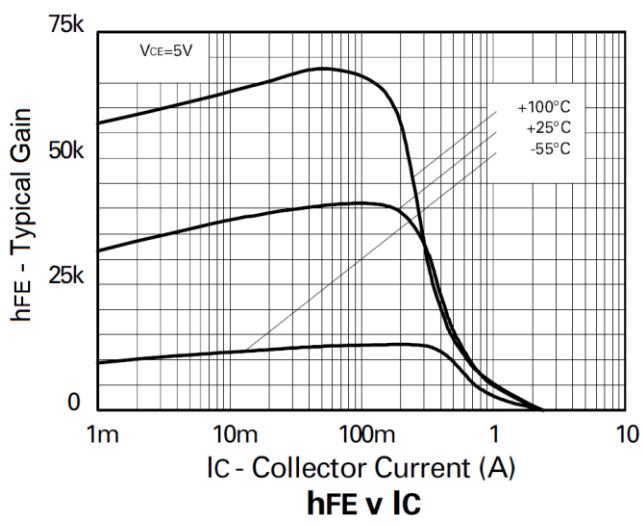
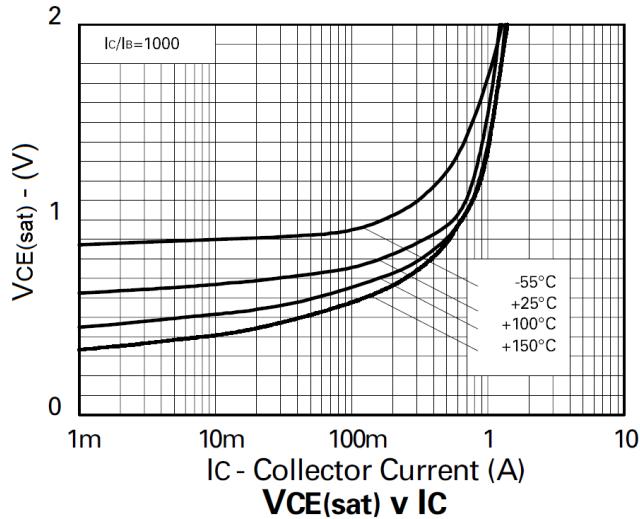
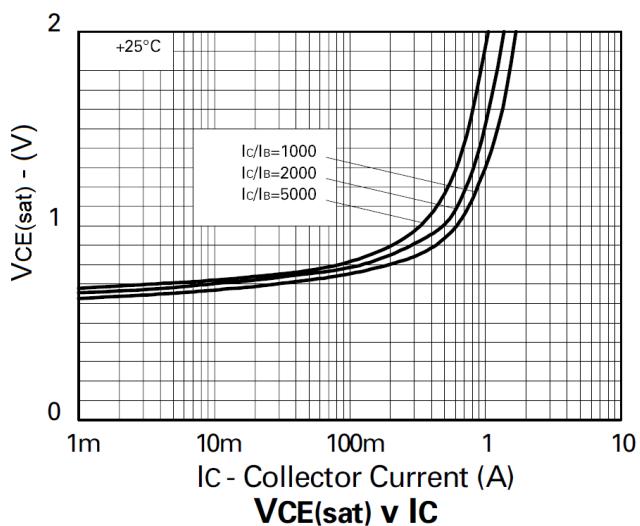
**Derating Curve**

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

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

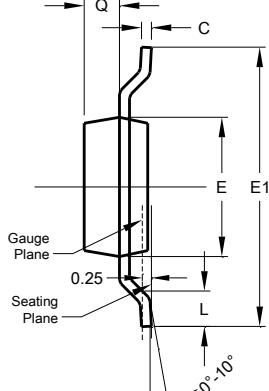
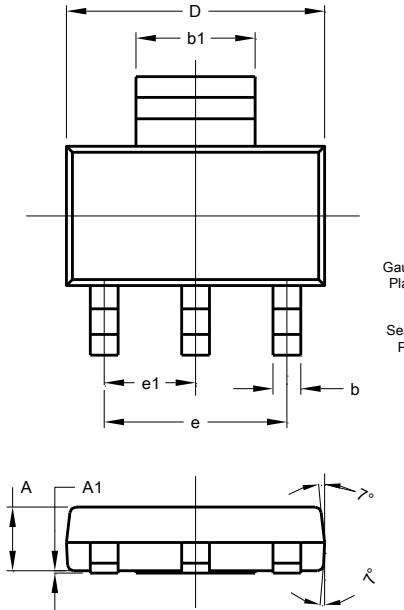
Note: 9. Measured under pulsed conditions. Pulse width  $\leq 300\ \mu\text{s}$ . Duty cycle  $\leq 2\%$ .

**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 the latest version.

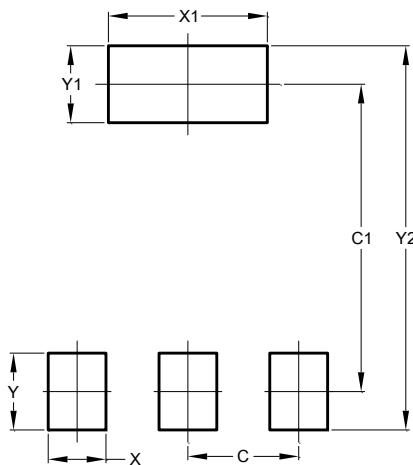


SOT223			
Dim	Min	Max	Typ
<b>A</b>	1.55	1.65	1.60
<b>A1</b>	0.010	0.15	0.05
<b>b</b>	0.60	0.80	0.70
<b>b1</b>	2.90	3.10	3.00
<b>C</b>	0.20	0.30	0.25
<b>D</b>	6.45	6.55	6.50
<b>E</b>	3.45	3.55	3.50
<b>E1</b>	6.90	7.10	7.00
<b>e</b>	-	-	4.60
<b>e1</b>	-	-	2.30
<b>L</b>	0.85	1.05	0.95
<b>Q</b>	0.84	0.94	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)
<b>C</b>	2.30
<b>C1</b>	6.40
<b>X</b>	1.20
<b>X1</b>	3.30
<b>Y</b>	1.60
<b>Y1</b>	1.60
<b>C2</b>	8.00

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