



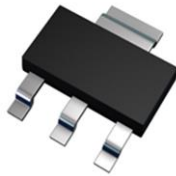
## Features

- $BV_{CEO} > -12V$
- $I_C = -6A$  High Continuous Collector Current
- $I_{CM} = -20A$  Peak Pulse Current
- Low Saturation Voltage  $V_{CE(sat)} < -170mV @ -2A$
- $h_{FE}$  Specified up to -10A for a High Gain Hold Up
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/104/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please [contact us](https://www.diodes.com/quality/product-definitions/) or your local Diodes representative. <https://www.diodes.com/quality/product-definitions/>**

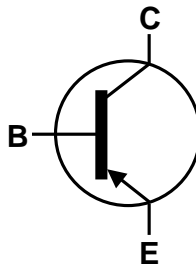
## Mechanical Data

- Package: SOT223 (Type DN)
- Package 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)

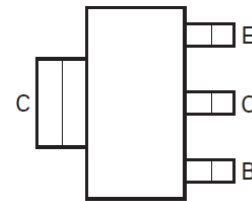
SOT223 (Type DN)



Top View



Device Symbol



Top View  
Pin-Out

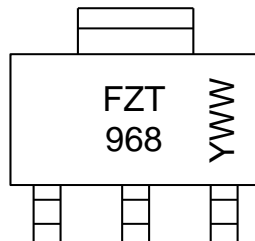
## Ordering Information (Note 4)

Orderable Part Number	Package	Marking	Reel size (inches)	Tape width (mm)	Packing	
					Quantity	Carrier
FZT968TA	SOT223 (Type DN)	FZT968	7	12	1,000	Reel

- Notes:
1. EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied.
  2. See <https://www.diodes.com/quality/lead-free/> 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 <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

## Marking Information

SOT223 (Type DN)



FZT 968 = Product Type Marking Code  
 YWW = Date Code Marking  
 Y or  $\bar{Y}$  = Last digit of year (ex: 3 = 2023)  
 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	$V_{CBO}$	-15	V
Collector-Emitter Voltage	$V_{CEO}$	-12	V
Emitter-Base Voltage	$V_{EBO}$	-6	V
Continuous Collector Current	$I_C$	-6	A
Peak Pulse Current	$I_{CM}$	-20	A

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

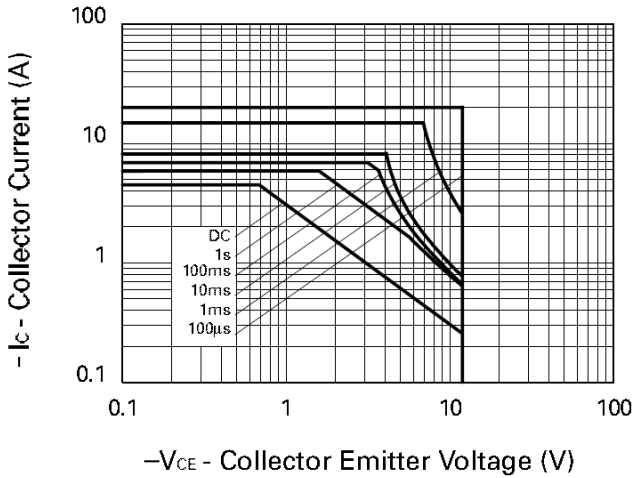
Characteristic	Symbol	Value	Unit
Power Dissipation Linear derating factor	$P_D$	3.0	W
		24	
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	1.6	mW / $^\circ\text{C}$
		12.8	
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	42	$^\circ\text{C/W}$
		78	
Thermal Resistance Junction to Lead	$R_{\theta JL}$	8.8	
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	$^\circ\text{C}$

**ESD Ratings** (Note 8)

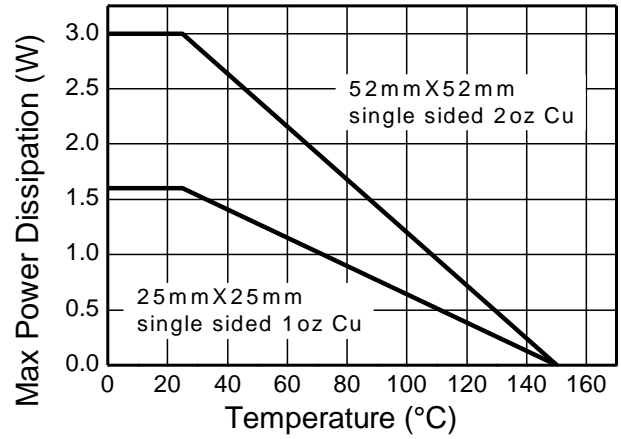
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

- 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 steady-state.
  6. Same as note 5, except the device is mounted on 25mm x 25mm 1oz 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.

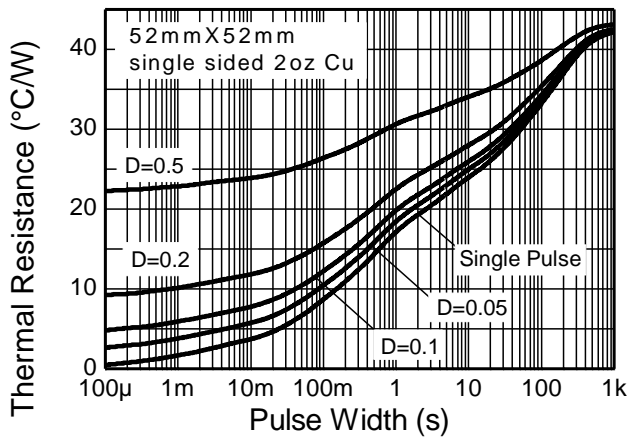
**Thermal Characteristics and Derating Information**



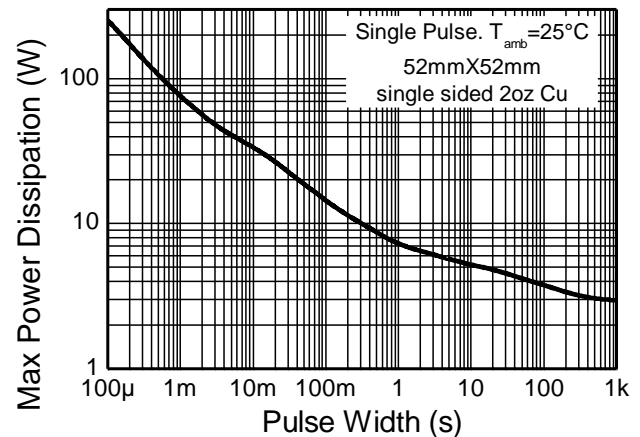
**Safe Operating Area**



**Derating Curve**



**Transient Thermal Impedance**



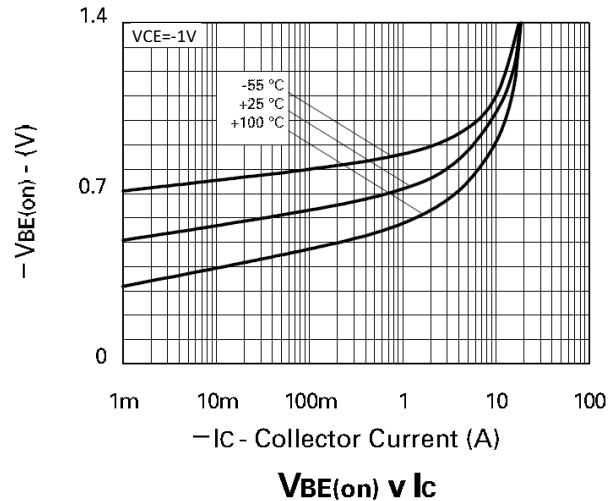
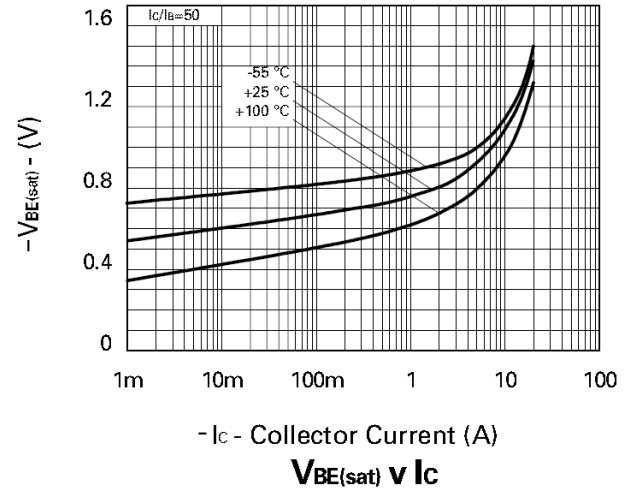
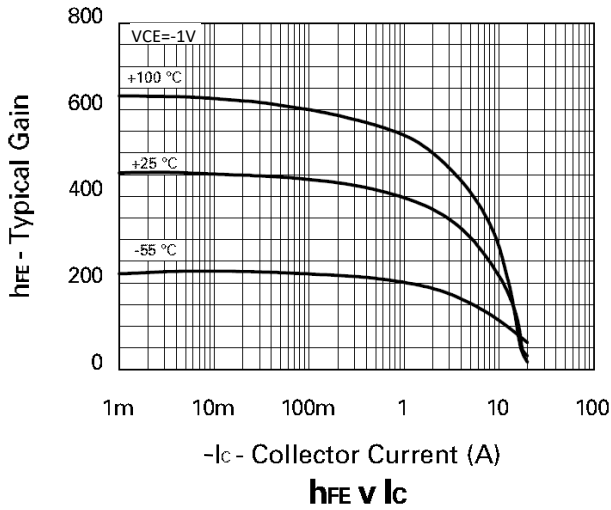
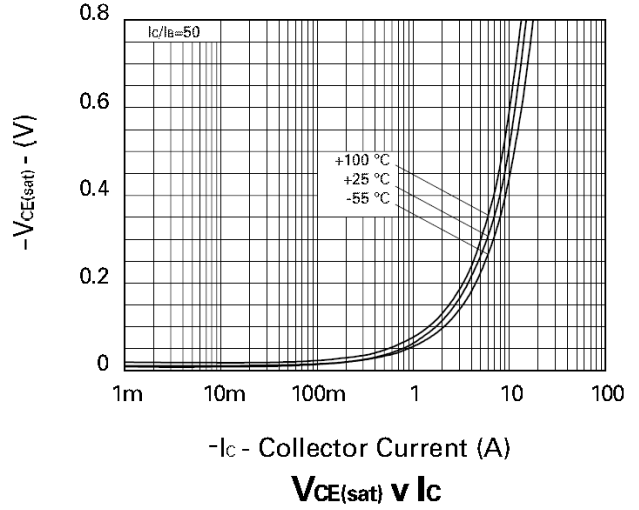
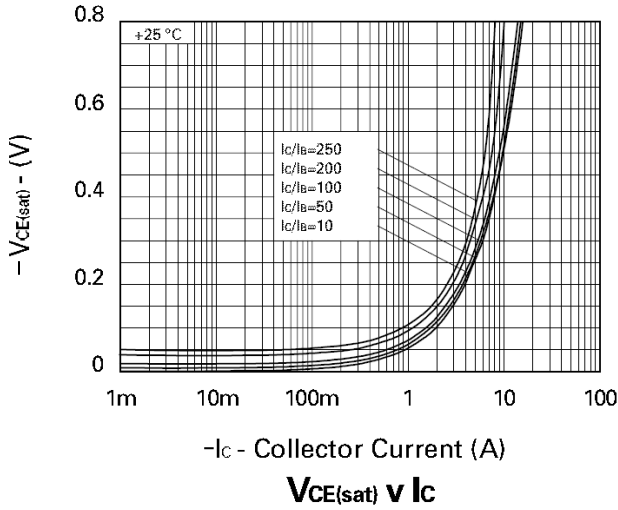
**Pulse Power Dissipation**

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV <sub>CB0</sub>	-15	-28	—	V	I <sub>C</sub> = -100μA
Collector-Emitter Breakdown Voltage (Note 9)	BV <sub>CEO</sub>	-12	-20	—	V	I <sub>C</sub> = -10mA
Emitter-Base Breakdown Voltage	BV <sub>EBO</sub>	-6	-8	—	V	I <sub>E</sub> = -100μA
Collector Cutoff Current	I <sub>CB0</sub>	—	—	-10 -1	nA μA	V <sub>CB</sub> = -12V V <sub>CB</sub> = -12V, T <sub>A</sub> = +100°C
Emitter Cutoff Current	I <sub>EBO</sub>	—	—	-10	nA	V <sub>EB</sub> = -6V
DC current transfer Static ratio (Note 9)	h <sub>FE</sub>	300	450	—	—	I <sub>C</sub> = -10mA, V <sub>CE</sub> = -1V
		300	450	1000		I <sub>C</sub> = -500mA, V <sub>CE</sub> = -1V
		200	300	—		I <sub>C</sub> = -5A, V <sub>CE</sub> = -1V
		150	240	—		I <sub>C</sub> = -10A, V <sub>CE</sub> = -1V
		—	50	—		I <sub>C</sub> = -20A, V <sub>CE</sub> = -1V
Collector-Emitter Saturation Voltage (Note 9)	V <sub>CE(sat)</sub>	—	-65	-130	mV	I <sub>C</sub> = -500mA, I <sub>B</sub> = -5mA
		—	-132	-170		I <sub>C</sub> = -2A, I <sub>B</sub> = -50mA
		—	-360	-450		I <sub>C</sub> = -6A, I <sub>B</sub> = -250mA
Base-Emitter Saturation Voltage (Note 9)	V <sub>BE(sat)</sub>	—	-1.05	-1.2	V	I <sub>C</sub> = -6A, I <sub>B</sub> = -250mA
Base-Emitter Turn-on Voltage (Note 9)	V <sub>BE(on)</sub>	—	-0.87	-1.05	V	I <sub>C</sub> = -6A, V <sub>CE</sub> = -1V
Transitional Frequency (Note 9)	f <sub>T</sub>	—	80	—	MHz	I <sub>C</sub> = -100mA, V <sub>CE</sub> = -10V, f = 50MHz
Output capacitance	C <sub>obo</sub>	—	161	—	pF	V <sub>CB</sub> = -20V, f = 1MHz
Switching Time	t <sub>on</sub>	—	120	—	ns	V <sub>CC</sub> = -10V, I <sub>C</sub> = -4A, I <sub>B1</sub> = -I <sub>B2</sub> = -400mA
	t <sub>off</sub>	—	116	—		

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

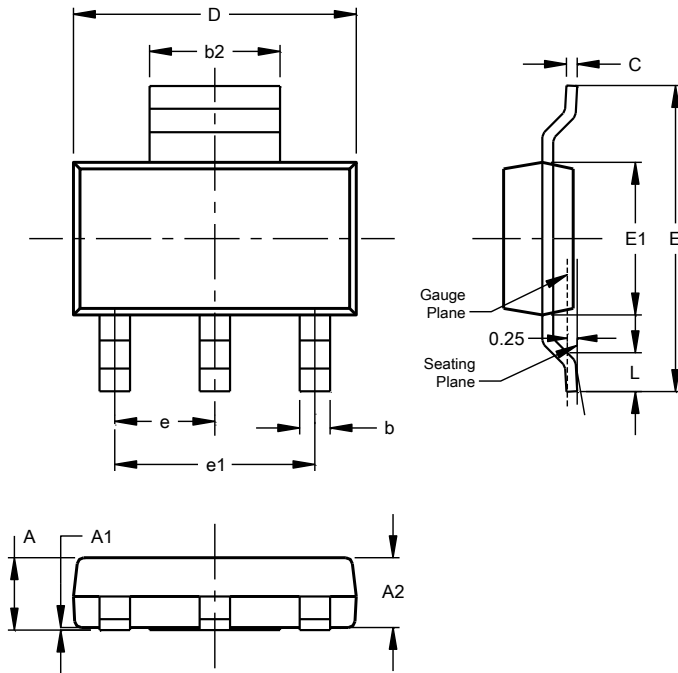
**Typical Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)



## Package Outline Dimensions

Please see <https://www.diodes.com/design/support/packaging/diodes-packaging/> for the latest version.

SOT223 (Type DN)

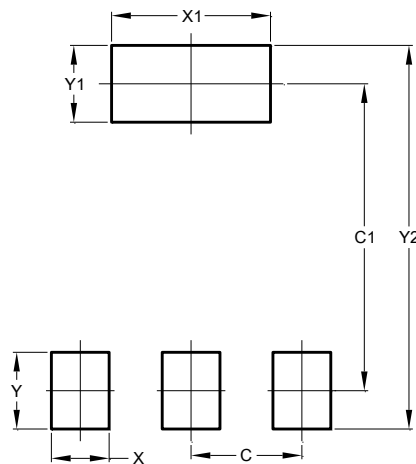


SOT223 (Type DN)			
Dim	Min	Max	Typ
A	--	1.70	--
A1	0.01	0.15	--
A2	1.50	1.68	1.60
b	0.60	0.80	0.70
b2	2.90	3.10	--
c	0.20	0.32	--
D	6.30	6.70	--
E	6.70	7.30	--
E1	3.30	3.70	--
e	--	--	2.30
e1	--	--	4.60
L	0.85	--	--
All Dimensions in mm			

## Suggested Pad Layout

Please see <https://www.diodes.com/design/support/packaging/diodes-packaging/> for the latest version.

SOT223 (Type DN)



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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