

Features

- $BV_{CEO} > -30V$
- $I_C = -5.5A$ High Continuous Collector Current
- $I_C = -20A$ Peak Pulse Current
- Low Saturation Voltage $V_{CE(sat)} < -140mV$ @ $-1A$
- h_{FE} Specified up to $-20A$ for a High Gain Hold-up
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **The DIODES™ FZT949Q is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF16949 certified facilities.**
<https://www.diodes.com/quality/product-definitions/>

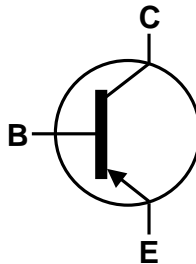
Mechanical Data

- Package: SOT223
- 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)

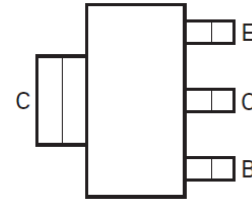
SOT223 (Type ZN)



Top View



Device Symbol



Top View
Pin-Out

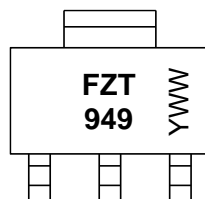
Ordering Information (Note 4)

Part Number	Package	Marking	Reel Size (inches)	Tape Width (mm)	Packing	
					Qty.	Carrier
FZT949QTA	SOT223 (Type ZN)	FZT949	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 ZN)



FZT 949 = 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 to 53)

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V _{CB0}	-50	V
Collector-Emitter Voltage	V _{CEO}	-30	V
Emitter-Base Voltage	V _{EB0}	-7	V
Continuous Collector Current	I _C	-5.5	A
Peak Pulse Current	I _{CM}	-20	A

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

Characteristic	Symbol	Value	Unit
Power Dissipation	P _D	3.0	W
Linear Derating Factor		24	
		1.6	
		12.8	mW/°C
Thermal Resistance, Junction to Ambient	R _{θJA}	42	°C/W
	R _{θJA}	78	
Thermal Resistance, Junction to Lead	R _{θJL}	8.8	
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	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 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

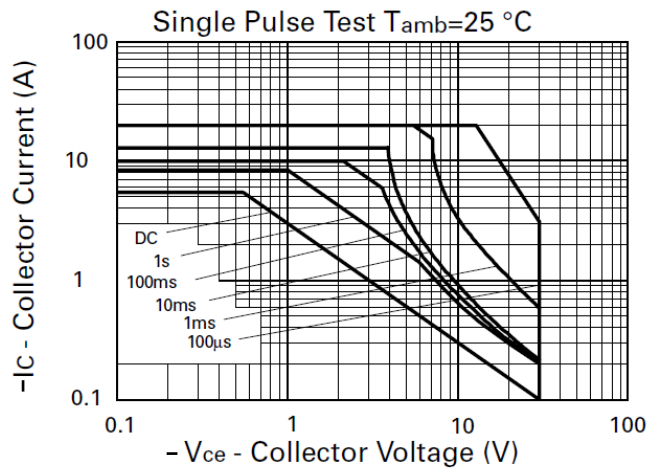


Figure 1. Safe Operating Area

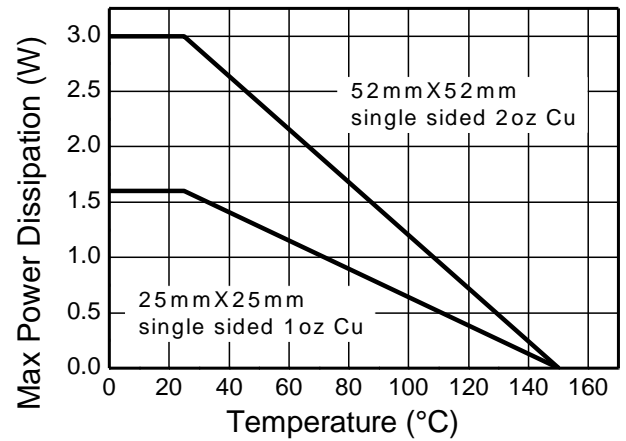


Figure 2. Derating Curve

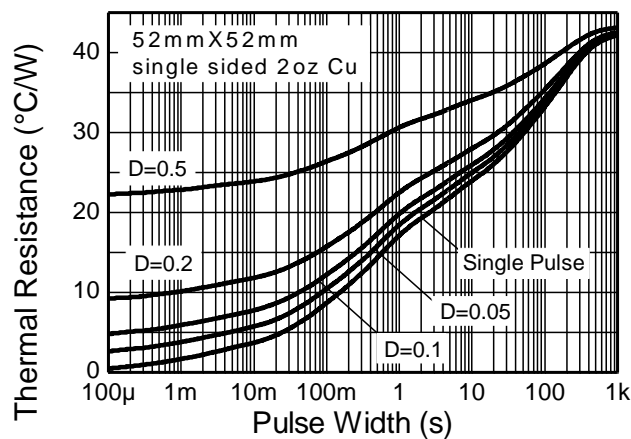


Figure 3. Transient Thermal Impedance

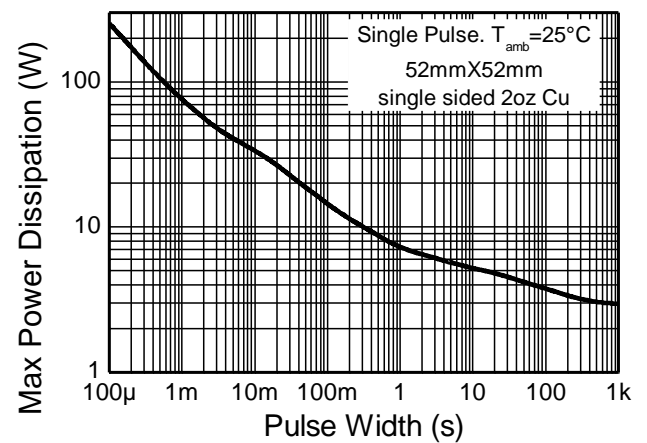


Figure 4. Pulse Power Dissipation

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

Characteristic	Symbol	Min	Typ.	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV _{CBO}	-50	-80	—	V	I _C = -100μA
Collector-Emitter Breakdown Voltage (Note 9)	BV _{CER}	-50	-80	—	V	I _C = -1μA, R _B ≤ 1kΩ
Collector-Emitter Breakdown Voltage (Note 9)	BV _{CEO}	-30	-45	—	V	I _C = -10mA
Emitter-Base Breakdown Voltage	BV _{EBO}	-7	-8	—	V	I _E = -100μA
Collector Cut-Off Current	I _{CBO}	—	—	-50 -1	nA μA	V _{CB} = -40V V _{CB} = -40V, T _A = +100°C
Collector Cut-Off Current	I _{CER}	—	—	-50 -1	nA μA	V _{CE} = -40V, R ≤ 1kΩ V _{CE} = -40V, T _A = +100°C
Emitter Cut-Off Current	I _{EBO}	—	—	-10	nA	V _{EB} = -6V
DC Current Transfer Static Ratio (Note 9)	h _{FE}	100	200	—	—	I _C = -10mA, V _{CE} = -1V
		100	200	300		I _C = -1A, V _{CE} = -1V
		75	140	—		I _C = -5A, V _{CE} = -1V
		—	35	—		I _C = -20A, V _{CE} = -2V
Collector-Emitter Saturation Voltage (Note 9)	V _{CE(sat)}	—	-50	-75	mV	I _C = -500mA, I _B = -20mA
		—	-85	-140		I _C = -1A, I _B = -20mA
		—	-190	-270		I _C = -2A, I _B = -200mA
		—	-350	-440		I _C = -5.5A, I _B = -500mA
Base-Emitter Saturation Voltage (Note 9)	V _{BE(sat)}	—	-1,100	-1,250	mV	I _C = -5.5A, I _B = -500mA
Base-Emitter Turn-On Voltage (Note 9)	V _{BE(on)}	—	-900	-1,060	mV	I _C = -5.5A, V _{CE} = -1V
Transitional Frequency (Note 9)	f _T	—	100	—	MHz	I _C = -100mA, V _{CE} = -10V f = 50MHz
Output Capacitance	C _{obo}	—	122	—	pF	V _{CB} = -10V, f = 1MHz
Switching Time	t _{on}	—	120	—	ns	V _{CC} = -10V, I _C = -4A I _{B1} = -I _{B2} = -400mA
	t _{off}	—	130	—		

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

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

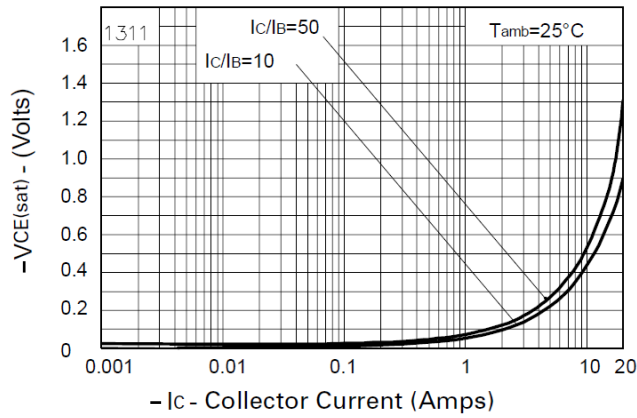


Figure 5. $V_{CE(sat)}$ v I_c

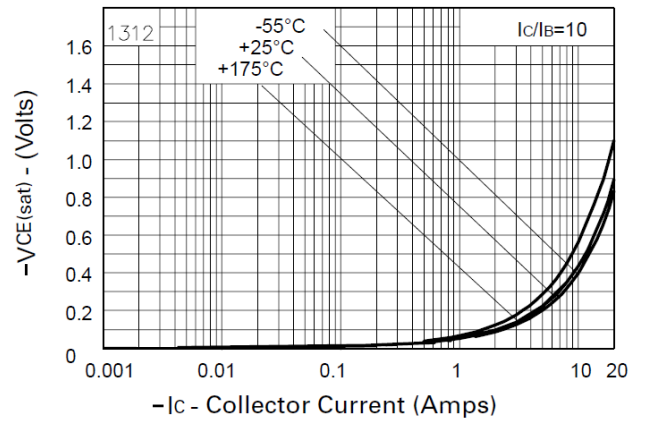


Figure 6. $V_{CE(sat)}$ v I_c

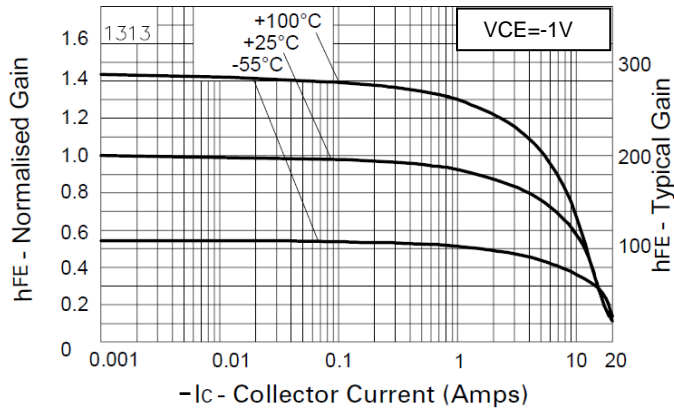


Figure 7. h_{FE} v I_c

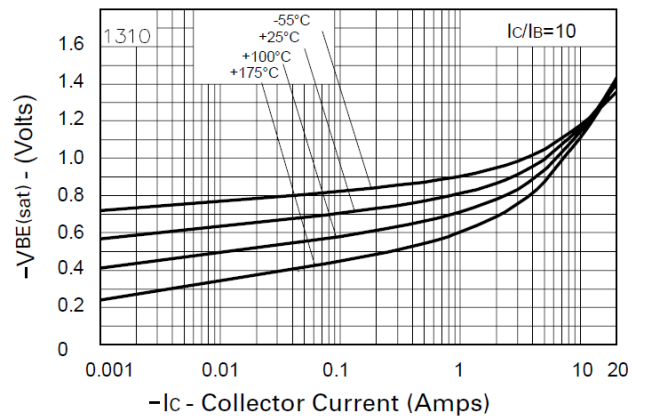


Figure 8. $V_{BE(sat)}$ v I_c

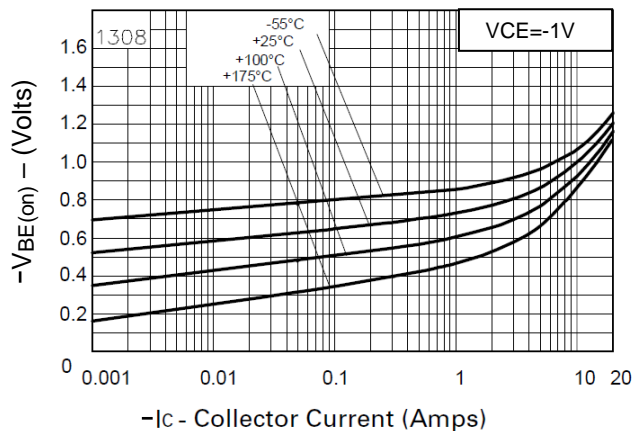
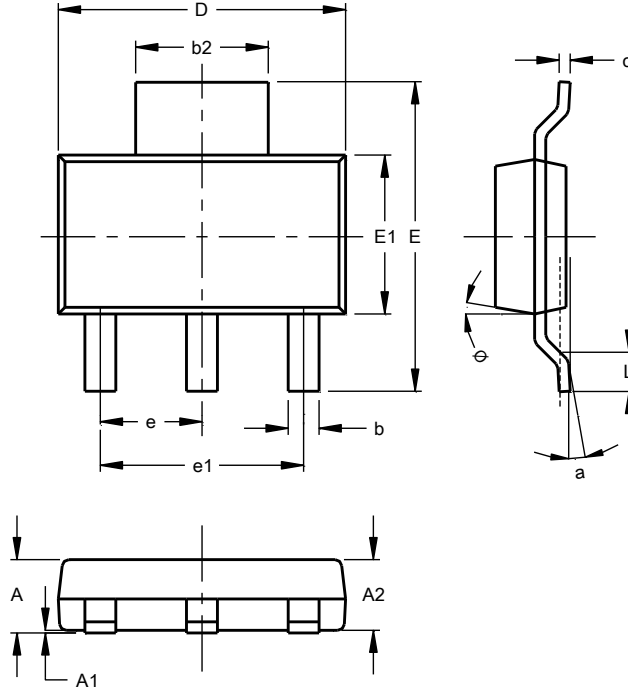


Figure 9. $V_{BE(on)}$ v I_c

Package Outline Dimensions

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

SOT223 (Type ZN)

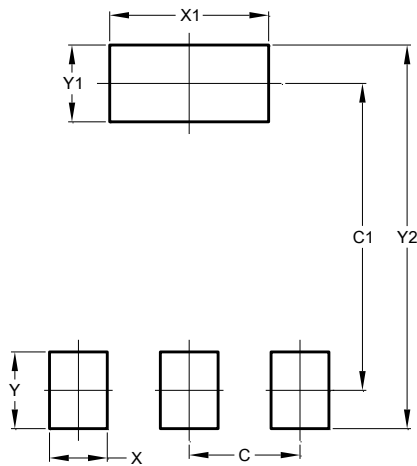


SOT223 (Type ZN)			
Dim	Min	Max	Typ
A	--	1.70	--
A1	0.02	0.10	--
A2	1.50	1.68	1.60
b	0.60	0.80	--
b2	2.90	3.10	--
c	0.24	0.32	--
D	6.30	6.70	--
E	6.70	7.30	--
E1	3.30	3.70	--
e	2.30 NOM		
e1	4.60 NOM		
L	0.90	--	--
a	--	--	10°
θ	--	15°	--
All Dimensions in mm			

Suggested Pad Layout

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

SOT223 (Type ZN)



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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