

20V PNP MEDIUM POWER TRANSISTOR IN SOT223

Features

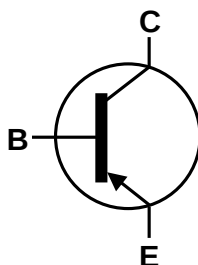
- $BV_{CEO} > -20V$
- $I_C = -6A$ High Continuous Collector Current
- $I_{CM} = -20A$ Peak Pulse Current
- Low Saturation Voltage $V_{CE(SAT)}$
- h_{FE} Specified up to -20A for a High Gain Hold-up
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

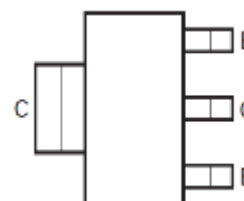
- Case: SOT223
- Case Material: Molded Plastic. "Green" Molding Compound.
UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Plated Leads. Solderable per MIL-STD-202, Method 208 (e3)
- Weight: 0.112 grams (Approximate)



Top View



Device Symbol



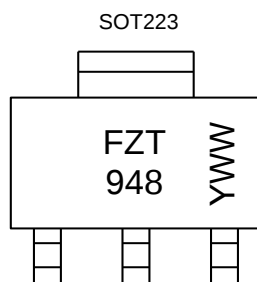
Top View
Pin-Out

Ordering Information (Note 4)

Product	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
FZT948TA	AEC-Q101	FZT948	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 <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



FZT 948 = Product Type Marking Code
 YWW = Date Code Marking
 Y or $\bar{Y}$ = Last Digit of Year (ex: 7 = 2017)
 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 _{CBO}	-40	V
Collector-Emitter Voltage	V _{CEO}	-20	V
Emitter-Base Voltage	V _{EBO}	-7	V
Continuous Collector Current	I _C	-6	A
Peak Pulse Current	I _{CM}	-20	A

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

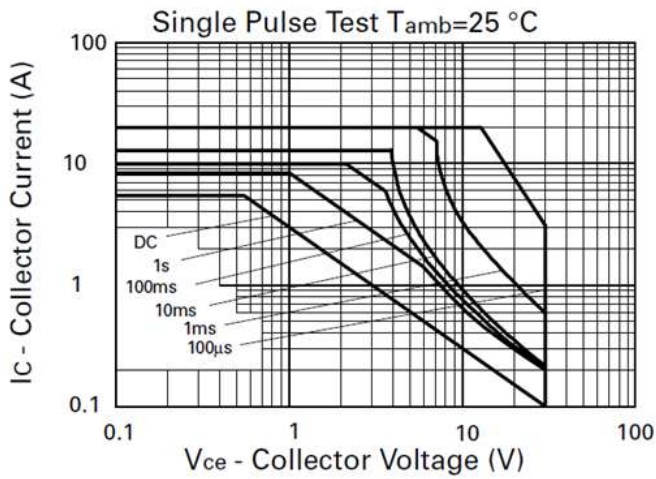
Characteristic	Symbol	Value	Unit
Power Dissipation	P _D	3.0	W
Linear Derating Factor		24	
		1.6	
		12.8	mW /°C
Thermal Resistance, Junction to Ambient	R _{θJA}	42	°C/W
	R _{θJA}	78	
Thermal Resistance Junction to Lead	R _{θJL}	8.84	
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

ESD Ratings (Note 8)

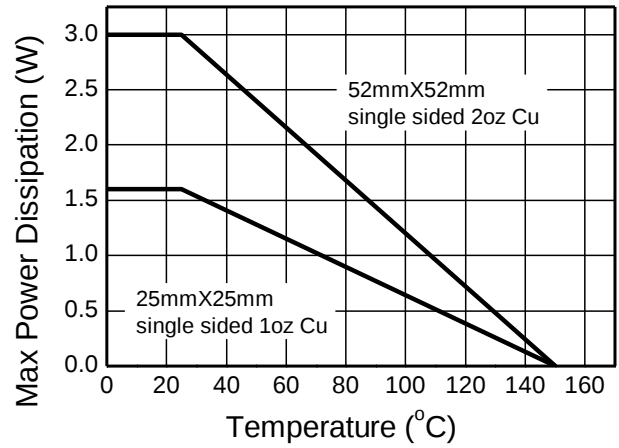
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3B
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

- 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.

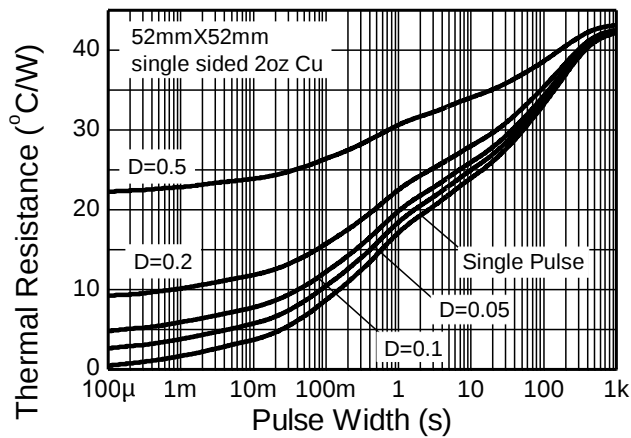
Thermal Characteristics and Derating Information



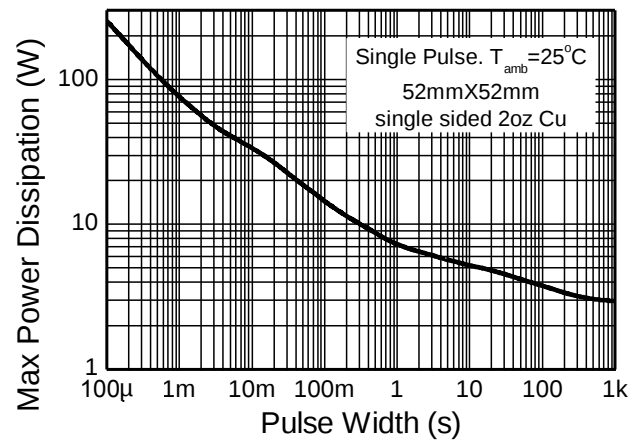
Safe Operating Area



Derating Curve



Transient Thermal Impedance



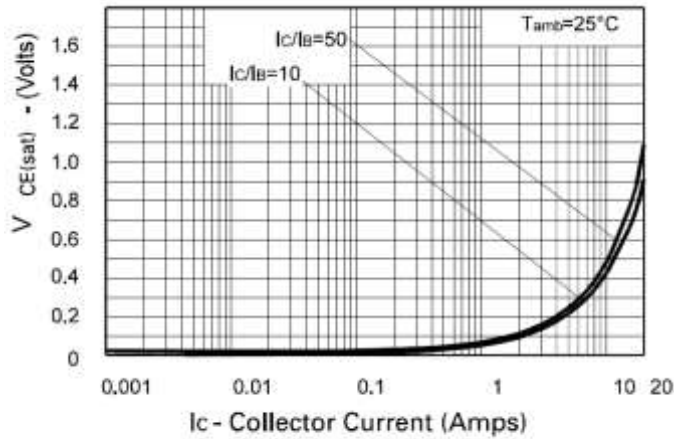
Pulse Power Dissipation

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

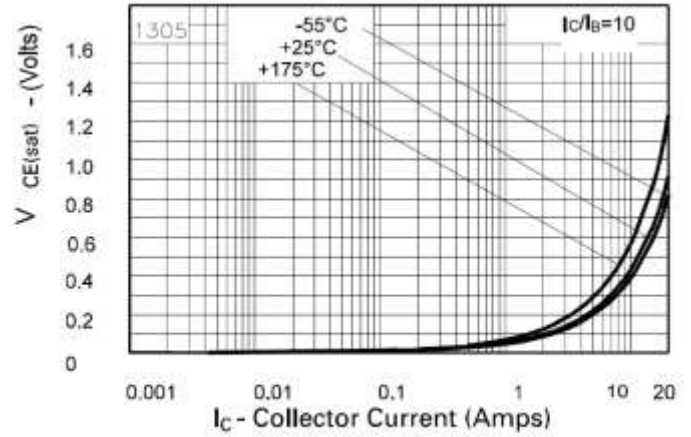
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV _{CBO}	-40	-55	—	V	I _C = -100μA
Collector-Emitter Breakdown Voltage (Note 9)	BV _{CER}	-40	-55	—	V	I _C = -1μA, R _B ≤ 1kΩ
Collector-Emitter Breakdown Voltage (Note 9)	BV _{CEO}	-20	-30	—	V	I _C = -10mA
Emitter-Base Breakdown Voltage	BV _{EBO}	-7	-8	—	V	I _E = -100μA
Collector Cut-Off Current	I _{CBO}	—	—	-50 -1	nA μA	V _{CB} = -30V V _{CB} = -30V, T _A = +100°C
Collector Cut-Off Current	I _{CER}	—	—	-50 -1	nA μA	V _{CE} = -30V, R ≤ 1kΩ V _{CE} = -30V, 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	160	—		I _C = -5A, V _{CE} = -1V
		60	130	—		I _C = -10A, V _{CE} = -1V
		15	40	—		I _C = -20A, V _{CE} = -2V
Collector-Emitter Saturation Voltage (Note 9)	V _{CE(SAT)}	—	-60	-130	mV	I _C = -0.5A, I _B = -10mA
		—	-110	-180		I _C = -2A, I _B = -200mA
		—	-200	-280		I _C = -4A, I _B = -400mA
		—	-360	-450		I _C = -6A, I _B = -250mA
Base-Emitter Saturation Voltage (Note 9)	V _{BE(SAT)}	—	-1,050	-1,200	mV	I _C = -5A, I _B = -300mA
Base-Emitter Turn-On Voltage (Note 9)	V _{BE(ON)}	—	-870	-1,050	mV	I _C = -6A, V _{CE} = -1V
Transitional Frequency (Note 9)	f _T	—	80	—	MHz	I _C = -100mA, V _{CE} = -10V, f = 50MHz
Output Capacitance	C _{OBO}	—	163	—	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}	—	126	—		

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

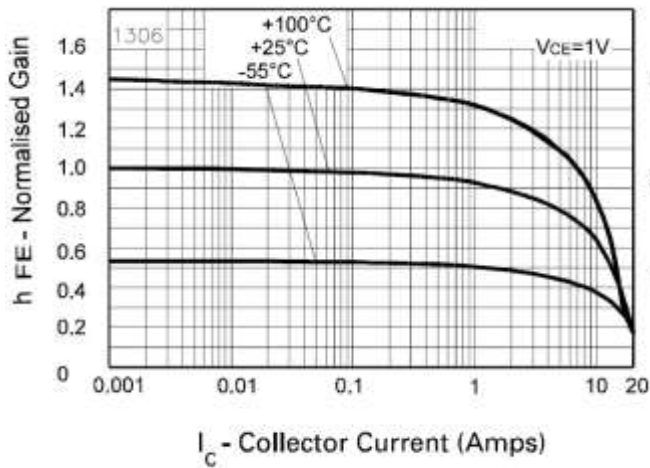
Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)



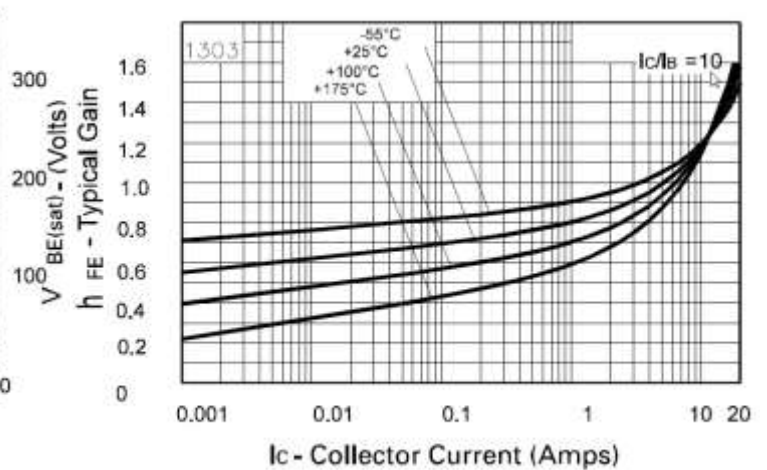
V_{CE(sat)} v I_C



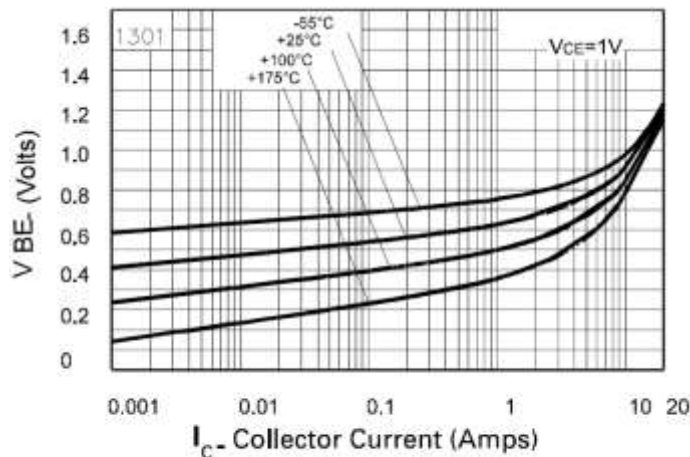
V_{CE(sat)} v I_C



h_{FE} v I_C



V_{BE(sat)} v I_C

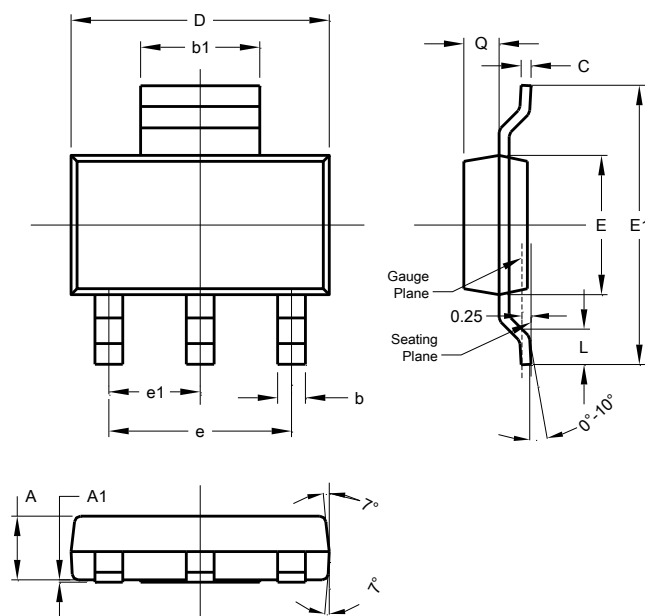


V_{BE(on)} v I_C

Package Outline Dimensions

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

SOT223

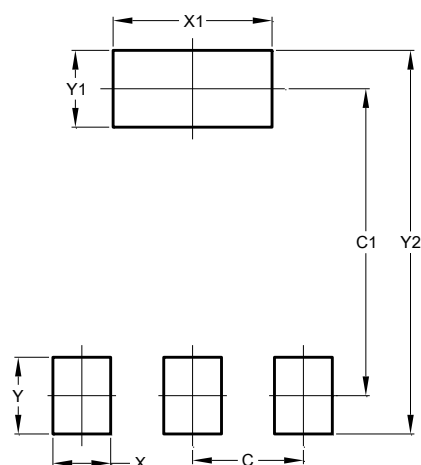


SOT223			
Dim	Min	Max	Typ
A	1.55	1.65	1.60
A1	0.010	0.15	0.05
b	0.60	0.80	0.70
b1	2.90	3.10	3.00
C	0.20	0.30	0.25
D	6.45	6.55	6.50
E	3.45	3.55	3.50
E1	6.90	7.10	7.00
e	-	-	4.60
e1	-	-	2.30
L	0.85	1.05	0.95
Q	0.84	0.94	0.89
All Dimensions in mm			

Suggested Pad Layout

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

SOT223



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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