



FZT957

#### 300V PNP MEDIUM POWER TRANSISTOR IN SOT223

#### **Features**

- BV<sub>CEO</sub> > -300V
- I<sub>C</sub> = -1A High Continuous Collector Current
- I<sub>CM</sub> = -2A Peak Pulse Current
- Low Saturation Voltage V<sub>CE(sat)</sub> < -240mV @ -1A</li>
- h<sub>FE</sub> Specified up to -2A for a High Gain Hold-Up
- Complementary NPN Type: FZT857
- Lead-Free Finish; RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)
- Qualified to AEC-Q101 Standards for High Reliability
- PPAP Capable (Note 4)

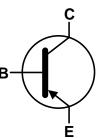
#### **Mechanical Data**

- 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 <sup>3</sup>
- Weight: 0.112 grams (Approximate)

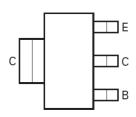




Top View



Device Symbol



Top View Pin-Out

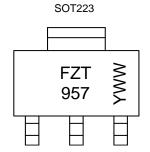
#### Ordering Information (Notes 4 & 5)

Product	Compliance	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
FZT957TA	AEC-Q101	FZT957	7	12	1,000
FZT957TC	AEC-Q101	FZT957	13	12	4,000
FZT957QTC	Automotive	FZT957	13	12	4,000

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 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. Automotive products are AEC-Q101 qualified and are PPAP capable. Automotive, AEC-Q101 and standard products are electrically and thermally the same, except where specified. For more information, please refer to http://www.diodes.com/quality/product\_compliance\_definitions/.
- 5. For packaging details, go to our website at http://www.diodes.com/products/packages.html.

#### **Marking Information**



FZT 957 = Product Type Marking Code YWW = Date Code Marking Y or  $\overline{Y}$  = Last Digit of Year (ex: 6= 2016) WW or  $\overline{W}W$  = Week Code (01~53)



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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CBO</sub>	-330	V
Collector-Emitter Voltage	V <sub>CEO</sub>	-300	V
Emitter-Base Voltage	V <sub>EBO</sub>	-7	V
Continuous Collector Current	Ic	-1	Α
Peak Pulse Current	I <sub>CM</sub>	-2	Α

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

Characteristic	Symbol	Value	Unit		
Power Dissipation	(Note 6)		3 24	W mW /°C	
Linear Derating Factor	(Note 7)	P <sub>D</sub>	1.6 12.8		
Thermal Decistores, Junction to Ambient	(Note 6)	$R_{\theta JA}$	42		
Thermal Resistance, Junction to Ambient	(Note 7)	$R_{\theta JA}$	78	°C/W	
Thermal Resistance Junction to Lead	(Note 8)	$R_{ heta JL}$	8.8		
Operating and Storage Temperature Range	T <sub>J,</sub> T <sub>STG</sub>	-55 to +150	°C		

#### ESD Ratings (Note 9)

Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	8,000	٧	3B
Electrostatic Discharge - Machine Model	ESD MM	400	V	С

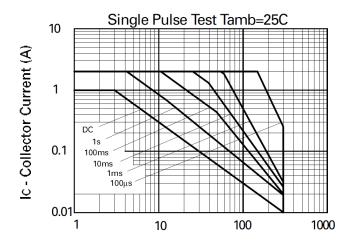
Notes:

- 6. 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.
- 7. Same as Note 6, except the device is mounted on 25mm x 25mm 1oz copper.
- 8. Thermal resistance from junction to solder-point (at the end of the collector lead).

  9. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

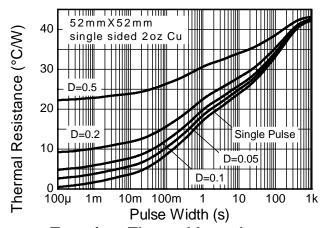


## **Thermal Characteristics and Derating Information**

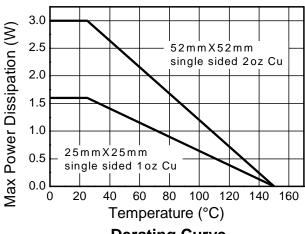




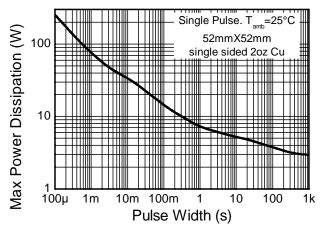
## **Safe Operating Area**



**Transient Thermal Impedance** 



**Derating Curve** 



**Pulse Power Dissipation** 



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

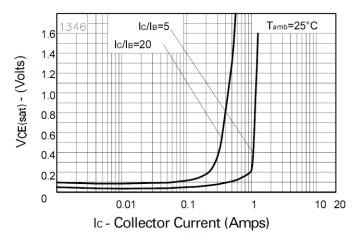
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV <sub>CBO</sub>	-330	-440	_	V	I <sub>C</sub> = -100μA
Collector-Emitter Breakdown Voltage	BV <sub>CER</sub>	-330	-440	_	V	$I_C = -1\mu A, R_B \le 1k\Omega$
Collector-Emitter Breakdown Voltage (Note 10)	BV <sub>CEO</sub>	-300	-400	_	V	I <sub>C</sub> = -10mA
Emitter-Base Breakdown Voltage	BV <sub>EBO</sub>	-7	-8	_	V	I <sub>E</sub> = -100μA
Collector Cut-Off Current	I <sub>CBO</sub>	_	<1	-50	nA	V <sub>CB</sub> = -300V; R ≤1kΩ
Concessor Cut on Current	ICBO	_	_	-1	μΑ	$V_{CB} = -300V, T_A = +100^{\circ}C$
Collector Cut-Off Current	ICER	_	<1	-50	nA	V <sub>CE</sub> = -300V
Concotor out on ourrent	ICER	_	_	-1	μΑ	$V_{CE} = -300V, T_A = +100^{\circ}C$
Emitter Cut-Off Current	$I_{EBO}$	1	<1	-10	nA	$V_{EB} = -6V$
	h <sub>FE</sub>	100	200	-	-	$I_C = -10 \text{mA}, V_{CE} = -10 \text{V}$
DC Current Transfer Static Datic (Note 10)		100	200	300		$I_C = -0.5A$ , $V_{CE} = -10V$
DC Current Transfer Static Ratio (Note 10)		90	170	_		I <sub>C</sub> = -1A, V <sub>CE</sub> = -10V
		_	10	_		I <sub>C</sub> = -2A, V <sub>CE</sub> = -10V
	VCE(sat)	1	-60	-100		$I_C = -100 \text{mA}, I_B = -10 \text{mA}$
Collector-Emitter Saturation Voltage (Note 10)		_	-110	-165	mV	$I_C = -500 \text{mA}, I_B = -100 \text{mA}$
		_	-170	-240		$I_C = -1A$ , $I_B = -300mA$
Base-Emitter Saturation Voltage (Note 10)	V <sub>BE(sat)</sub>	_	-910	-1,150	mV	I <sub>C</sub> = -1A, I <sub>B</sub> = -300mA
Base-Emitter Turn-on Voltage (Note 10)	V <sub>BE(on)</sub>	_	-750	-1,020	mV	I <sub>C</sub> = -1A, V <sub>CE</sub> = -10V
Transitional Frequency	f <sub>T</sub>	_	85	_	MHz	$I_C = -100 \text{mA}, V_{CE} = -10 \text{V},$ f = 50 MHz
Output Capacitance	C <sub>obo</sub>	_	23	_	pF	V <sub>CB</sub> = -20V, f = 1MHz
Switching Time	t <sub>ON</sub>	_	108	_	no	V <sub>CC</sub> = -100V, I <sub>C</sub> = -500mA,
Switching Time	t <sub>OFF</sub>		2,500	_	ns	$-I_{B1} = I_{B2} = -50 \text{mA}$

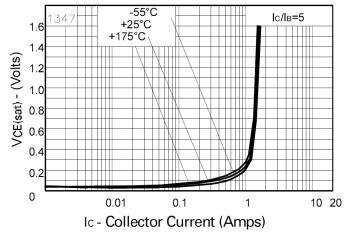
Note:

10. Measured under pulsed conditions. Pulse width  $\leq$  300 $\mu$ s. Duty cycle  $\leq$  2%.



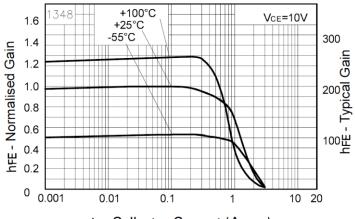
## Typical Electrical Characteristics (@T<sub>A</sub> = +25°C, unless otherwise specified.)

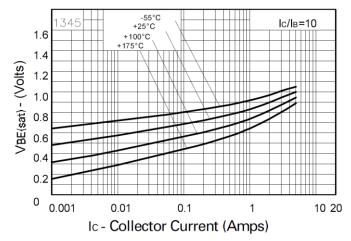




#### VCE(sat) v IC

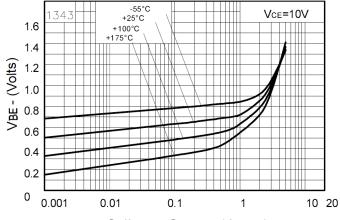






Ic - Collector Current (Amps)

hFE v IC VBE(sat) v IC



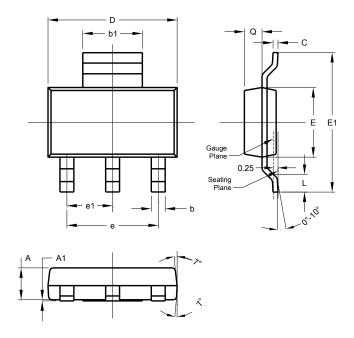
Ic - Collector Current (Amps)

VBE(on) v IC



## **Package Outline Dimensions**

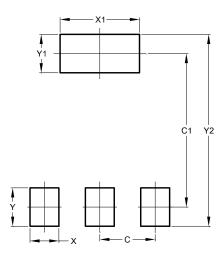
Please see http://www.diodes.com/package-outlines.html for the latest version.



SOT223					
Dim	Min	Max	Тур		
Α	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		
С	0.20	0.30	0.25		
D	6.45	6.55	6.50		
Е	3.45	3.55	3.50		
E1	6.90	7.10	7.00		
е	-	-	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.



Dimensions	Value (in mm)
C	2.30
C1	6.40
Х	1.20
X1	3.30
Y	1.60
Y1	1.60
Y2	8.00



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