

FZT658

400V NPN HIGH VOLTAGE TRANSISTOR IN SOT223

Features

- BVcEo > 400V
- Ic = 500mA High Continuous Current
- Icm = 1A Peak Pulse Current
- Low Saturation Voltage V_{CE(sat)} < 250mV @ 50mA
- hFE > 40 Specified up to 200mA for High Current Gain Hold-Up
- Complementary PNP Type: FZT758
- 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 or your local Diodes representative. https://www.diodes.com/quality/product-definitions/

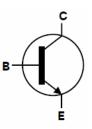
Mechanical Data

- 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)

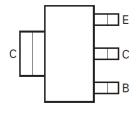
SOT223 (Type DN)







Device Symbol



Top View Pin-Out

Ordering Information (Note 4)

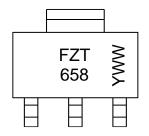
Part Number	Compliance	Pookogo	Marking	Reel Size (inches)	Tana Width (mm)	Packing		
Fait Nulliber	Compliance	Package	Warking	Reel Size (Iliches)	rape widin (min)	Qty.	Carrier	
FZT658TA	Standard	SOT223 (Type DN)	FZT658	7	12	1,000	Reel	

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 658 = Product Type Marking Code YWW = Date Code Marking Y or \overline{Y} = Last Digit of Year (ex: 2 = 2022) WW or $\overline{W}W$ = Week Code (01 to 53)



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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V _{CBO}	400	V
Collector-Emitter Voltage	Vceo	400	V
Emitter-Base Voltage	VEBO	7	V
Continuous Collector Current	Ic	0.5	Α
Peak Pulse Current	Ісм	1	Α

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

Characteristic	Symbol	Value	Unit		
	(Note 5)	PD	3		
Power Dissipation	(Note 6)		2	W	
Power Dissipation	(Note 7)	PD	1.6	VV	
	(Note 8)		1.2		
	(Note 5)		41.7		
Thermal Resistance, Junction to Ambient	(Note 6)	R _θ JA	62.5		
Thermal Resistance, Junction to Ambient	(Note 7)		78.1	°C/W	
	(Note 8)		104		
Thermal Resistance Junction to Lead (Note 9)		RθJL	12.9		
Operating and Storage Temperature Range	T_{J} , T_{STG}	-55 to +150	°C		

ESD Ratings (Note 10)

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	С

Notes:

- 5. For a device mounted with the collector lead on 50mm x 50mm 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.

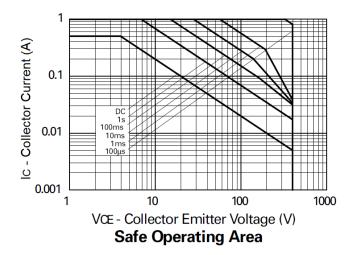
 6. Same as Note 5, except the device is mounted on 25mm x 25mm 2oz copper.

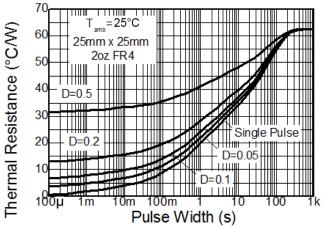
 7. Same as Note 5, except the device is mounted on 25mm x 25mm 1oz copper.

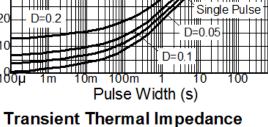
- 8. Same as Note 5, except the device is mounted on minimum recommended pad layout.
- 9. Thermal resistance from junction to solder-point (at the end of the collector lead).
- 10. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

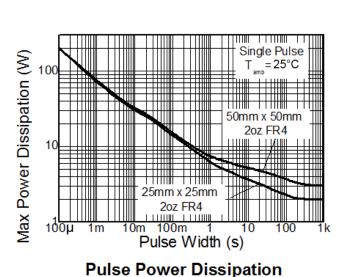


Thermal Characteristics and Derating Information









Thermal Resistance (°C/W) D=0.1Pulse Width (s)

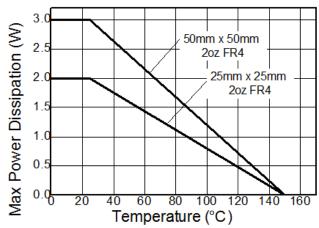
T_{amb}=25°C

50mm x 50mm

2oz FR4

D = 0.5





Derating Curve



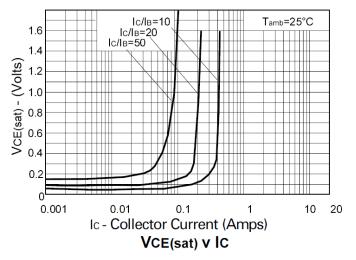
Electrical Characteristics (@TA = +25°C, unless otherwise specified.)

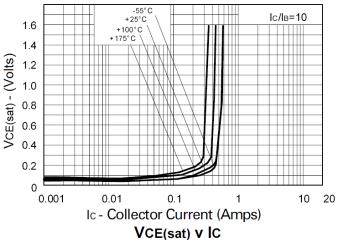
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV _{CBO}	400	_	_	V	I _C = 100μA
Collector-Emitter Breakdown Voltage (Note 11)	BVceo	400	_	_	V	Ic = 10mA
Emitter-Base Breakdown Voltage	BVEBO	7	_	_	V	I _E = 100μA
Collector Cut-Off Current	I _{CBO}	_	_	100	nA	V _{CB} = 320V
Emitter Cut-Off Current	I _{EBO}	1	1	100	nA	V _{EB} = 6V
		_	_	300	mV	Ic = 20mA, I _B = 1mA
Collector-Emitter Saturation Voltage (Note 11)	VcE(sat)			250		$I_C = 50$ mA, $I_B = 5$ mA
				500		$I_C = 100 \text{mA}, I_B = 10 \text{mA}$
Base-Emitter Saturation Voltage (Note 11)	V _{BE} (sat)	_	_	0.9	V	Ic = 100mA, I _B = 10mA
Base-Emitter Turn-On Voltage (Note 11)	V _{BE(on)}	_	_	1	V	Ic = 100mA, VcE = 5V
		50	_	_		Ic = 1mA, VcE = 5V
DC Current Gain (Note 11)	hFE	50	_	_	_	Ic = 100mA, VcE = 5V
		40	_	_		Ic = 200mA, VcE = 10V
Current Gain-Bandwidth Product (Note 11)	f⊤	50	_	_	MHz	V _{CE} = 20V, I _C = 10mA, f = 20MHz
Output Capacitance (Note 11)	Cobo		10		pF	V _{CB} = 20V, f = 1MHz
Switching Time	ton		130		ns	Ic = 100mA, Vcc = 100V
Switching Time	t _{off}	_	3,300	_	115	I _{B1} = 10mA, I _{B2} = -20mA

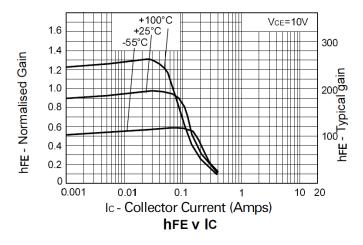
Note: 11. Measured under pulsed conditions. Pulse width \leq 300 μ s. Duty cycle \leq 2%.

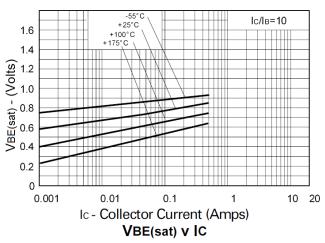


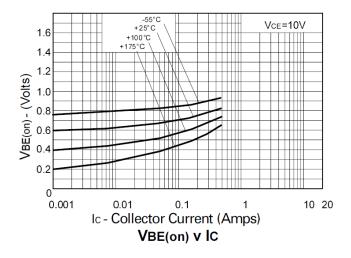
Typical Electrical Characteristics (@TA = +25°C, unless otherwise specified.)









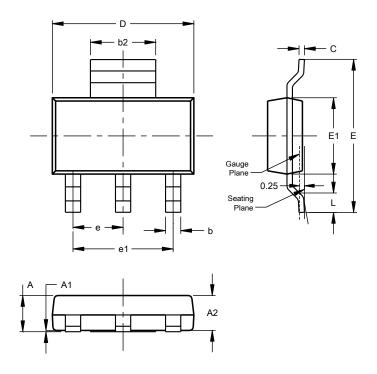




Package Outline Dimensions

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

SOT223 (Type DN)

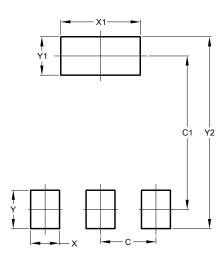


SOT223 (Type DN)					
Dim	Min	Max	Тур		
Α		1.70			
A1	0.01	0.15			
A2	1.50	1.68	1.60		
b	0.60	0.80	0.70		
b2	2.90	3.10			
С	0.20	0.32			
D	6.30	6.70			
Е	6.70	7.30			
E1	3.30	3.70			
е			2.30		
e1			4.60		
L	0.85				
All Dimensions in mm					

Suggested Pad Layout

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

SOT223 (Type DN)



Dimensions	Value (in mm)		
С	2.30		
C1	6.40		
Х	1.20		
X1	3.30		
Υ	1.60		
Y1	1.60		
V2	8.00		

Note: For high voltage applications, the appropriate industry sector guidelines should be considered with regards to voltage spacing between terminals.



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