



A Product Line of Diodes Incorporated



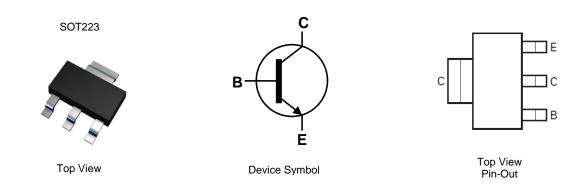
#### 400V NPN MEDIUM POWER TRANSISTOR IN SOT223

#### Features

- BV<sub>CEO</sub> > 400V
- I<sub>C</sub> = 300mA High Continuous Current
- Excellent h<sub>FE</sub> Characteristics up to 100mA
- Low Saturation Voltage V<sub>CE(sat)</sub> < 200mV @ 20mA</li>
- Complementary PNP Type: FZT558
- 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>(63)</sup>
- Weight: 0.112 grams (Approximate)



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

Product	Compliance	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel	
FZT458TA	AEC-Q101	FZT458	7	12	1,000	
FZT458QTA	Automotive	FZT458	7	12	1,000	
Notes: 1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.						

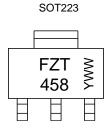
EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
See http://www.diodes.com/quality/lead\_free.html for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.

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.

5. For packaging details, go to our website at http://www.diodes.com/products/packages.html.

### **Marking Information**



FZT 458 = Product Type Marking Code YWW = Date Code Marking Y or  $\overline{Y}$  = Last Digit of Year (ex: 5= 2015) WW or  $\overline{W}W$  = Week Code (01~53)





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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CBO</sub>	400	V
Collector-Emitter Voltage	V <sub>CEO</sub>	400	V
Emitter-Base Voltage	V <sub>EBO</sub>	7	V
Continuous Collector Current	Ic	300	mA
Base Current	IB	200	mA
Peak Pulse Current	I <sub>CM</sub>	1	А

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

Characteristic	Symbol	Value	Unit		
Power Dissipation	(Note 6)	P	2	W	
Power Dissipation	(Note 7)	PD PD	3	W	
Thermal Desistance Junction to Ambient	(Note 6)	<b>D</b>	62.5	°C/W	
Thermal Resistance, Junction to Ambient	(Note 7)	R <sub>0JA</sub>	41.7	°C/W	
Thermal Resistance, Junction to Leads (Note	R <sub>θJL</sub>	19.41	°C/W		
Operating and Storage Temperature Range	TJ, TSTG	-55 to +150	°C		

## ESD Ratings (Note 9)

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

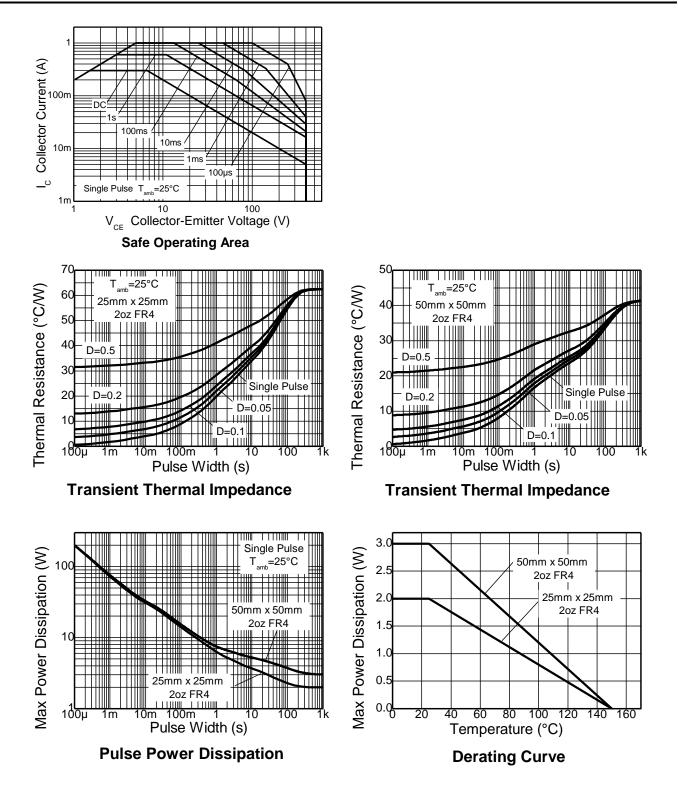
Notes: 6. For a device mounted with the collector lead on 25mm x 25mm 2oz copper that is on a single-sided 1.6mm FR4 PCB; device is measured under still air conditions whilst operating in a steady-state.

Same as Note 6, except the device is mounted on 50mm x 50mm single sided 2oz weight copper.
Thermal resistance from junction to solder-point (at the end of the collector lead).
Refer to JEDEC specification JESD22-A114 and JESD22-A115.





## **Thermal Characteristics and Derating Characteristics**







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

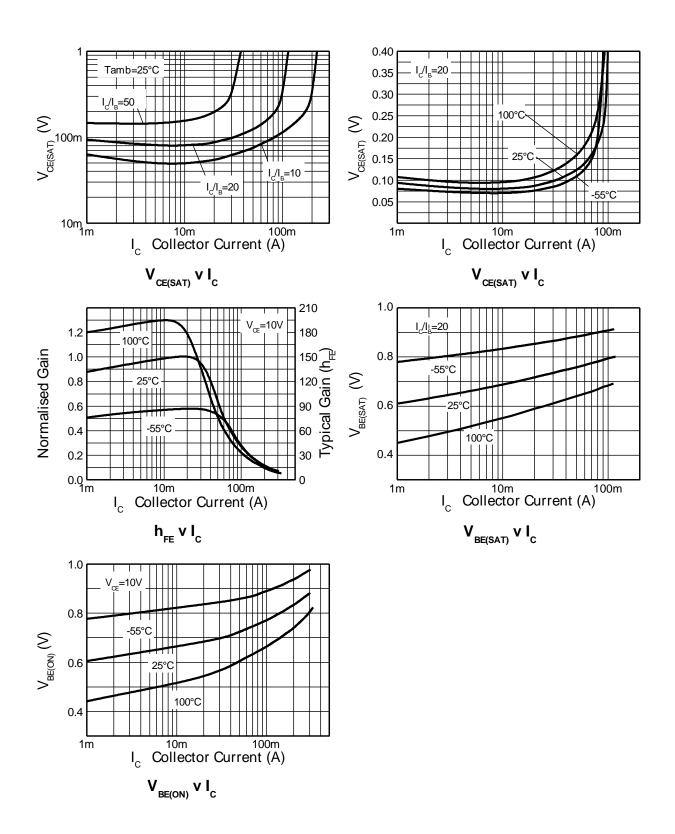
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV <sub>CBO</sub>	400	-	-	V	I <sub>C</sub> = 100μA
Collector-Emitter Breakdown Voltage (Note 10)	BV <sub>CEO</sub>	400	-	-	V	$I_{\rm C} = 10 {\rm mA}$
Emitter-Base Breakdown Voltage	BV <sub>EBO</sub>	7	-	-	V	I <sub>E</sub> = 100μA
Collector Cut-Off Current	ICBO	-	-	100	nA	V <sub>CB</sub> = 320V
Collector Cut-Off Current	ICES	-	-	100	nA	V <sub>CE</sub> = 320V
Emitter Cut-Off Current	I <sub>EBO</sub>	-	-	100	nA	$V_{EB} = 4V$
Collector Emitter Seturation Valtage (Nate 10)	N	-	-	0.2	V	$I_{\rm C} = 20 {\rm mA}, I_{\rm B} = 2 {\rm mA}$
Collector-Emitter Saturation Voltage (Note 10)	V <sub>CE(sat)</sub>	-	-	0.5		$I_{\rm C} = 50 {\rm mA}, I_{\rm B} = 6 {\rm mA}$
Base-Emitter Saturation Voltage (Note 10)	V <sub>BE(sat)</sub>	-	-	0.9	V	$I_{\rm C} = 50 {\rm mA}, I_{\rm B} = 5 {\rm mA}$
Base-Emitter Turn-On Voltage (Note 10)	V <sub>BE(on)</sub>	-	-	0.9	V	I <sub>C</sub> = 50mA, V <sub>CE</sub> = 10V
		100	-	-		$I_{C} = 1 m A, V_{CE} = 10 V$
DC Current Gain (Note 10)	h <sub>FE</sub>	100	-	300		$I_{C} = 50 \text{mA}, V_{CE} = 10 \text{V}$
		15	-	-		$I_{C} = 100 \text{mA}, V_{CE} = 10 \text{V}$
Current Gain-Bandwidth Product (Note 10)	fT	50	-	-	MHz	$V_{CE} = 20V, I_{C} = 10mA$
		50				f = 20MHz
Output Capacitance (Note 10)	Cobo	-	-	5	pF	$V_{CB} = 20V. f = 1MHz$
Switching Timos	t <sub>on</sub>		135		20	$I_{\rm C} = 50 {\rm mA}, V_{\rm CC} = 100 {\rm V}$
Switching Times	t <sub>off</sub>		2260	] –	ns	$I_{B1} = 5mA$ , $I_{B2} = -10mA$

Note: 10. Measured under pulsed conditions. Pulse width  $\leq$  300µs. Duty cycle  $\leq$  2%.





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

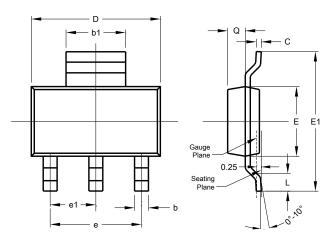


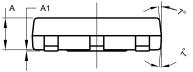




## **Package Outline Dimensions**

Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.

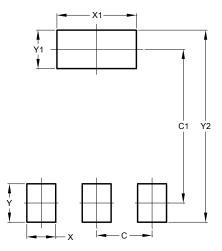




	SOT223						
Dim	Min	Max	Тур				
Α	1.55	1.65	1.60				
A1	0.010	0.15	0.05				
b	0.60	0.80	0.70				
b1	2.90	3.10	3.00				
С	0.20	0.30	0.25				
D	6.45	6.55	6.50				
Е	3.45	3.55	3.50				
E1	6.90	7.10	7.00				
е	-	-	4.60				
e1	-	-	2.30				
L	0.85	1.05	0.95				
Q	0.84	0.94	0.89				
All [	All Dimensions in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

## **Suggested Pad Layout**

Please see AP02001 at http://www.diodes.com/datasheets/ap02001.pdf for the latest version.



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

Note: For high voltage applications, the appropriate industry sector guidelines should be considered with regards to creepage and clearance distances between device terminals and PCB tracking.





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