

## Features

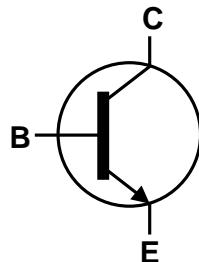
- $BV_{CEO} > 300V$
- $I_C = 3.5A$  High Continuous Collector Current
- $I_{CM} = 5A$  Peak Pulse Current
- Very Low Saturation Voltage  $V_{CE(SAT)} < 155mV$  @ 1A
- $R_{CE(SAT)} = 87m\Omega$  for a Low Equivalent On-Resistance
- $h_{FE}$  Specified Up to 3A for a High Gain Hold-Up
- Complementary PNP Type: FZT957
- **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

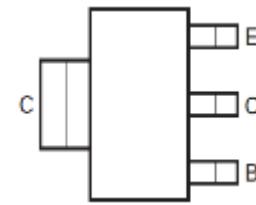
- Case: SOT223
- Case Material: Molded Plastic. "Green" Molding Compound. UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 (e3)
- Weight: 0.112 grams (Approximate)



Top View



Device Symbol



Top View  
Pin-Out

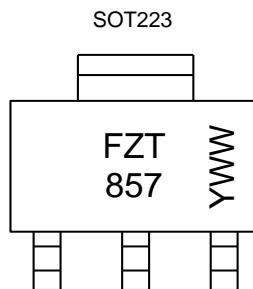
## Ordering Information (Notes 4 & 5)

Product	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
FZT857TA	AEC-Q101	FZT857	7	12	1,000
FZT857QTA	Automotive	FZT857	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. 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 <https://www.diodes.com/quality/>.
5. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

## Marking Information



FZT 857 = Product Type Marking Code  
 YWW = Date Code Marking  
 Y or  $\bar{Y}$  = Last Digit of Year (ex: 7 = 2017)  
 WW or  $\bar{WW}$  = Week Code (01–53)

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	$V_{\text{CBO}}$	350	V
Collector-Emitter Voltage	$V_{\text{CEO}}$	300	V
Emitter-Base Voltage	$V_{\text{EBO}}$	7	V
Continuous Collector Current	$I_C$	3.5	A
Peak Pulse Current	$I_{\text{CM}}$	5	A

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

Characteristic	Symbol	Value	Unit
Power Dissipation Linear Derating Factor	(Note 6)	3.0	W mW/°C
		24	
Thermal Resistance, Junction to Ambient	(Note 6)	1.6	°C/W
		12.8	
Thermal Resistance Junction to Lead	(Note 8)	42	
Operating and Storage Temperature Range	$R_{\theta JA}$	78	
	$R_{\theta JL}$	8.8	
	$T_J, T_{\text{STG}}$	-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	C

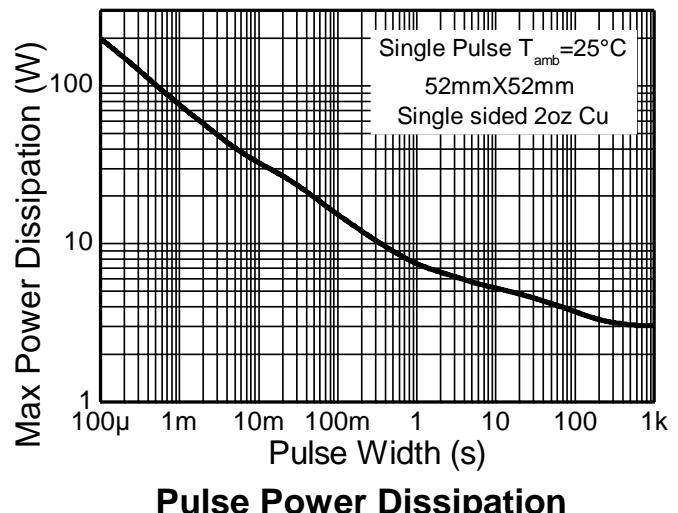
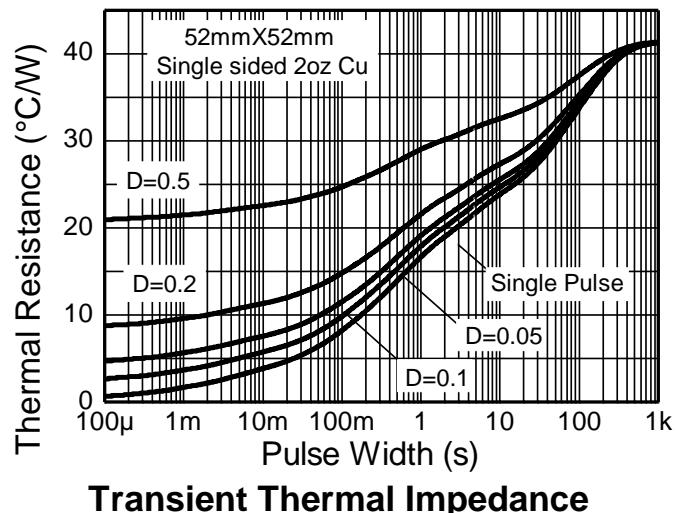
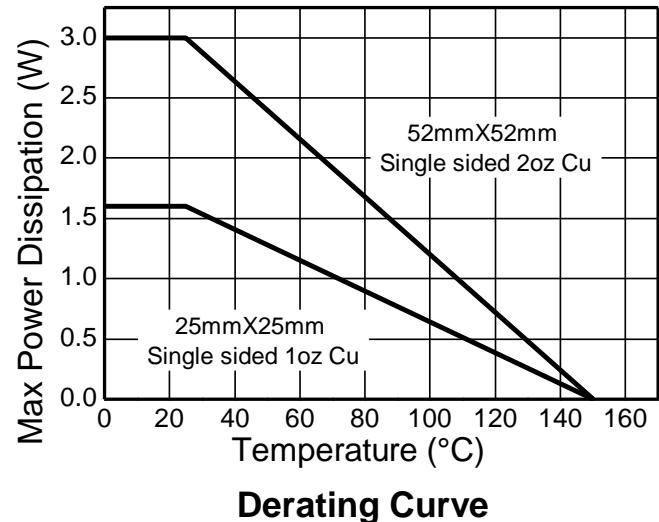
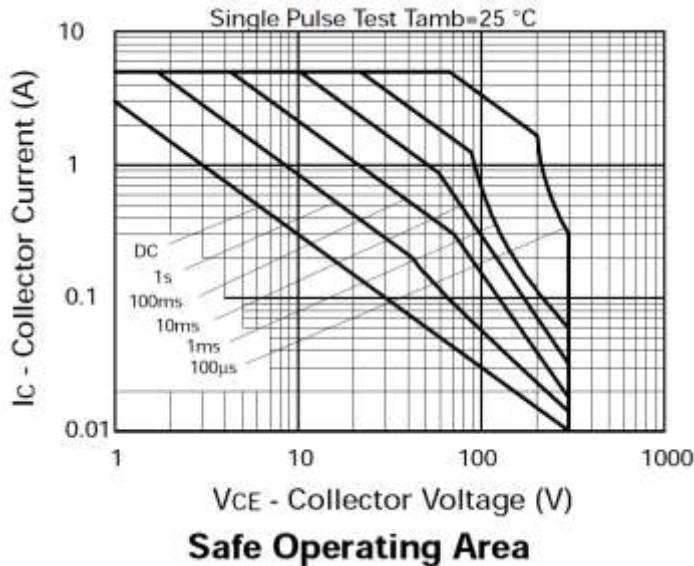
Notes: 6. For a device mounted with the collector lead on 52mm x 52mm 2oz copper that is on a single-sided 1.6mm FR4 PCB; device is measured under still air conditions whilst operating in steady-state.

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

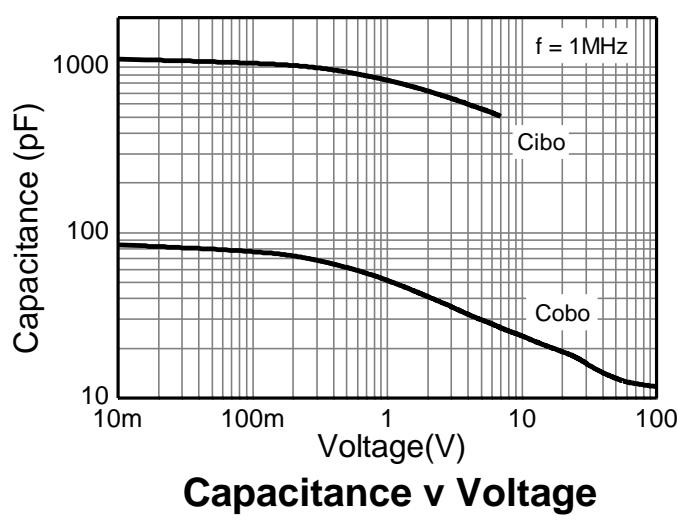
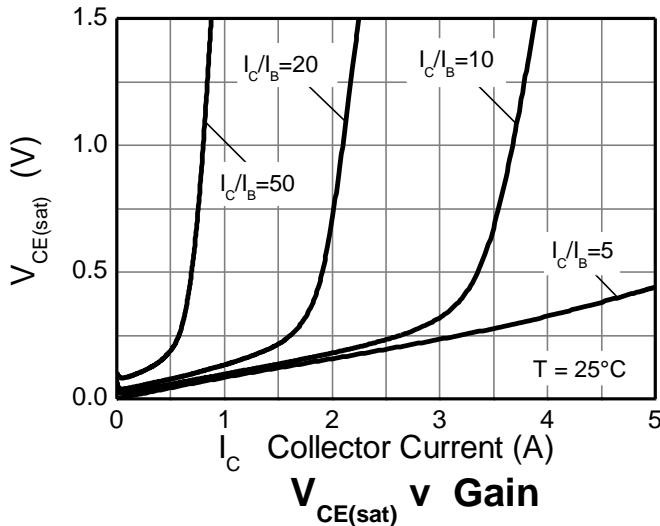
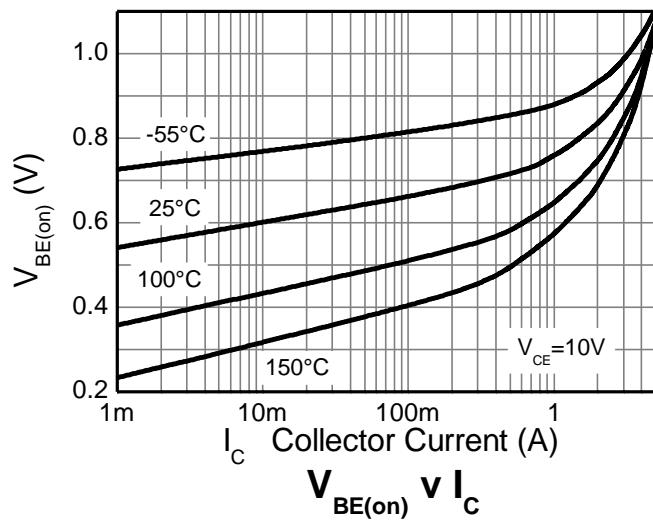
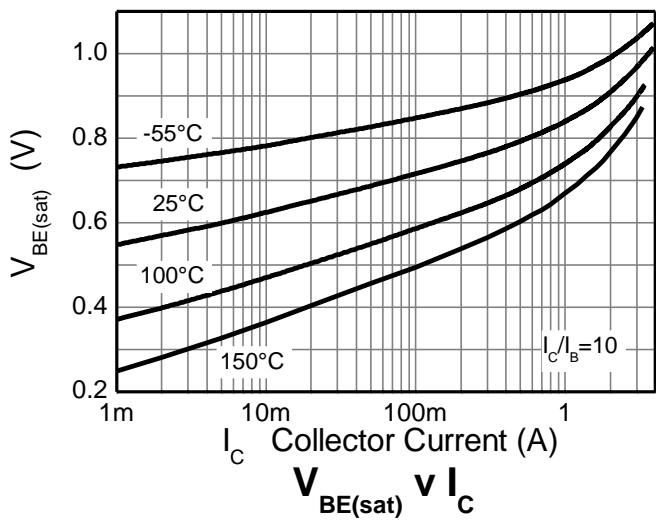
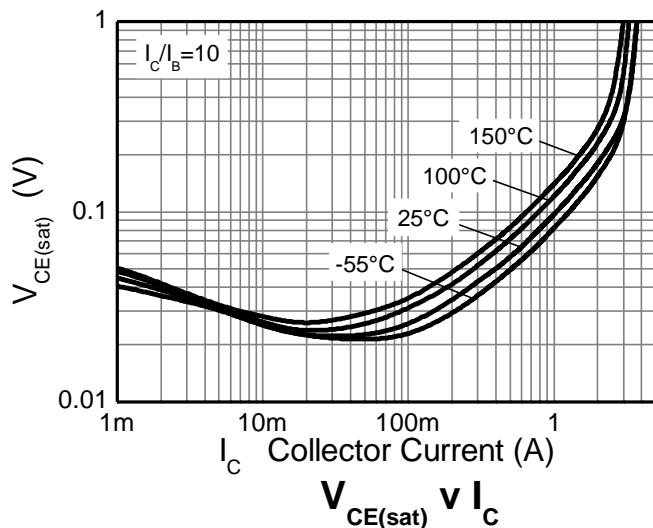
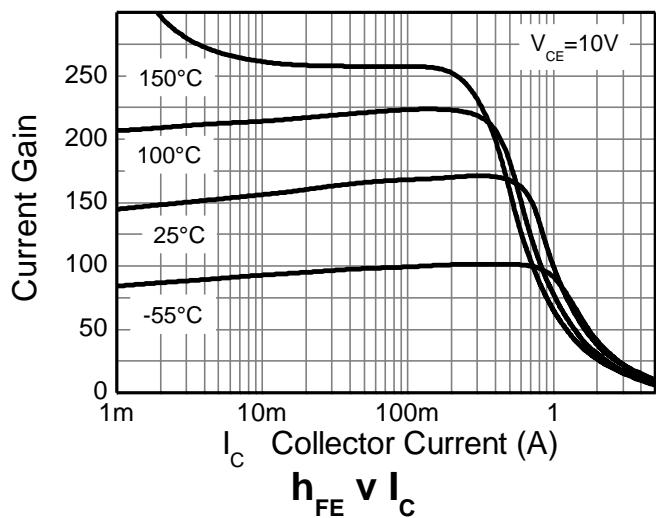


**Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	$\text{BV}_{\text{CBO}}$	350	475	—	V	$I_C = 100\mu\text{A}$
Collector-Emitter Breakdown Voltage	$\text{BV}_{\text{CER}}$	350	475	—	V	$I_C = 1\mu\text{A}, R_B \leq 1\text{k}\Omega$
Collector-Emitter Breakdown Voltage (Note 10)	$\text{BV}_{\text{CEO}}$	300	350	—	V	$I_C = 1\text{mA}$
Emitter-Base Breakdown Voltage	$\text{BV}_{\text{EBO}}$	7	8	—	V	$I_E = 100\mu\text{A}$
Collector Cut-Off Current	$I_{\text{CBO}}$	—	<1	50	nA	$V_{\text{CB}} = 300\text{V}$
			—	1	$\mu\text{A}$	$V_{\text{CB}} = 300\text{V}, T_A = +100^\circ\text{C}$
Collector Cut-Off Current	$I_{\text{CER}}$	—	<1	50	nA	$V_{\text{CE}} = 300\text{V}, R_B \leq 1\text{k}\Omega$
			—	1	$\mu\text{A}$	$V_{\text{CE}} = 300\text{V}, T_A = +100^\circ\text{C}$
Emitter Cut-Off Current	$I_{\text{EBO}}$	—	<1	10	nA	$V_{\text{EB}} = 6\text{V}$
DC Current Gain (Note 10)	$h_{\text{FE}}$	100	200	—	—	$I_C = 10\text{mA}, V_{\text{CE}} = 5\text{V}$
		100	200	300		$I_C = 500\text{mA}, V_{\text{CE}} = 10\text{V}$
		15	25	—		$I_C = 2\text{A}, V_{\text{CE}} = 10\text{V}$
		—	15	—		$I_C = 3\text{A}, V_{\text{CE}} = 10\text{V}$
Collector-Emitter Saturation Voltage (Note 10)	$V_{\text{CE}(\text{SAT})}$	—	59	100	mV	$I_C = 500\text{mA}, I_B = 50\text{mA}$
		—	95	155		$I_C = 1\text{A}, I_B = 100\text{mA}$
		—	180	230		$I_C = 2\text{A}, I_B = 200\text{mA}$
		—	300	345		$I_C = 3.5\text{A}, I_B = 600\text{mA}$
Base-Emitter Saturation Voltage (Note 10)	$V_{\text{BE}(\text{SAT})}$	—	1,020	1,250	mV	$I_C = 3.5\text{A}, I_B = 600\text{mA}$
Base-Emitter Turn-On Voltage (Note 10)	$V_{\text{BE}(\text{ON})}$	—	940	1,120	mV	$I_C = 3.5\text{A}, V_{\text{CE}} = 10\text{V}$
Current Gain-Bandwidth Product (Note 10)	$f_T$	—	80	—	MHz	$I_C = 100\text{mA}, V_{\text{CE}} = 10\text{V}, f = 50\text{MHz}$
Output Capacitance	$C_{\text{OBO}}$	—	21	—	pF	$V_{\text{CB}} = 20\text{V}, f = 1\text{MHz}$
Switching Times	$t_{\text{ON}}$	—	100	—	ns	$I_C = 250\text{mA}, V_{\text{CC}} = 50\text{V}, I_{B1} = -I_{B2} = 25\text{mA}$
	$t_{\text{OFF}}$	—	5,300	—		

Note: 10. Measured under pulsed conditions. Pulse width  $\leq 300\mu\text{s}$ . Duty cycle  $\leq 2\%$ .

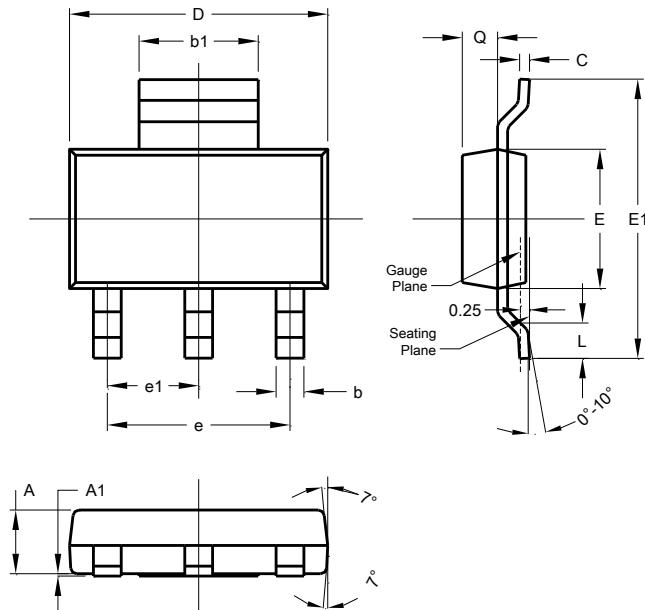
**Typical Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)



## Package Outline Dimensions

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

**SOT223**



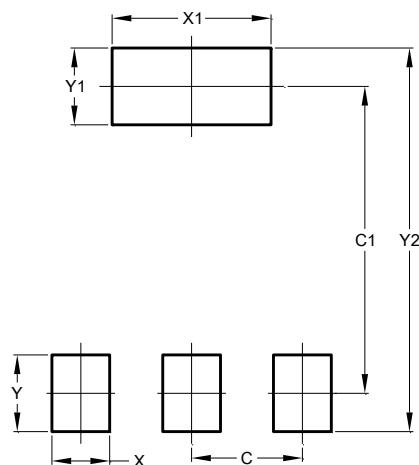
<b>SOT223</b>			
Dim	Min	Max	Typ
<b>A</b>	1.55	1.65	1.60
<b>A1</b>	0.010	0.15	0.05
<b>b</b>	0.60	0.80	0.70
<b>b1</b>	2.90	3.10	3.00
<b>C</b>	0.20	0.30	0.25
<b>D</b>	6.45	6.55	6.50
<b>E</b>	3.45	3.55	3.50
<b>E1</b>	6.90	7.10	7.00
<b>e</b>	-	-	4.60
<b>e1</b>	-	-	2.30
<b>L</b>	0.85	1.05	0.95
<b>Q</b>	0.84	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)
<b>C</b>	2.30
<b>C1</b>	6.40
<b>X</b>	1.20
<b>X1</b>	3.30
<b>Y</b>	1.60
<b>Y1</b>	1.60
<b>Y2</b>	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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