

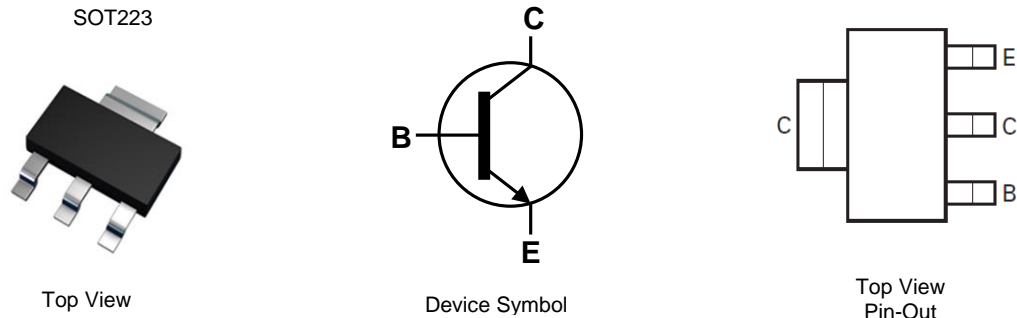
Features

- $BV_{CEO} > 300V$
- I_C Max. 3.5A High Continuous Collector Current
- I_{CM} Max. 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: FZT957Q
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **The FZT857Q is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF16949 certified facilities.**

<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 (e3)
- Weight: 0.112 grams (Approximate)

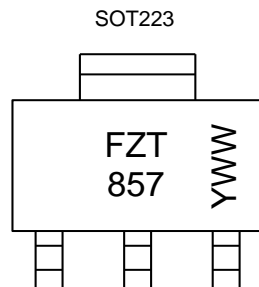


Ordering Information (Note 4)

Product	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
FZT857QTA	Automotive	FZT857	7	12	1,000

- 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



FZT 857 = Product Type Marking Code
 YWW = Date Code Marking
 Y or \bar{Y} = Last Digit of Year (ex: 1 = 2021)
 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_{CBO}	350	V
Collector-Emitter Voltage	V_{CEO}	300	V
Emitter-Base Voltage	V_{EBO}	7	V
Continuous Collector Current	I_C	3.5	A
Peak Pulse Current	I_{CM}	5	A

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

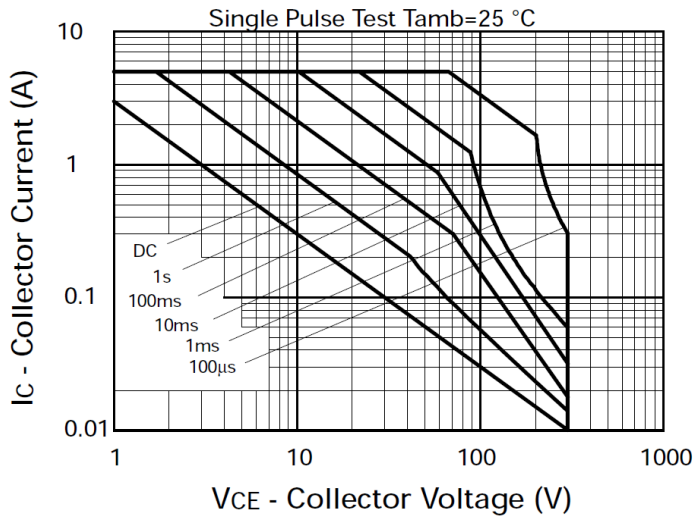
Characteristic	Symbol	Value	Unit
Power Dissipation Linear Derating Factor	P_D	3.0	W
		24	
		1.6	mW/ $^\circ\text{C}$
		12.8	
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	42	$^\circ\text{C/W}$
	$R_{\theta JA}$	78	
Thermal Resistance Junction to Lead	$R_{\theta JL}$	8.8	
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

ESD Ratings (Note 8)

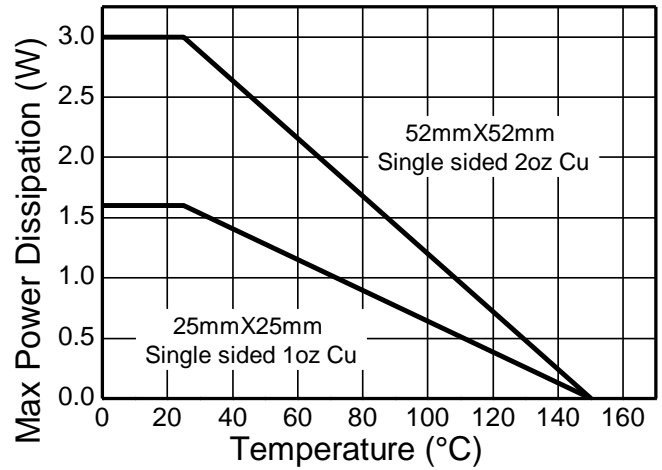
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	8,000	V	3B
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

- Notes:
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 6, 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.

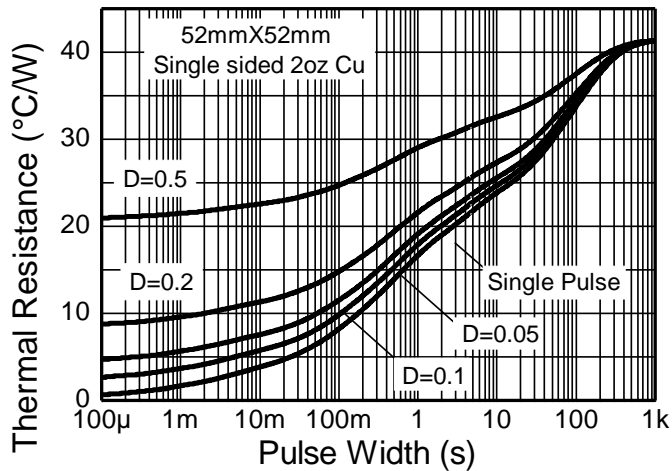
Thermal Characteristics and Derating Information



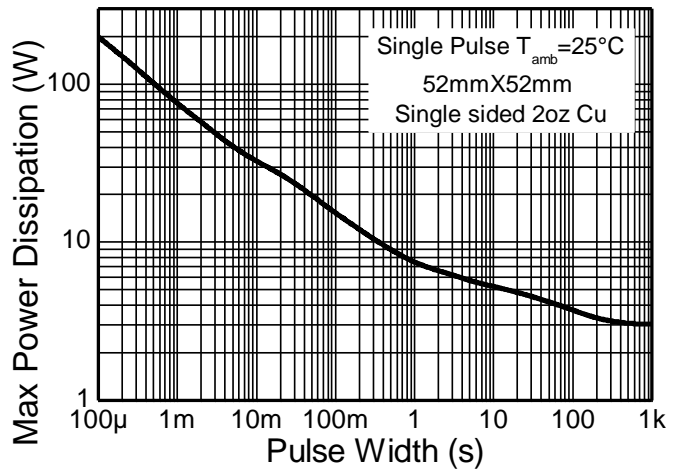
Safe Operating Area



Derating Curve



Transient Thermal Impedance



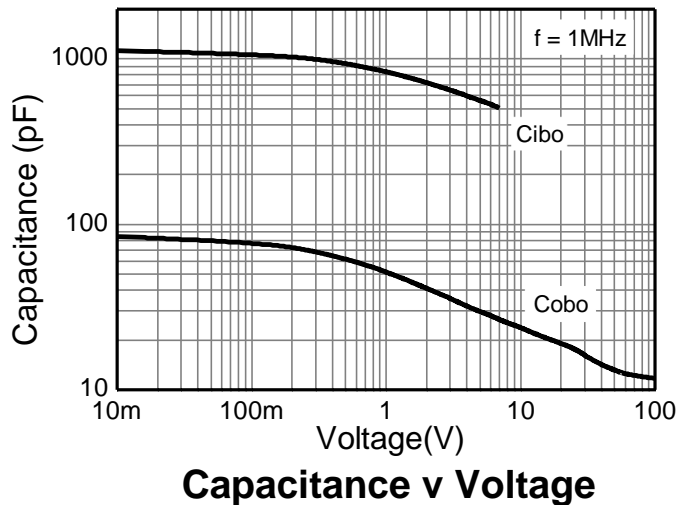
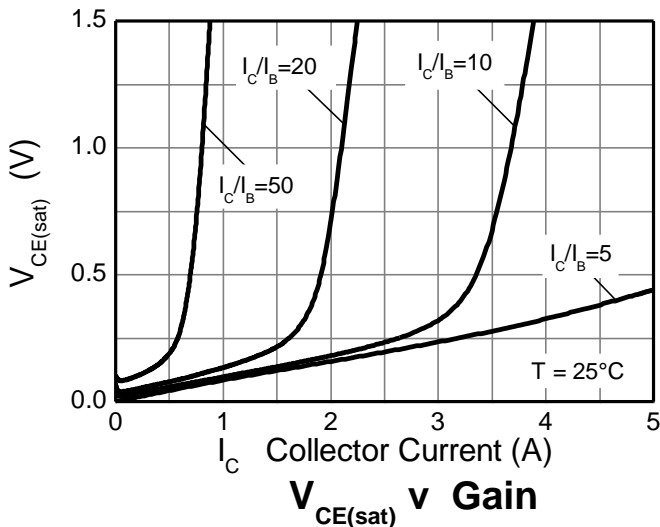
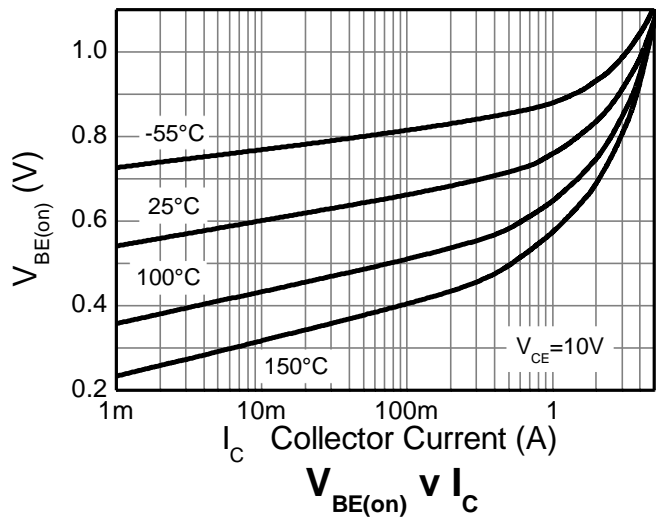
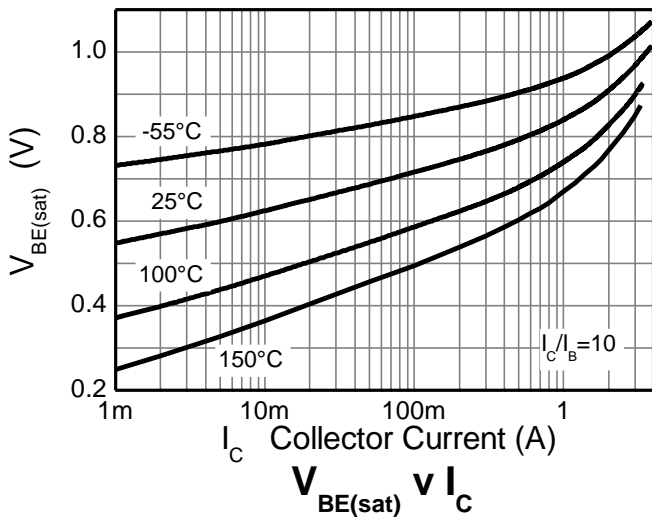
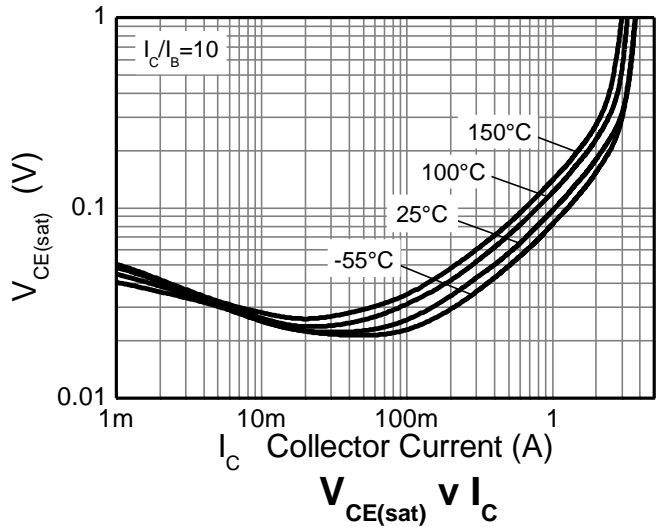
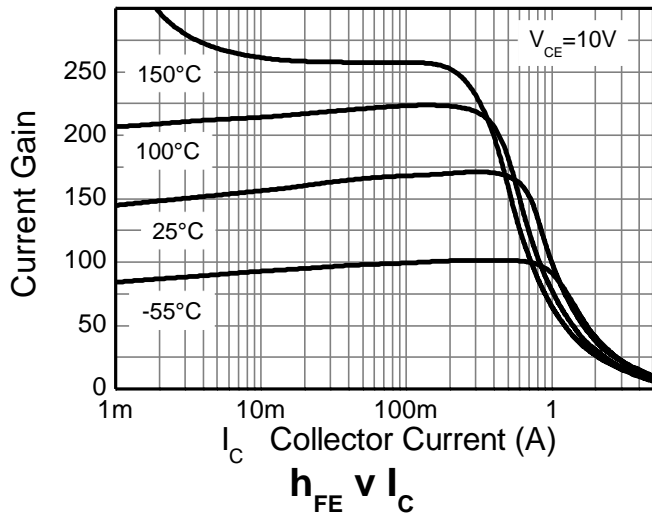
Pulse Power Dissipation

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	350	475	—	V	$I_C = 100\mu\text{A}$
Collector-Emitter Breakdown Voltage	BV_{CER}	350	475	—	V	$I_C = 1\mu\text{A}$, $R_B \leq 1\text{k}\Omega$
Collector-Emitter Breakdown Voltage (Note 9)	BV_{CEO}	300	350	—	V	$I_C = 1\text{mA}$
Emitter-Base Breakdown Voltage	BV_{EBO}	7	8	—	V	$I_E = 100\mu\text{A}$
Collector Cut-Off Current	I_{CBO}	—	1	50	nA μA	$V_{CB} = 300\text{V}$ $V_{CB} = 300\text{V}$, $T_A = +100^\circ\text{C}$
Collector Cut-Off Current	I_{CER}	—	1	50	nA μA	$V_{CE} = 300\text{V}$, $R_B \leq 1\text{k}\Omega$ $V_{CE} = 300\text{V}$, $T_A = +100^\circ\text{C}$
Emitter Cut-Off Current	I_{EBO}	—	1	10	nA	$V_{EB} = 6\text{V}$
DC Current Gain (Note 9)	h_{FE}	100	200	—	—	$I_C = 10\text{mA}$, $V_{CE} = 5\text{V}$
		100	200	300		$I_C = 500\text{mA}$, $V_{CE} = 10\text{V}$
		15	25	—		$I_C = 2\text{A}$, $V_{CE} = 10\text{V}$
		—	15	—		$I_C = 3\text{A}$, $V_{CE} = 10\text{V}$
Collector-Emitter Saturation Voltage (Note 9)	$V_{CE(sat)}$	—	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 9)	$V_{BE(sat)}$	—	1,020	1,250	mV	$I_C = 3.5\text{A}$, $I_B = 600\text{mA}$
Base-Emitter Turn-On Voltage (Note 9)	$V_{BE(on)}$	—	940	1,120	mV	$I_C = 3.5\text{A}$, $V_{CE} = 10\text{V}$
Current Gain-Bandwidth Product (Note 9)	f_T	—	80	—	MHz	$I_C = 100\text{mA}$, $V_{CE} = 10\text{V}$, $f = 50\text{MHz}$
Output Capacitance	C_{obo}	—	21	—	pF	$V_{CB} = 20\text{V}$, $f = 1\text{MHz}$
Switching Times	t_{on}	—	100	—	ns	$I_C = 250\text{mA}$, $V_{CC} = 50\text{V}$, $I_{B1} = -I_{B2} = 25\text{mA}$
	t_{off}	—	5,300	—		

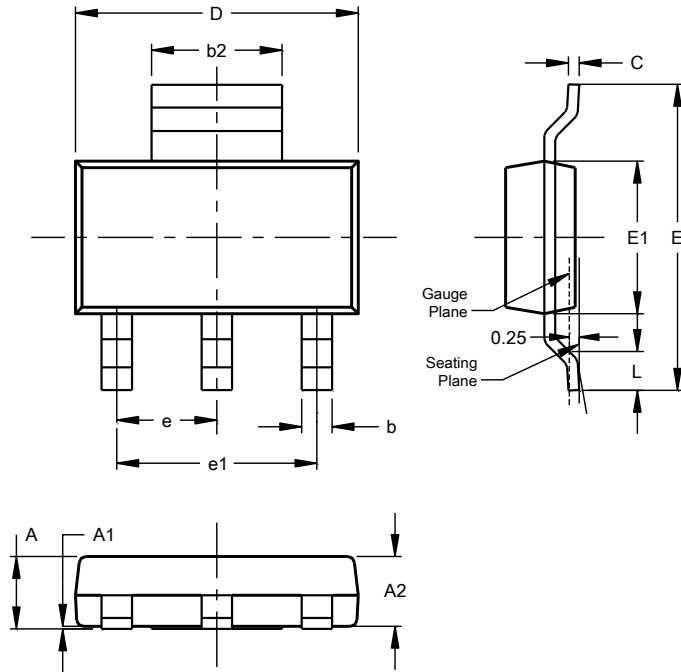
Note: 9. Measured under pulsed conditions. Pulse width $\leq 300\mu\text{s}$. Duty cycle $\leq 2\%$.

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



Package Outline Dimensions

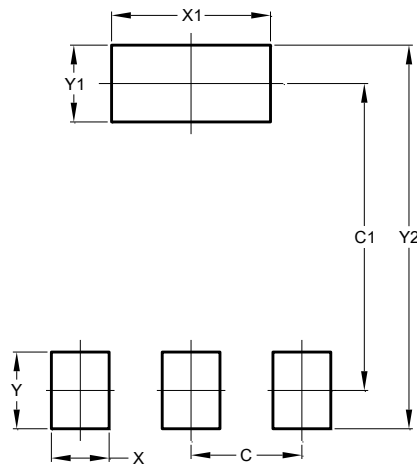
Please see <https://www.diodes.com/design/support/packaging/diodes-packaging/> for the latest version.



SOT223 (Type DN)			
Dim	Min	Max	Typ
A	--	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	--
c	0.20	0.32	--
D	6.30	6.70	--
E	6.70	7.30	--
E1	3.30	3.70	--
e	--	--	2.30
e1	--	--	4.60
L	0.85	--	--
All Dimensions in mm			

Suggested Pad Layout

Please see <https://www.diodes.com/design/support/packaging/diodes-packaging/> for the latest version.



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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