

Description

This Darlington transistor is designed to meet the stringent requirement of Automotive Applications.

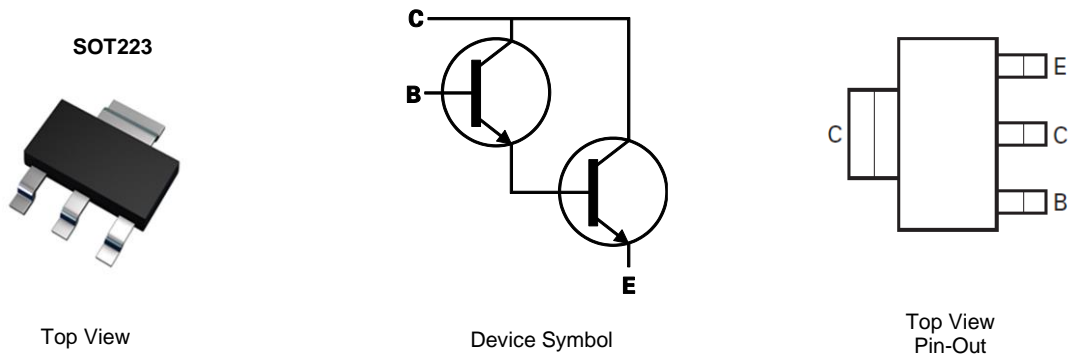
Features

- $BV_{CEO} > 80V$
- $BV_{CBO} > 100V$
- $I_C = 2A$ High Continuous Current
- Useful h_{FE} up to 6A
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **The FZT603Q is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF 16949 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 ^{Ⓔ3}
- Weight: 0.112 grams (Approximate)

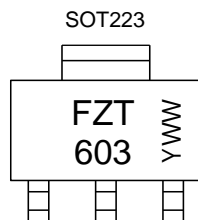


Ordering Information (Note 4)

Orderable Part Number	Package	Marking	Reel Size (inches)	Tape Width (mm)	Packing	
					Qty.	Carrier
FZT603QTA	SOT223	FZT603	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



FZT603 = Product Type Marking Code
 YWW = Date Code Marking
 Y or \bar{Y} = Last Digit of Year (ex: 5 = 2025)
 WW or $\bar{W}W$ = Week Code (01 to 53)

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V _{CBO}	100	V
Collector-Emitter Voltage	V _{CEO}	80	V
Emitter-Base Voltage	V _{EBO}	10	V
Continuous Collector Current	I _C	2	A
Peak Pulse Current	I _{CM}	6	A

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

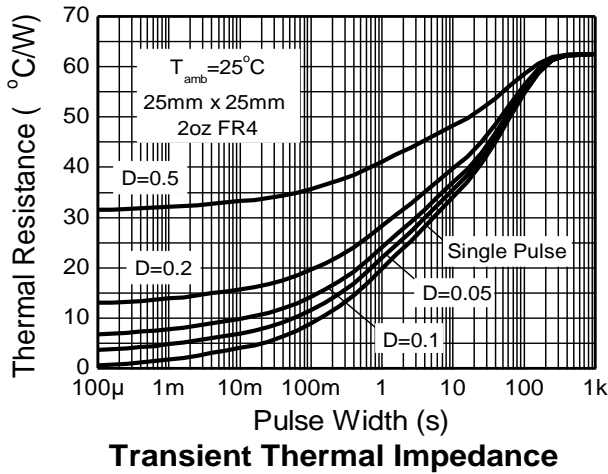
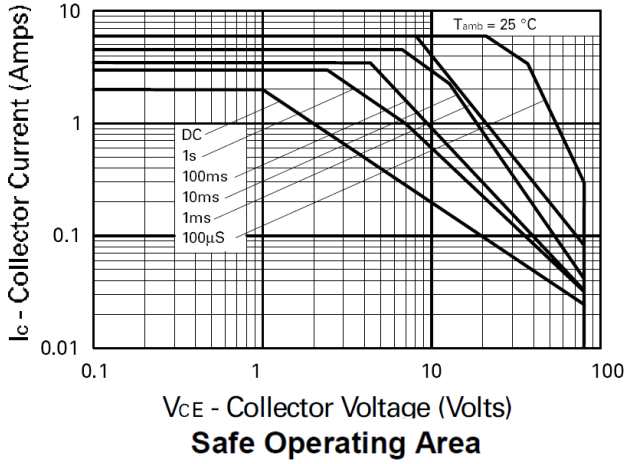
Characteristic	Symbol	Value	Unit	
Power Dissipation	P _D	(Note 5)	3.0	
		(Note 6)	2.0	
		(Note 7)	1.6	
		(Note 8)	1.2	
Thermal Resistance, Junction to Ambient	R _{θJA}	(Note 5)	41.7	
		(Note 6)	62.5	
		(Note 7)	78.1	
		(Note 8)	104	
Thermal Resistance Junction to Lead	R _{θJL}	12.9	°C/W	
Thermal Resistance, Junction to Case	R _{θJC}	(Note 6)		1.1
		(Note 7)		4.7
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C	

ESD Ratings (Note 10)

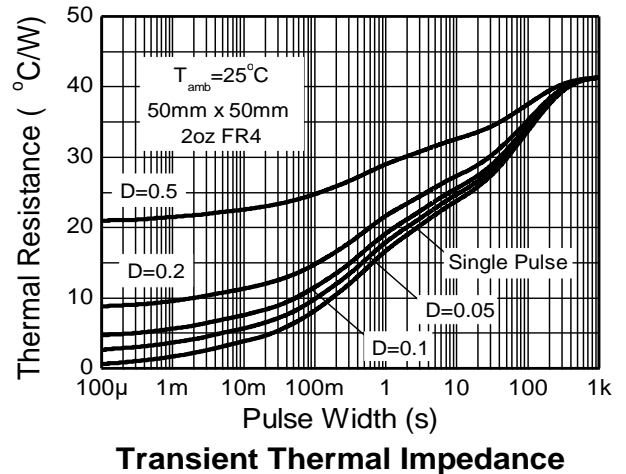
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge — Human Body Model	ESD HBM	2000	V	2
Electrostatic Discharge — Machine Model	ESD MM	200	V	B

- 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.

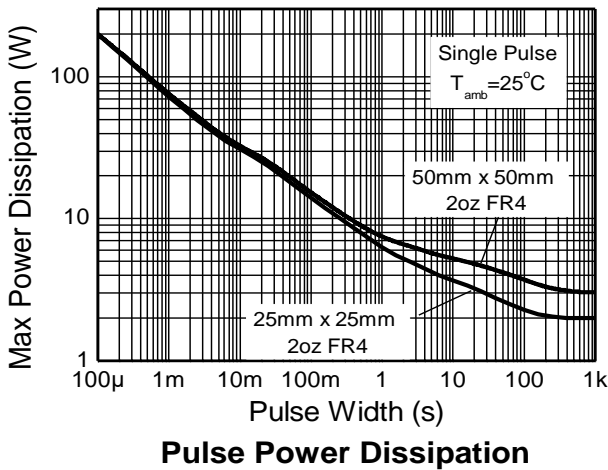
Thermal Characteristics and Derating Information



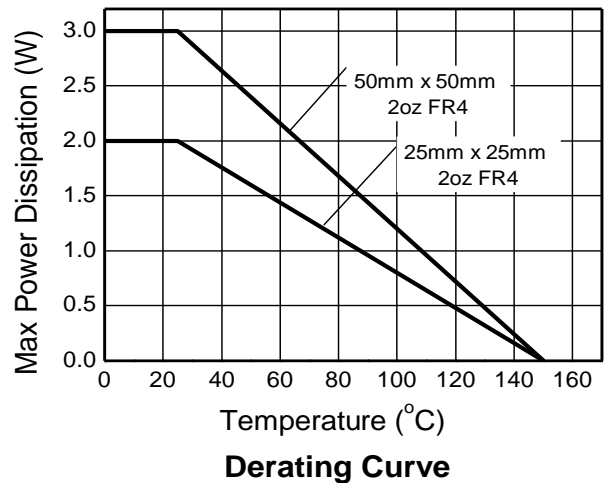
Transient Thermal Impedance



Transient Thermal Impedance



Pulse Power Dissipation



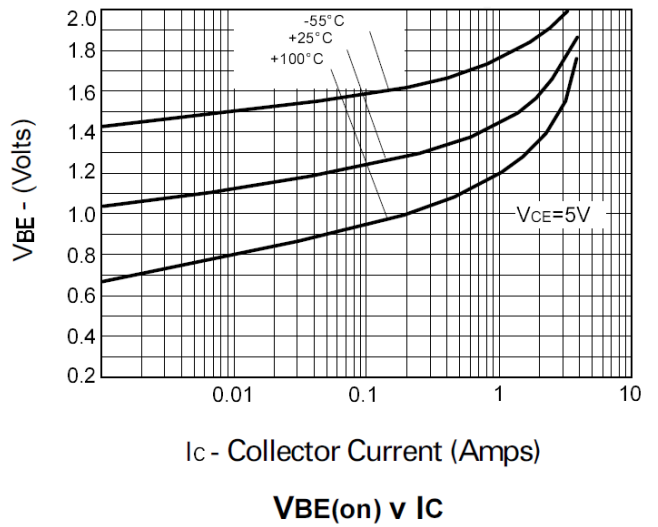
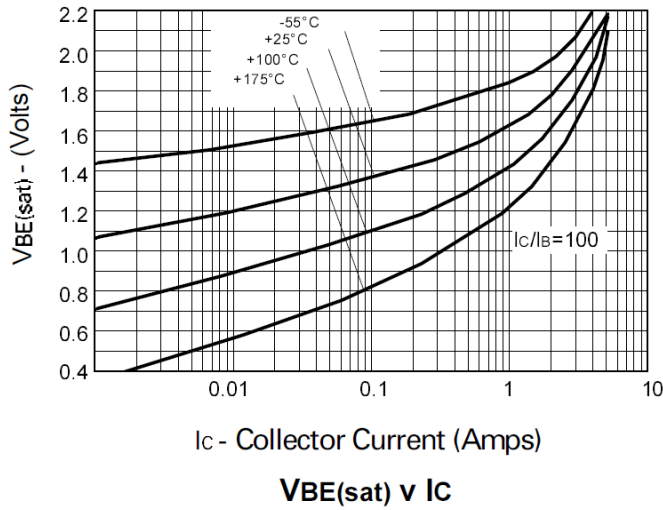
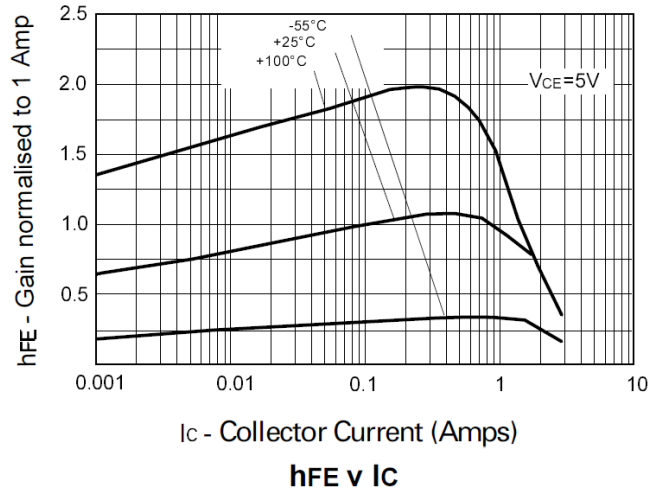
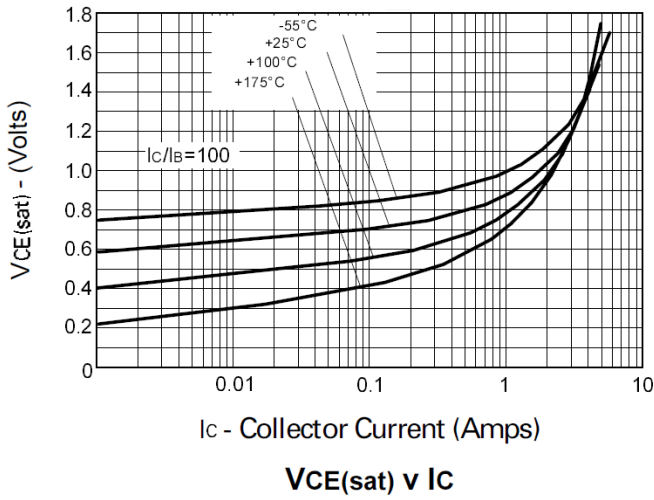
Derating Curve

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV _{CB0}	100	240	—	V	I _C = 100μA
Collector-Emitter Breakdown Voltage (Note 11)	BV _{CEO}	80	110	—	V	I _C = 10mA
Emitter-Base Breakdown Voltage	BV _{EBO}	10	16	—	V	I _E = 100μA
Collector-Base Cut-Off Current	I _{CB0}	—	—	10 10	nA μA	V _{CB} = 80V V _{CB} = 80V, T _A = +100°C
Collector-Emitter Cut-Off Current	I _{CES}	—	—	10	μA	V _{CES} = 80V
Emitter Cutoff Current	I _{EBO}	—	—	100	nA	V _{EB} = 8V
DC Current Gain (Note 11)	h _{FE}	3000 5000 3000 2000 — —	14,000 15,000 14,000 10,000 2000 750	— 100,000 — — — —	—	I _C = 50mA, V _{CE} = 5V I _C = 500mA, V _{CE} = 5V I _C = 1A, V _{CE} = 5V I _C = 2A, V _{CE} = 5V I _C = 5A, V _{CE} = 5V I _C = 6A, V _{CE} = 5V
Collector-Emitter Saturation Voltage (Note 11)	V _{CE(sat)}	—	0.79 0.80 0.88 0.99 0.86	0.88 0.90 1.00 1.13 —	V	I _C = 250mA, I _B = 0.25mA I _C = 0.4A, I _B = 0.4mA I _C = 1A, I _B = 1mA I _C = 2A, I _B = 20mA I _C = 2A, I _B = 20mA, T _J = +150°C
Base-Emitter Saturation Voltage (Note 11)	V _{BE(sat)}	—	1.70	1.95	V	I _C = 2A, I _B = 20mA
Base-Emitter Turn-On Voltage (Note 11)	V _{BE(on)}	—	1.50	1.75	V	I _C = 2A, V _{CE} = 5V
Input Capacitance (Note 11)	C _{ibo}	—	90	—	pF	V _{EB} = 0.5V, f = 1MHz
Output Capacitance (Note 11)	C _{obo}	—	15	—	pF	V _{CB} = 10V, f = 1MHz
Current Gain-Bandwidth Product (Note 11)	f _T	150	—	—	MHz	V _{CE} = 10V, I _C = 100mA, f = 20MHz
Turn-On Time	t _{on}	—	0.5	—	μs	V _{CC} = 10V, I _C = 500mA
Turn-Off Time	t _{off}	—	1.6	—	μs	I _{B1} = -I _{B2} = 0.5mA

Note: 11. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

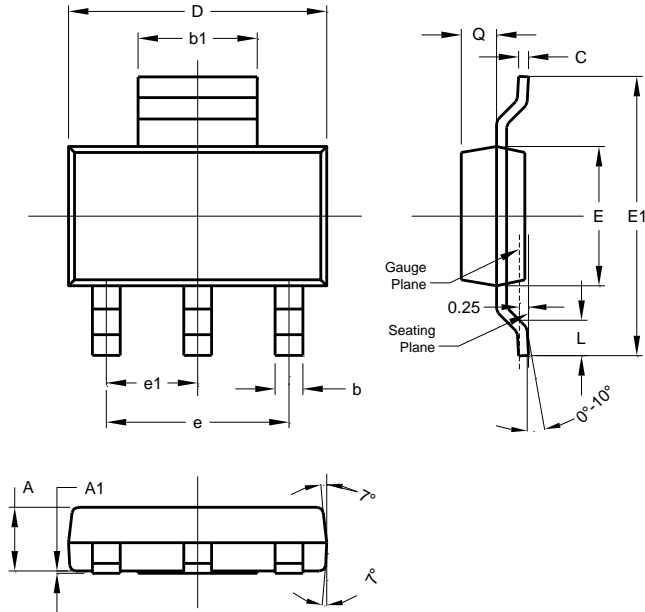
Typical Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)



Package Outline Dimensions

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

SOT223

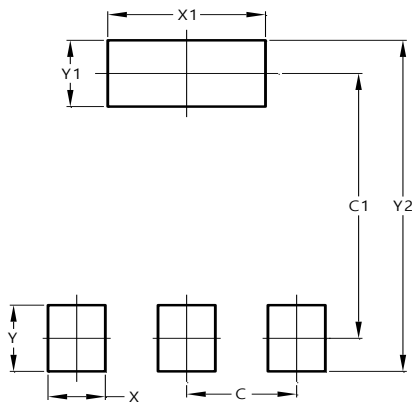


SOT223			
Dim	Min	Max	Typ
A	1.55	1.65	1.60
A1	0.010	0.15	0.05
b	0.60	0.80	0.70
b1	2.90	3.10	3.00
C	0.20	0.30	0.25
D	6.45	6.55	6.50
E	3.45	3.55	3.50
E1	6.90	7.10	7.00
e	—	—	4.60
e1	—	—	2.30
L	0.85	1.05	0.95
Q	0.84	0.94	0.89
All Dimensions in mm			

Suggested Pad Layout

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

SOT223



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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