

## Description

This Bipolar Junction Transistor (BJT) is designed to meet the stringent requirements of automotive applications.


## Features

- $BV_{CEO} > -60V$
- $I_C = -3A$  High Continuous Current
- $I_{CM} = -6A$  Peak Pulse Current
- Low Saturation Voltage  $V_{CE(SAT)} < -300mV$  @  $-1A$
- Complementary NPN Type: FZT651Q
- **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)**

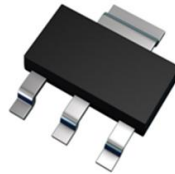
## Applications

- Automotive Lighting
- MOSFET and IGBT Gate Driving

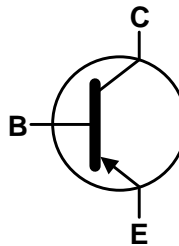
## Mechanical Data

- 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 
- Weight: 0.112 grams (Approximate)

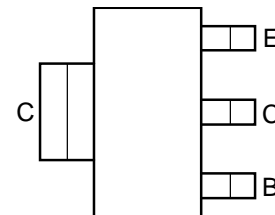
SOT223



Top View



Device Symbol



Top View  
Pin-Out

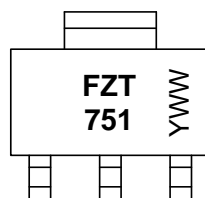
## Ordering Information (Note 5)

Part Number	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity Per Reel
FZT751QTA	Automotive	FZT751	7	12	1,000
FZT751QTC	Automotive	FZT751	13	12	4,000

- 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. Automotive products are AEC-Q101 qualified and are PPAP capable. 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

SOT223



FZT 751 = Product Type Marking Code  
 YWW = Date Code Marking  
 Y or  $\bar{Y}$  = Last Digit of Year (ex: 8 = 2018)  
 WW or  $\bar{W}W$  = Week Code (01 to 53)

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CBO</sub>	-80	V
Collector-Emitter Voltage	V <sub>CEO</sub>	-60	V
Emitter-Base Voltage	V <sub>EBO</sub>	-7	V
Continuous Collector Current	I <sub>C</sub>	-3	A
Peak Pulse Current	I <sub>CM</sub>	-6	A

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

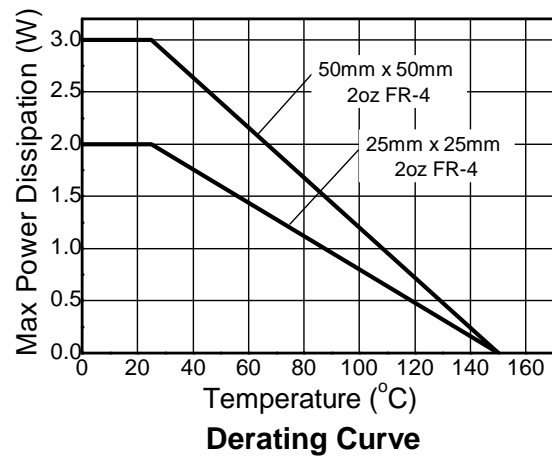
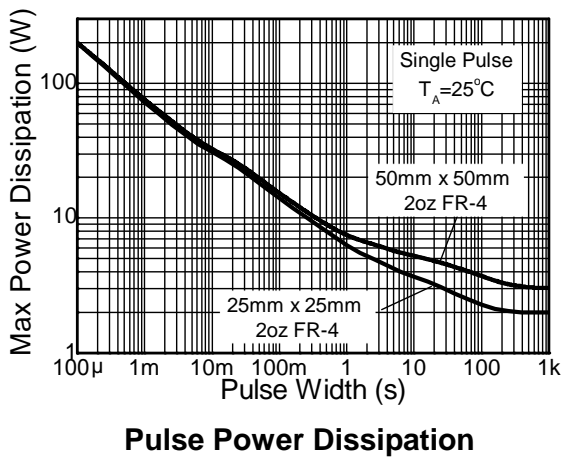
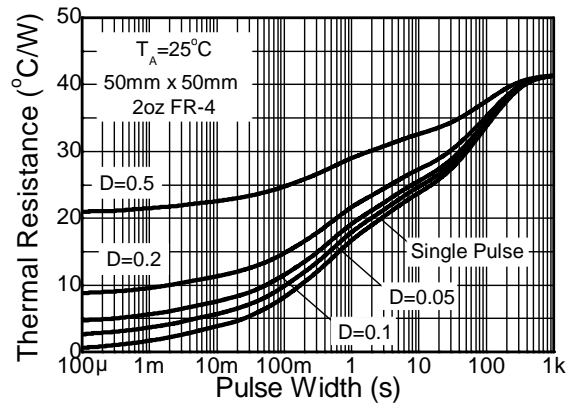
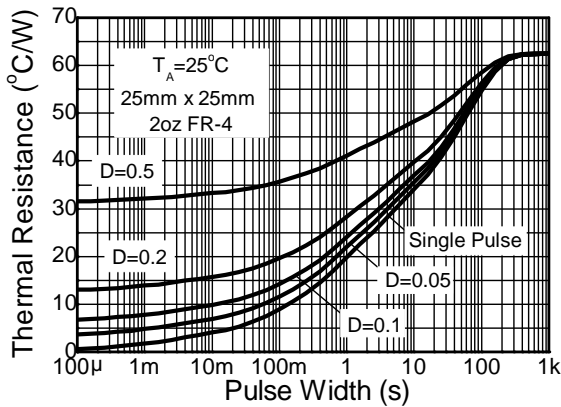
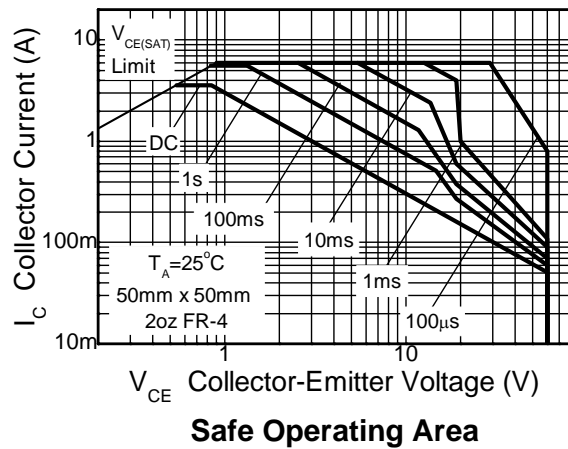
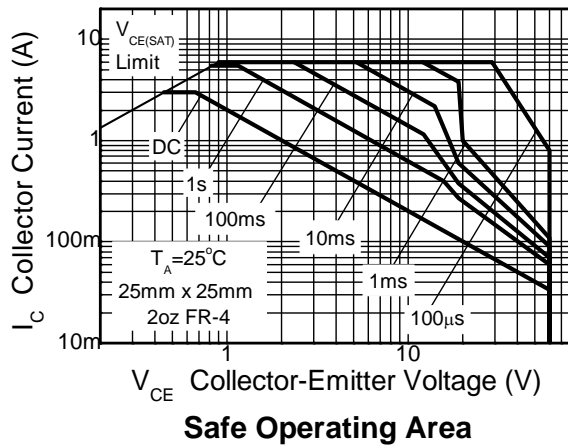
Characteristic	Symbol	Value	Unit
Power Dissipation	P <sub>D</sub>	2	W
		3	W
Thermal Resistance, Junction to Ambient	R <sub>θJA</sub>	62.5	°C/W
		41.7	°C/W
Thermal Resistance, Junction to Leads	R <sub>θJL</sub>	12.9	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

**ESD Ratings** (Note 9)

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	C

- Notes:
6. For a device mounted with the collector lead on 25mm x 25mm 2oz copper that is on a single-sided 1.6mm FR-4 PCB; device is measured under still air conditions whilst operating in steady-state.
  7. Same as Note 6, except the device is mounted on 50mm x 50mm 2oz 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

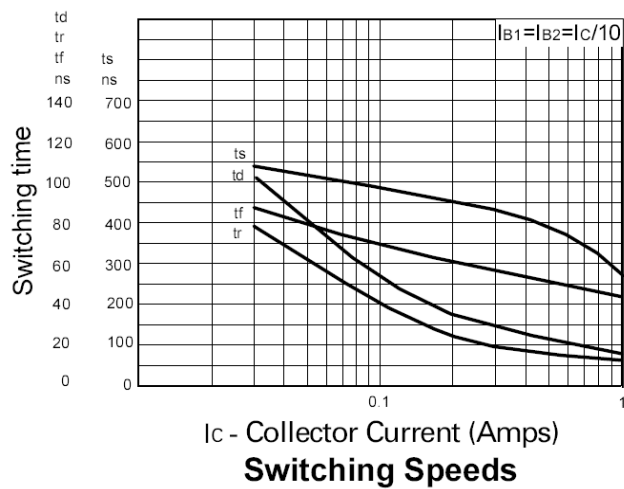
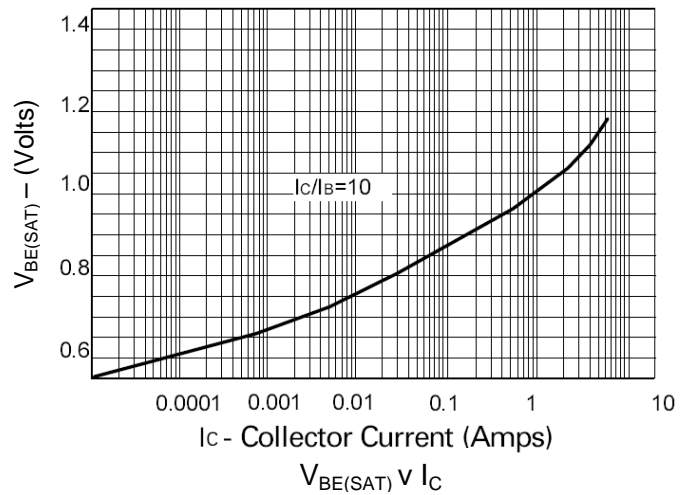
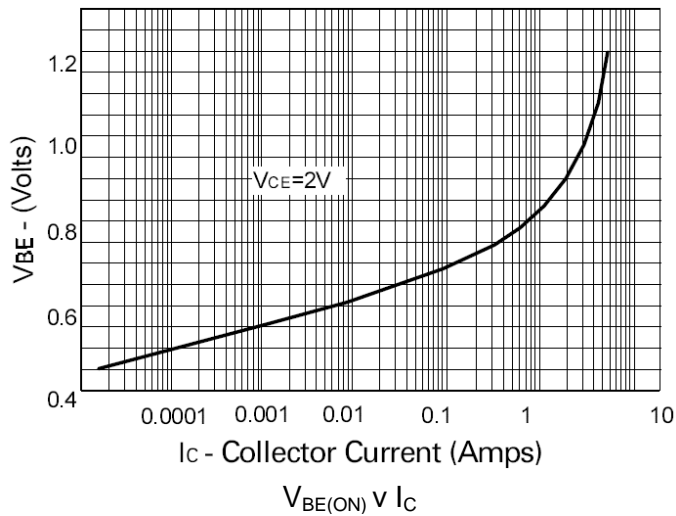
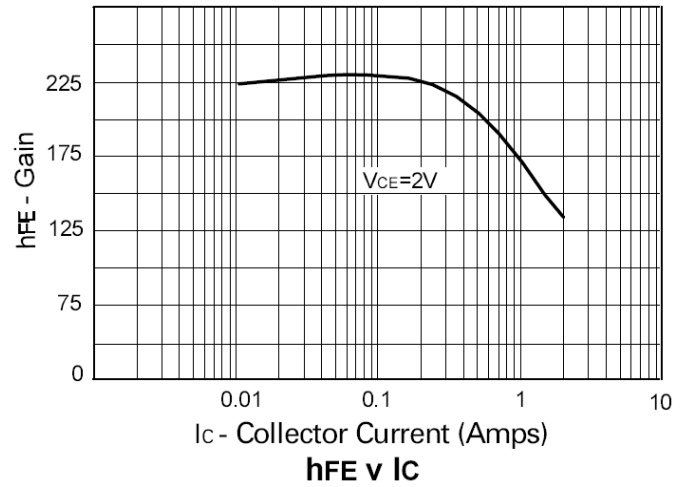
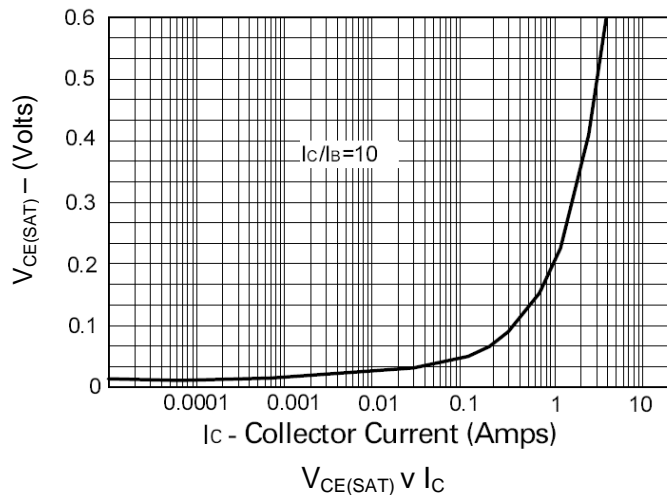


**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV <sub>CBO</sub>	-80	—	—	V	I <sub>C</sub> = -100μA
Collector-Emitter Breakdown Voltage (Note 10)	BV <sub>CEO</sub>	-60	—	—	V	I <sub>C</sub> = -10mA
Emitter-Base Breakdown Voltage	BV <sub>EBO</sub>	-7	—	—	V	I <sub>E</sub> = -100μA
Collector Cut-off Current	I <sub>CBO</sub>	—	<-1	-100	nA	V <sub>CB</sub> = -60V
		—	—	-10	μA	V <sub>CB</sub> = -60V, T <sub>A</sub> = +100°C
Emitter Cut-off Current	I <sub>EBO</sub>	—	<-1	-100	nA	V <sub>EB</sub> = -4V
Collector-Emitter Saturation Voltage (Note 10)	V <sub>CE(SAT)</sub>	—	-0.15	-0.3	V	I <sub>C</sub> = -1A, I <sub>B</sub> = -100mA
		—	-0.45	-0.6		I <sub>C</sub> = -3A, I <sub>B</sub> = -300mA
Base-Emitter Saturation Voltage (Note 10)	V <sub>BE(SAT)</sub>	—	-0.9	-1.25	V	I <sub>C</sub> = -1A, I <sub>B</sub> = -100mA
Base-Emitter Turn-On Voltage (Note 10)	V <sub>BE(ON)</sub>	—	-0.8	-1.0	V	I <sub>C</sub> = -1A, V <sub>CE</sub> = -2V
DC Current Gain (Note 10)	h <sub>FE</sub>	70	200	—	—	I <sub>C</sub> = -50mA, V <sub>CE</sub> = -2V
		100	200	300		I <sub>C</sub> = -500mA, V <sub>CE</sub> = -2V
		80	170	—		I <sub>C</sub> = -1A, V <sub>CE</sub> = -2V
		40	150	—		I <sub>C</sub> = -2A, V <sub>CE</sub> = -2V
Current Gain-Bandwidth Product	f <sub>T</sub>	100	140	—	MHz	V <sub>CE</sub> = -5V, I <sub>C</sub> = -100mA f = 100MHz
Turn-On Time	t <sub>ON</sub>	—	40	—	ns	V <sub>CC</sub> = -10V, I <sub>C</sub> = -500mA
Turn-Off Time	t <sub>OFF</sub>	—	450	—	ns	I <sub>B1</sub> = I <sub>B2</sub> = -50mA
Output Capacitance	C <sub>OBO</sub>	—	—	30	pF	V <sub>CB</sub> = -10V, f = 1MHz

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

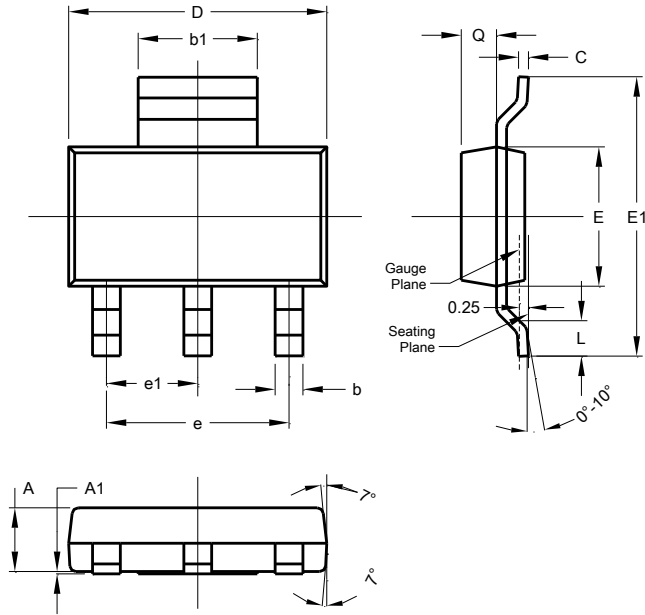
**Typical Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)



## Package Outline Dimensions

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

### SOT223

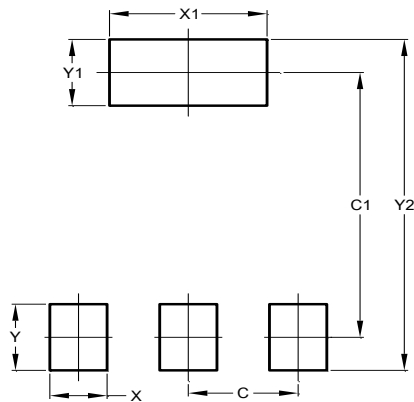


SOT223			
Dim	Min	Max	Typ
A	1.55	1.65	1.60
A1	0.010	0.15	0.05
b	0.60	0.80	0.70
b1	2.90	3.10	3.00
C	0.20	0.30	0.25
D	6.45	6.55	6.50
E	3.45	3.55	3.50
E1	6.90	7.10	7.00
e	-	-	4.60
e1	-	-	2.30
L	0.85	1.05	0.95
Q	0.84	0.94	0.89
All Dimensions in mm			

## 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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