

Description

This bipolar junction transistor (BJT) is designed to meet the stringent requirements of automotive applications.

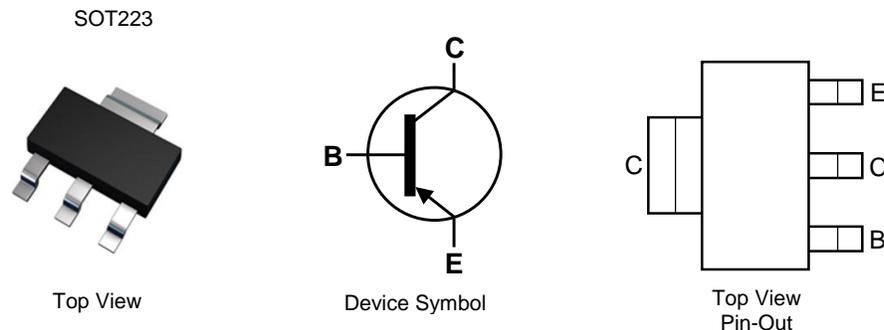
Features

- $BV_{CEO} > -100V$
- $I_C = -2A$ High Continuous Current
- $I_{CM} = -6A$ Peak Pulse Current
- Low Saturation Voltage $V_{CE(sat)} < -300mV @ -1A$
- Complementary NPN Type: DIODES™ FZT653
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen- and Antimony-Free. "Green" Device (Note 3)**
- **The DIODES™ FZT753Q 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 (Type DN)
- 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)

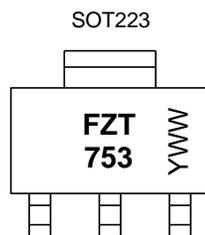


Ordering Information (Note 4)

Part Number	Package	Marking	Reel Size (inches)	Tape Width (mm)	Packing	
					Qty.	Carrier
FZT753QTA	SOT223 (Type DN)	FZT753	7	12	1,000	Reel
FZT753QTC	SOT223 (Type DN)	FZT753	13	12	4,000	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



FZT 753 = Product Type Marking Code
 YWW = Date Code Marking
 Y or \bar{Y} = Last Digit of Year (ex: 2 = 2022)
 WW or $\bar{W}W$ = 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}	-120	V
Collector-Emitter Voltage	V_{CEO}	-100	V
Emitter-Base Voltage	V_{EBO}	-7	V
Continuous Collector Current	I_C	-2	A
Peak Pulse Current	I_{CM}	-6	A

Thermal Characteristics (@ $T_A = +25^\circ\text{C}$, 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	$R_{\theta JA}$	(Note 5)	41.7
		(Note 6)	62.5
		(Note 7)	78.1
		(Note 8)	104
Thermal Resistance Junction to Lead	$R_{\theta JL}$	12.9	
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

ESD Ratings (Note 10)

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:
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

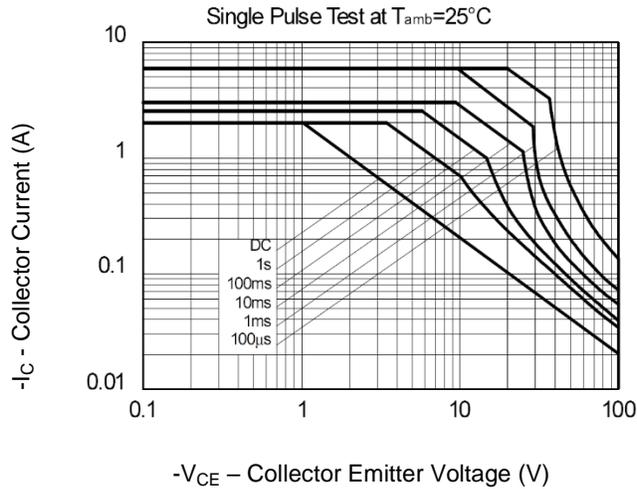


Figure 1. Safe Operating Area

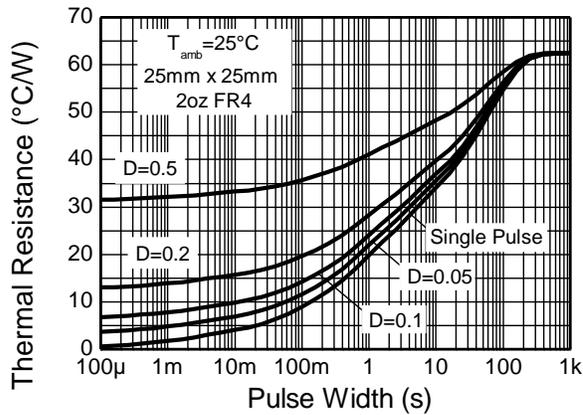


Figure 2. Transient Thermal Impedance

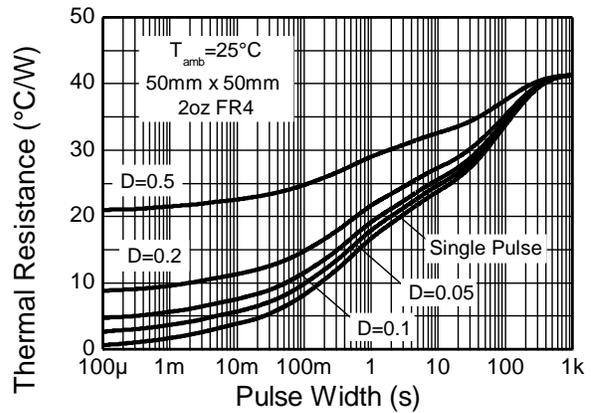


Figure 3. Transient Thermal Impedance

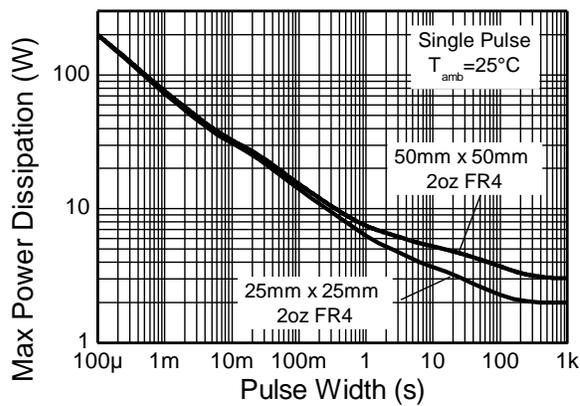


Figure 4. Power Pulse Dissipation

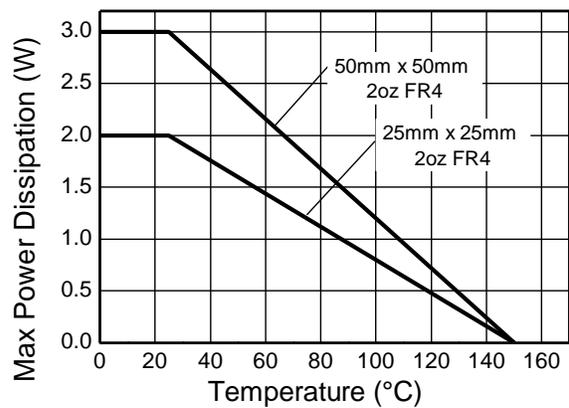


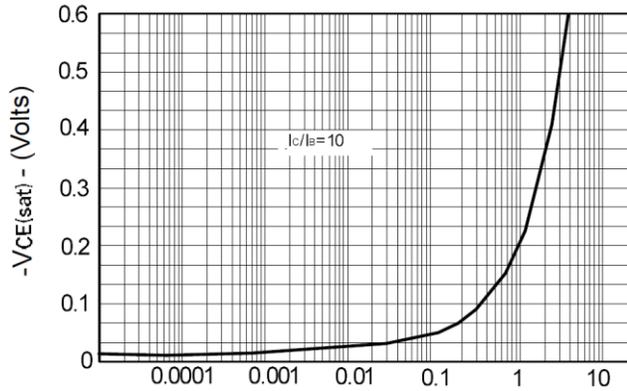
Figure 5. Derating Curve

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}	-120	-	-	V	$I_C = -100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Note 11)	BV_{CEO}	-100	-	-	V	$I_C = -1\text{mA}$
Emitter-Base Breakdown Voltage	BV_{EBO}	-7	-	-	V	$I_E = -100\mu\text{A}$
Collector Cut-Off Current	I_{CBO}	-	1	-100	nA	$V_{CB} = -100\text{V}$
		-	-	-10	μA	$V_{CB} = -100\text{V}$, $T_A = +125^\circ\text{C}$
Emitter Cut-Off Current	I_{EBO}	-	1	-100	nA	$V_{EB} = -5.6\text{V}$
Collector-Emitter Saturation Voltage (Note 11)	$V_{CE(sat)}$	-	-0.17	-0.3	V	$I_C = -1\text{A}$, $I_B = -100\text{mA}$
		-	-0.30	-0.5		$I_C = -2\text{A}$, $I_B = -200\text{mA}$
Base-Emitter Saturation Voltage (Note 11)	$V_{BE(sat)}$	-	-0.9	-1.25	V	$I_C = -1\text{A}$, $I_B = -100\text{mA}$
Base-Emitter Turn-On Voltage (Note 11)	$V_{BE(on)}$	-	-0.8	-1.0	V	$I_C = -1\text{A}$, $V_{CE} = -2\text{V}$
DC Current Gain (Note 11)	h_{FE}	70	200	-	-	$I_C = -50\text{mA}$, $V_{CE} = -2\text{V}$
		100	200	300		$I_C = -500\text{mA}$, $V_{CE} = -2\text{V}$
		55	170	-		$I_C = -1\text{A}$, $V_{CE} = -2\text{V}$
		25	55	-		$I_C = -2\text{A}$, $V_{CE} = -2\text{V}$
Current Gain-Bandwidth Product	f_T	100	140	-	MHz	$V_{CE} = -5\text{V}$, $I_C = -100\text{mA}$ $f = 100\text{MHz}$
Turn-On Time	t_{on}	-	40	-	ns	$V_{CC} = -10\text{V}$, $I_C = -500\text{mA}$
Turn-Off Time	t_{off}	-	600	-	ns	$I_{B1} = -I_{B2} = -50\text{mA}$
Output Capacitance	C_{obo}	-	-	30	pF	$V_{CB} = -10\text{V}$, $f = 1\text{MHz}$

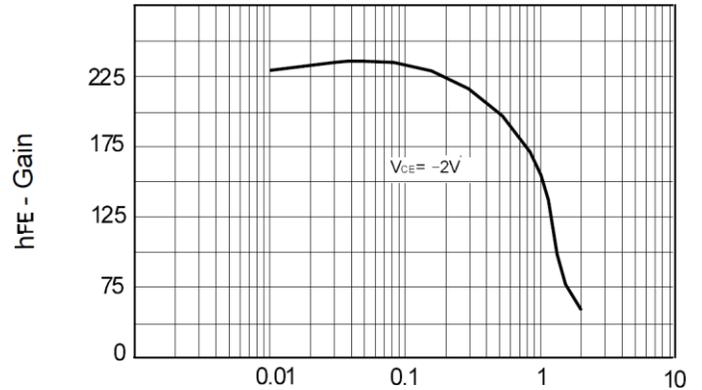
Note: 11. Measured under pulsed conditions. Pulse width $\leq 300\mu\text{s}$. Duty cycle $\leq 2\%$.

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



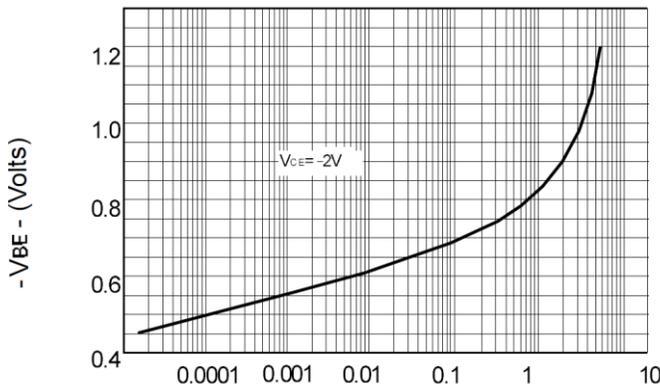
-Ic - Collector Current (Amps)

Figure 6. $V_{CE(sat)} \ v \ I_c$



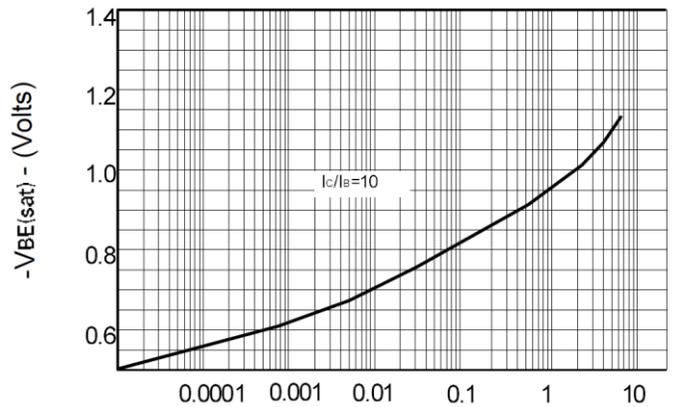
-Ic - Collector Current (Amps)

Figure 7. $h_{FE} \ v \ I_c$



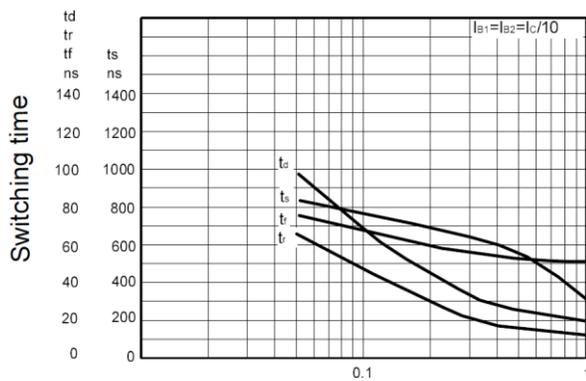
-Ic - Collector Current (Amps)

Figure 8. $V_{BE(on)} \ v \ I_c$



-Ic - Collector Current (Amps)

Figure 9. $V_{BE(sat)} \ v \ I_c$



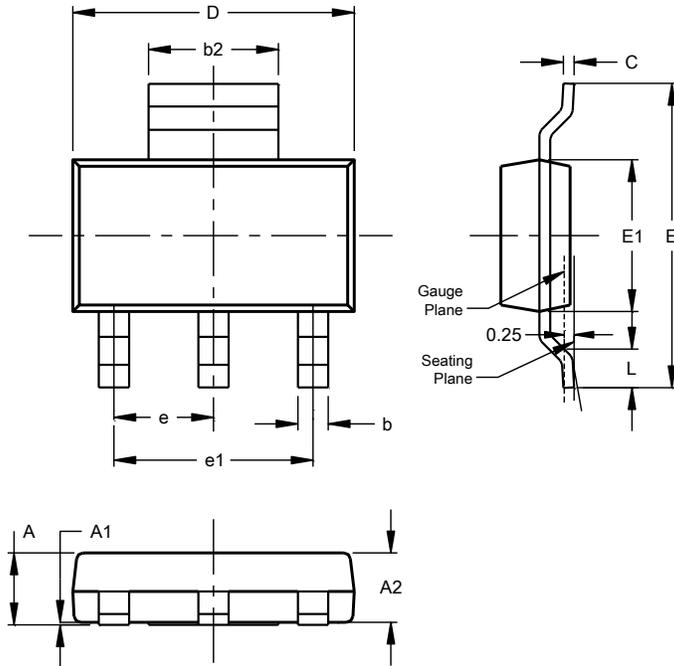
-Ic - Collector Current (Amps)

Figure 10. Switching Speed

Package Outline Dimensions

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

SOT223 (Type DN)

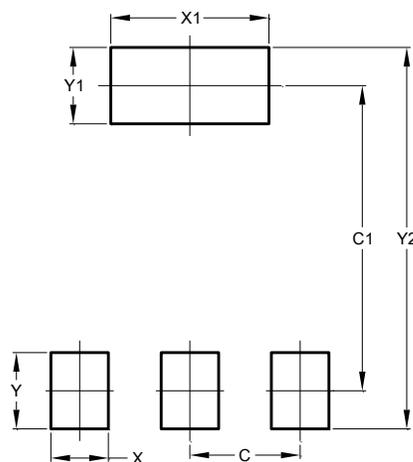


SOT223 (Type DN)			
Dim	Min	Max	Typ
A	--	1.70	--
A1	0.01	0.15	--
A2	1.50	1.68	1.60
b	0.60	0.80	0.70
b2	2.90	3.10	--
c	0.20	0.32	--
D	6.30	6.70	--
E	6.70	7.30	--
E1	3.30	3.70	--
e	--	--	2.30
e1	--	--	4.60
L	0.85	--	--
All Dimensions in mm			

Suggested Pad Layout

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

SOT223 (Type DN)



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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