

Features

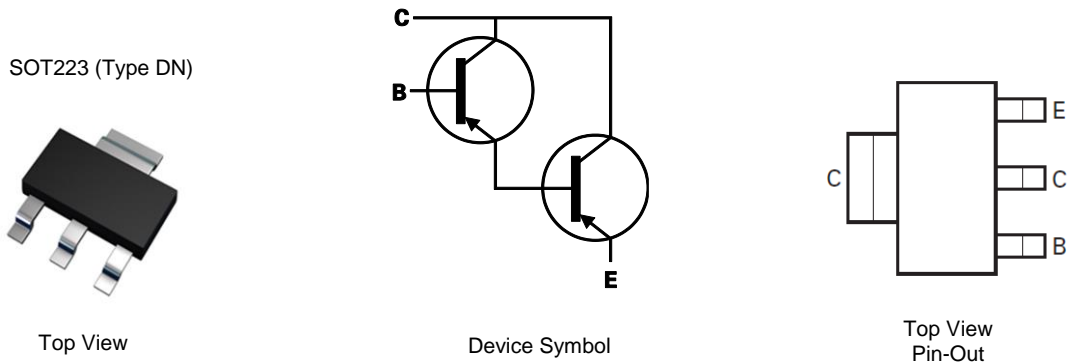
- $BV_{CEO} > -120V$
- $BV_{CBO} > -140V$
- $I_C = -2A$ High Continuous Current
- $h_{FE} > 2k$ for High Gain @ -2A
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **An Automotive-Compliant Part is Available Under Separate Datasheet ([FZT705Q](#))**

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)

Applications

- Lamps
- Relays
- Solenoid driving

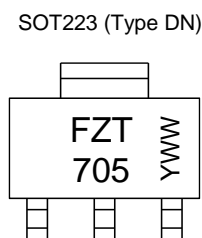


Ordering Information (Note 4)

Part Number	Package	Marking	Reel Size (inches)	Tape Width (mm)	Packing	
					Qty.	Carrier
FZT705TA	SOT223 (Type DN)	FZT705	7	12	1,000	Reel
FZT705TC	SOT223 (Type DN)	FZT705	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



FZT705 = 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 to 53)

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V _{CB0}	-140	V
Collector-Emitter Voltage	V _{CEO}	-120	V
Emitter-Base Voltage	V _{EBO}	-12	V
Continuous Collector Current	I _C	-2	A
Peak Pulse Current	I _{CM}	-4	A

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

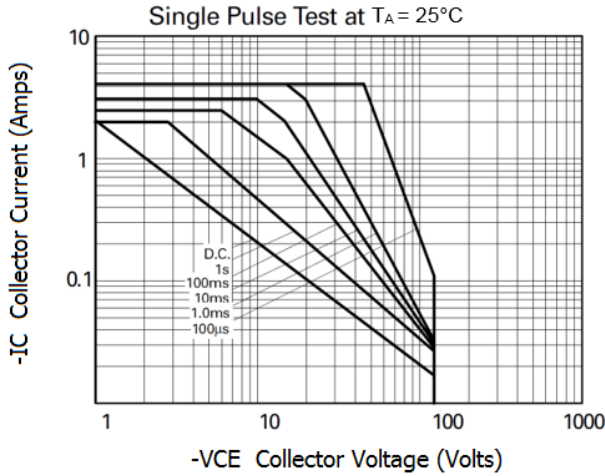
Characteristic	Symbol	Value	Unit
Power Dissipation	P _D	(Note 5)	3
		(Note 6)	2
		(Note 7)	1.6
		(Note 8)	1.2
Thermal Resistance, Junction to Ambient	R _{θJA}	(Note 5)	41.7
		(Note 6)	62.5
		(Note 7)	78.1
		(Note 8)	104
Thermal Resistance Junction to Lead	R _{θJL}	12.9	
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

ESD Ratings (Note 10)

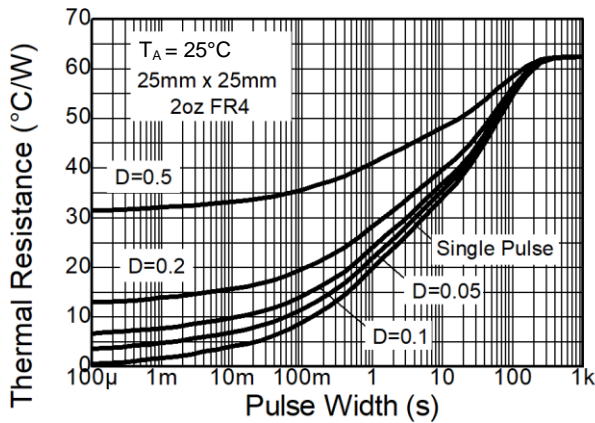
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge – Human Body Model	ESD HBM	2,000	V	2
Electrostatic Discharge – Machine Model	ESD MM	≥ 200	V	B

- Notes:
5. For a device mounted with the collector lead on 50mm x 50mm 2oz copper that is on a single-sided 1.6mm FR-4 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.

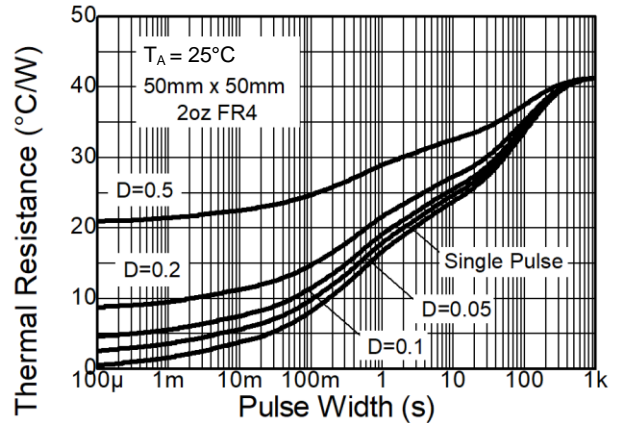
Thermal Characteristics and Derating Information



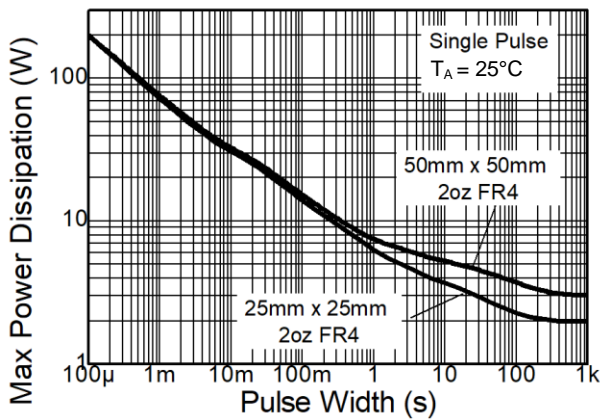
Safe Operating Area FZT705



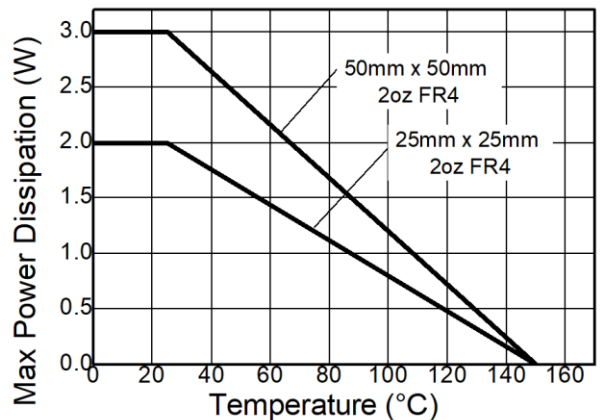
Transient Thermal Impedance



Transient Thermal Impedance



Pulse Power Dissipation



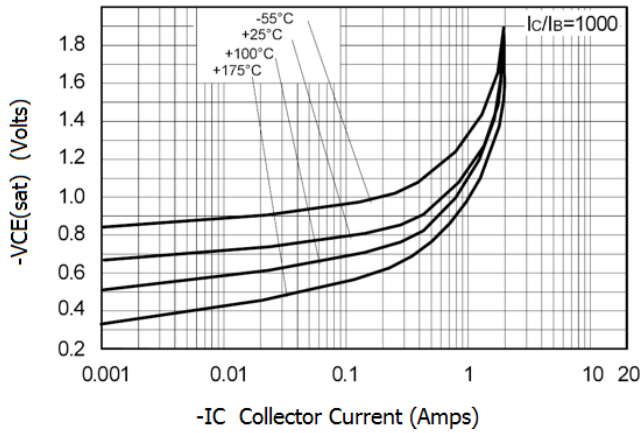
Derating Curve

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

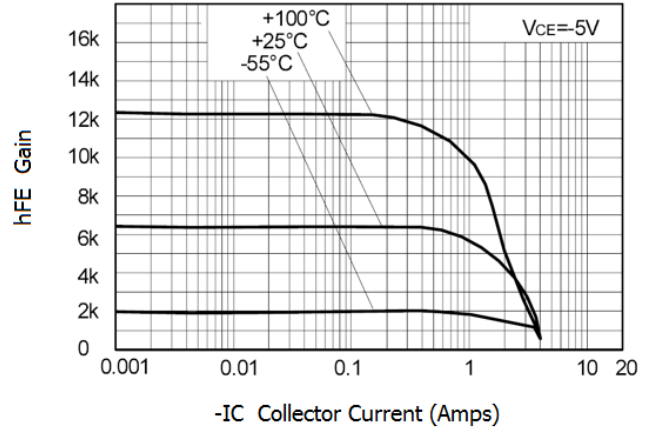
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition	
Collector-Base Breakdown Voltage	BV _{CB0}	-140	-170	—	V	I _C = -100μA	
Collector-Emitter Breakdown Voltage (Note 11)	BV _{CEO}	-120	-140	—	V	I _C = -10mA	
Emitter-Base Breakdown Voltage	BV _{EB0}	-12	-16.4	—	V	I _E = -100μA	
Collector-Base Cut-Off Current	I _{CBO}	—	-2	-100	nA	V _{CB} = -120V	
			—	-10	μA	V _{CB} = -120V, T _A = +100°C	
Collector-Emitter Cut-Off Current	I _{CES}	—	-0.2	-10	μA	V _{CE} = -80V	
Emitter Cut-Off Current	I _{EBO}	—	—	-50	nA	V _{EB} = -10V	
DC Current Gain (Note 11)	h _{FE}	—	3k	12k	—	—	I _C = -10mA, V _{CE} = -5V
			3k	12k	—		I _C = -100mA, V _{CE} = -5V
			3k	10k	30k		I _C = -1A, V _{CE} = -5V
			2k	7k	—		I _C = -2A, V _{CE} = -5V
Collector-Emitter Saturation Voltage (Note 11)	V _{CE(sat)}	—	-0.97	-1.3	V	I _C = -1A, I _B = -1mA	
			—	-1.3		-2.5	I _C = -2A, I _B = -2mA
Base-Emitter Saturation Voltage (Note 11)	V _{BE(sat)}	—	-1.67	-1.8	V	I _C = -1A, I _B = -10mA	
Base-Emitter Turn-On Voltage (Note 11)	V _{BE(on)}	—	-1.53	-1.7	V	I _C = -1A, V _{CE} = -5V	
Output Capacitance	C _{obo}	—	15	—	pF	V _{EB} = -10V, f = 1MHz	
Current Gain-Bandwidth Product	f _T	—	160	—	MHz	V _{CE} = -10V, I _C = -100mA, f = 20MHz	
Turn-On Time	t _{on}	—	0.6	—	μs	V _{CC} = -10V, I _C = -500mA,	
Turn-Off Time	t _{off}	—	0.8	—	μs	I _{B1} = -I _{B2} = -0.5mA	

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

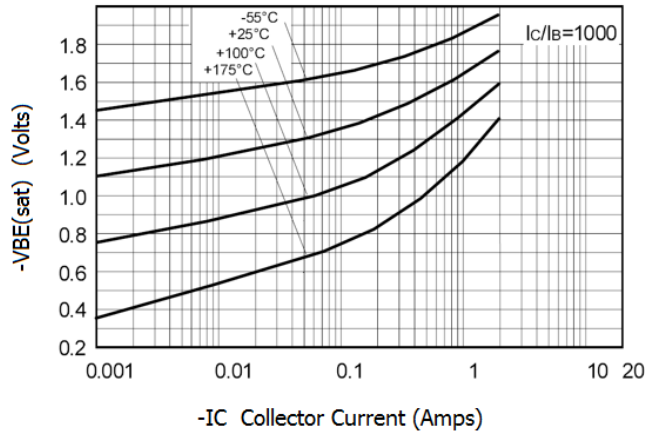
Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)



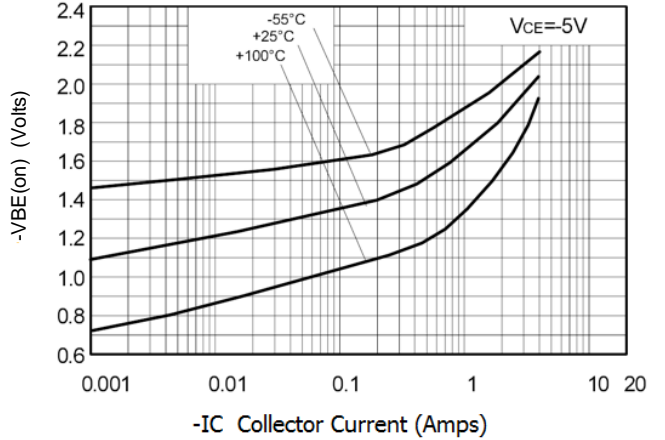
VCE(sat) v IC



hFE v IC



VBE(sat) v IC

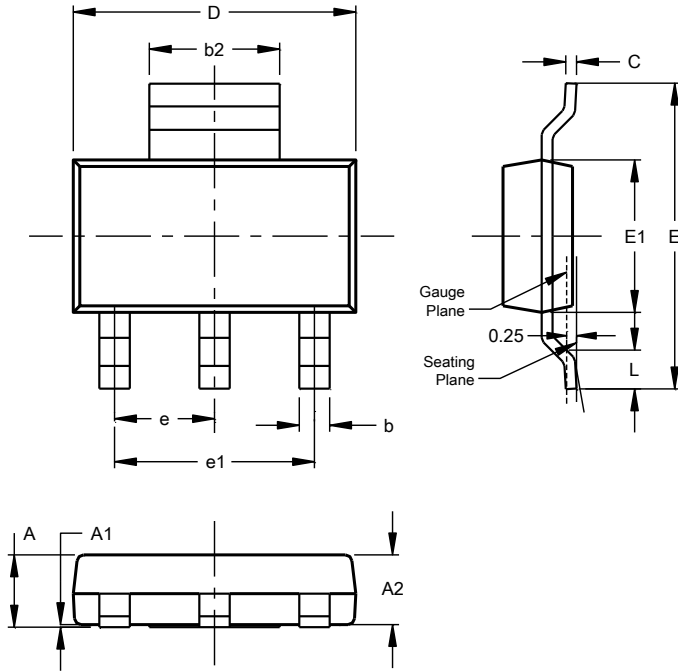


VBE(on) v IC

Package Outline Dimensions

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

SOT223 (Type DN)

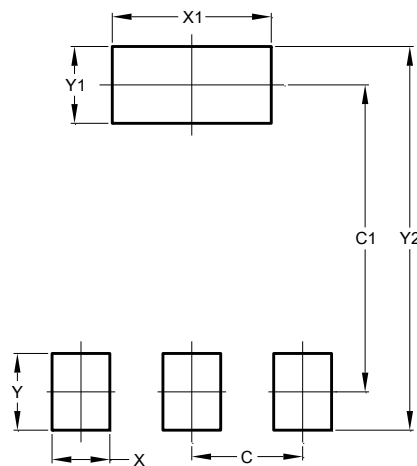


SOT223 (Type DN)			
Dim	Min	Max	Typ
A	--	1.70	--
A1	0.01	0.15	--
A2	1.50	1.68	1.60
b	0.60	0.80	0.70
b2	2.90	3.10	--
c	0.20	0.32	--
D	6.30	6.70	--
E	6.70	7.30	--
E1	3.30	3.70	--
e	--	--	2.30
e1	--	--	4.60
L	0.85	--	--
All Dimensions in mm			

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

Note: For high voltage applications, the appropriate industry sector guidelines should be considered with regards to voltage spacing between terminals.

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