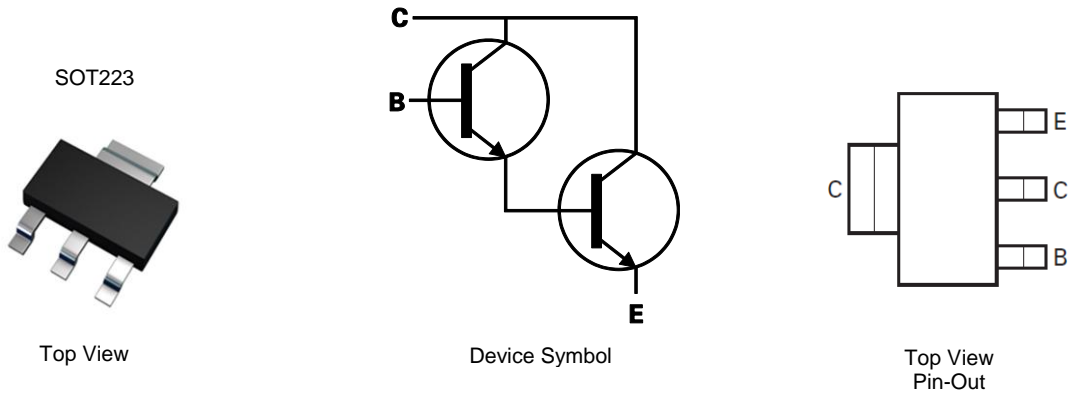


Features

- $BV_{CEO} > 140V$
- $BV_{CBO} > 160V$
- $I_C = 2A$ High Continuous Current
- NPN Darlington with Gain $>10k$
- Guaranteed h_{FE} Specified up to 1A
- **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)**

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 ③
- Weight: 0.112 grams (Approximate)

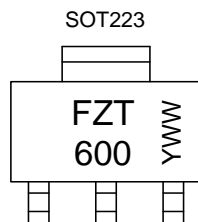


Ordering Information (Notes 4 & 5)

Product	Compliance	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
FZT600TA	AEC-Q101	FZT600	7	12	1,000
FZT600BTA	AEC-Q101	FZT600B	7	12	1,000
FZT600BQTA	Automotive	FZT600B	7	12	1,000

- Notes:
1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
 2. See http://www.diodes.com/quality/lead_free.html 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. Automotive, AEC-Q101 and standard products are electrically and thermally the same, except where specified. For more information, please refer to http://www.diodes.com/quality/product_compliance_definitions/.
 5. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

Marking Information



FZT 600 = Product Type Marking Code (Group A)
 FZT 600B = Product Type Marking Code (Group B)
 YYWW = Date Code Marking
 Y or \bar{Y} = Last Digit of Year (ex: 5= 2015)
 WW or \bar{W} = Week Code (01-53)

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V _{CB0}	160	V
Collector-Emitter Voltage	V _{CEO}	140	V
Emitter-Base Voltage	V _{EBO}	10	V
Continuous Collector Current	I _C	2	A
Peak Pulse Current	I _{CM}	4	A

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

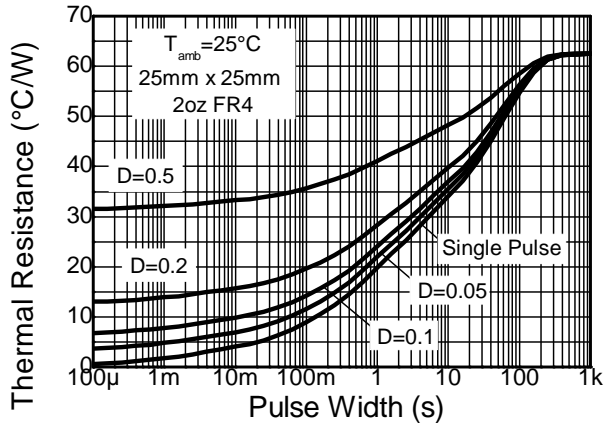
Characteristic	Symbol	Value	Unit
Power Dissipation	P _D	(Note 6)	3.0
		(Note 7)	2.0
		(Note 8)	1.6
		(Note 9)	1.2
Thermal Resistance, Junction to Ambient	R _{θJA}	(Note 6)	41.7
		(Note 7)	62.5
		(Note 8)	78.1
		(Note 9)	104
Thermal Resistance Junction to Lead	R _{θJL}	12.9	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

ESD Ratings (Note 11)

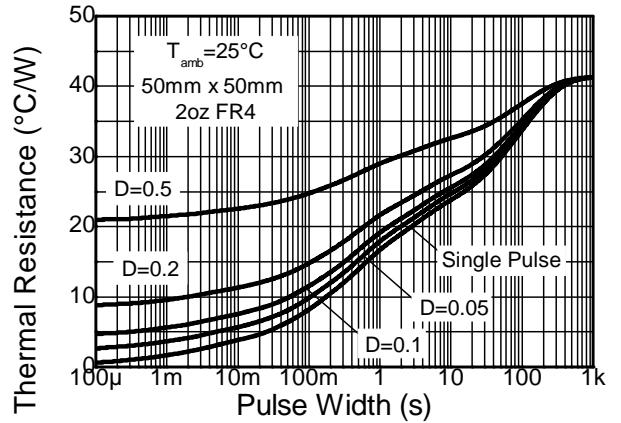
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	2,000	V	2
Electrostatic Discharge - Machine Model	ESD MM	200	V	B

- Notes:
6. 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.
 7. Same as Note 6, except the device is mounted on 25mm x 25mm 2oz copper.
 8. Same as Note 6, except the device is mounted on 25mm x 25mm 1oz copper.
 9. Same as Note 6, except the device is mounted on minimum recommended pad layout.
 10. Thermal resistance from junction to solder-point (at the end of the collector lead).
 11. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

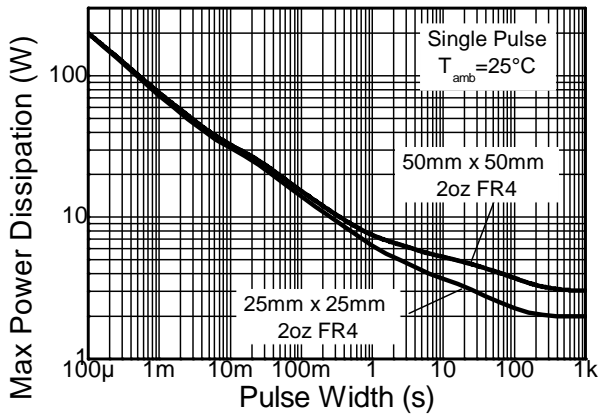
Thermal Characteristics and Derating Information



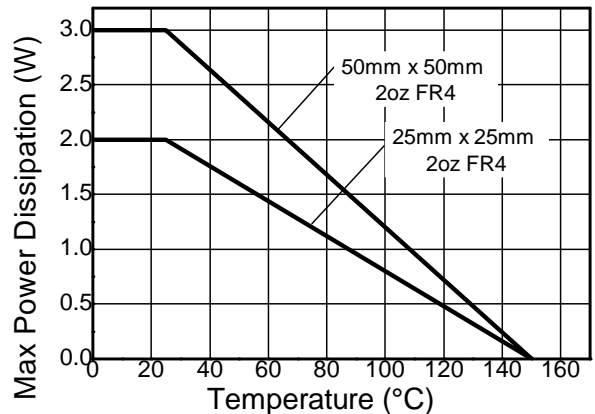
Transient Thermal Impedance



Transient Thermal Impedance



Pulse Power Dissipation



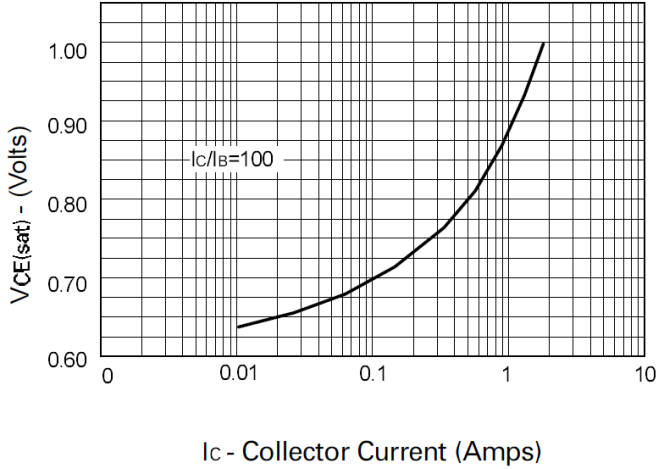
Derating Curve

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition	
Collector-Base Breakdown Voltage	BV_{CBO}	160	—	—	V	$I_C = 100\mu\text{A}$	
Collector-Emitter Breakdown Voltage (Note 12)	BV_{CEO}	140	—	—	V	$I_C = 10\text{mA}$	
Emitter-Base Breakdown Voltage	BV_{EBO}	10	—	—	V	$I_E = 100\mu\text{A}$	
Collector-Base Cut-Off Current	I_{CBO}	—	—	0.01 10	μA μA	$V_{CB} = 140\text{V}$ $V_{CB} = 140\text{V}, T_A = +100^\circ\text{C}$	
Collector-Emitter Cut-Off Current	I_{CES}	-	—	10	μA	$V_{CES} = 140\text{V}$	
Emitter Cut-Off Current	I_{EBO}	-	—	0.1	μA	$V_{EB} = 8\text{V}$	
DC Current Gain (Note 12)	h_{FE}	Group A (FZT600)		1,000 2,000 1,000	— — —	— 100,000 —	$I_C = 50\text{mA}, V_{CE} = 10\text{V}$ $I_C = 500\text{mA}, V_{CE} = 10\text{V}$ $I_C = 1\text{A}, V_{CE} = 10\text{V}$
		Group B (FZT600B)		5,000 10,000 5,000	10,000 20,000 10,000	— 100,000 —	$I_C = 50\text{mA}, V_{CE} = 10\text{V}$ $I_C = 500\text{mA}, V_{CE} = 10\text{V}$ $I_C = 1\text{A}, V_{CE} = 10\text{V}$
Collector-Emitter Saturation Voltage (Note 12)	$V_{CE(sat)}$	—	0.75 0.85	1.1 1.2	V	$I_C = 500\text{mA}, I_B = 5\text{mA}$ $I_C = 1\text{A}, I_B = 10\text{mA}$	
Base-Emitter Saturation Voltage (Note 12)	$V_{BE(sat)}$	—	1.7	1.9	V	$I_C = 1\text{A}, I_B = 10\text{mA}$	
Base-Emitter Turn-On Voltage (Note 12)	$V_{BE(on)}$	—	1.5	1.7	V	$I_C = 1\text{A}, V_{CE} = 5\text{V}$	
Output Capacitance (Note 12)	C_{obo}	—	10	15	pF	$V_{CB} = 10\text{V}, f = 1\text{MHz}$	
Current Gain-Bandwidth Product (Note 12)	f_T	150	250	—	MHz	$V_{CE} = 10\text{V}, I_C = 100\text{mA}, f = 20\text{MHz}$	
Turn-On Time	t_{on}	—	0.75	—	μs	$V_{CC} = 10\text{V}, I_C = 500\text{mA}$	
Turn-Off Time	t_{off}	—	2.20	—	μs	$I_{B1} = -I_{B2} = 0.5\text{mA}$	

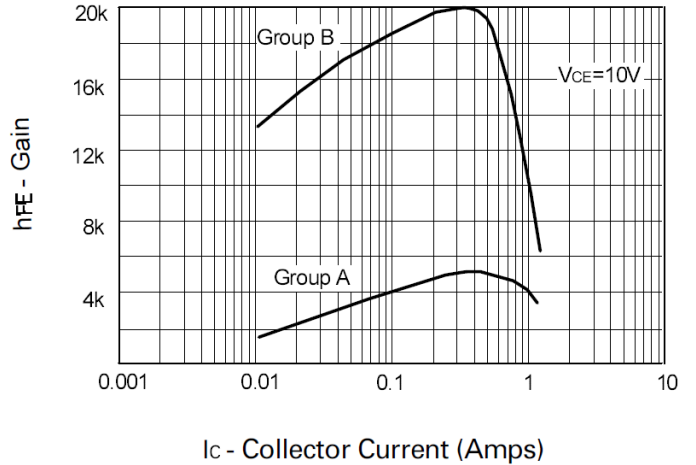
Note: 12. Measured under pulsed conditions. Pulse width $\leq 300\ \mu\text{s}$. Duty cycle $\leq 2\%$.

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



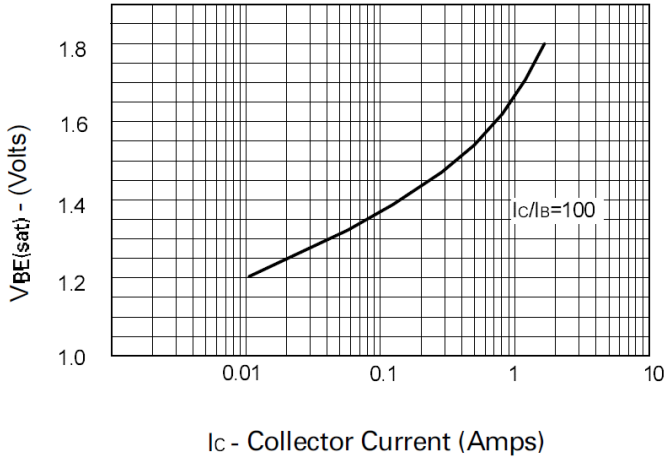
IC - Collector Current (Amps)

VCE(sat) v IC



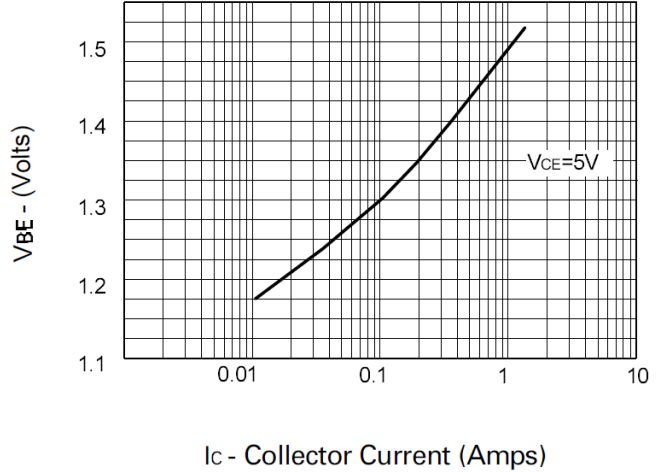
IC - Collector Current (Amps)

hFE v IC



IC - Collector Current (Amps)

VBE(sat) v IC

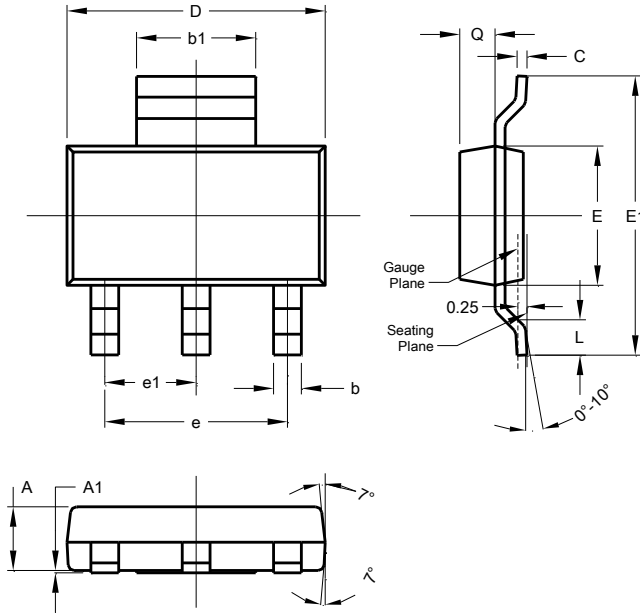


IC - Collector Current (Amps)

VBE(on) v IC

Package Outline Dimensions

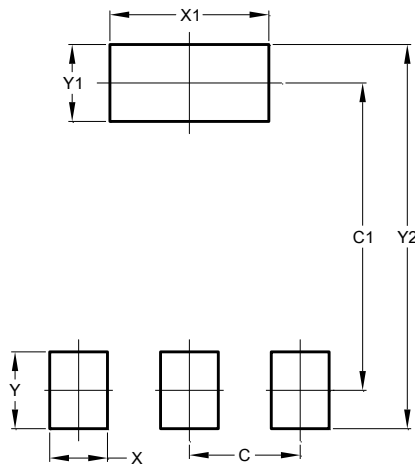
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



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 AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> 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

Note: For high voltage applications, the appropriate industry sector guidelines should be considered with regards to creepage and clearance distances between device terminals and PCB tracking.

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