

60V NPN SILICON PLANAR HIGH PERFORMANCE TRANSISTOR IN SOT223

Features

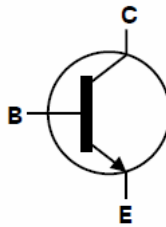
- $BV_{CEO} > 60V$
- Maximum continuous current $I_{C(cont)} = 3A$
- Low Saturation Voltage
- Complementary Type – FZT751
- **Lead-Free Finish; RoHS compliant (Note 1)**
- **Halogen and Antimony Free. "Green" Device (Note 2)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

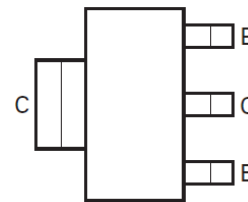
- Case: SOT223
- UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish
- Weight: 0.112 grams (approximate)



Top View



Device Symbol



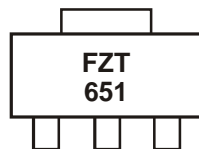
Top View
Pin-Out

Ordering Information (Notes 3 & 4)

Product	Grade	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
FZT651TA	Commercial	FZT651	7	12	1,000
FZT651QTA	Automotive	FZT651	7	12	1,000
FZT651TC	Commercial	FZT651	13	12	4,000
FZT651QTC	Automotive	FZT651	13	12	4,000

- Notes:
1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
 2. Halogen and Antimony free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
 3. For packaging details, go to our website at <http://www.diodes.com>.
 4. Products with Q-suffix are automotive grade. Automotive products are electrical and thermal the same as the commercial, except where specified.

Marking Information



FZT651 = Product type Marking Code

Maximum Ratings @ $T_A = 25^\circ\text{C}$ unless otherwise specified

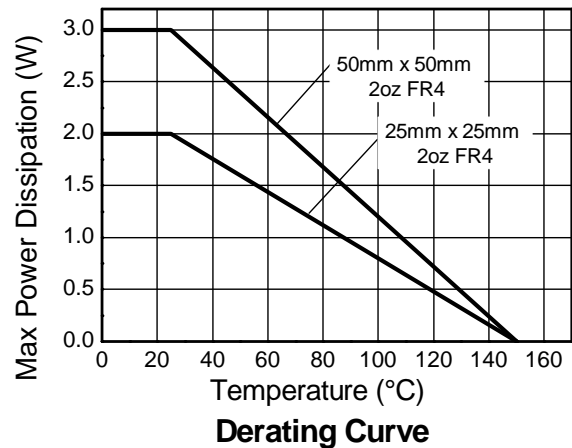
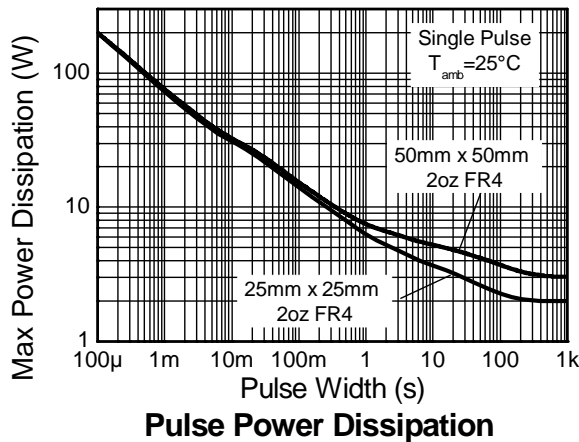
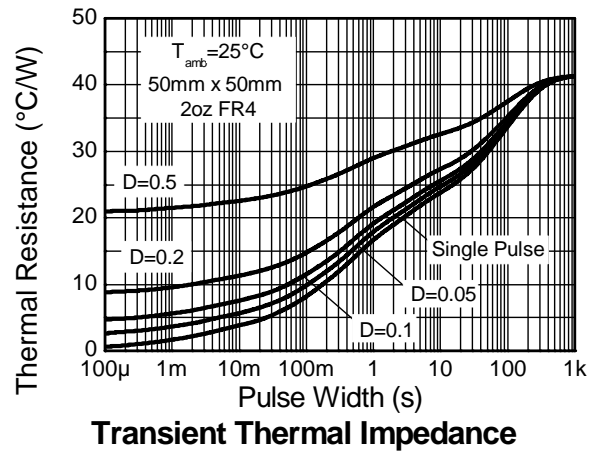
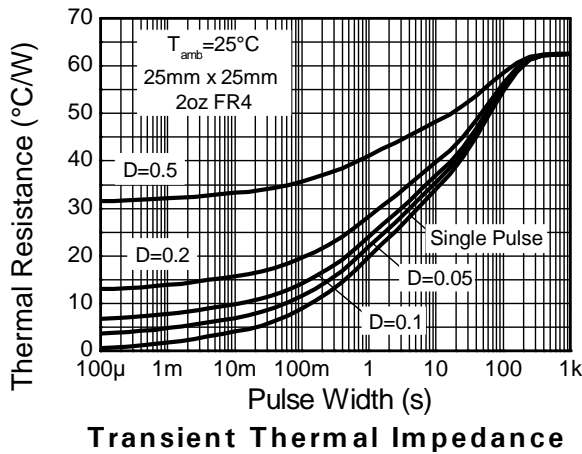
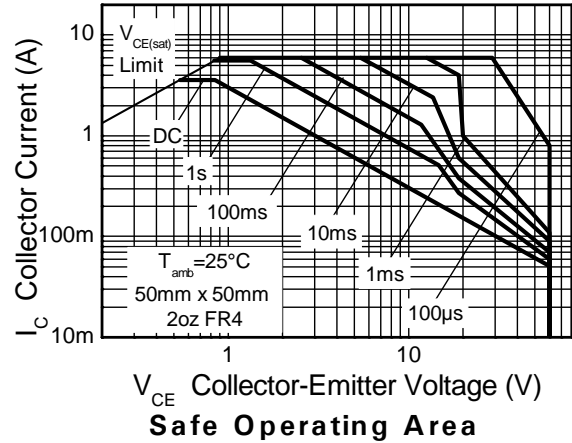
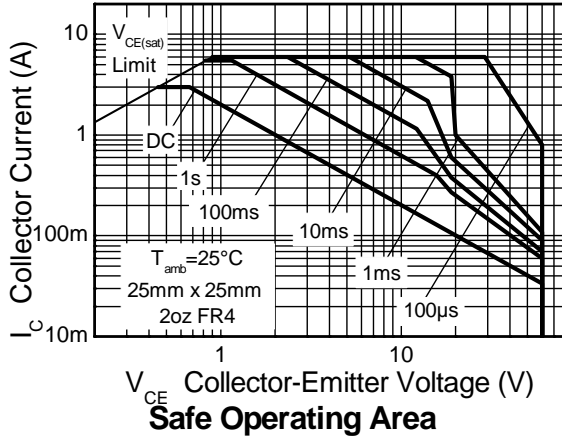
Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	80	V
Collector-Emitter Voltage	V_{CEO}	60	V
Emitter-Base Voltage	V_{EBO}	5	V
Continuous Collector Current	I_C	3	A
Peak Pulse Current	I_{CM}	6	A

Thermal Characteristics @ $T_A = 25^\circ\text{C}$ unless otherwise specified

Characteristic	Symbol	Value	Unit	
Power Dissipation	P_D	(Note 5)	2	W
		(Note 6)	3	W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	(Note 5)	62.5	$^\circ\text{C/W}$
		(Note 6)	41.7	$^\circ\text{C/W}$
Thermal Resistance, Junction to Leads (Note 7)	$R_{\theta JL}$	12.93	$^\circ\text{C/W}$	
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ\text{C}$	

- Notes:
- 5. For devices mounted on 25mm X 25mm single sided 2oz weight copper, in still air conditions.
 - 6. For devices mounted on 50mm X 50mm single sided 2oz weight copper, in still air conditions.
 - 7. Thermal resistance from junction to solder-point (at the end of the collector lead)

Thermal Characteristics

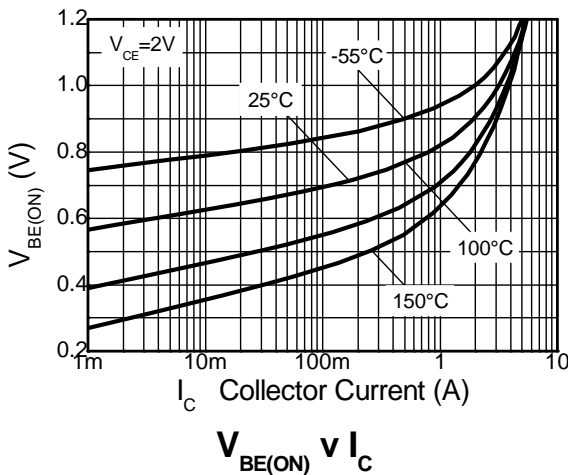
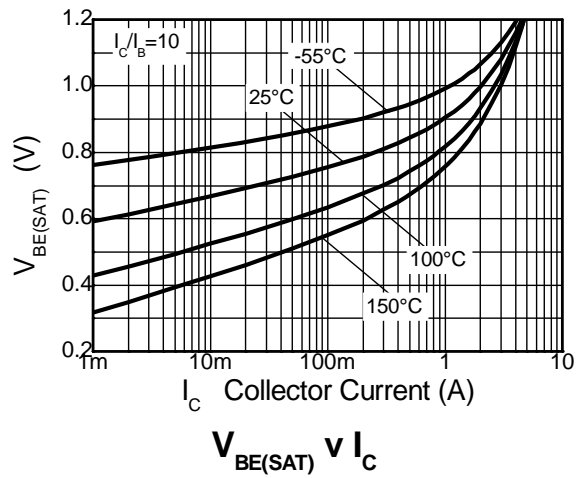
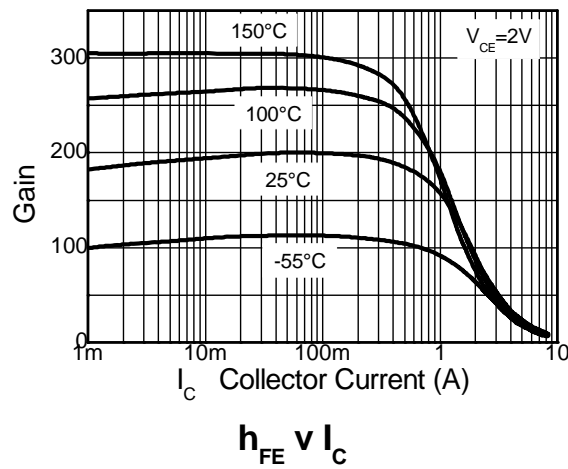
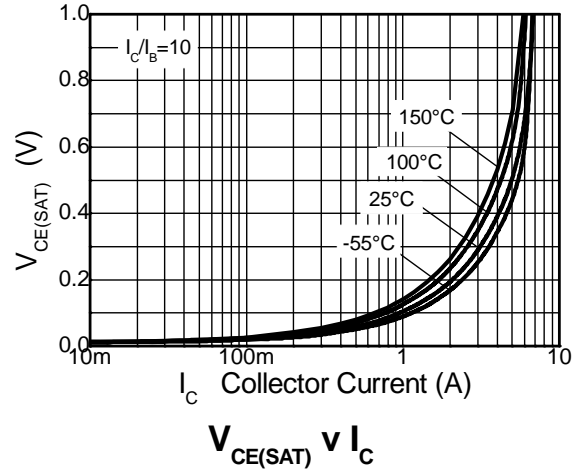
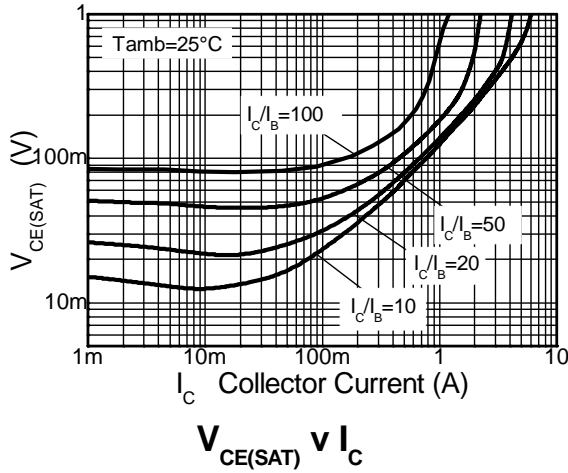


Electrical Characteristics @ $T_A = 25^\circ\text{C}$ unless otherwise specified

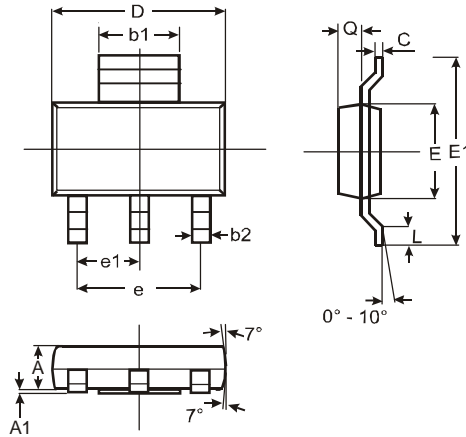
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	80	–	–	V	$I_C = 100\mu\text{A}$
Collector-Emitter Breakdown Voltage (Note 8)	BV_{CEO}	60	–	–	V	$I_C = 10\text{mA}$
Emitter-Base Breakdown Voltage	BV_{EBO}	5	–	–	V	$I_E = 100\mu\text{A}$
Collector Cut-off Current	I_{CBO}	–	–	0.1	μA	$V_{CB} = 60\text{V}$
		–	–	10		$V_{CB} = 60\text{V}, T_A = 125^\circ\text{C}$
Emitter Cut-off Current	I_{EBO}	–	–	100	nA	$V_{EB} = 4\text{V}$
Collector-Emitter Saturation Voltage (Note 8)	$V_{CE(sat)}$	–	0.12	0.3	V	$I_C = 1\text{A}, I_B = 100\text{mA}$
		–	0.43	0.6		$I_C = 3\text{A}, I_B = 300\text{mA}$
Base-Emitter Saturation Voltage (Note 8)	$V_{BE(sat)}$	–	0.9	1.25	V	$I_C = 1\text{A}, I_B = 100\text{mA}$
Base-Emitter Turn-On Voltage (Note 8)	$V_{BE(on)}$	–	0.8	1.0	V	$I_C = 1\text{A}, V_{CE} = 2\text{V}$
DC Current Gain (Note 8)	h_{FE}	70	200	–	–	$I_C = 50\text{mA}, V_{CE} = 2\text{V}$
		100	200	300		$I_C = 500\text{mA}, V_{CE} = 2\text{V}$
		80	170	–		$I_C = 1\text{A}, V_{CE} = 2\text{V}$
		40	80	–		$I_C = 2\text{A}, V_{CE} = 2\text{V}$
Current Gain-Bandwidth Product (Note 8)	f_T	140	175	–	MHz	$V_{CE} = 5\text{V}, I_C = 100\text{mA}, f = 100\text{MHz}$
Switching Times	t_{on}	–	45	–	ns	$I_C = 500\text{mA}, V_{CC} = 10\text{V}, I_{B1} = I_{B2} = 50\text{mA}$
	t_{off}	–	800	–		
Output Capacitance (Note 8)	C_{obo}	–	–	30	pF	$V_{CB} = 10\text{V}, f = 1\text{MHz}$

Notes: 8. Measured under pulsed conditions. Pulse width $\leq 300\mu\text{s}$. Duty cycle $\leq 2\%$

Typical Characteristics

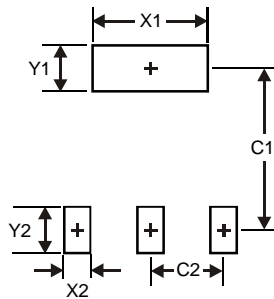


Package Outline Dimensions



SOT223			
Dim	Min	Max	Typ
A	1.55	1.65	1.60
A1	0.010	0.15	0.05
b1	2.90	3.10	3.00
b2	0.60	0.80	0.70
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



Dimensions	Value (in mm)
X1	3.3
X2	1.2
Y1	1.6
Y2	1.6
C1	6.4
C2	2.3

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