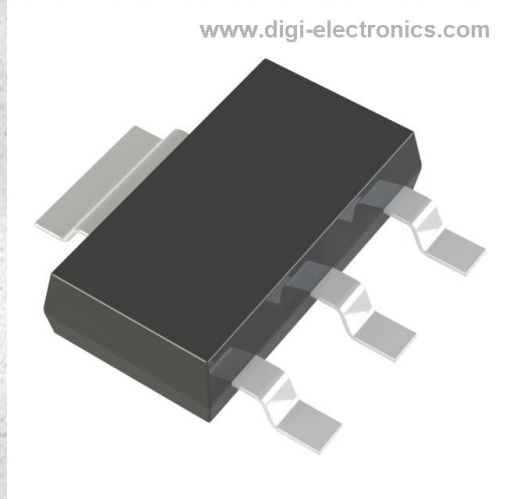
FZT651TA Datasheet



https://www.DiGi-Electronics.com

DiGi Electronics Part Number	FZT651TA-DG
Manufacturer	Diodes Incorporated
Manufacturer Product Number	FZT651TA
Description	TRANS NPN 60V 3A SOT223-3
Detailed Description	Bipolar (BJT) Transistor NPN 60 V 3 A 175MHz 2 W Surface Mount SOT-223-3

Tel: +00 852-30501935

RFQ Email: Info@DiGi-Electronics.com

Purchase and inquiry

Manufacturer Product Number:	Manufacturer:
FZT651TA	Diodes Incorporated
Series:	Product Status:
-	Active
Transistor Type:	Current - Collector (Ic) (Max):
NPN	3 A
Voltage - Collector Emitter Breakdown (Max):	Vce Saturation (Max) @ Ib, Ic:
60 V	600mV @ 300mA, 3A
Current - Collector Cutoff (Max):	DC Current Gain (hFE) (Min) @ Ic, Vce:
100nA (ICBO)	100 @ 500mA, 2V
Power - Max:	Frequency - Transition:
2 W	175MHz
Operating Temperature:	Mounting Type:
-55°C ~ 150°C (TJ)	Surface Mount
Package / Case:	Supplier Device Package:
TO-261-4, TO-261AA	SOT-223-3
Base Product Number:	
FZT651	

Environmental & Export classification

RoHS Status:	Moisture Sensitivity Level (MSL):
ROHS3 Compliant	1 (Unlimited)
REACH Status:	ECCN:
REACH Unaffected	EAR99
HTSUS:	
8541.29.0075	

Green

FZT651

60V NPN MEDIUM POWER TRANSISTOR IN SOT223

Features

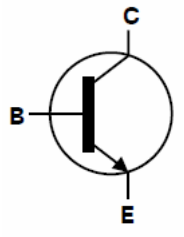
- BV_{CEO} > 60V
- I_C = 3A High Continuous Current
- I_{CM} = 6A Peak Pulse Current
- Low Saturation Voltage $V_{CE(sat)}$ < 300mV @ 1A
- Complementary PNP Type: FZT751
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/104/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please contact us or your local Diodes representative. https://www.diodes.com/quality/product-definitions/**
- **An Automotive-Compliant Part is Available Under Separate Datasheet (FZT651Q)**

Mechanical Data

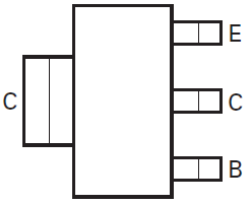
- Package: SOT223 (Type DN)
- Package Material: Molded Plastic. "Green" Molding Compound; UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Plated Leads; Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.112 grams (Approximate)

SOT223 (Type DN)

Top View



Device Symbol



Top View
Pin-Out

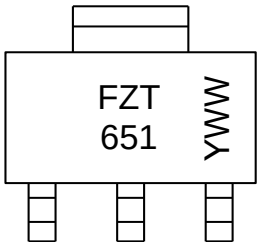
Ordering Information (Note 4)

Product	Compliance	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
FZT651TA	Standard	FZT651	7	12	1,000
FZT651TC	Standard	FZT651	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. For packaging details, go to our website at https://www.diodes.com/design/support/packaging/diodes-packaging/.

Marking Information

SOT223 (Type DN)



FZT 651 = Product Type Marking Code
YWW = Date Code Marking
Y or $\overline{Y}$ = Last Digit of Year (ex: 2 = 2022)
WW or $\overline{W}W$ = Week Code (01~53)

Absolute Maximum Ratings (@T_A = +25°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}	7	V
Continuous Collector Current	I_C	3	A
Peak Pulse Current	I_{CM}	6	A

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

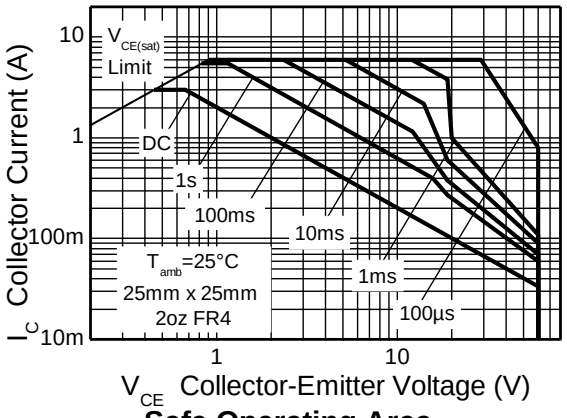
Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 5)	P_D	2	W
	(Note 6)		3	W
Thermal Resistance, Junction to Ambient	(Note 5)	$R_{\theta JA}$	62.5	°C/W
	(Note 6)		41.7	°C/W
Thermal Resistance, Junction to Leads (Note 7)		$R_{\theta JL}$	12.9	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

ESD Ratings (Note 8)

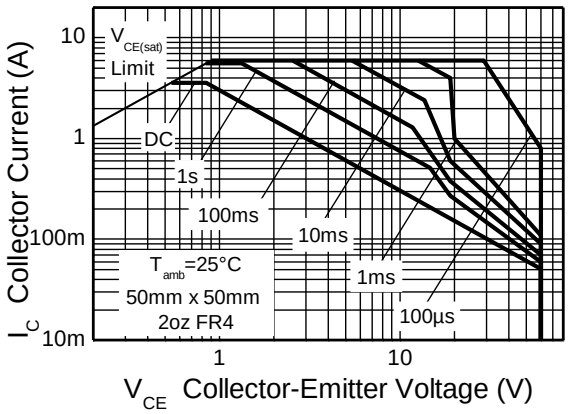
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

Notes:
5. For a device mounted with the collector lead on 25mm x 25mm 2oz copper that is on a single-sided 1.6mm FR4 PCB; device is measured under still air conditions whilst operating in steady-state.
6. Same as Note 5, except the device is mounted on 50mm x 50mm 2oz copper.
7. Thermal resistance from junction to solder-point (at the end of the collector lead).
8. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

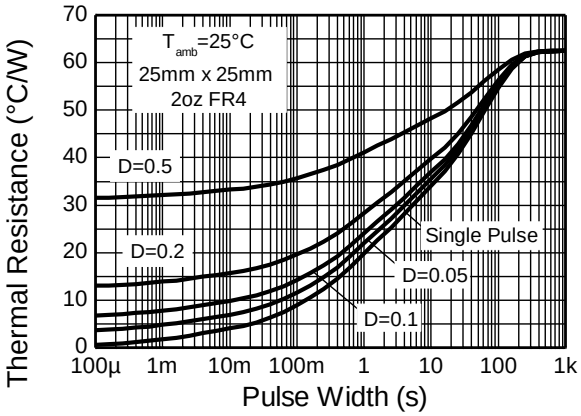
Thermal Characteristics and Derating Information



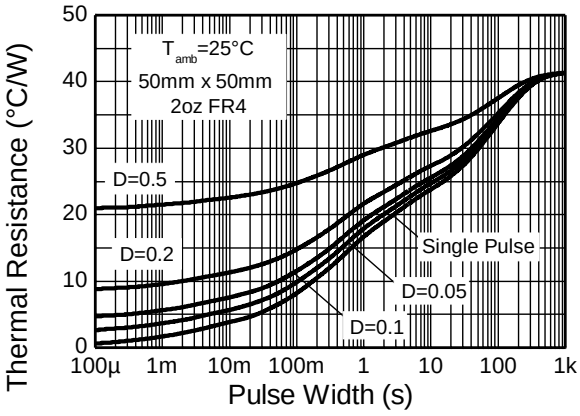
Safe Operating Area



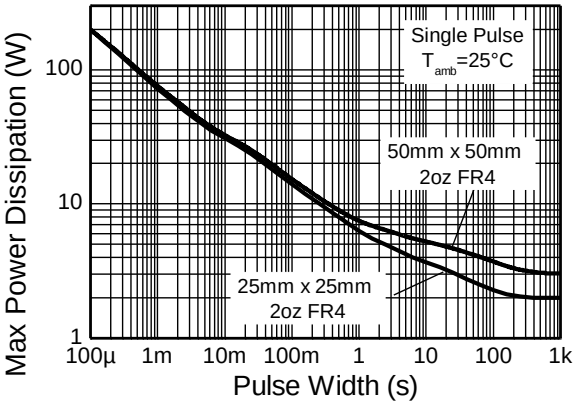
Safe Operating Area



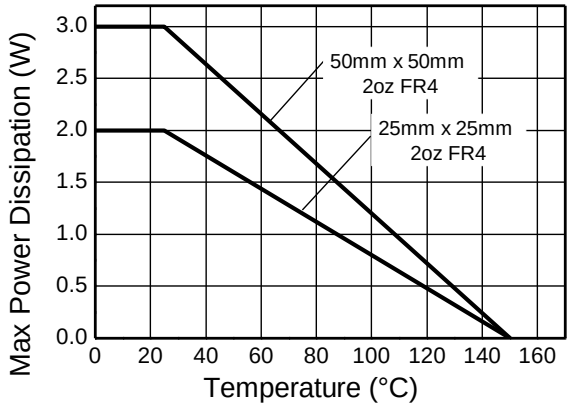
Transient Thermal Impedance



Transient Thermal Impedance



Pulse Power Dissipation



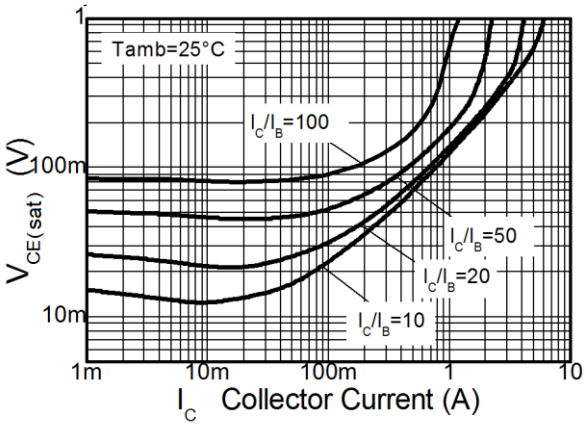
Derating Curve

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

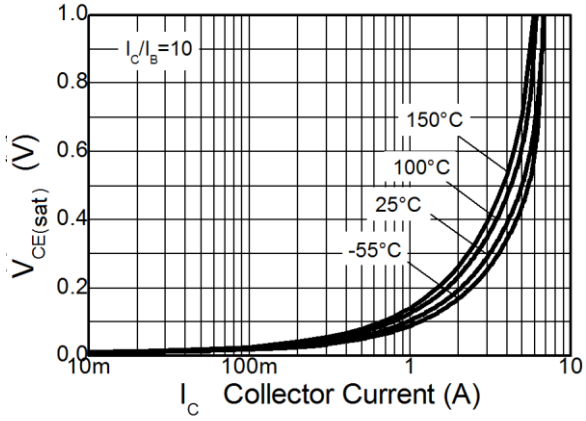
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	80	–	–	V	I_C = 100µA
Collector-Emitter Breakdown Voltage (Note 9)	BV_{CEO}	60	–	–	V	I_C = 10mA
Emitter-Base Breakdown Voltage	BV_{EBO}	7	–	–	V	I_E = 100µA
Collector Cut-Off Current	I_{CBO}	–	–	0.1	µA	V_{CB} = 60V
		–	–	10		V_{CB} = 60V, T_A = +125°C
Emitter Cut-Off Current	I_{EBO}	–	–	20	nA	V_{EB} = 6V
Collector-Emitter Saturation Voltage (Note 9)	$V_{CE(sat)}$	–	0.12	0.3	V	I_C = 1A, I_B = 100mA
		–	0.43	0.6		I_C = 3A, I_B = 300mA
Base-Emitter Saturation Voltage (Note 9)	$V_{BE(sat)}$	–	0.9	1.25	V	I_C = 1A, I_B = 100mA
Base-Emitter Turn-On Voltage (Note 9)	$V_{BE(on)}$	–	0.8	1.0	V	I_C = 1A, V_{CE} = 2V
DC Current Gain (Note 9)	h_{FE}	70	200	–	–	I_C = 50mA, V_{CE} = 2V
		100	200	300		I_C = 500mA, V_{CE} = 2V
		80	170	–		I_C = 1A, V_{CE} = 2V
		40	80	–		I_C = 2A, V_{CE} = 2V
Current Gain-Bandwidth Product (Note 9)	f_T	140	175	–	MHz	V_{CE} = 5V, I_C = 100mA, f = 100MHz
Switching Times	t_{on}	–	45	–	ns	I_C = 500mA, V_{CC} = 10V, I_{B1} = -I_{B2} = 50mA
	t_{off}	–	800	-		
Output Capacitance (Note 9)	C_{obo}	–	–	30	pF	V_{CB} = 10V, f = 1MHz

Note: 9. Measured under pulsed conditions. Pulse width ≤ 300µs. Duty cycle ≤ 2%.

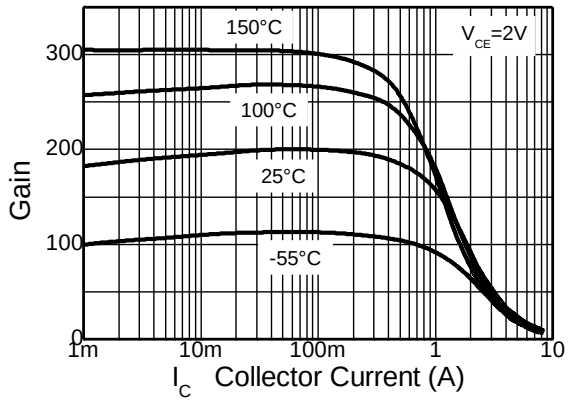
Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)



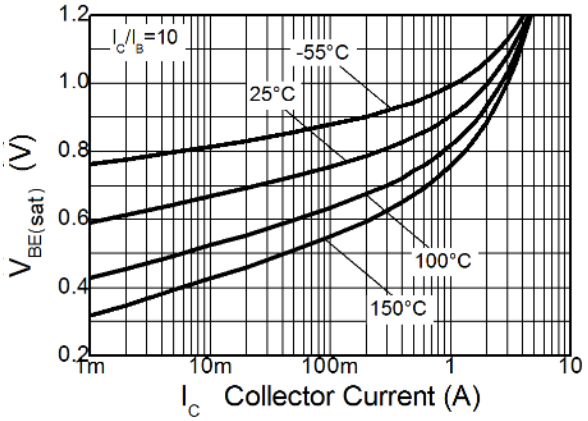
$V_{CE(sat)}$ v I_C



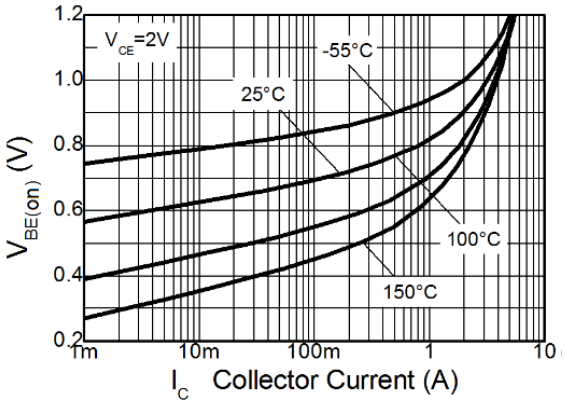
$V_{CE(sat)}$ v I_C



h_{FE} v I_C



$V_{BE(sat)}$ v I_C

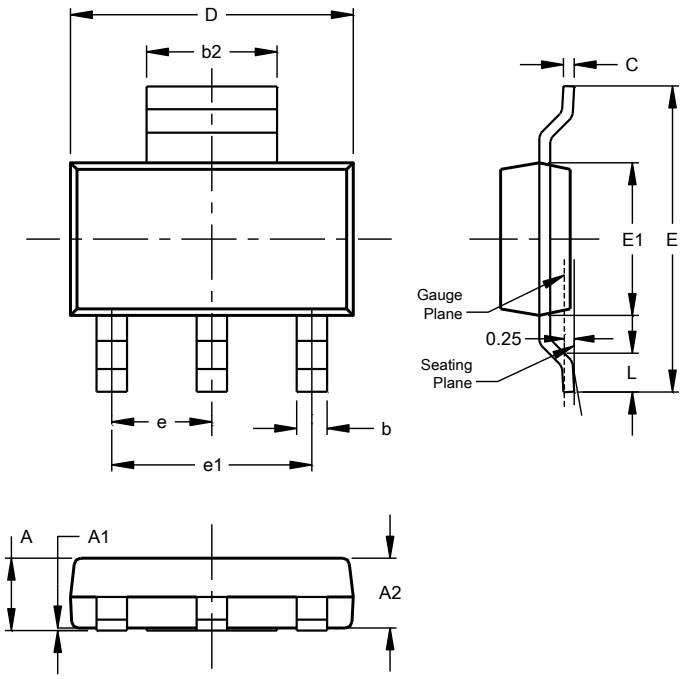


$V_{BE(on)}$ v I_C

Package Outline Dimensions

Please see https://www.diodes.com/design/support/packaging/ for the latest version.

SOT223 (Type DN)

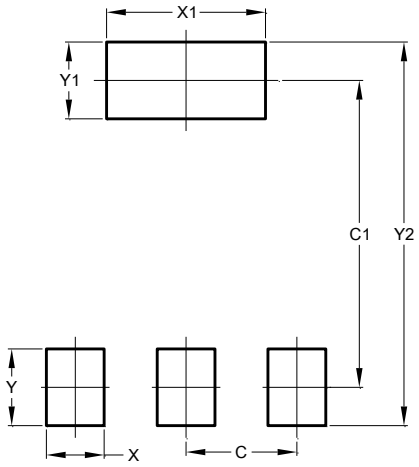


SOT223 (Type DN)			
Dim	**Min**	**Max**	**Typ**
A	--	1.70	--
A1	0.01	0.15	--
A2	1.50	1.68	1.60
b	0.60	0.80	0.70
b2	2.90	3.10	--
c	0.20	0.32	--
D	6.30	6.70	--
E	6.70	7.30	--
E1	3.30	3.70	--
e	--	--	2.30
e1	--	--	4.60
L	0.85	--	--
All Dimensions in mm			

Suggested Pad Layout

Please see https://www.diodes.com/design/support/packaging/ 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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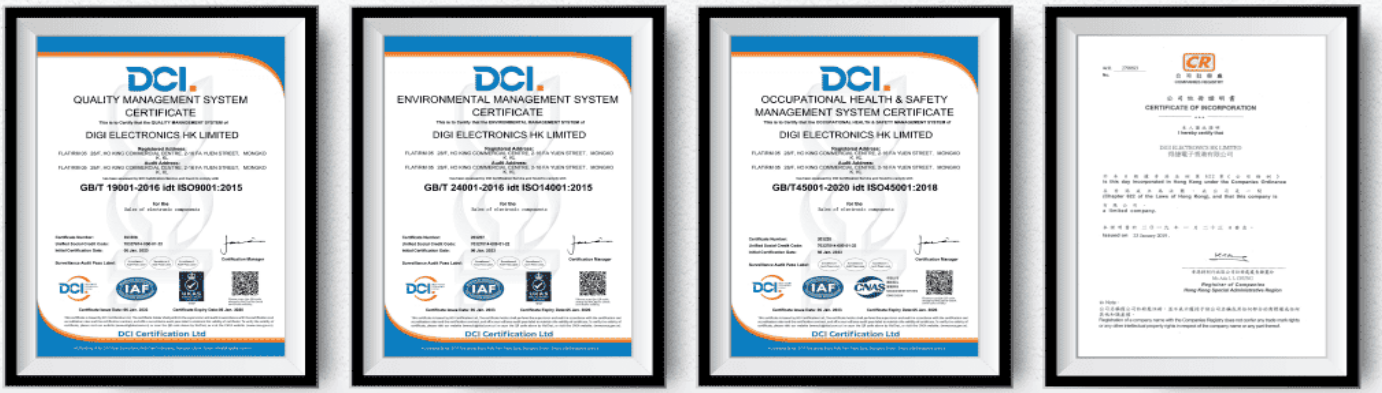

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