

Description

This Bipolar Junction Transistor (BJT) is designed to meet the stringent requirements of Automotive Applications.

Features

- $BV_{CEO} > 160V$
- $BV_{EBO} > 6V$
- $I_C = 600mA$ Continuous Collector Current
- Low Saturation Voltage (150mV max @10mA)
- h_{FE} specified up to 50mA for a high gain hold up
- Complementary PNP Type: DZT5401
- **Totally Lead-Free & Fully 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)**

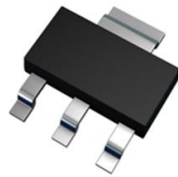
Mechanical Data

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

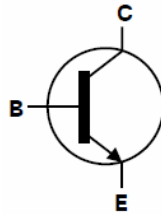
Applications

- High Voltage Amplification Applications
- High Voltage Switching

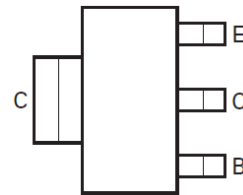
SOT223



Top View



Device Schematic



Pin-Out Top View

Ordering Information (Note 5)

Part Number	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
DZT5551Q-13	K4N	13	12	2,500

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
 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. Refer to http://www.diodes.com/quality/product_grade_definitions/.
 5. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

Marking Information

SOT223



K4N = Product Type Marking Code
 JII = Manufacturer's Code Marking
 YWW = Date Code Marking
 Y = Last Digit of Year ex: 5 = 2015
 WW = Week Code 01 ~ 53

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V _{CB0}	180	V
Collector-Emitter Voltage	V _{CEO}	160	V
Emitter-Base Voltage	V _{EBO}	6	V
Continuous Collector Current	I _C	600	mA
Peak Collector Current	I _{CM}	1	A

Thermal Characteristics

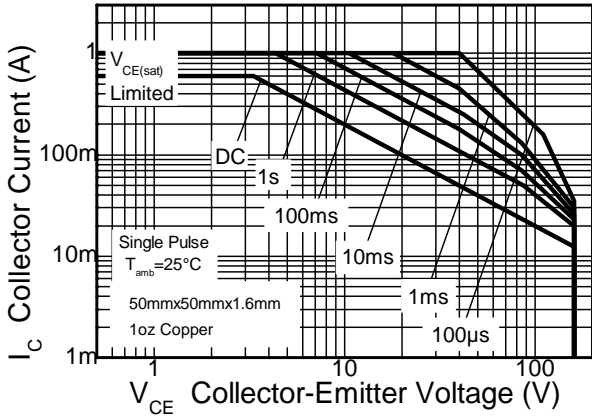
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 6)	P _D	2	W
Thermal Resistance, Junction to Ambient (Note 6)	R _{θJA}	62.5	°C/W
Thermal Resistance, Junction to Leads (Note 7)	R _{θJL}	34.05	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

ESD Ratings (Note 8)

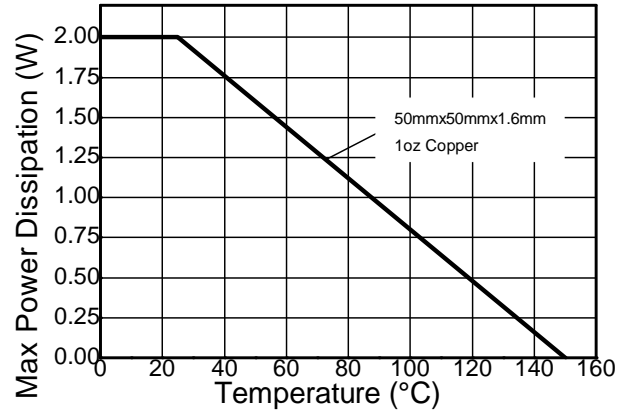
Characteristic	Symbol	Value	Unit	JEDEC Class
Electrostatic Discharge - Human Body Model	ESD HBM	4,000	V	3A
Electrostatic Discharge - Machine Model	ESD MM	400	V	C

- Notes:
6. Device mounted on 50mm X 50mm X 1.6mm FR-4 PCB with high coverage of single sided 1 oz. copper, in still air condition.
 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.

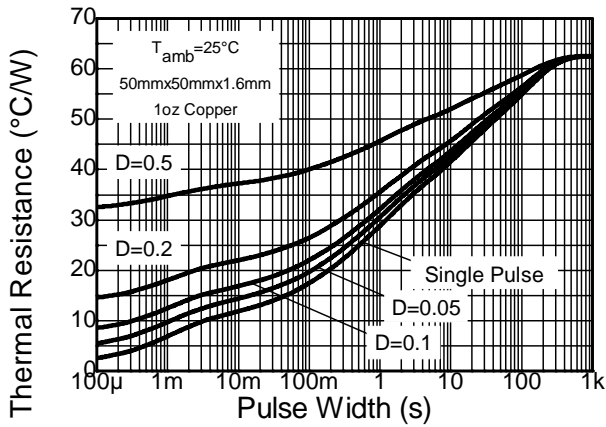
Thermal Characteristics and Derating Information



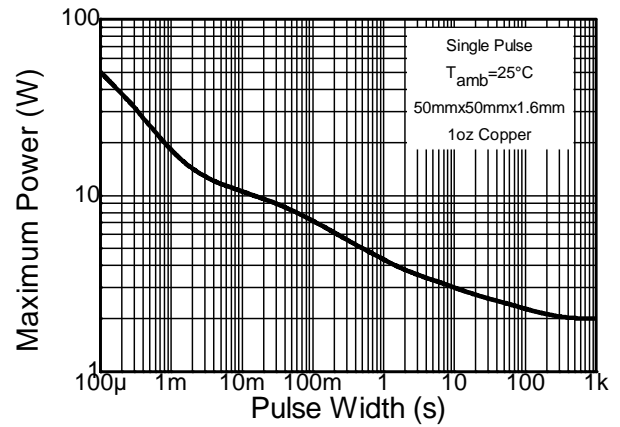
Safe Operating Area



Derating Curve



Transient Thermal Impedance



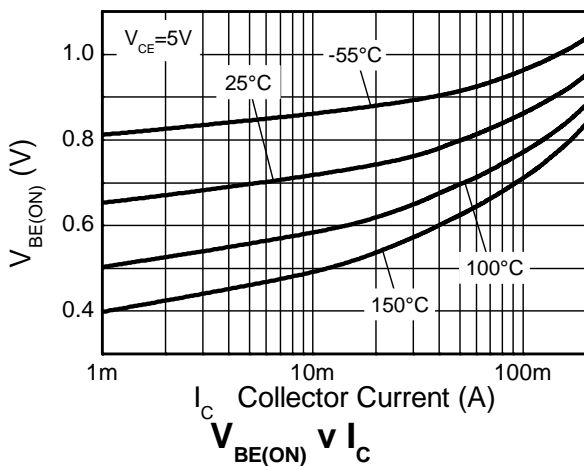
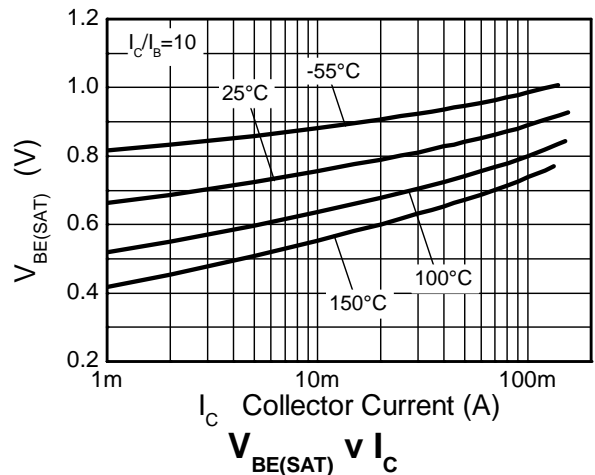
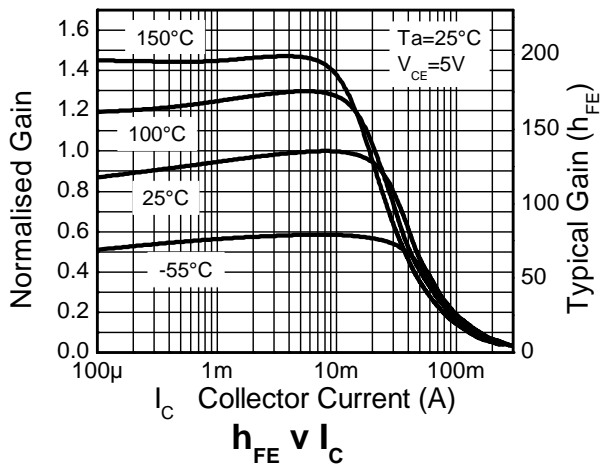
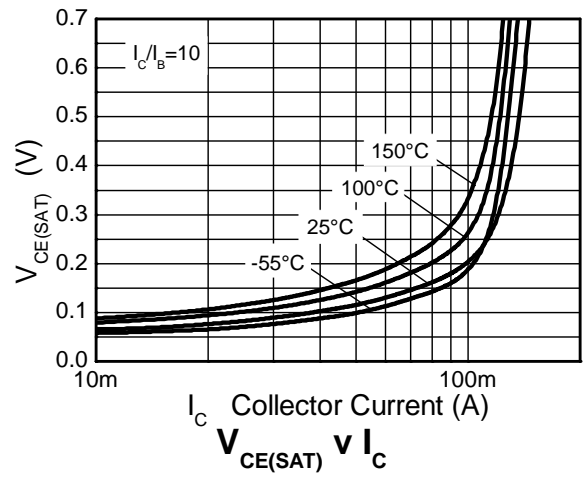
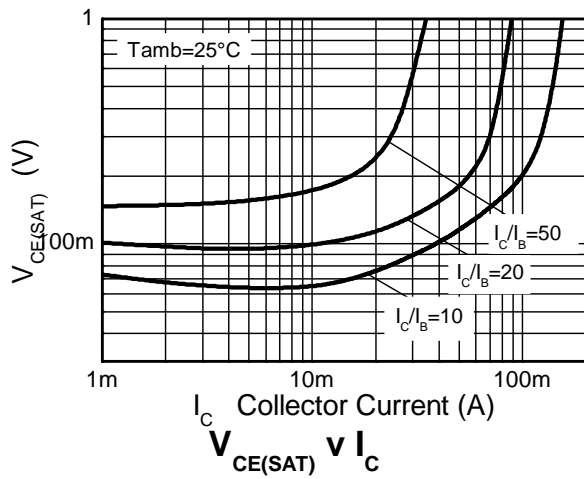
Pulse Power Dissipation

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Collector-Base Breakdown Voltage	BV_{CBO}	180	270	—	V	$I_C = 100\mu\text{A}, I_E = 0$
Collector-Emitter Breakdown Voltage (Note 9)	BV_{CEO}	160	200	—	V	$I_C = 1\text{mA}, I_B = 0$
Emitter-Base Breakdown Voltage	BV_{EBO}	6.0	7.85	—	V	$I_E = 100\mu\text{A}, I_C = 0$
Collector Cutoff Current	I_{CBO}	—	<1	50	nA	$V_{CB} = 120\text{V}, I_E = 0$
Emitter Cutoff Current	I_{EBO}	—	<1	50	nA	$V_{CB} = 120\text{V}, I_E = 0, T_A = +100^\circ\text{C}$
						$V_{EB} = 4\text{V}, I_C = 0$
ON CHARACTERISTICS (Note 9)						
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	—	65	150	mV	$I_C = 10\text{mA}, I_B = 1\text{mA}$
		—	115	200	mV	$I_C = 50\text{mA}, I_B = 5\text{mA}$
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	—	760	1,000	mV	$I_C = 10\text{mA}, I_B = 1\text{mA}$
		—	840	1,200	mV	$I_C = 50\text{mA}, I_B = 5\text{mA}$
DC Current Gain	h_{FE}	80	130	—	—	$I_C = 1\text{mA}, V_{CE} = 5\text{V}$
		80	145	250	—	$I_C = 10\text{mA}, V_{CE} = 5\text{V}$
		30	65	—	—	$I_C = 50\text{mA}, V_{CE} = 5\text{V}$
SMALL SIGNAL CHARACTERISTICS						
Transition Frequency	f_T	100	130	300	MHz	$V_{CE} = 10\text{V}, I_C = 10\text{mA}, f = 100\text{MHz}$
Small Signal Current Gain	h_{fe}	50	—	260	—	$V_{CE} = 10\text{V}, I_C = 10\text{mA}, f = 1\text{kHz}$
Output Capacitance	C_{obo}	—	—	6	pF	$V_{CB} = 10\text{V}, f = 1\text{MHz}$
Noise Figure	NF	—	—	8	dB	$V_{CE} = 5.0\text{V}, I_C = 200\mu\text{A}, R_S = 1.0\text{k}\Omega, f = 1.0\text{kHz}$
Delay Time	t_d	—	95	—	ns	$V_{CC} = 10\text{V}, I_C = 10\text{mA}, I_{B1} = -I_{B2} = 1\text{mA}$
Rise Time	t_r	—	64	—	ns	
Storage Time	t_s	—	1,256	—	ns	
Delay Time	t_f	—	140	—	ns	

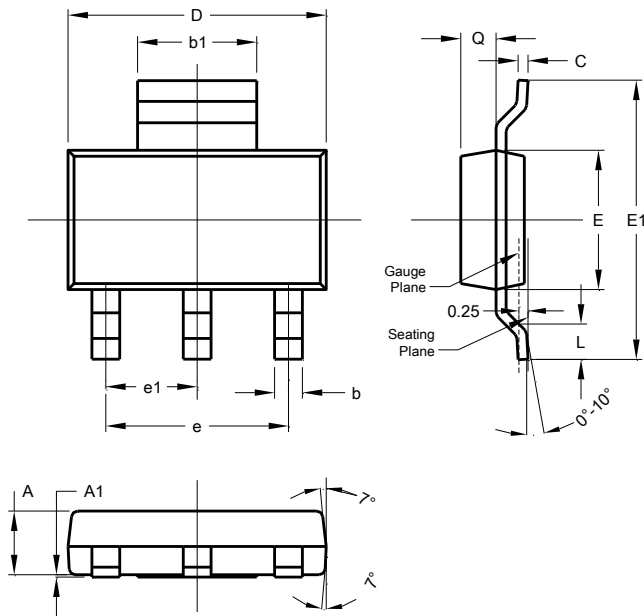
Note: 9. Measured under pulsed conditions. Pulse width $\leq 300\mu\text{s}$. Duty cycle $\leq 2\%$.

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



Package Outline Dimensions

Please see AP02001 at http://www.diodes.com/_files/datasheets/ap02001.pdf for the latest version.

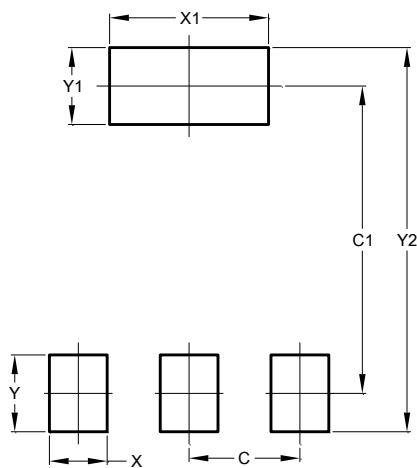


SOT223			
Dim	Min	Max	Typ
A	1.55	1.65	1.60
A1	0.010	0.15	0.05
b1	2.90	3.10	3.00
b2	0.60	0.80	0.70
C	0.20	0.30	0.25
D	6.45	6.55	6.50
E	3.45	3.55	3.50
E1	6.90	7.10	7.00
e	—	—	4.60
e1	—	—	2.30
L	0.85	1.05	0.95
Q	0.84	0.94	0.89

All Dimensions in mm

Suggested Pad Layout

Please see AP02001 at http://www.diodes.com/_files/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

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