

## Features

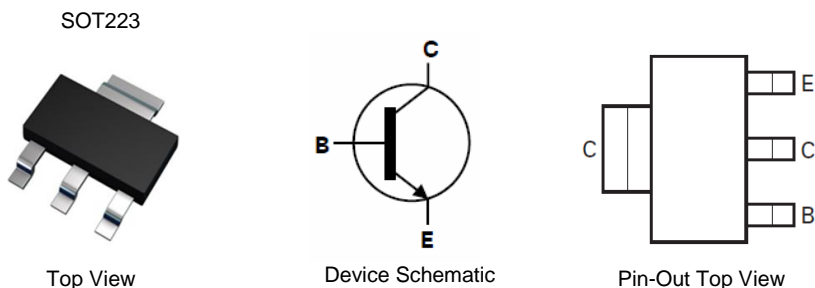
- $BV_{CEO} > 160V$
- $BV_{EBO} > 6V$
- $I_C = 600mA$  Continuous Collector Current
- Low Saturation Voltage (150mV max @10mA)
- $h_{FE}$  specified up to 50mA for a high gain hold up
- Complementary PNP Type: DZT5401
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **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](https://www.diodes.com) or your local Diodes representative. <https://www.diodes.com/quality/product-definitions/>**

## 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 **Ⓔ**
- Weight: 0.112 grams (approximate)

## Applications

- High-voltage amplification applications
- High-voltage switching applications

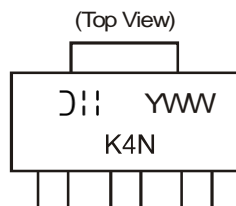


## Ordering Information (Note 4)

Orderable Part Number	Package	Marking	Reel Size (Inches)	Tape Width (mm)	Packing	
					Quantity	Carrier
DZT5551-13	SOT223	K4N	13	12	2,500	Reel

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
  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



- K4N = Product type marking code  
 311 = Manufacturer's code marking  
 YWW = Date code marking  
 Y = Last digit of year ex: 7 = 2007  
 WW = Week code 01 - 52

**Maximum Ratings** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

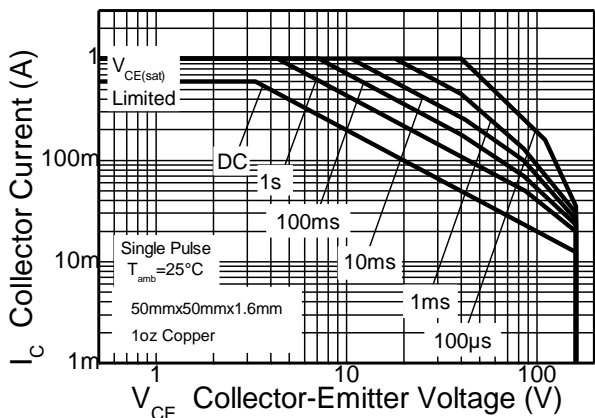
Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CB0</sub>	180	V
Collector-Emitter Voltage	V <sub>CEO</sub>	160	V
Emitter-Base Voltage	V <sub>EBO</sub>	6	V
Continuous Collector Current	I <sub>C</sub>	600	mA
Peak Collector Current	I <sub>CM</sub>	1	A

**Thermal Characteristics**

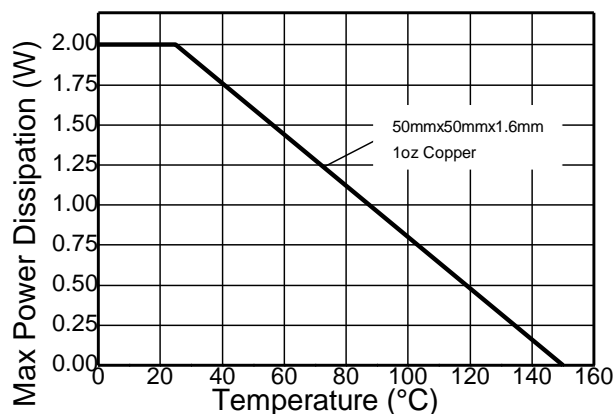
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P <sub>D</sub>	2	W
Thermal Resistance, Junction to Ambient (Note 5)	R <sub>θJA</sub>	62.5	°C/W
Thermal Resistance, Junction to Leads (Note 6)	R <sub>θJL</sub>	45	°C/W
Thermal Resistance, Junction to Case (Note 7)	R <sub>θJC</sub>	27	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

- Notes:
- 5. 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
  - 6. Thermal resistance from junction to solder-point (at the end of the collector lead).
  - 7. Thermal resistance from junction to the top of the case.

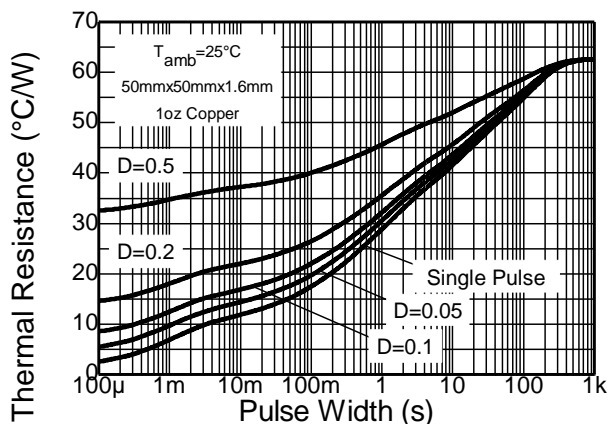
**Thermal Characteristics and Derating Information**



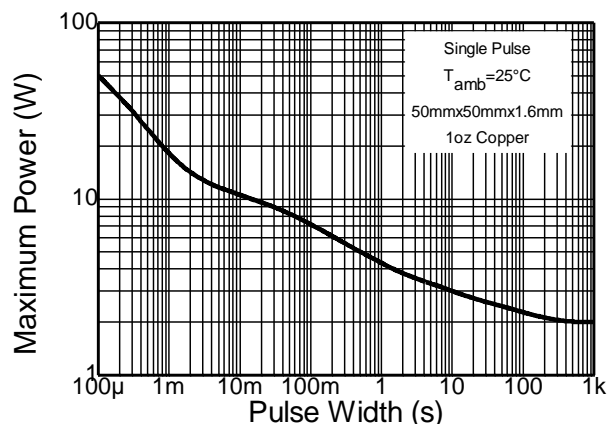
**Figure 1. Safe Operating Area**



**Figure 2. Derating Curve**



**Figure 3. Transient Thermal Impedance**



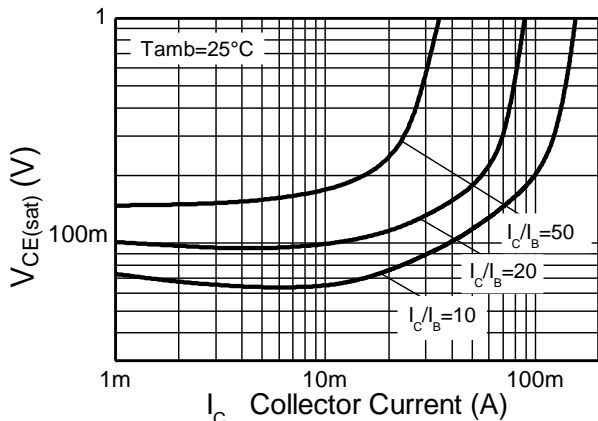
**Figure 4. Pulse Power Dissipation**

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

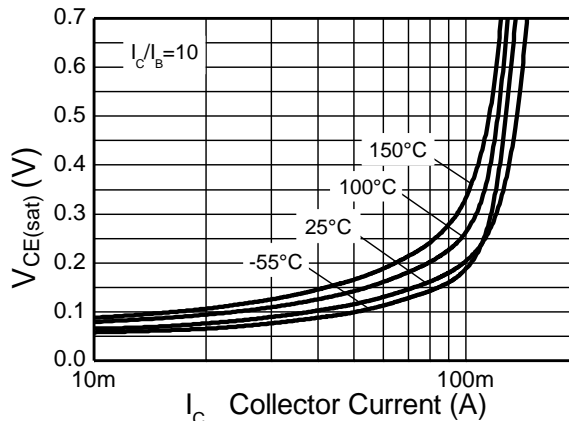
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS</b>						
Collector-Base Breakdown Voltage	BV <sub>CB0</sub>	180	270	—	V	I <sub>C</sub> = 100μA
Collector-Emitter Breakdown Voltage (Note 8)	BV <sub>CEO</sub>	160	200	—	V	I <sub>C</sub> = 1mA
Emitter-Base Breakdown Voltage	BV <sub>EBO</sub>	6.0	7.85	—	V	I <sub>E</sub> = 100μA
Collector Cutoff Current	I <sub>CB0</sub>	—	1	50	nA	V <sub>CB</sub> = 120V
Emitter Cutoff Current	I <sub>EBO</sub>	—	1	50	nA	V <sub>CB</sub> = 120V, T <sub>A</sub> = +100°C
						V <sub>EB</sub> = 4V
<b>ON CHARACTERISTICS (Note 8)</b>						
Collector-Emitter Saturation Voltage	V <sub>CE(sat)</sub>	—	65	150	mV	I <sub>C</sub> = 10mA, I <sub>B</sub> = 1mA
		—	115	200	mV	I <sub>C</sub> = 50mA, I <sub>B</sub> = 5mA
Base-Emitter Saturation Voltage	V <sub>BE(sat)</sub>	—	760	1000	mV	I <sub>C</sub> = 10mA, I <sub>B</sub> = 1mA
		—	840	1200	mV	I <sub>C</sub> = 50mA, I <sub>B</sub> = 5mA
DC Current Gain	h <sub>FE</sub>	80	130	—	—	I <sub>C</sub> = 1mA, V <sub>CE</sub> = 5V
		80	145	250	—	I <sub>C</sub> = 10mA, V <sub>CE</sub> = 5V
		30	65	—	—	I <sub>C</sub> = 50mA, V <sub>CE</sub> = 5V
<b>SMALL SIGNAL CHARACTERISTICS</b>						
Transition Frequency	f <sub>T</sub>	100	130	300	MHz	V <sub>CE</sub> = 10V, I <sub>C</sub> = 10mA, f = 100MHz
Small Signal Current Gain	h <sub>fe</sub>	50	—	260	—	V <sub>CE</sub> = 10V, I <sub>C</sub> = 10mA, f = 1kHz
Output Capacitance	C <sub>obo</sub>	—	—	6	pF	V <sub>CB</sub> = 10V, f = 1MHz
Noise Figure	NF	—	—	8	dB	V <sub>CE</sub> = 5.0V, I <sub>C</sub> = 200μA, R <sub>S</sub> = 1.0kΩ, f = 1.0kHz
Delay Time	t <sub>(d)</sub>	—	95	—	ns	V <sub>CC</sub> = 10V, I <sub>C</sub> = 10mA, I <sub>B1</sub> = -I <sub>B2</sub> = 1mA
Rise Time	t <sub>(r)</sub>	—	64	—	ns	
Storage Time	t <sub>(s)</sub>	—	1256	—	ns	
Delay Time	t <sub>(f)</sub>	—	140	—	ns	

Notes: 8. Pulse Test: Pulse width ≤ 300μs. Duty cycle ≤ 2.0%.

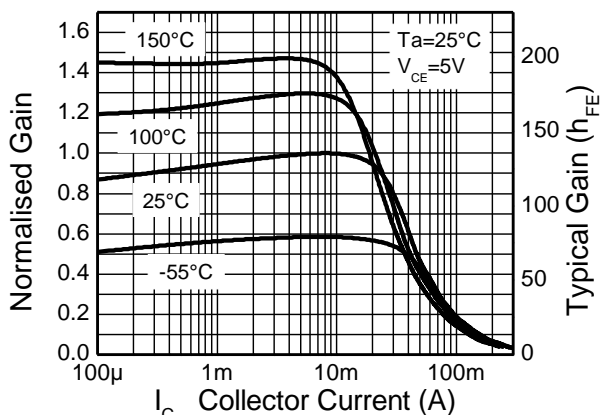
**Typical Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)



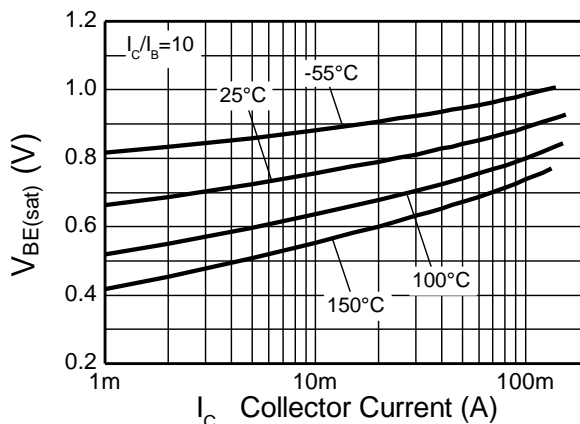
**Figure 5.  $V_{CE(sat)}$  v  $I_C$**



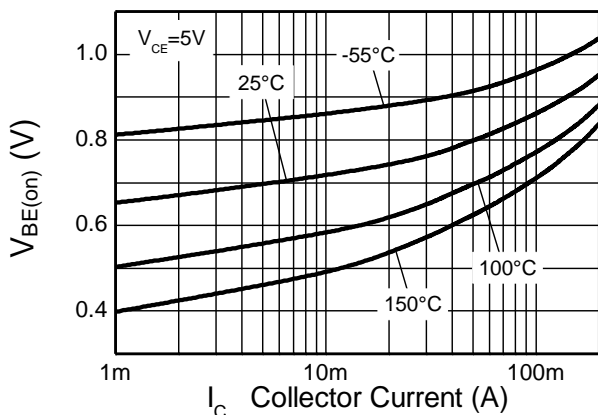
**Figure 6.  $V_{CE(sat)}$  v  $I_C$**



**Figure 7.  $h_{FE}$  v  $I_C$**



**Figure 8.  $V_{BE(sat)}$  v  $I_C$**

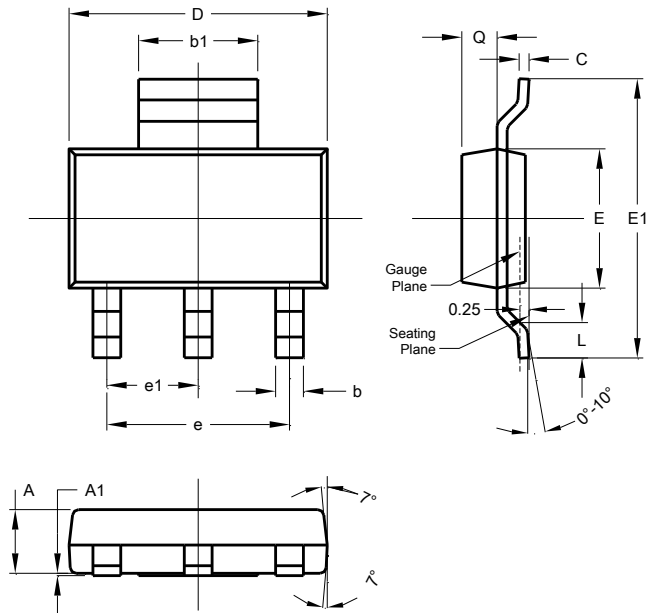


**Figure 9.  $V_{BE(on)}$  v  $I_C$**

**Package Outline Dimensions**

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

**SOT223**

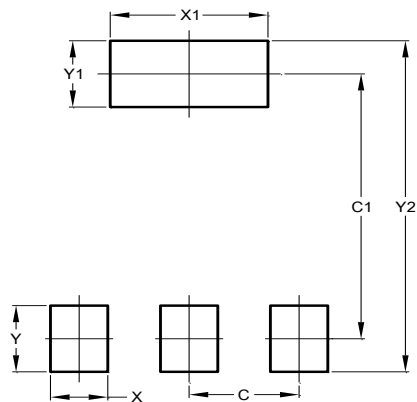


SOT223			
Dim	Min	Max	Typ
A	1.55	1.65	1.60
A1	0.010	0.15	0.05
b	0.60	0.80	0.70
b1	2.90	3.10	3.00
C	0.20	0.30	0.25
D	6.45	6.55	6.50
E	3.45	3.55	3.50
E1	6.90	7.10	7.00
e	-	-	4.60
e1	-	-	2.30
L	0.85	1.05	0.95
Q	0.84	0.94	0.89
All Dimensions in mm			

**Suggested Pad Layout**

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

**SOT223**



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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