


**160V NPN VOLTAGE TRANSISTOR IN SOT223**
**Features**

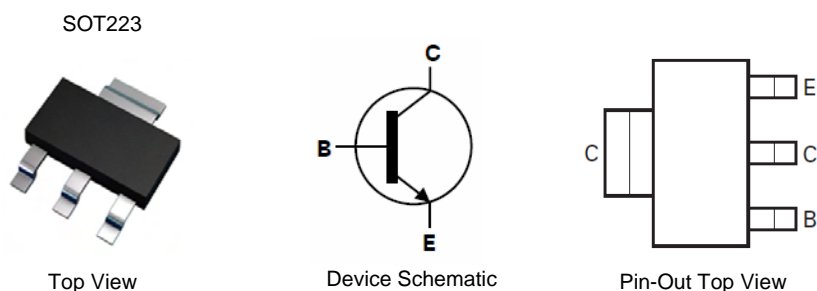
- $BV_{CEO} > 160V$
- $BV_{EBO} > 6V$
- $I_C = 600mA$  Continuous Collector Current
- Low Saturation Voltage (150mV max @10mA)
- $h_{FE}$  specified up to 50mA for a high gain hold up
- Complementary PNP Type: DZT5401
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

**Applications**

- High Voltage Amplification Applications
- High Voltage Switching

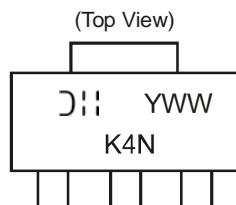
**Mechanical Data**

- 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 
- Weight: 0.112 grams (approximate)


**Ordering Information** (Note 4)

Part Number	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
DZT5551-13	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> 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 <http://www.diodes.com>

**Marking Information**


K4N = Product type marking code  
 J11 = 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.)

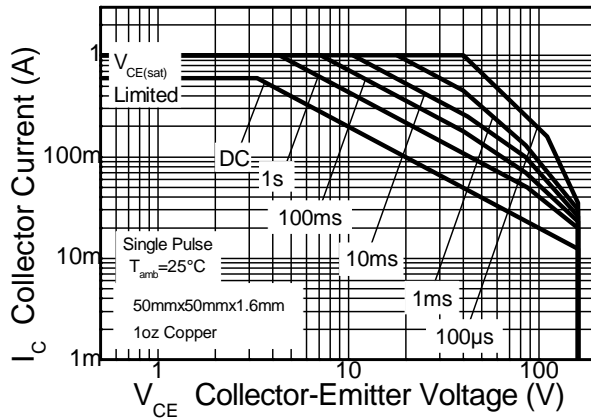
Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CBO</sub>	180	V
Collector-Emitter Voltage	V <sub>CEO</sub>	160	V
Emitter-Base Voltage	V <sub>EBO</sub>	6	V
Continuous Collector Current	I <sub>C</sub>	600	mA
Peak Collector Current	I <sub>CM</sub>	1	A

**Thermal Characteristics**

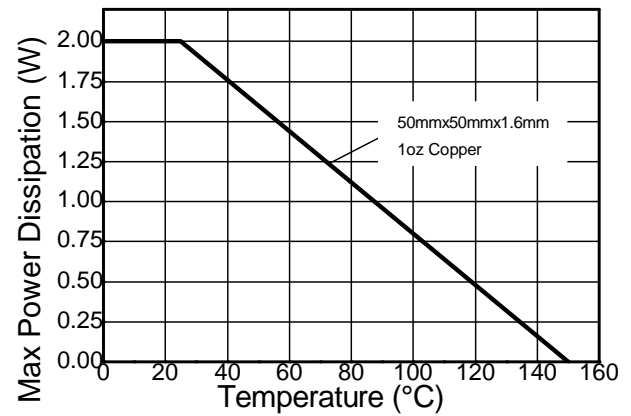
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P <sub>D</sub>	2	W
Thermal Resistance, Junction to Ambient (Note 5)	R <sub>θJA</sub>	62.5	°C/W
Thermal Resistance, Junction to Leads (Note 6)	R <sub>θJL</sub>	34.05	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-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).

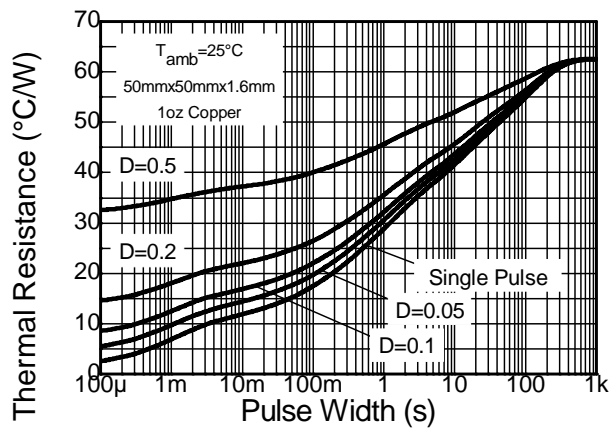
## Thermal Characteristics and Derating Information



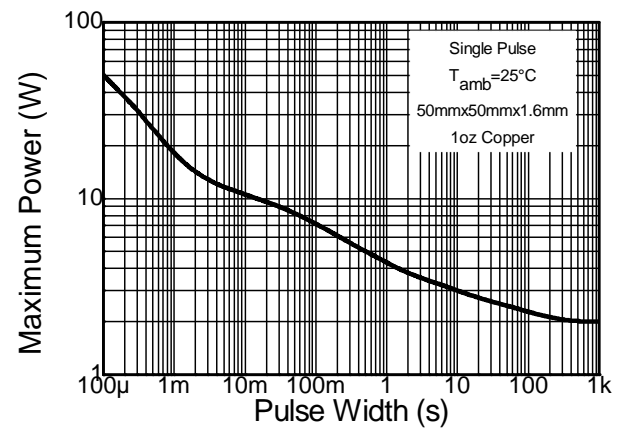
**Safe Operating Area**



**Derating Curve**



**Transient Thermal Impedance**



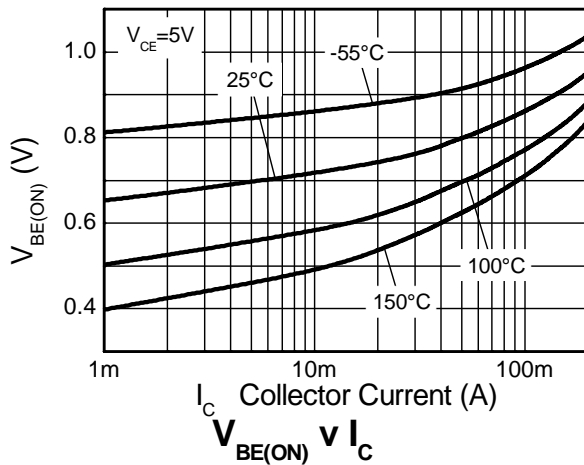
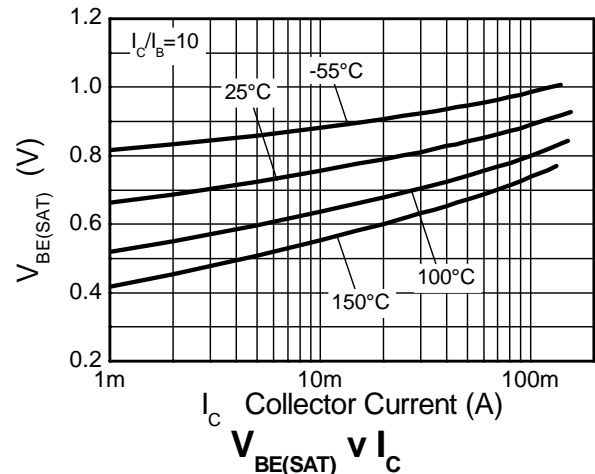
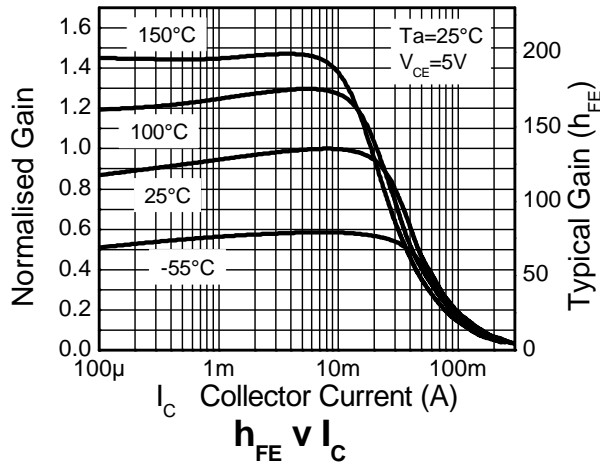
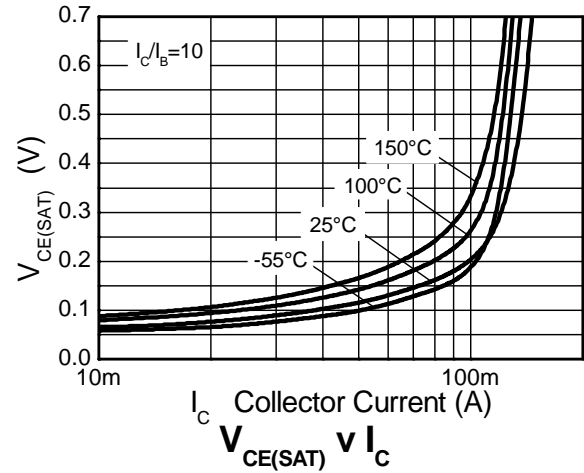
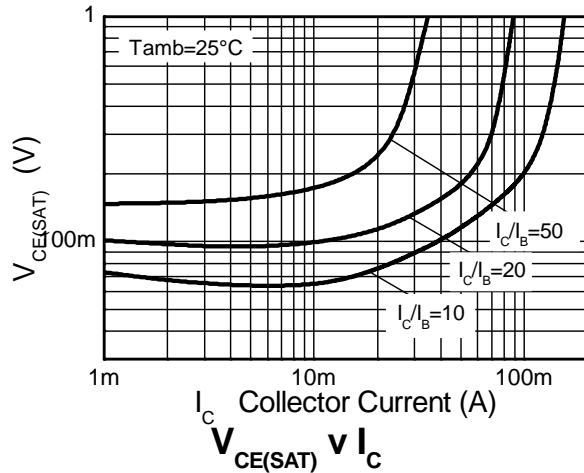
**Pulse Power Dissipation**

# 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>CBO</sub>	180	270	—	V	I <sub>C</sub> = 100μA, I <sub>E</sub> = 0
Collector-Emitter Breakdown Voltage (Note 7)	BV <sub>CEO</sub>	160	200	—	V	I <sub>C</sub> = 1mA, I <sub>B</sub> = 0
Emitter-Base Breakdown Voltage	BV <sub>EBO</sub>	6.0	7.85	—	V	I <sub>E</sub> = 100μA, I <sub>C</sub> = 0
Collector Cutoff Current	I <sub>CBO</sub>	—	<1	50	nA	V <sub>CB</sub> = 120V, I <sub>E</sub> = 0
Emitter Cutoff Current	I <sub>EBO</sub>	—	<1	50	μA	V <sub>CB</sub> = 120V, I <sub>E</sub> = 0, T <sub>A</sub> = +100°C
						V <sub>EB</sub> = 4V, I <sub>C</sub> = 0
<b>ON CHARACTERISTICS (Note 7)</b>						
Collector-Emitter Saturation Voltage	V <sub>CE(sat)</sub>	—	65 115	150 200	mV mV	I <sub>C</sub> = 10mA, I <sub>B</sub> = 1mA I <sub>C</sub> = 50mA, I <sub>B</sub> = 5mA
Base-Emitter Saturation Voltage	V <sub>BE(sat)</sub>	—	760 840	1000 1200	mV mV	I <sub>C</sub> = 10mA, I <sub>B</sub> = 1mA I <sub>C</sub> = 50mA, I <sub>B</sub> = 5mA
DC Current Gain	h <sub>FE</sub>	80 80 30	130 145 65	— 250 —	—	I <sub>C</sub> = 1mA, V <sub>CE</sub> = 5V I <sub>C</sub> = 10mA, V <sub>CE</sub> = 5V 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	

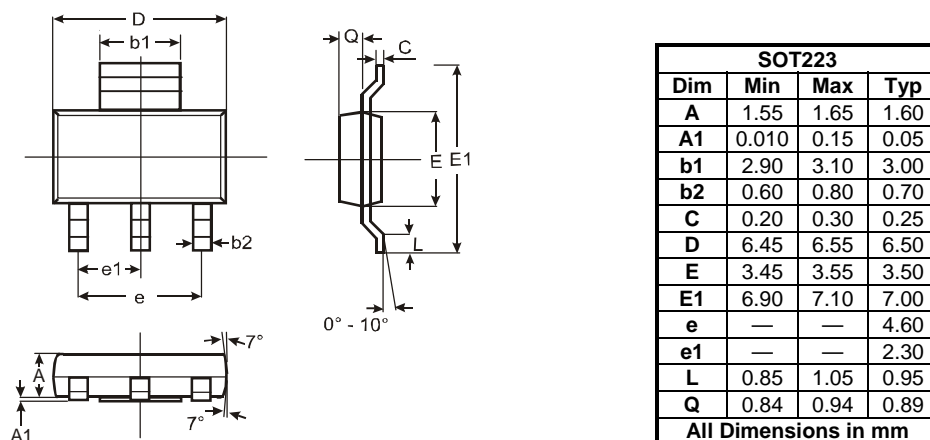
Notes: 7. Pulse Test: Pulse width ≤ 300μs. Duty cycle ≤ 2.0%.

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



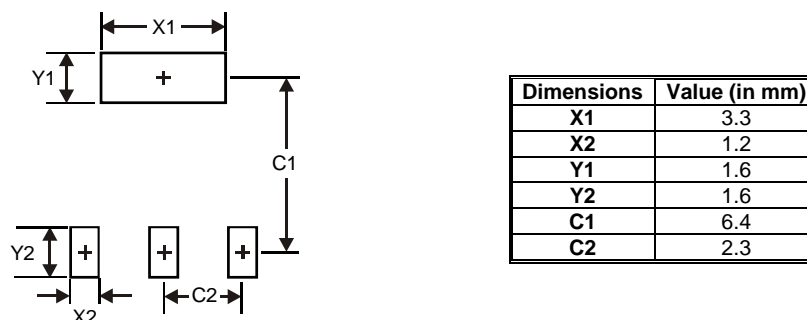
## Package Outline Dimensions

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



## Suggested Pad Layout

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



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