

## Features

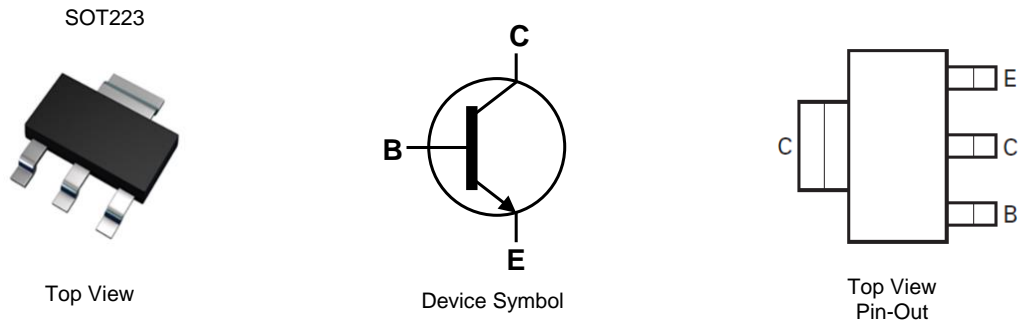
- $BV_{CEO} > 40V$
- Epitaxial Planar Die Construction
- Ideally Suited for Automated Assembly Processes
- Complementary PNP Type Available: DIODES™ DZT2907A
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **For automotive applications 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 (E3)
- Weight: 0.112 grams (Approximate)

## Applications

- Medium power switching & amplification

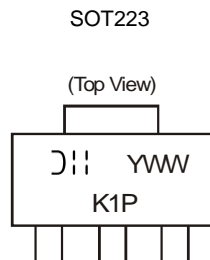


## Ordering Information (Note 4)

Part Number	Package	Marking	Reel Size (inches)	Tape Width (mm)	Packing	
					Qty.	Carrier
DZT2222A-13	SOT223	K1P	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



K1P = Product Type Marking Code  
 YWW = Date Code Marking  
 Y or  $\bar{Y}$  = Last Digit of Year (ex: 3 = 2023)  
 WW = Week Code (01 to 52)

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

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CB0</sub>	75	V
Collector-Emitter Voltage	V <sub>CEO</sub>	40	V
Emitter-Base Voltage	V <sub>EBO</sub>	6	V
Collector Current	I <sub>C</sub>	600	mA

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

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P <sub>D</sub>	0.83	W
Thermal Resistance, Junction to Ambient Air (Note 5)	R <sub>θJA</sub>	150	°C/W
Thermal Resistance, Junction to Case (Note 5)	R <sub>θJC</sub>	53	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

Note: 5. For a device mounted on minimum recommended pad (MRP) layout that is on a single-sided 1.6mm FR4 PCB; device is measured under still air conditions whilst operating in a steady-state.

**Thermal Characteristics and Derating Information**

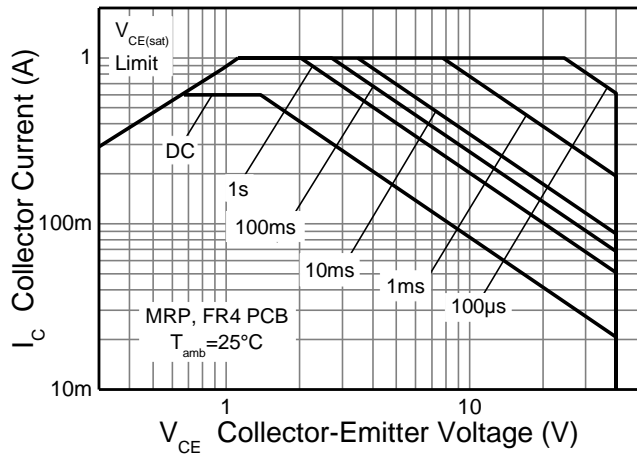


Figure 1. Safe Operating Area

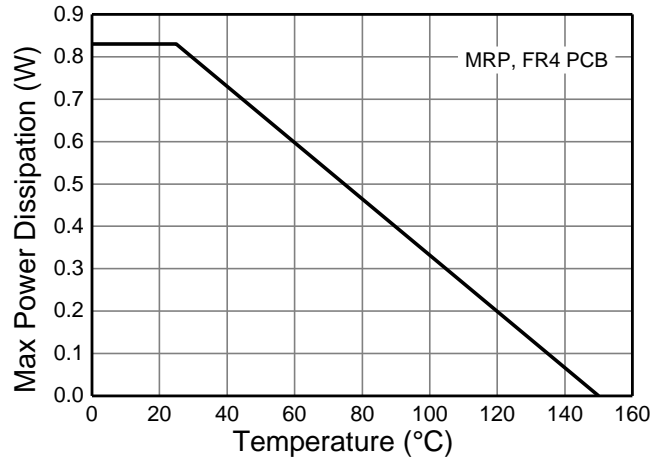


Figure 2. Derating Curve

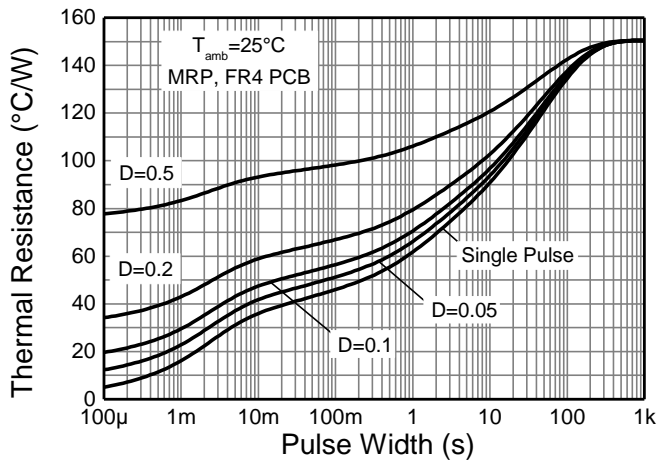


Figure 3. Transient Thermal Impedance

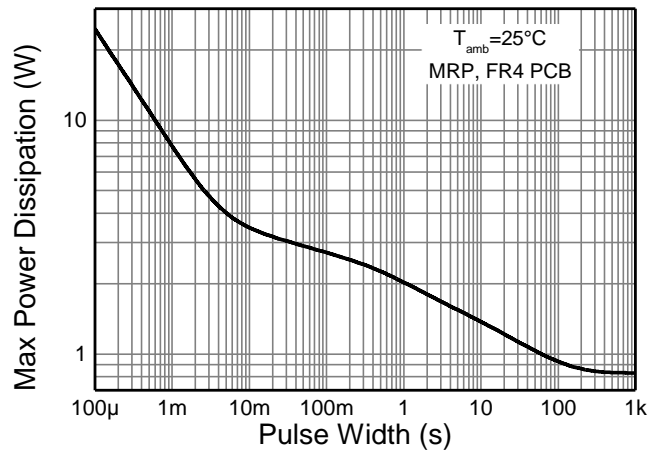


Figure 4. Pulse Power Dissipation

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Conditions
<b>OFF CHARACTERISTICS (Note 6)</b>						
Collector-Base Breakdown Voltage	BV <sub>CBO</sub>	75	125	—	V	I <sub>C</sub> = 100μA
Collector-Emitter Breakdown Voltage	BV <sub>CEO</sub>	40	59	—	V	I <sub>C</sub> = 10mA
Emitter-Base Breakdown Voltage	BV <sub>EBO</sub>	6	7.5	—	V	I <sub>E</sub> = 100μA
Collector-Base Cut-Off Current	I <sub>CBO</sub>	—	2	10	nA	V <sub>CB</sub> = 50V
		—	—	10	μA	V <sub>CB</sub> = 50V, T <sub>A</sub> = +150°C
Emitter-Base Cut-Off Current	I <sub>EBO</sub>	—	2	10	nA	V <sub>EB</sub> = 3V
Collector-Emitter Cut-Off Current	I <sub>CEX</sub>	—	—	10	nA	V <sub>CE</sub> = 60V, V <sub>EB(off)</sub> = 3V
<b>ON CHARACTERISTICS (Note 6)</b>						
Collector-Emitter Saturation Voltage	V <sub>CE(sat)</sub>	—	0.11	0.3	V	I <sub>C</sub> = 150mA, I <sub>B</sub> = 15mA
		—	0.31	1.0	V	I <sub>C</sub> = 500mA, I <sub>B</sub> = 50mA
Base-Emitter Saturation Voltage	V <sub>BE(sat)</sub>	0.6	0.87	1.2	V	I <sub>C</sub> = 150mA, I <sub>B</sub> = 15mA
		—	1.04	2.0	V	I <sub>C</sub> = 500mA, I <sub>B</sub> = 50mA
DC Current Gain	h <sub>FE</sub>	35	2.12	—	—	I <sub>C</sub> = 0.1mA, V <sub>CE</sub> = 10V
		50	263	—		I <sub>C</sub> = 1mA, V <sub>CE</sub> = 10V
		75	223	—		I <sub>C</sub> = 10mA, V <sub>CE</sub> = 10V
		35	131	—		I <sub>C</sub> = 10mA, V <sub>CE</sub> = 10V, T <sub>A</sub> = -55°C
		100	229	300		I <sub>C</sub> = 150mA, V <sub>CE</sub> = 10V
		50	123	—		I <sub>C</sub> = 150mA, V <sub>CE</sub> = 1V
		40	67	—		I <sub>C</sub> = 500mA, V <sub>CE</sub> = 10V
<b>SMALL SIGNAL CHARACTERISTICS</b>						
Transition Frequency	f <sub>T</sub>	300	—	—	MHz	I <sub>C</sub> = 20mA, V <sub>CE</sub> = 20V, f = 100MHz
Output Capacitance	C <sub>obo</sub>	—	—	8	pF	V <sub>CB</sub> = 10V, f = 1MHz
Input Capacitance	C <sub>ibo</sub>	—	—	25	pF	V <sub>EB</sub> = 0.5V, f = 1MHz
<b>SWITCHING CHARACTERISTICS</b>						
Delay Time	t <sub>d</sub>	—	3.9	10	ns	V <sub>CE</sub> = 30V, V <sub>EB(off)</sub> = 0.5V, I <sub>C</sub> = 150mA, I <sub>B1</sub> = 15mA
Rise Time	t <sub>r</sub>	—	6.4	25	ns	
Storage Time	t <sub>s</sub>	—	188	225	ns	V <sub>CE</sub> = 30V, I <sub>C</sub> = 150mA, I <sub>B1</sub> = -I <sub>B2</sub> = 15mA
Fall Time	t <sub>f</sub>	—	42	60	ns	

Note: 6. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

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

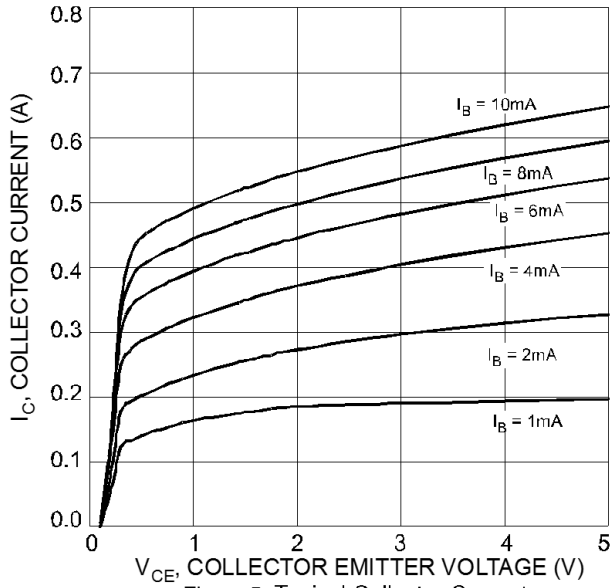


Figure 5. Typical Collector Current vs. Collector Emitter Voltage

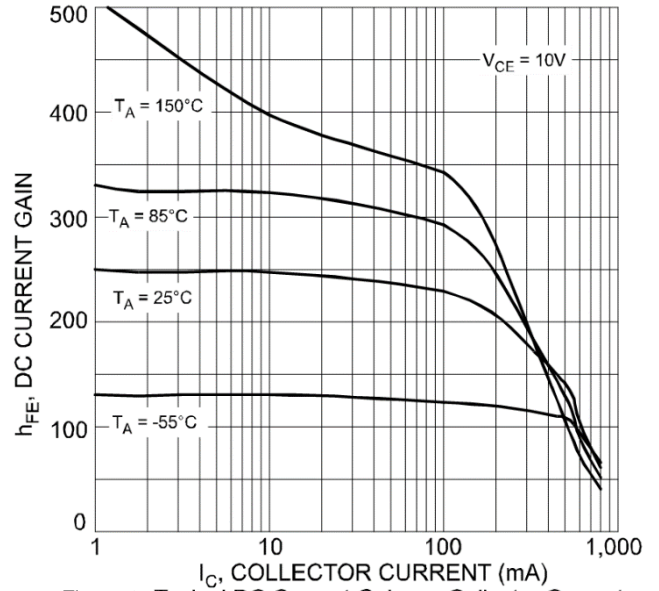


Figure 6. Typical DC Current Gain vs. Collector Current

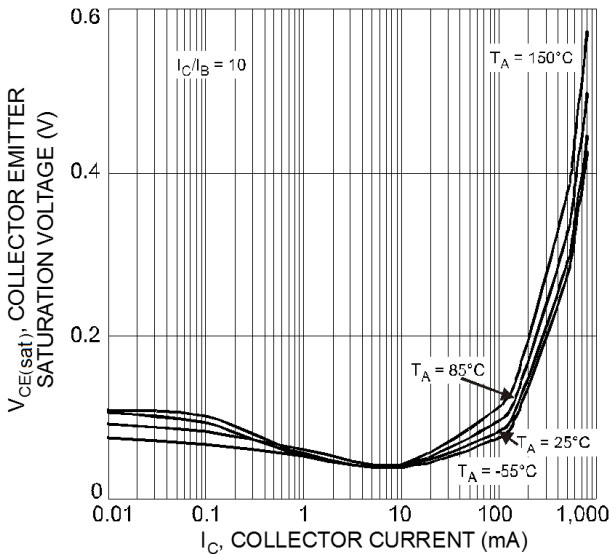


Figure 7. Typical Collector Emitter Saturation Voltage vs. Collector Current

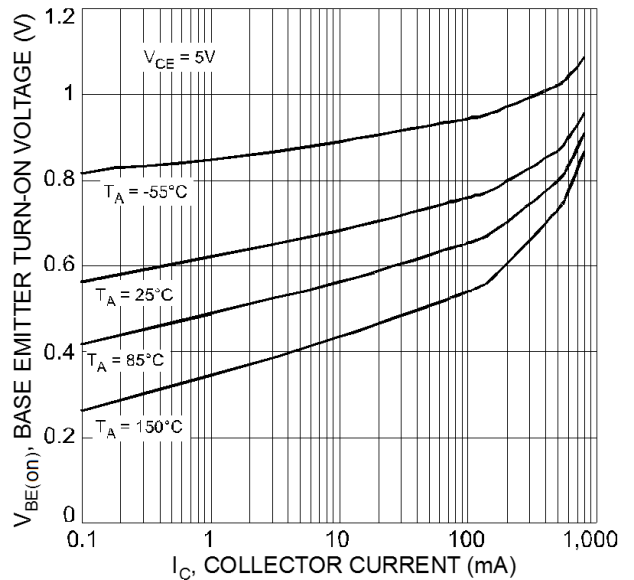


Figure 8. Typical Base Emitter Turn-On Voltage vs. Collector Current

**Typical Electrical Characteristics** (continued)

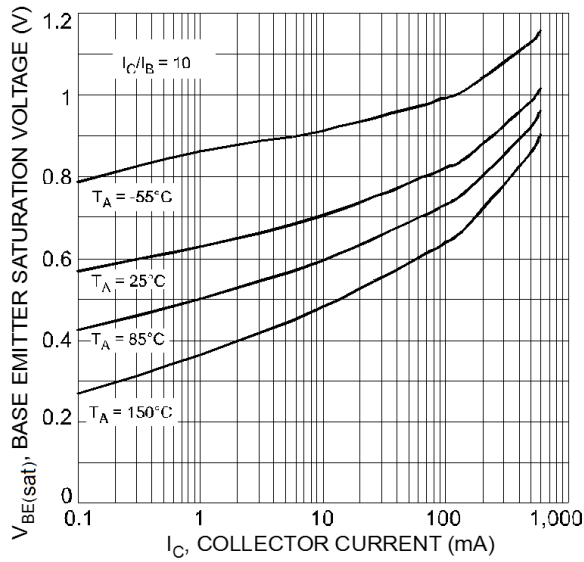


Figure 9. Typical Base Emitter Saturation Voltage vs. Collector Current

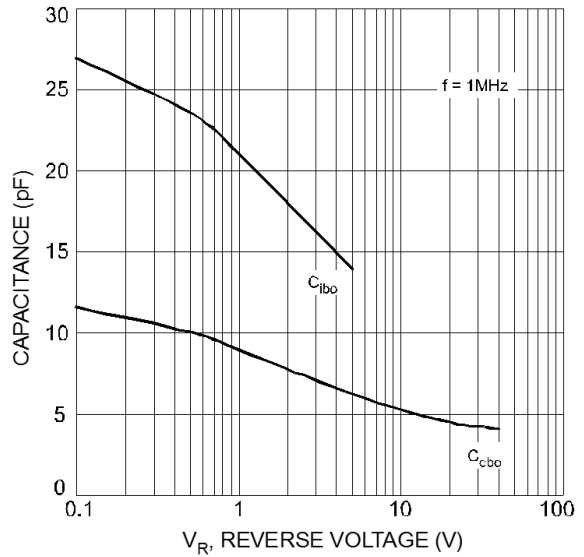


Figure 10. Typical Capacitance Characteristics

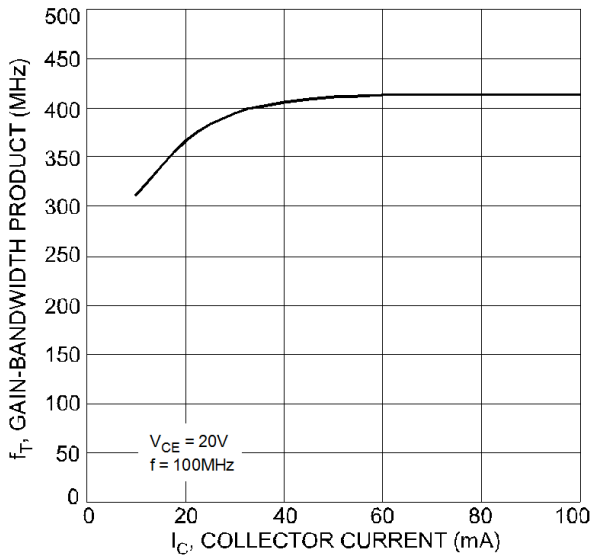
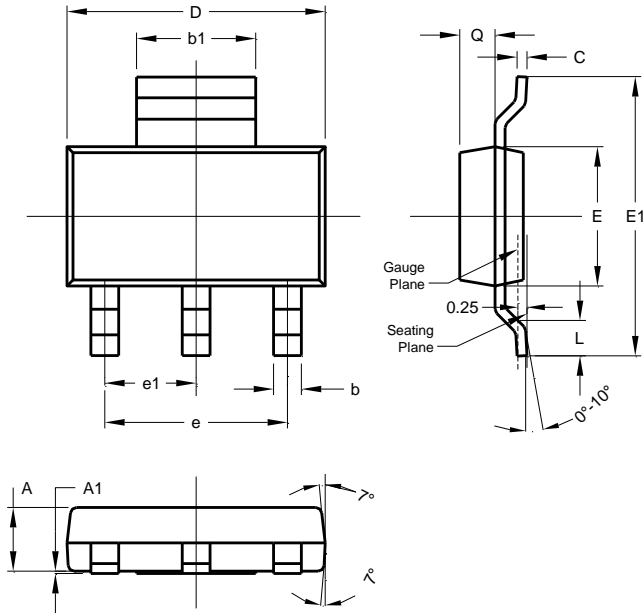


Figure 11. Typical Gain-Bandwidth Product vs. Collector Current

**Package Outline Dimensions**

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

**SOT223**

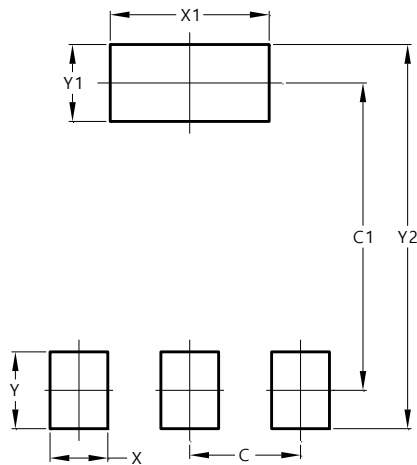


SOT223			
Dim	Min	Max	Typ
A	1.55	1.65	1.60
A1	0.010	0.15	0.05
b	0.60	0.80	0.70
b1	2.90	3.10	3.00
C	0.20	0.30	0.25
D	6.45	6.55	6.50
E	3.45	3.55	3.50
E1	6.90	7.10	7.00
e	-	-	4.60
e1	-	-	2.30
L	0.85	1.05	0.95
Q	0.84	0.94	0.89
<b>All Dimensions in mm</b>			

**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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