

## Features

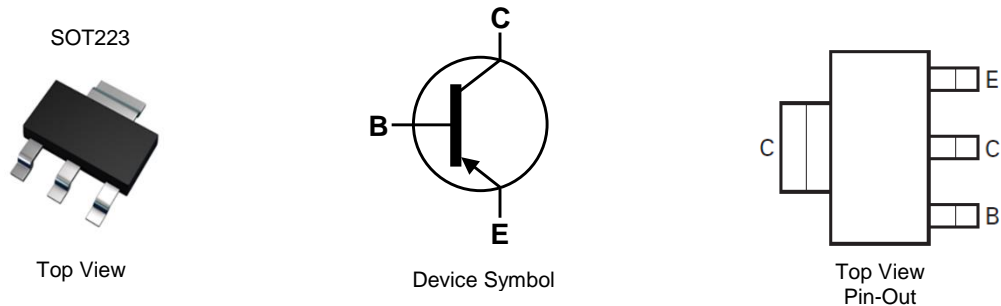
- $BV_{CEO} > -60V$
- Epitaxial Planar Die Construction
- Ideally Suited for Automated Assembly Processes
- Complementary NPN Type: DIODES™ DZT2222A
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. “Green” Device (Note 3)**
- **For automotive applications requiring 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](mailto:contact@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 amplification and switching

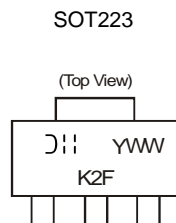


## Ordering Information (Note 4)

Part Number	Package	Marking	Reel Size (inches)	Tape Width (mm)	Packing	
					Qty.	Carrier
DZT2907A-13	SOT223	K2F	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



K2F = 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>CBO</sub>	-60	V
Collector-Emitter Voltage	V <sub>CEO</sub>	-60	V
Emitter-Base Voltage	V <sub>EBO</sub>	-5	V
Collector Continuous Current	I <sub>C</sub>	-600	mA
Peak Collector Current	I <sub>CM</sub>	-800	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
Power Derating Factor above +25°C (Note 5)	P <sub>DER</sub>	6.66	mW/°C
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**

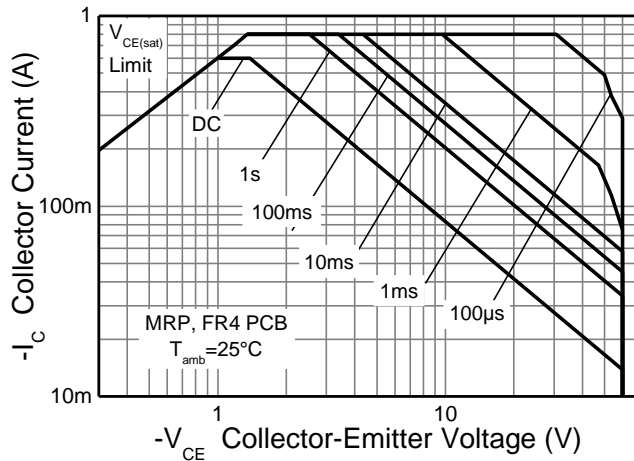


Figure 1. Safe Operating Area

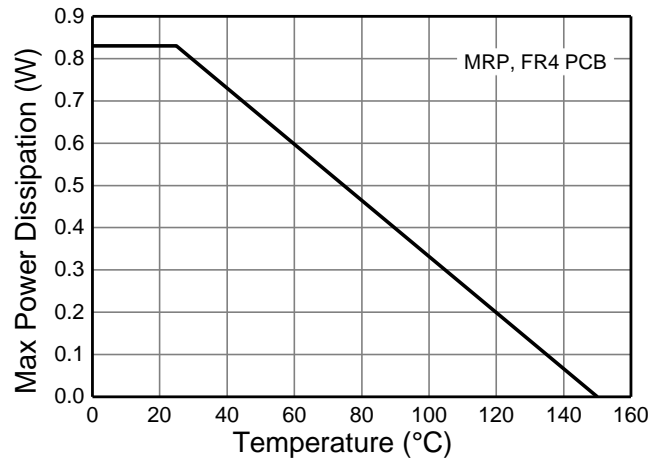


Figure 2. Derating Curve

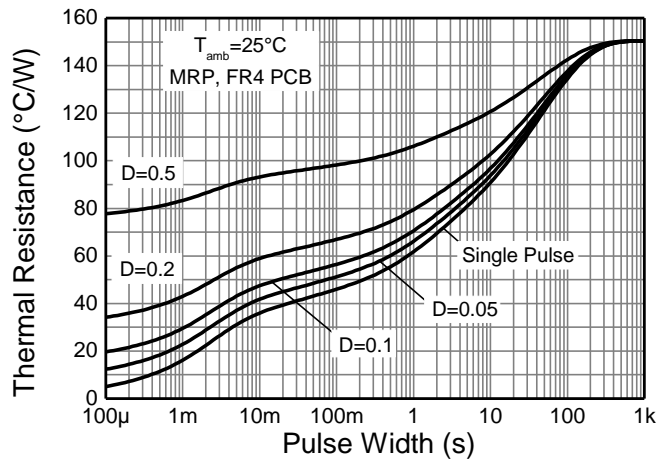


Figure 3. Transient Thermal Impedance

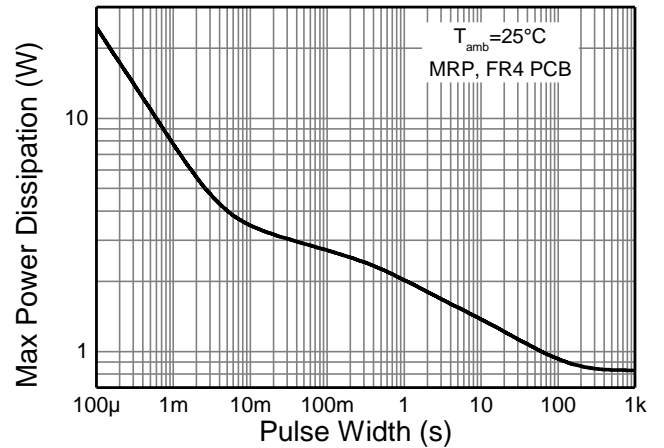


Figure 4. Pulse Power Dissipation

**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>	-60	—	—	V	I <sub>C</sub> = -10μA
Collector-Emitter Breakdown Voltage	BV <sub>CEO</sub>	-60	—	—	V	I <sub>C</sub> = -10mA
Emitter-Base Breakdown Voltage	BV <sub>EBO</sub>	-5	—	—	V	I <sub>E</sub> = -10μA
Collector-Base Cutoff Current	I <sub>CBO</sub>	—	—	-0.01	μA	V <sub>CB</sub> = -50V
		—	—	-10		V <sub>CB</sub> = -50V, T <sub>A</sub> = +150°C
Collector Cutoff Current	I <sub>CEX</sub>	—	—	-50	nA	V <sub>CE</sub> = -30V, V <sub>EB(off)</sub> = -0.5V
Base Cutoff Current	I <sub>BL</sub>	—	—	-50	nA	V <sub>CE</sub> = -30V, V <sub>EB(off)</sub> = -0.5V
<b>ON CHARACTERISTICS (Note 6)</b>						
Collector-Emitter Saturation Voltage	V <sub>CE(sat)</sub>	—	—	-0.4	V	I <sub>C</sub> = -150mA, I <sub>B</sub> = -15mA
		—	—	-1.6	V	I <sub>C</sub> = -500mA, I <sub>B</sub> = -50mA
DC Current Gain	h <sub>FE</sub>	75	—	—	—	V <sub>CE</sub> = -10V, I <sub>C</sub> = -100μA
		100	—	—	—	V <sub>CE</sub> = -10V, I <sub>C</sub> = -1mA
		100	—	—	—	V <sub>CE</sub> = -10V, I <sub>C</sub> = -10mA
		100	—	300	—	V <sub>CE</sub> = -10V, I <sub>C</sub> = -150mA
		50	—	—	—	V <sub>CE</sub> = -10V, I <sub>C</sub> = -500mA
Base-Emitter Saturation Voltage	V <sub>BE(sat)</sub>	—	—	-1.3	V	I <sub>C</sub> = -150mA, I <sub>B</sub> = -15mA
		—	—	-2.6	V	I <sub>C</sub> = -500mA, I <sub>B</sub> = -50mA
<b>SMALL SIGNAL CHARACTERISTICS</b>						
Current Gain-Bandwidth Product	f <sub>T</sub>	200	—	—	MHz	V <sub>CE</sub> = -20V, I <sub>C</sub> = -50mA, f = 100MHz
Output Capacitance	C <sub>obo</sub>	—	—	8	pF	V <sub>CB</sub> = -10V, f = 1MHz
Input Capacitance	C <sub>ibo</sub>	—	—	30	pF	V <sub>EB</sub> = -2V, f = 1MHz
<b>SWITCHING CHARACTERISTICS</b>						
Turn-On Time	t <sub>on</sub>	—	—	45	ns	V <sub>CC</sub> = -30V, I <sub>C</sub> = -150mA, I <sub>B1</sub> = -15mA
Delay Time	t <sub>d</sub>	—	—	10	ns	
Rise Time	t <sub>r</sub>	—	—	40	ns	
Turn-Off Time	t <sub>off</sub>	—	—	100	ns	V <sub>CC</sub> = -6V, I <sub>C</sub> = -150mA, I <sub>B1</sub> = -I <sub>B2</sub> = -15mA
Storage Time	t <sub>s</sub>	—	—	80	ns	
Fall Time	t <sub>f</sub>	—	—	30	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.)

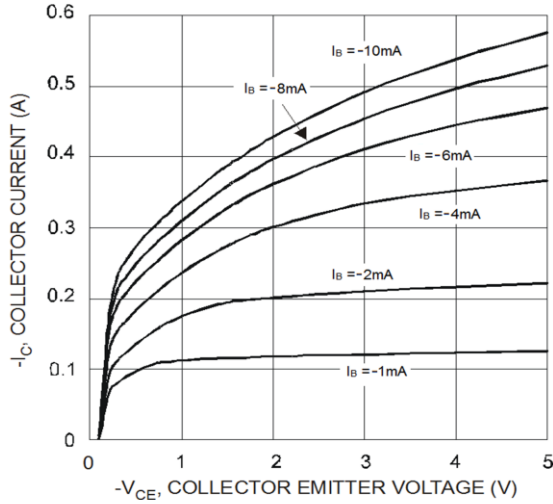


Figure 5. Typical Collector Current as a Function of Collector Emitter Voltage

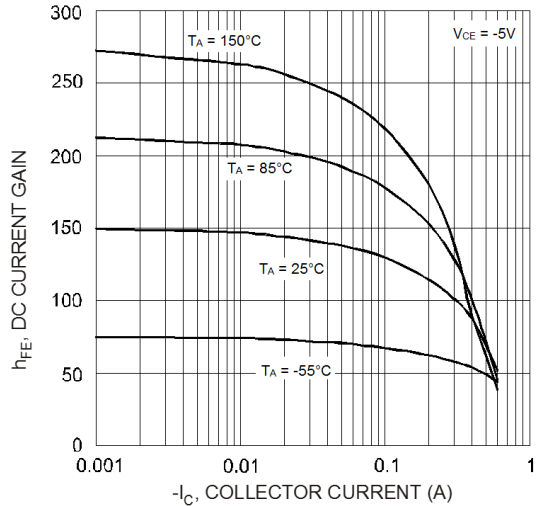


Figure 6. Typical DC Current Gain vs. Collector Current

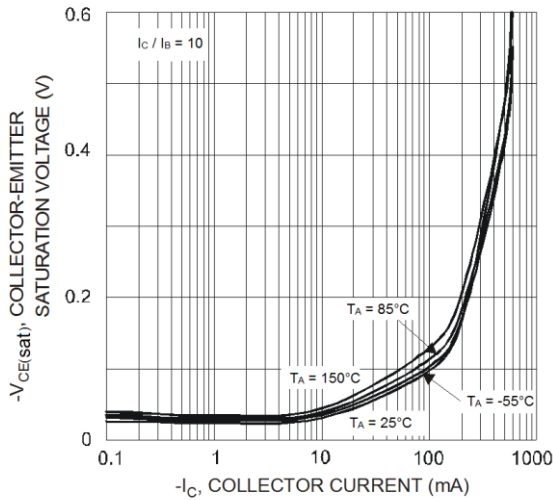


Figure 7. Typical Collector-Emitter Saturation Voltage vs. Collector Current

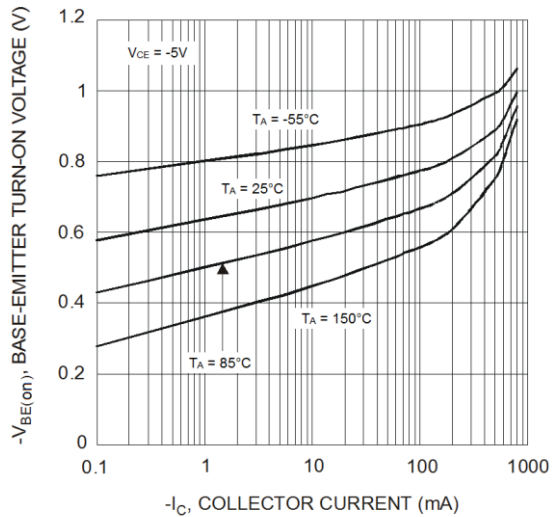


Figure 8. Typical Base-Emitter Turn-On Voltage vs. Collector Current

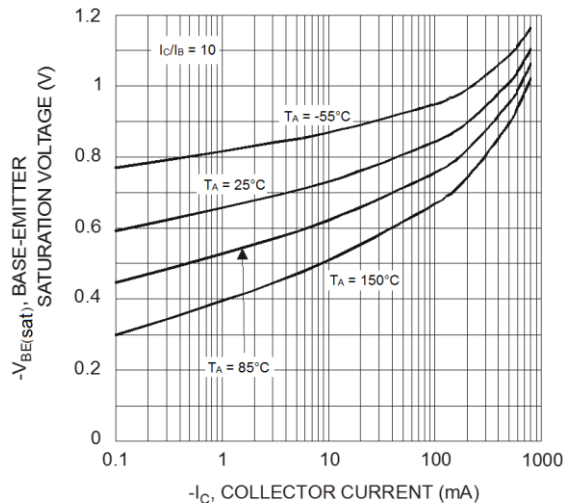


Figure 9. Typical Base-Emitter Saturation Voltage vs. Collector Current

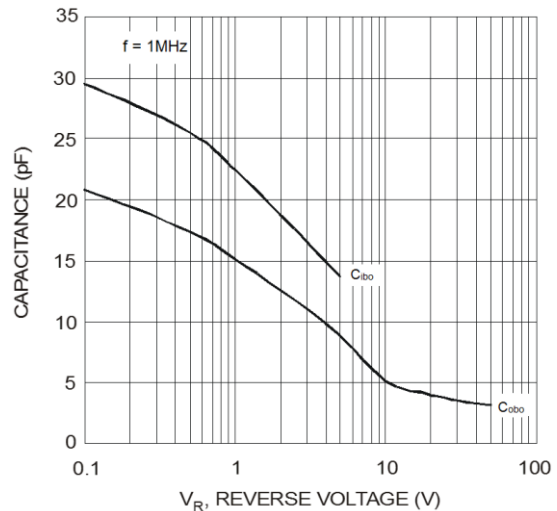


Figure 10. Typical Capacitance Characteristics

**Typical Electrical Characteristics** (continued)

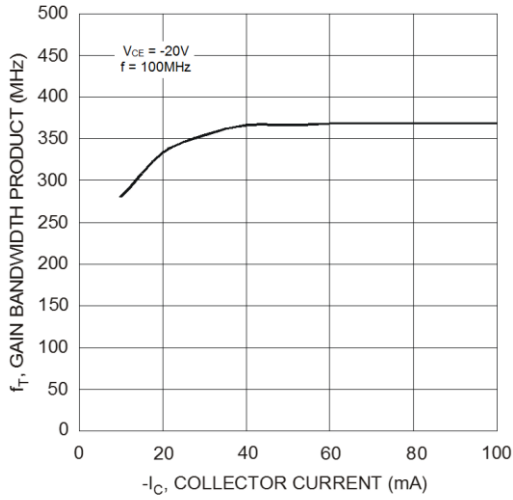
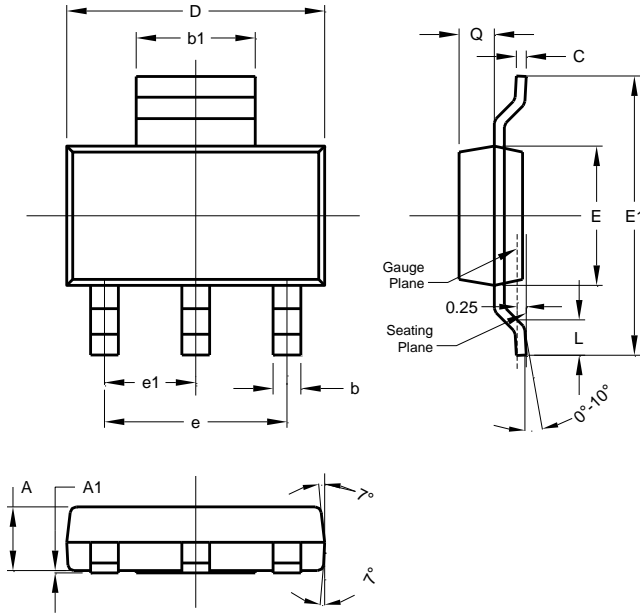


Figure 11. Typical Gain-Bandwidth Product vs. Collector Current

**Package Outline Dimensions**

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

**SOT223**

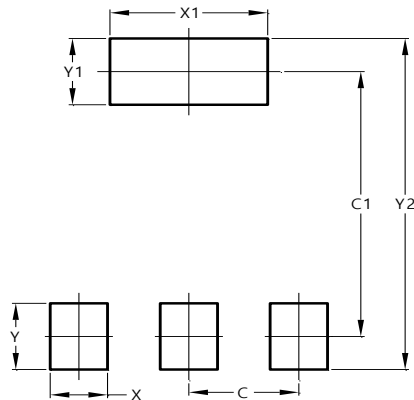


SOT223			
Dim	Min	Max	Typ
A	1.55	1.65	1.60
A1	0.010	0.15	0.05
b	0.60	0.80	0.70
b1	2.90	3.10	3.00
C	0.20	0.30	0.25
D	6.45	6.55	6.50
E	3.45	3.55	3.50
E1	6.90	7.10	7.00
e	-	-	4.60
e1	-	-	2.30
L	0.85	1.05	0.95
Q	0.84	0.94	0.89
All Dimensions in mm			

**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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