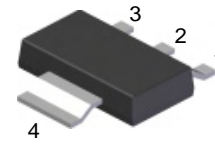


## Features

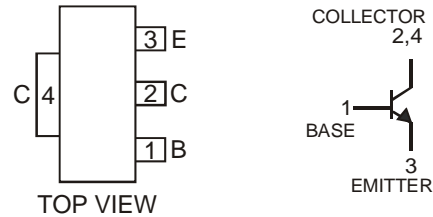
- Epitaxial Planar Die Construction
- Complementary PNP Type Available (DZT2907A)
- Ideally Suited for Automated Assembly Processes
- Ideal for Medium Power Switching or Amplification Applications
- **Lead Free By Design/RoHS Compliant (Note 1)**
- **"Green" Device (Note 2)**



SOT-223

## Mechanical Data

- Case: SOT-223
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020C
- Terminals: Finish - Matte Tin annealed over Copper Leadframe (Lead Free Plating). Solderable per MIL-STD-202, Method 208
- Marking Information: See Page 4
- Ordering Information: See Page 4
- Weight: 0.115 grams (approximate)



Schematic and Pin Configuration

## Maximum Ratings @ $T_A = 25^\circ\text{C}$ unless otherwise specified

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	$V_{CBO}$	75	V
Collector-Emitter Voltage	$V_{CEO}$	40	V
Emitter-Base Voltage	$V_{EBO}$	6	V
Collector Continuous Current	$I_C$	600	mA

## Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation @ $T_A = 25^\circ\text{C}$ (Note 3)	$P_d$	1	W
Thermal Resistance, Junction to Ambient Air (Note 3) @ $T_A = 25^\circ\text{C}$	$R_{\theta JA}$	125	$^\circ\text{C/W}$
Operating and Storage Temperature Range	$T_j, T_{STG}$	-55 to +150	$^\circ\text{C}$

- Notes:
1. No purposefully added lead.
  2. Diodes Inc.'s "Green" policy can be found on our website at [http://www.diodes.com/products/lead\\_free/index.php](http://www.diodes.com/products/lead_free/index.php).
  3. Device mounted on FR-4 PCB pad layout as shown on Diodes Inc. suggested pad layout document AP02001, which can be found on our website at <http://www.diodes.com/datasheets/ap02001.pdf>.

## Electrical Characteristics @T<sub>A</sub> = 25°C unless otherwise specified

Characteristic	Symbol	Min	Max	Unit	Test Conditions
<b>OFF CHARACTERISTICS (Note 4)</b>					
Collector-Base Breakdown Voltage	V <sub>(BR)CBO</sub>	75	—	V	I <sub>C</sub> = 10μA, I <sub>E</sub> = 0
Collector-Emitter Breakdown Voltage	V <sub>(BR)CEO</sub>	40	—	V	I <sub>C</sub> = 10mA, I <sub>B</sub> = 0
Emitter-Base Breakdown Voltage	V <sub>(BR)EBO</sub>	6	—	V	I <sub>E</sub> = 10μA, I <sub>C</sub> = 0
Collector Cut-Off Current	I <sub>CBO</sub>	—	10	nA	V <sub>CB</sub> = 50V, I <sub>E</sub> = 0
Emitter Cut-Off Current	I <sub>EBO</sub>	—	10	nA	V <sub>EB</sub> = 3V, I <sub>C</sub> = 0
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 4)</b>					
Collector-Emitter Saturation Voltage	V <sub>CE(SAT)</sub>	—	0.3	V	I <sub>C</sub> = 150mA, I <sub>B</sub> = 15mA
		—	1.0	V	I <sub>C</sub> = 500mA, I <sub>B</sub> = 50mA
Base-Emitter Saturation Voltage	V <sub>BE(SAT)</sub>	0.6	1.2	V	I <sub>C</sub> = 150mA, I <sub>B</sub> = 15mA
		—	2.0	V	I <sub>C</sub> = 500mA, I <sub>B</sub> = 50mA
DC Current Gain	h <sub>FE</sub>	35	—	V	I <sub>C</sub> = 0.1mA, V <sub>CE</sub> = 10V
		50	—		I <sub>C</sub> = 1mA, V <sub>CE</sub> = 10V
		75	—		I <sub>C</sub> = 10mA, V <sub>CE</sub> = 10V
		35	—		I <sub>C</sub> = 10mA, V <sub>CE</sub> = 10V, T <sub>A</sub> = -55°C
		100	300		I <sub>C</sub> = 150mA, V <sub>CE</sub> = 10V
		50	—		I <sub>C</sub> = 150mA, V <sub>CE</sub> = 1V
		40	—		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, I <sub>E</sub> = 0, f = 1MHz
Input Capacitance	C <sub>ibo</sub>	—	25	pF	V <sub>EB</sub> = 0.5V, I <sub>C</sub> = 0, f = 1MHz
<b>SWITCHING CHARACTERISTICS</b>					
Delay Time	t <sub>d</sub>	—	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>	—	25	ns	
Storage Time	t <sub>s</sub>	—	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>	—	60	ns	

Notes: 4. Measured under pulsed conditions. Pulse width = 300 μs. Duty Cycle, d < = 2%.

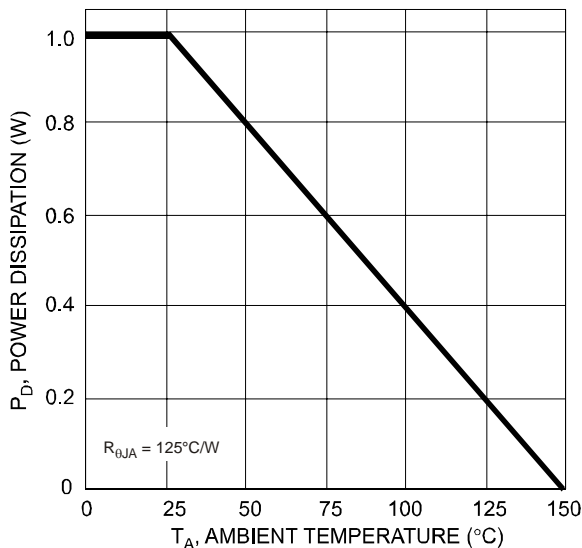


Fig. 1 Power Dissipation vs. Ambient Temperature

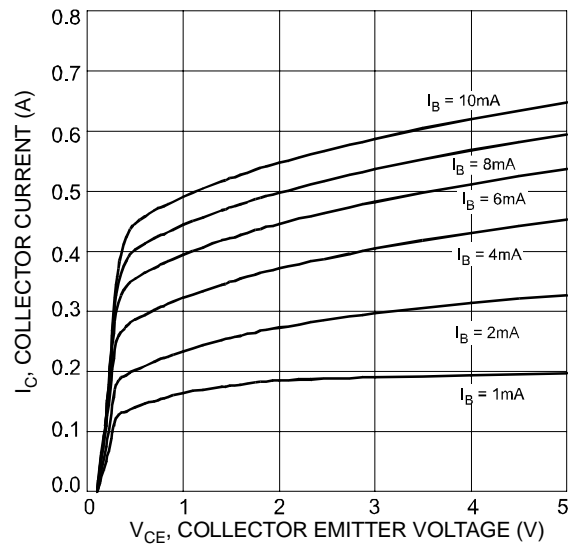


Fig. 2 Typical Collector Current vs. Collector Emitter Voltage

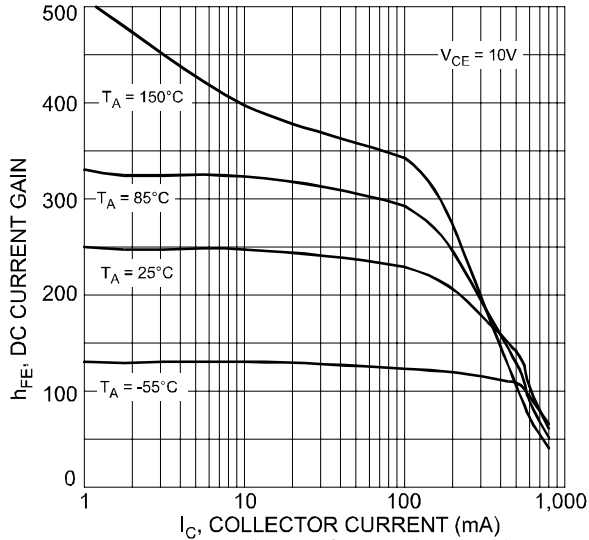


Fig. 3 Typical DC Current Gain vs. Collector Current

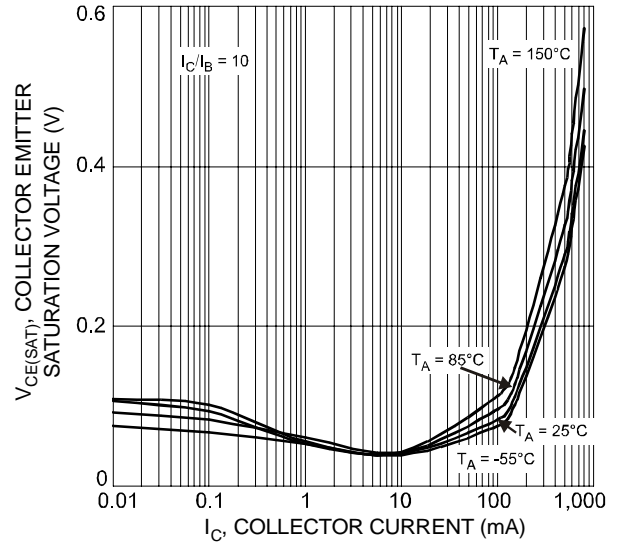


Fig. 4 Typical Collector Emitter Saturation Voltage vs. Collector Current

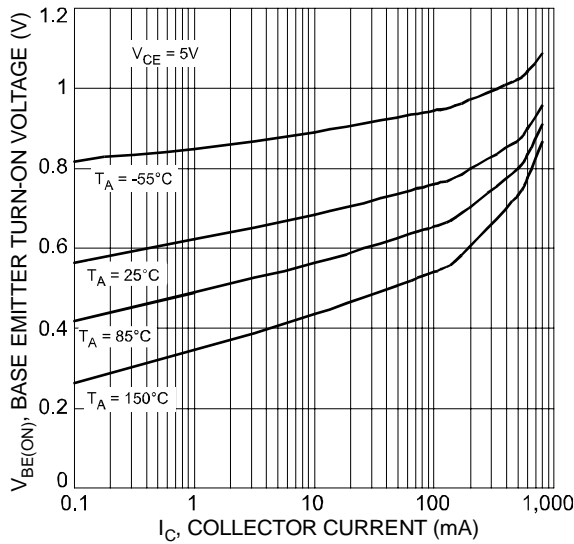


Fig. 5 Typical Base Emitter Turn-On Voltage vs. Collector Current

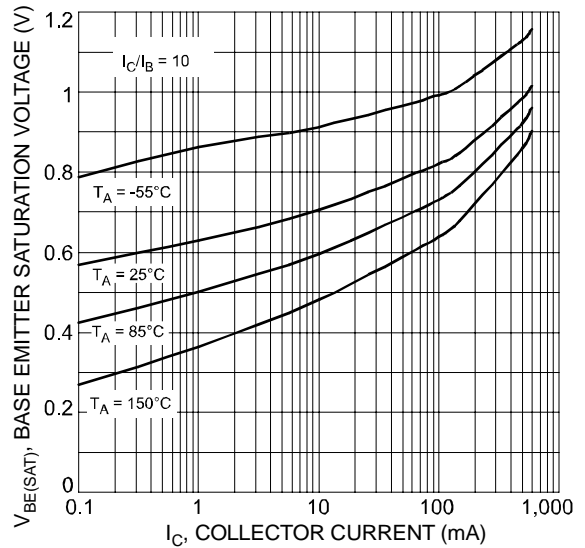


Fig. 6 Typical Base Emitter Saturation Voltage vs. Collector Current

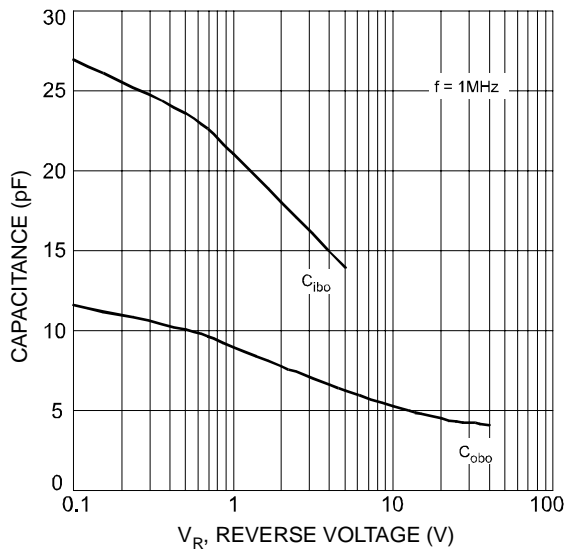


Fig. 7 Typical Capacitance Characteristics

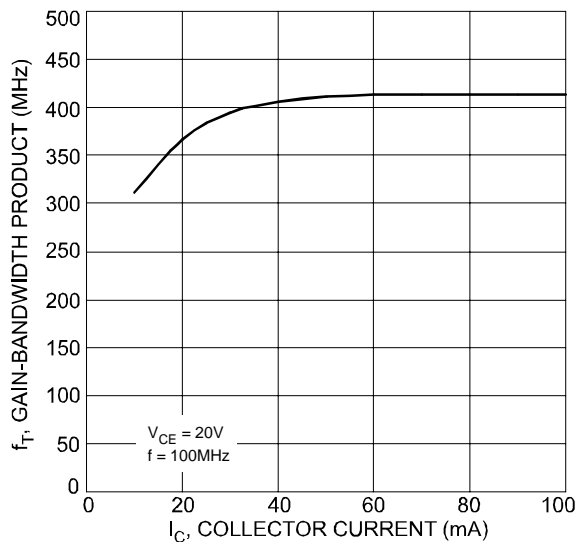


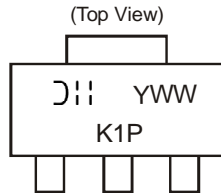
Fig. 8 Typical Gain-Bandwidth Product vs. Collector Current

## Ordering Information (Note 5)

Device	Packaging	Shipping
DZT2222A-13	SOT-223	2500/Tape & Reel

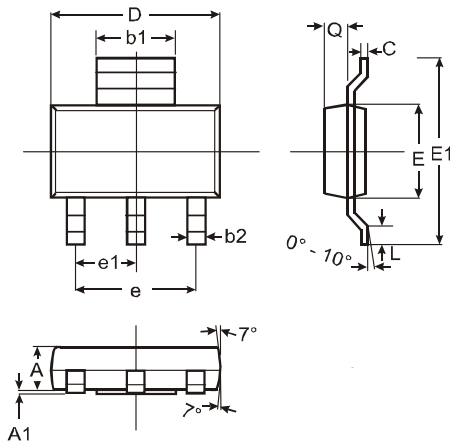
Notes: 5. For packaging details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

## Marking Information



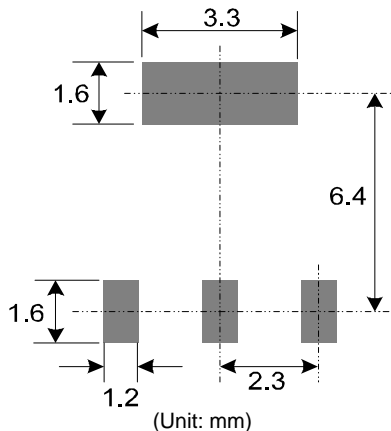
K1P = Product Type Marking Code  
 YWW = Date Code Marking  
 Y = Last Digit of Year ex: 7 = 2007  
 WW = Week Code 01-52

## Package Outline Dimensions



SOT-223			
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	0.55	0.75	0.65
Q	0.84	0.94	0.89
All Dimensions in mm			

## Suggested Pad Layout: (Based on IPC-SM-782)



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