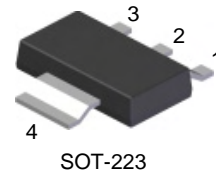


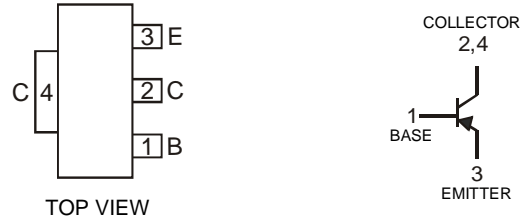
**Features**

- Epitaxial Planar Die Construction
- Complementary NPN Type Available (DZT2222A)
- Ideally Suited for Automated Assembly Processes
- Ideal for Medium Power Amplification and Switching
- **Lead Free By Design/RoHS Compliant (Note 1)**
- **"Green" Device (Note 2)**



**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 & Type Code 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	$V_{CBO}$	-60	V
Collector-Emitter Voltage	$V_{CEO}$	-60	V
Emitter-Base Voltage	$V_{EBO}$	-5	V
Collector Continuous Current (Note 3)	$I_C$	-600	mA
Peak Collector Current	$I_{CM}$	-800	mA

**Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Power Dissipation @ $T_A = 25^\circ\text{C}$	$P_d$	1000 (Note 3)	mW
		1500 (Note 4)	
Power Derating Factor above $25^\circ\text{C}$ (Note 4)	$P_{der}$	12	mW/ $^\circ\text{C}$
Operating and Storage Temperature Range	$T_j, T_{STG}$	-55 to +150	$^\circ\text{C}$
Thermal Resistance, Junction to Ambient Air @ $T_A = 25^\circ\text{C}$ (Note 4)	$R_{\theta JA}$	83.3	$^\circ\text{C}/\text{W}$

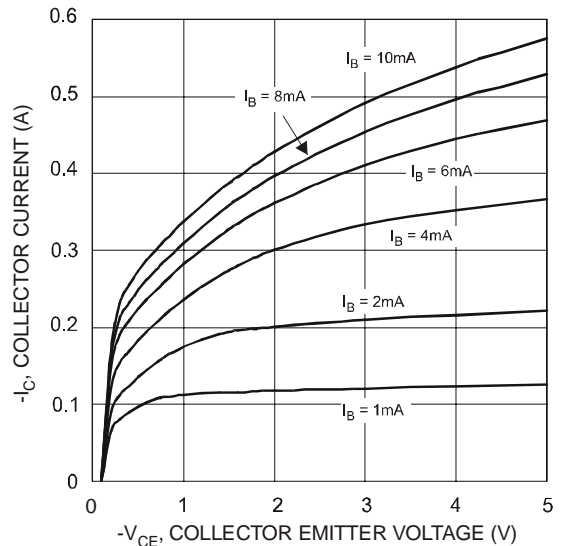
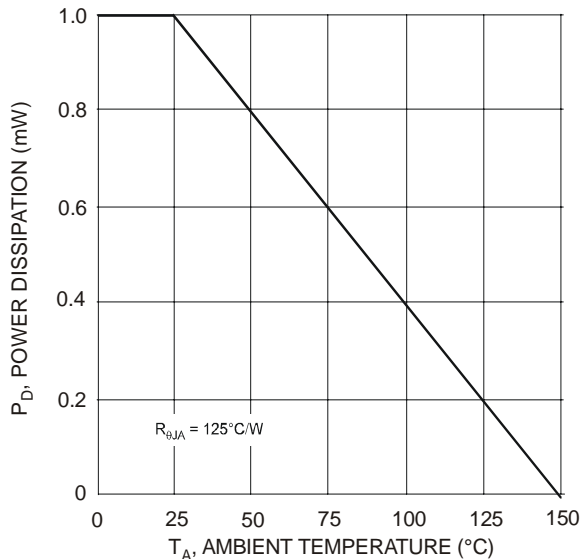
- Notes:
1. No purposefully added lead.
  2. Diodes Inc.'s "Green" policy can be found on our website at [http://www.diodes.com/products/lead\\_free/index.php](http://www.diodes.com/products/lead_free/index.php).
  3. Device mounted on 2" x 2" FR-4 PC board, 2 oz. copper, single sided, pad layout as shown on page 4, or on Diodes Inc. suggested pad layout document AP02001, which can be found on our website at <http://www.diodes.com/datasheets/ap02001.pdf>.
  4. Device mounted on FR-4 PCB, 7cm<sup>2</sup> of copper pad area.

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

Characteristic	Symbol	Min	Max	Unit	Test Conditions
<b>OFF CHARACTERISTICS (Note 5)</b>					
Collector-Base Cutoff Current	I <sub>CB0</sub>	—	-0.01	μA	V <sub>CB</sub> = -50V, I <sub>E</sub> = 0
		—	-10		V <sub>CB</sub> = -50V, I <sub>E</sub> = 0, 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
Collector-Base Breakdown Voltage	V <sub>(BR)CBO</sub>	-60	—	V	I <sub>C</sub> = -10 μA, I <sub>E</sub> = 0
Collector-Emitter Breakdown Voltage	V <sub>(BR)CEO</sub>	-60	—	V	I <sub>C</sub> = -10 mA, I <sub>B</sub> = 0
Emitter-Base Breakdown Voltage	V <sub>(BR)EBO</sub>	-5	—	V	I <sub>E</sub> = -10 μA, I <sub>C</sub> = 0
<b>ON CHARACTERISTICS (Note 5)</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, I <sub>E</sub> = 0A, f = 1MHz
Input Capacitance	C <sub>ibo</sub>	—	30	pF	V <sub>EB</sub> = -2V, I <sub>C</sub> = 0A, 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	

Notes: 5. Pulse Test: Pulse width, tp < 300 μs, Duty Cycle, d < 0.02

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



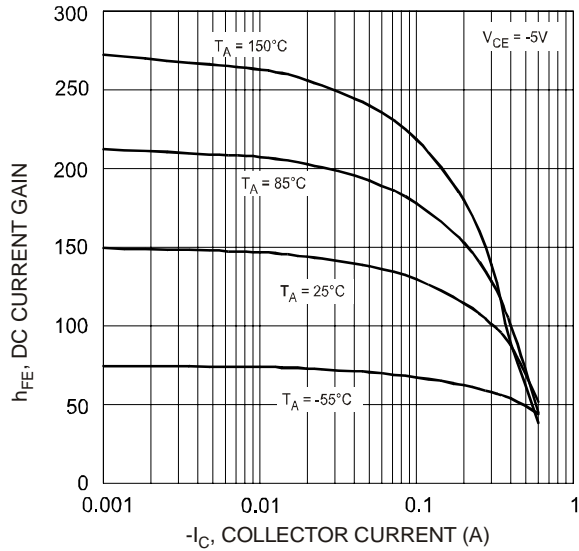


Fig. 3 Typical DC Current Gain vs. Collector Current

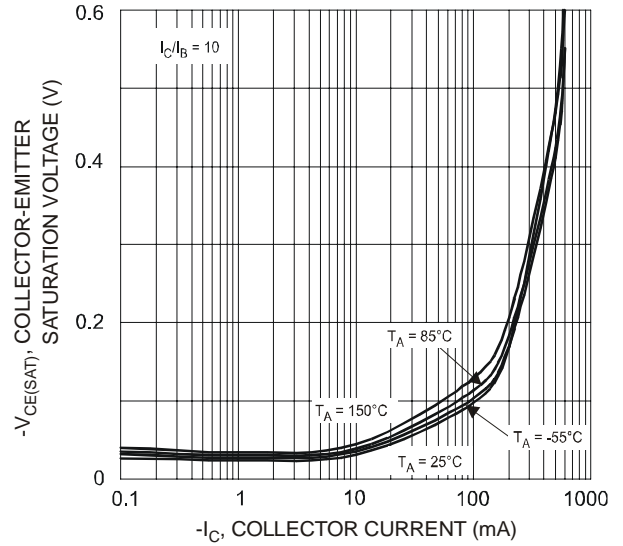


Fig. 4 Typical Collector-Emitter Saturation Voltage vs. Collector Current

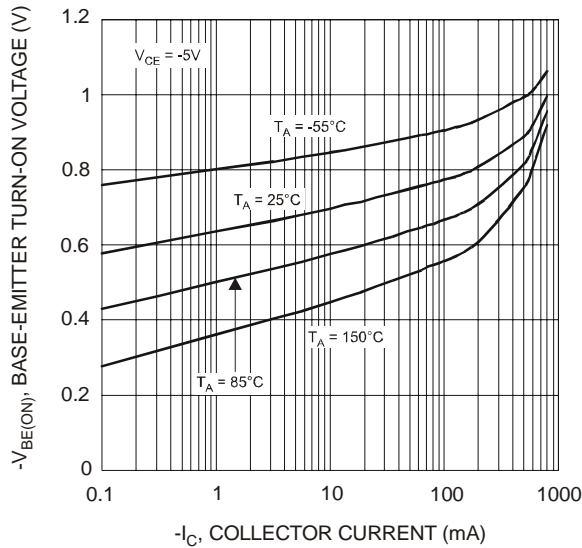


Fig. 5 Typical Base-Emitter Turn-On Voltage vs. Collector Current

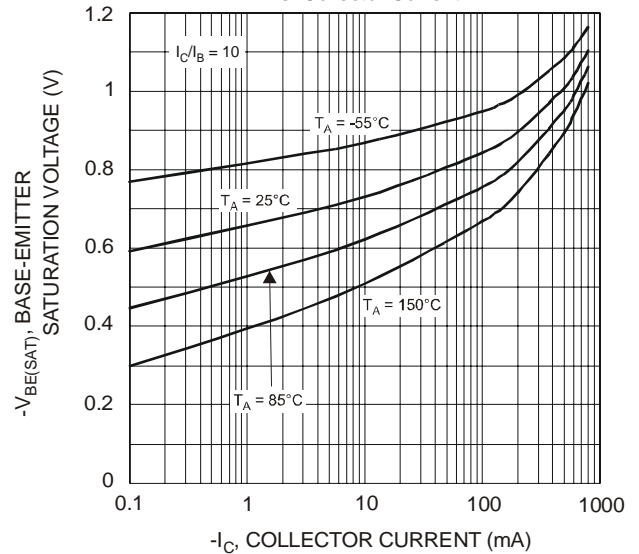


Fig. 6 Typical Base-Emitter Saturation Voltage vs. Collector Current

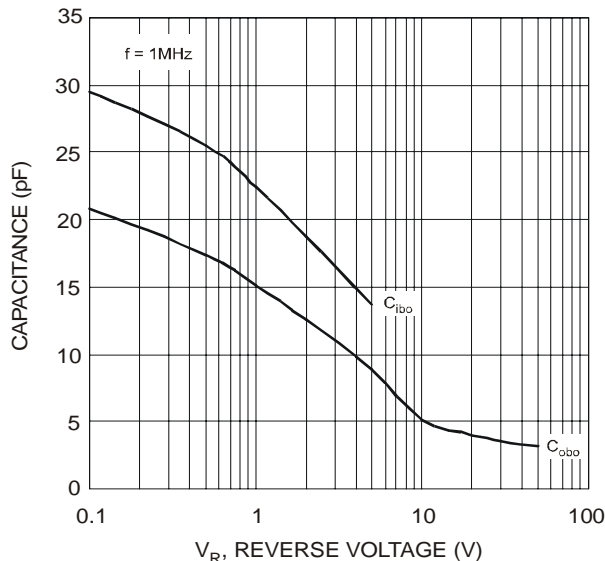


Fig. 7 Typical Capacitance Characteristics

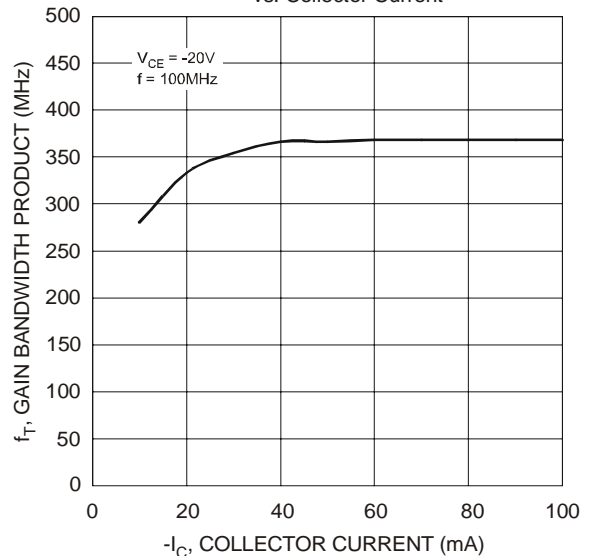


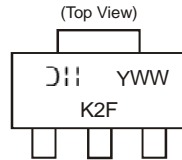
Fig. 8 Typical Gain-Bandwidth Product vs. Collector Current

## Ordering Information (Note 6)

Device	Packaging	Shipping
DZT2907A-13	SOT-223	2500/Tape & Reel

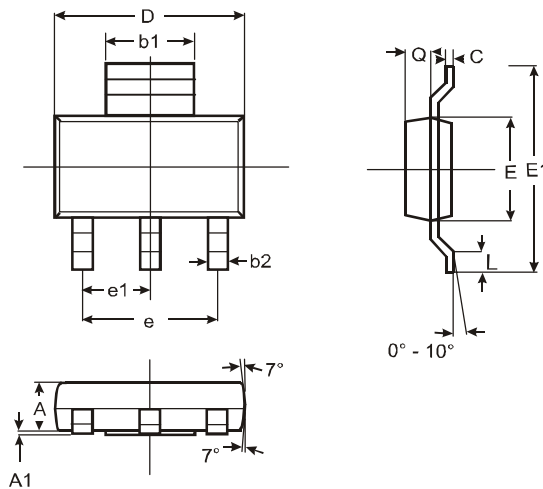
Notes: 6. For packaging details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

## Marking Information



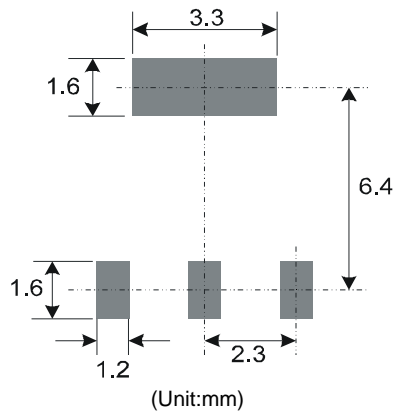
D = Manufacturer's code marking  
 K2F = Product type marking code  
 YWW = Date code marking  
 Y = Last digit of year ex: 7 = 2007  
 WW = Week code 01 - 52

## 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	0.85	1.05	0.95
Q	0.84	0.94	0.89
All Dimensions in mm			

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



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