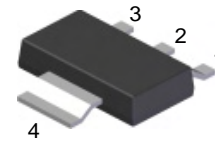


Features

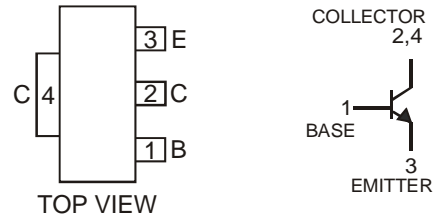
- Epitaxial Planar Die Construction
- Complementary PNP Type Available (DZT2907A)
- Ideally Suited for Automated Assembly Processes
- Ideal for Medium Power Switching or Amplification Applications
- **Lead Free By Design/RoHS Compliant (Note 1)**
- **"Green" Device (Note 2)**



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.
 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_A = 25°C unless otherwise specified

| Characteristic | Symbol | Min | Max | Unit | Test Conditions |
|--------------------------------------|----------------------|-----|-----|------|--|
| OFF CHARACTERISTICS (Note 4) | | | | | |
| Collector-Base Breakdown Voltage | V _{(BR)CBO} | 75 | — | V | I _C = 10μA, I _E = 0 |
| Collector-Emitter Breakdown Voltage | V _{(BR)CEO} | 40 | — | V | I _C = 10mA, I _B = 0 |
| Emitter-Base Breakdown Voltage | V _{(BR)EBO} | 6 | — | V | I _E = 10μA, I _C = 0 |
| Collector Cut-Off Current | I _{CBO} | — | 10 | nA | V _{CB} = 50V, I _E = 0 |
| Emitter Cut-Off Current | I _{EBO} | — | 10 | nA | V _{EB} = 3V, I _C = 0 |
| Collector-Emitter Cut-Off Current | I _{CEX} | — | 10 | nA | V _{CE} = 60V, V _{EB(off)} = 3V |
| ON CHARACTERISTICS (Note 4) | | | | | |
| Collector-Emitter Saturation Voltage | V _{CE(SAT)} | — | 0.3 | V | I _C = 150mA, I _B = 15mA |
| | | — | 1.0 | V | I _C = 500mA, I _B = 50mA |
| Base-Emitter Saturation Voltage | V _{BE(SAT)} | 0.6 | 1.2 | V | I _C = 150mA, I _B = 15mA |
| | | — | 2.0 | V | I _C = 500mA, I _B = 50mA |
| DC Current Gain | h _{FE} | 35 | — | V | I _C = 0.1mA, V _{CE} = 10V |
| | | 50 | — | | I _C = 1mA, V _{CE} = 10V |
| | | 75 | — | | I _C = 10mA, V _{CE} = 10V |
| | | 35 | — | | I _C = 10mA, V _{CE} = 10V, T _A = -55°C |
| | | 100 | 300 | | I _C = 150mA, V _{CE} = 10V |
| | | 50 | — | | I _C = 150mA, V _{CE} = 1V |
| | | 40 | — | | I _C = 500mA, V _{CE} = 10V |
| SMALL SIGNAL CHARACTERISTICS | | | | | |
| Transition Frequency | f _T | 300 | — | MHz | I _C = 20mA, V _{CE} = 20V, f = 100MHz |
| Output Capacitance | C _{obo} | — | 8 | pF | V _{CB} = 10V, I _E = 0, f = 1MHz |
| Input Capacitance | C _{ibo} | — | 25 | pF | V _{EB} = 0.5V, I _C = 0, f = 1MHz |
| SWITCHING CHARACTERISTICS | | | | | |
| Delay Time | t _d | — | 10 | ns | V _{CE} = 30V, V _{EB(off)} = 0.5V, I _C = 150mA, I _{B1} = 15mA |
| Rise Time | t _r | — | 25 | ns | |
| Storage Time | t _s | — | 225 | ns | V _{CE} = 30V, I _C = 150mA, I _{B1} = I _{B2} = 15mA |
| Fall Time | t _f | — | 60 | ns | |

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

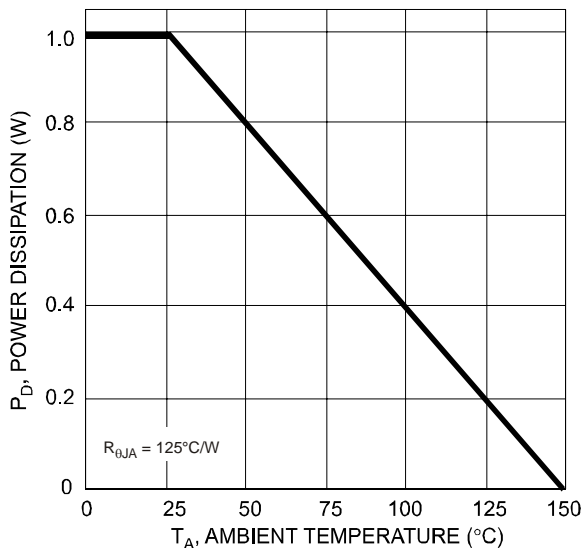


Fig. 1 Power Dissipation vs. Ambient Temperature

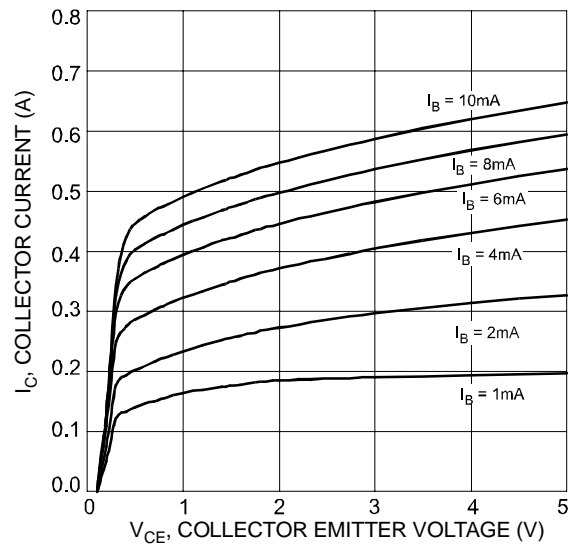


Fig. 2 Typical Collector Current vs. Collector Emitter Voltage

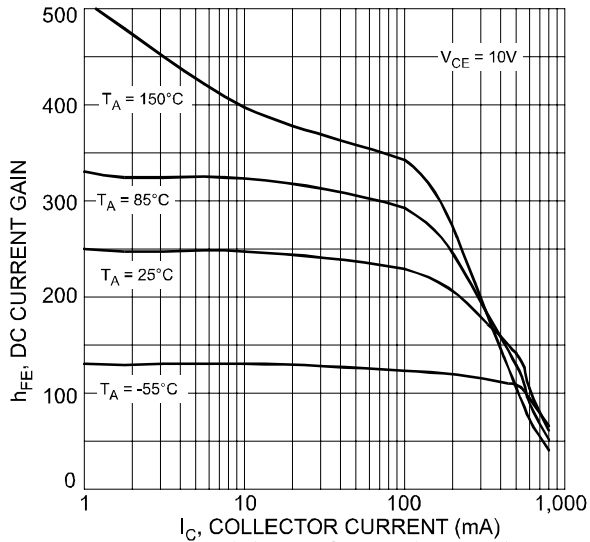


Fig. 3 Typical DC Current Gain vs. Collector Current

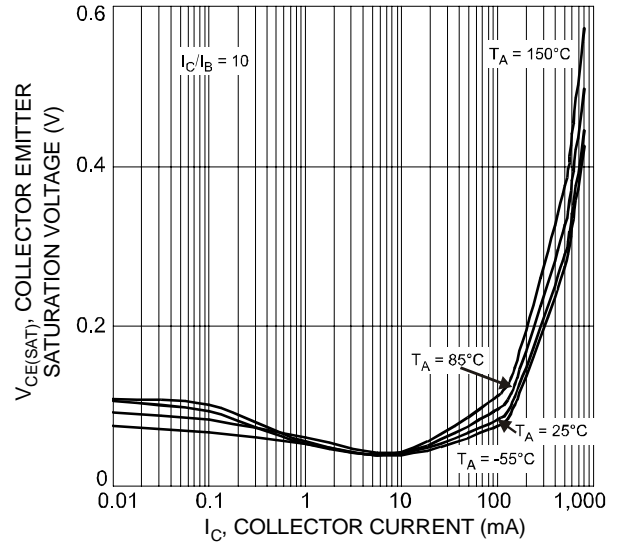


Fig. 4 Typical Collector Emitter Saturation Voltage vs. Collector Current

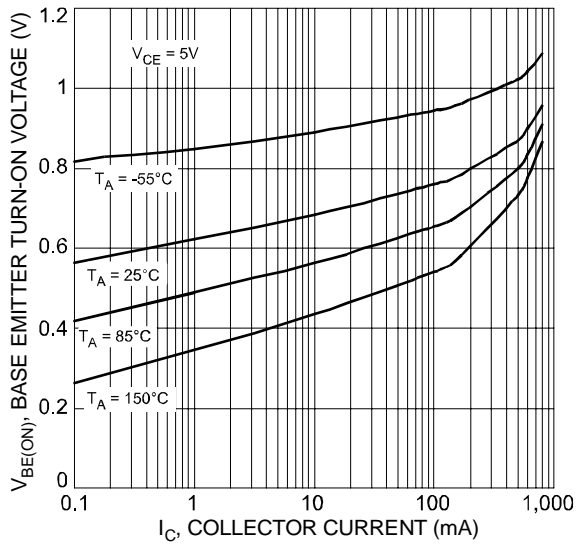


Fig. 5 Typical Base Emitter Turn-On Voltage vs. Collector Current

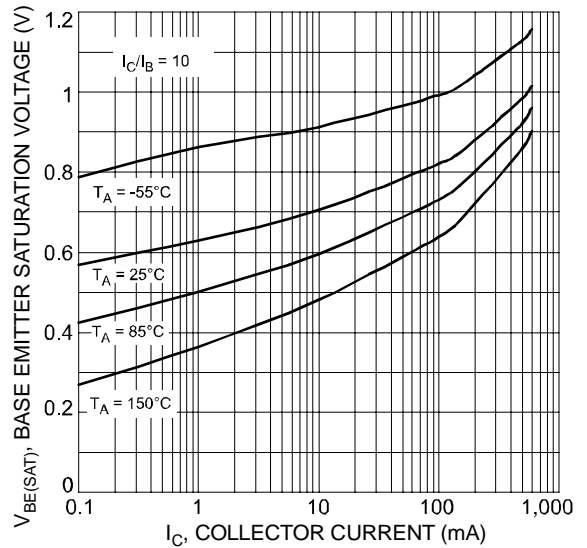


Fig. 6 Typical Base Emitter Saturation Voltage vs. Collector Current

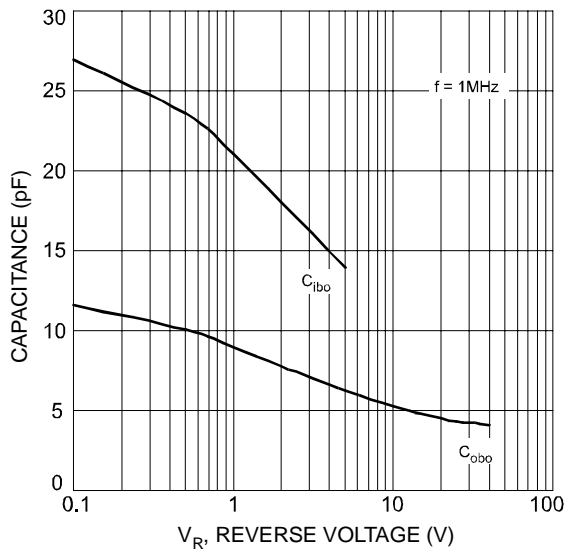


Fig. 7 Typical Capacitance Characteristics

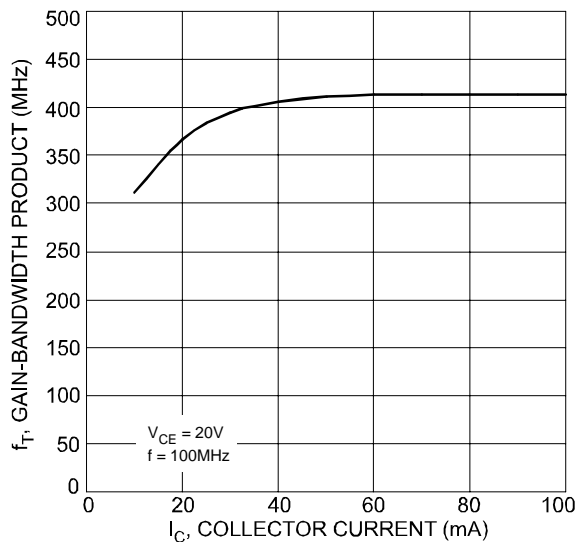


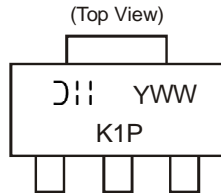
Fig. 8 Typical Gain-Bandwidth Product vs. Collector Current

Ordering Information (Note 5)

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

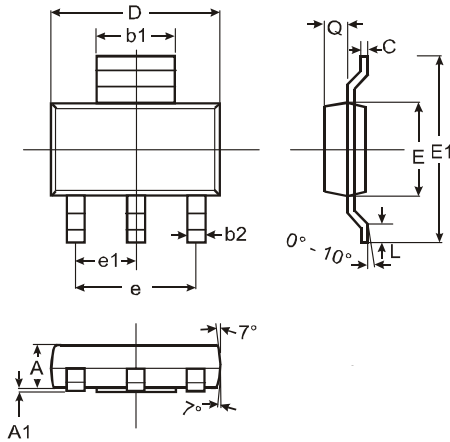
Notes: 5. For packaging details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

Marking Information



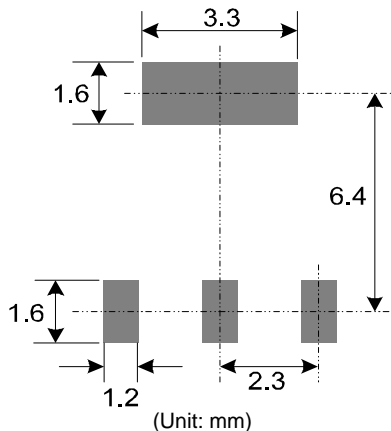
K1P = Product Type Marking Code
 YWW = Date Code Marking
 Y = Last Digit of Year ex: 7 = 2007
 WW = Week Code 01-52

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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