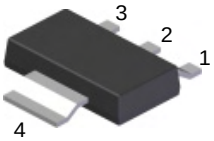
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# DZT2222A

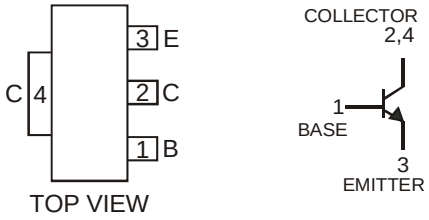
**NPN SURFACE MOUNT TRANSISTOR**

## 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




Schematic and Pin Configuration

## 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)

## Maximum Ratings @$T_A$ = 25°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°C (Note 3) | $P_d$ | 1 | W |
| Thermal Resistance, Junction to Ambient Air (Note 3) @$T_A$ = 25°C | $R_{\theta JA}$ | 125 | °C/W |
| Operating and Storage Temperature Range | $T_j$, $T_{STG}$ | -55 to +150 | °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.



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## 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 |
| | | — | 10 | μA | $V_{CB}$ = 50V, $I_E$ = 0, $T_A$ = 150°C |
| 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%.

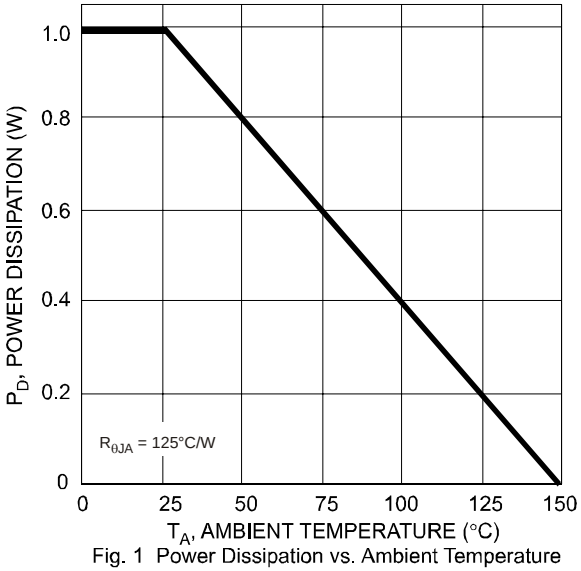


Fig. 1 Power Dissipation vs. Ambient Temperature

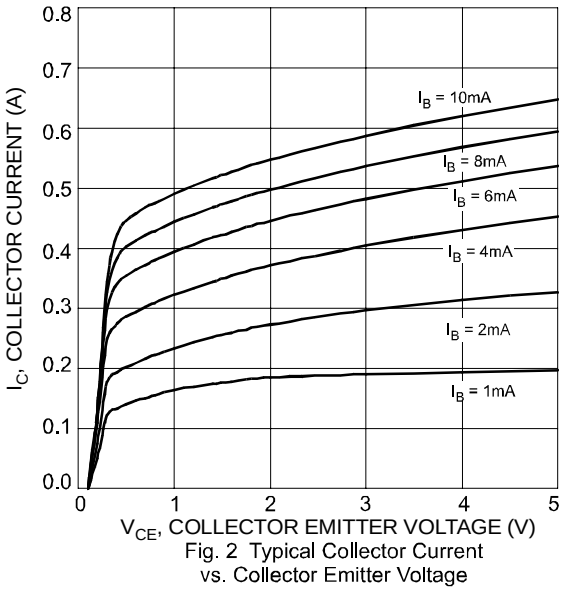


Fig. 2 Typical Collector Current vs. Collector Emitter Voltage


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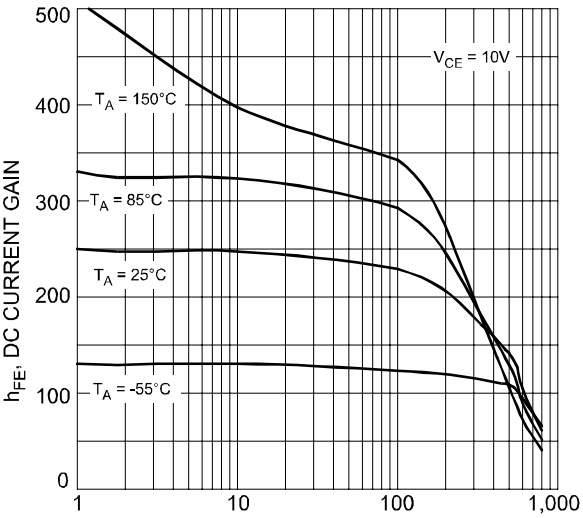



Fig. 3 Typical DC Current Gain vs. Collector Current

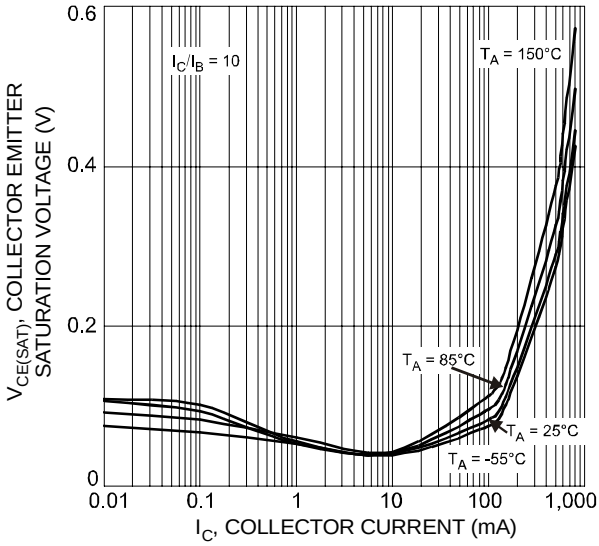



Fig. 4 Typical Collector Emitter Saturation Voltage vs. Collector Current

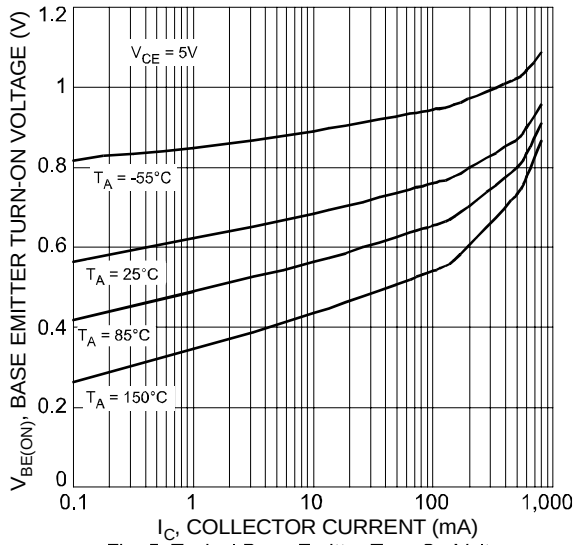



Fig. 5 Typical Base Emitter Turn-On Voltage vs. Collector Current

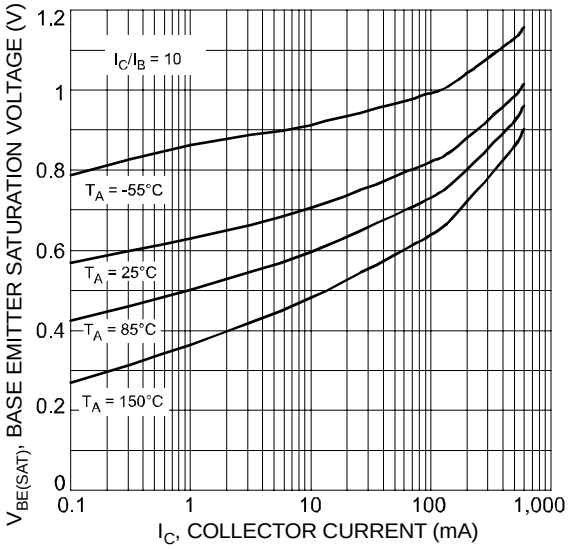



Fig. 6 Typical Base Emitter Saturation Voltage vs. Collector Current

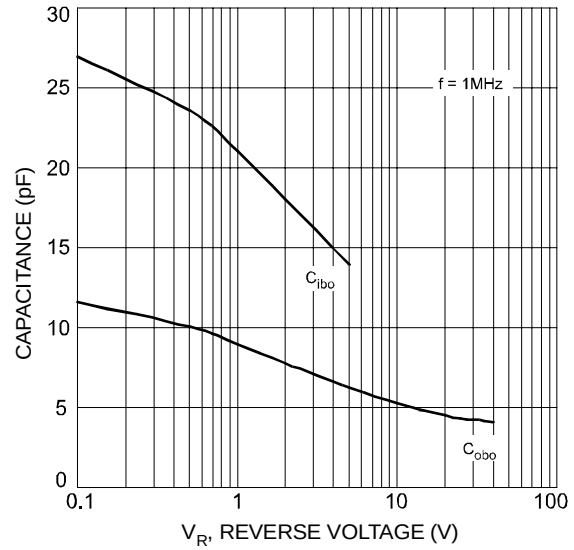



Fig. 7 Typical Capacitance Characteristics

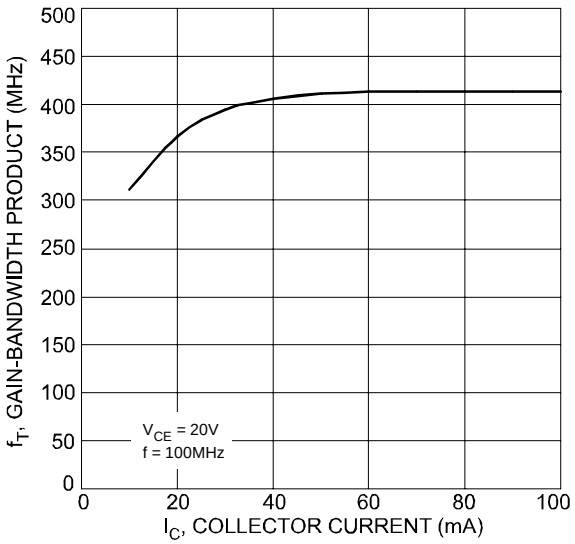



Fig. 8 Typical Gain-Bandwidth Product vs. Collector Current



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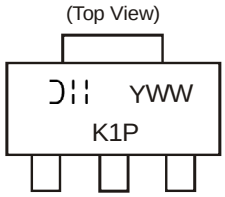
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## Ordering Information (Note 5)

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

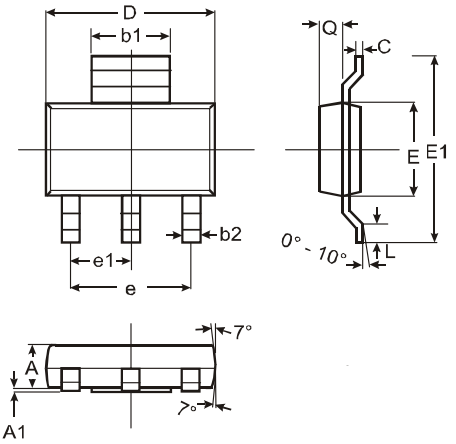
Notes: 5. For packaging details, go to our website at http://www.diodes.com/datasheets/ap02007.pdf.

## Marking Information



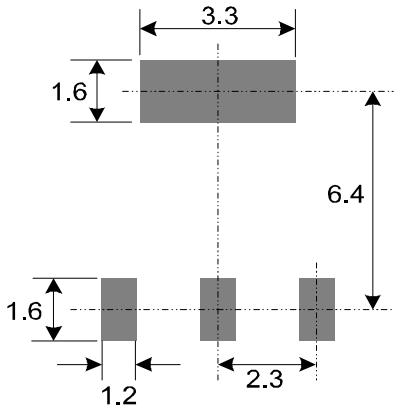

K1P = Product Type Marking Code
YWW = Date Code Marking
Y = Last Digit of Year ex: 7 = 2007
WW = Week Code 01-52

## 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)




(Unit: mm)

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