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PART OBSOLETE - USE FZT591TA

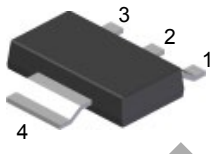
Lead-free Green

# DZT591C

## PNP SURFACE MOUNT TRANSISTOR

## Features

- Epitaxial Planar Die Construction
- Complementary NPN Type Available (DZT491)
- 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 3)**




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 & Type Code Information: See Page 3
- Ordering Information: See Page 3
- Weight: 0.115 grams (approximate)

## Maximum Ratings @$T_A$ = 25°C unless otherwise specified

| Characteristic | Symbol | Value | Unit |
|---|---|---|---|
| Collector-Base Voltage | $V_{CBO}$ | -80 | V |
| Collector-Emitter Voltage | $V_{CEO}$ | -60 | V |
| Emitter-Base Voltage | $V_{EBO}$ | -5 | V |
| Collector Continuous Current (Note 3) | $I_C$ | -1 | A |
| Peak Collector Current | $I_{CM}$ | -2 | A |
| Base Current | $I_B$ | -200 | mA |
| Power Dissipation (Note 3) | $P_d$ | 1 | W |
| Operating and Storage Temperature Range | $T_j$, $T_{STG}$ | -55 to +150 | °C |

## Electrical Characteristics @$T_A$ = 25°C unless otherwise specified

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Conditions |
|---|---|---|---|---|---|---|
| **OFF CHARACTERISTICS (Note 4)** | | | | | | |
| Collector-Base Cutoff Current | $I_{CBO}$ | — | — | -100 | nA | $V_{CB}$ = -60V |
| Emitter-Base Cutoff Current | $I_{EBO}$ | — | — | -100 | nA | $V_{EB}$ = -4V |
| Collector-Emitter Cutoff Current | $I_{CES}$ | — | — | -100 | nA | $V_{CES}$ = -60V |
| Collector-Base Breakdown Voltage | $V_{(BR)CBO}$ | -80 | — | — | V | $I_C$ = 100μA |
| Collector-Emitter Breakdown Voltage | $V_{(BR)CEO}$ | -60 | — | — | V | $I_C$ = 10mA |
| Emitter-Base Breakdown Voltage | $V_{(BR)EBO}$ | -5 | — | — | V | $I_E$ = 100μA |
| **ON CHARACTERISTICS (Note 4)** | | | | | | |
| Collector-Emitter Saturation Voltage | $V_{CE(SAT)}$ | — | — | -0.3 | V | $I_C$ = -500mA, $I_B$ = -50mA |
| | | — | — | -0.6 | V | $I_C$ = -1A, $I_B$ = -100mA |
| DC Current Gain | $h_{FE}$ | 100 | — | — | — | $V_{CE}$ = -5V, $I_C$ = -1mA |
| | | 100 | — | 300 | — | $V_{CE}$ = -5V, $I_C$ = -500mA |
| | | 80 | — | — | — | $V_{CE}$ = -5V, $I_C$ = -1A |
| | | 15 | — | — | — | $V_{CE}$ = -5V, $I_C$ = -2A |
| Base-Emitter Saturation Voltage | $V_{BE(SAT)}$ | — | — | -1.2 | V | $I_C$ = -1A, $I_B$ = -100mA |
| Base-Emitter Turn-On Voltage | $V_{BE(on)}$ | — | — | -1 | V | $I_C$ = -1A, $V_{CE}$ = -5V |
| **SMALL SIGNAL CHARACTERISTICS** | | | | | | |
| Current Gain-Bandwidth Product | $f_T$ | 150 | — | — | MHz | $V_{CE}$ = -10V, $I_C$ = -50mA, f = 100MHz |
| Output Capacitance | $C_{obo}$ | — | 13 | — | pF | $V_{CB}$ = -10V, f =1MHz |

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 page 4 or in Diodes Inc. suggested pad layout document AP02001, which can be found on our website at http://www.diodes.com/datasheets/ap02001.pdf.
4. Measured under pulsed conditions. Pulse width = 300ms. Duty cycle ≤ 2%.

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## Typical Characteristics @$T_A$ = 25°C unless otherwise specified

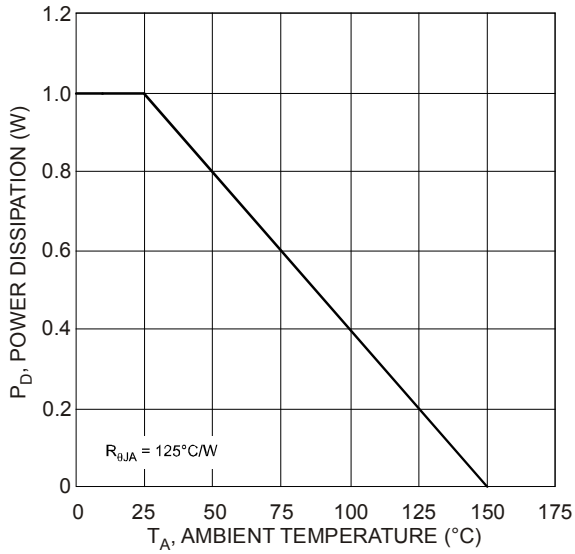


Fig. 1 Power Dissipation vs. Ambient Temperature (Note 3)

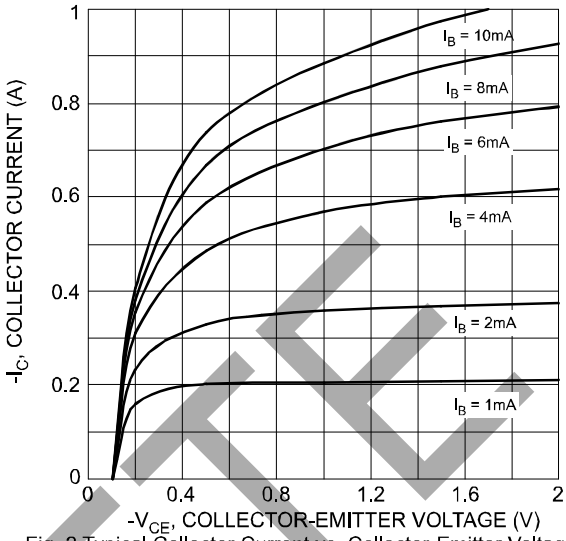


Fig. 2 Typical Collector Current vs. Collector-Emitter Voltage

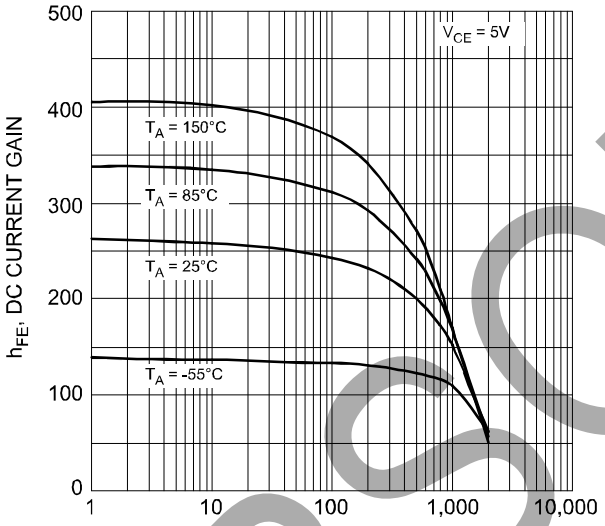


Fig. 3 Typical DC Current Gain vs. Collector Current

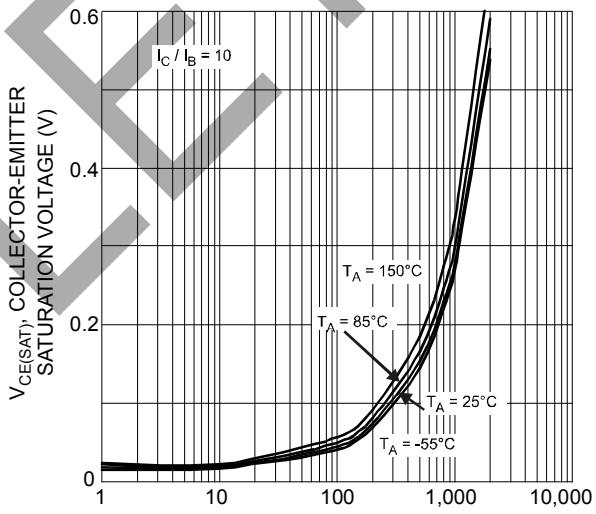


Fig. 4 Typical Collector-Emitter Saturation Voltage vs. Collector Current

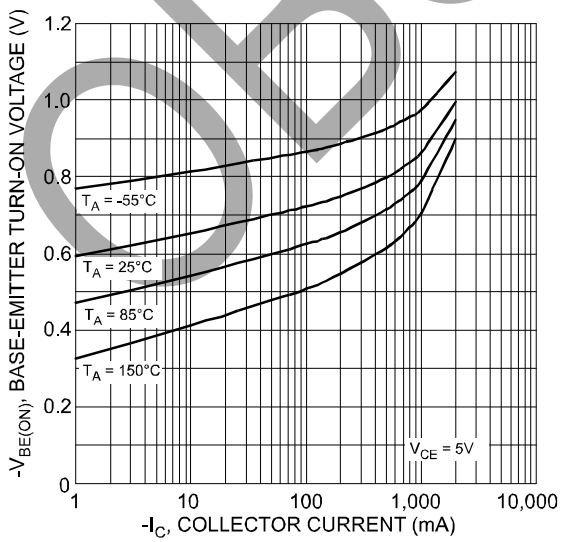


Fig. 5 Typical Base-Emitter Turn-On Voltage vs. Collector Current

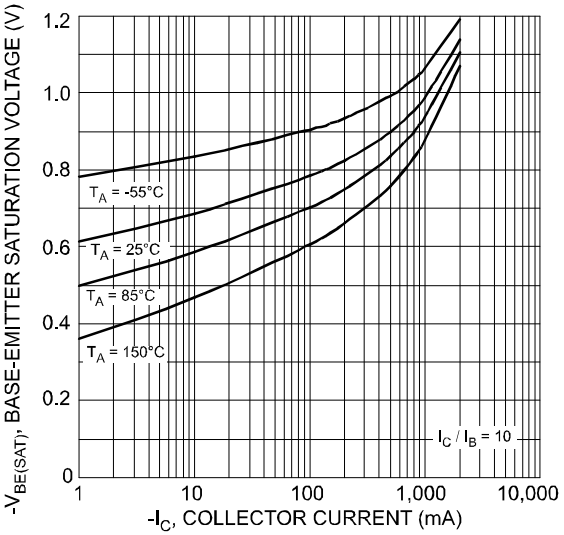


Fig. 6 Typical Base-Emitter Saturation Voltage vs. Collector Current

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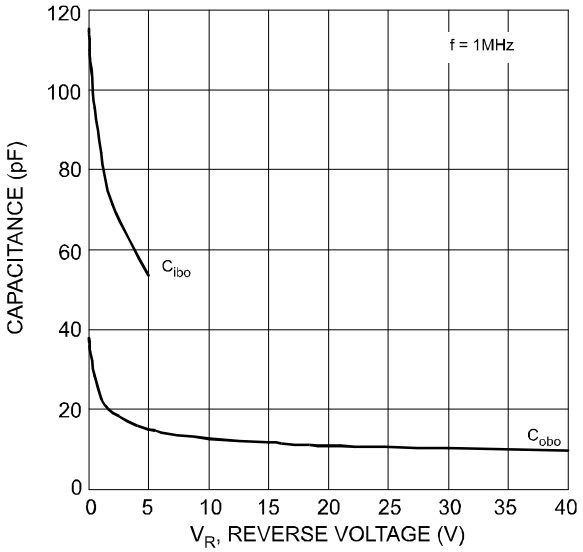


Fig. 7 Typical Capacitance Characteristics

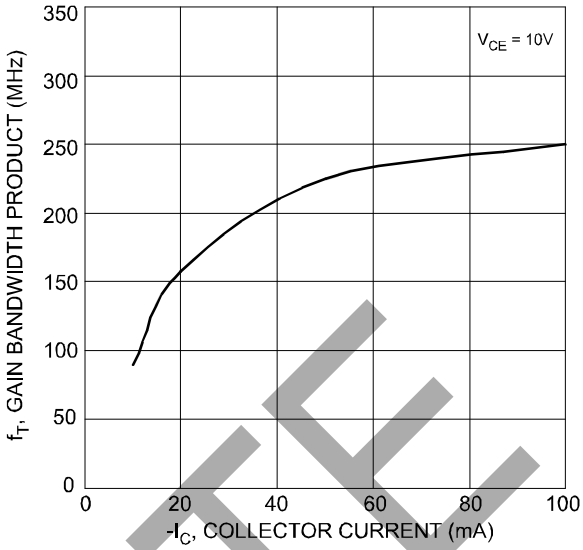


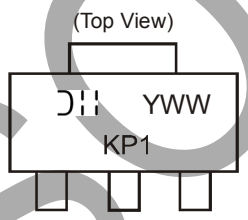
Fig. 8 Typical Gain-Bandwidth Product vs. Collector Current

## Ordering Information (Note 5)

| Device | Packaging | Shipping |
|---|---|---|
| DZT591C-13 | SOT-223 | 2500/Tape & Reel |

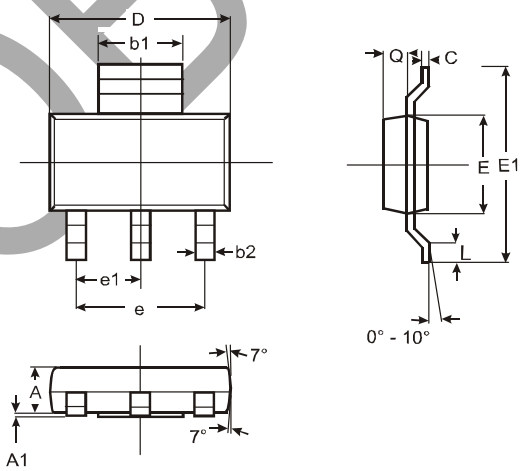
Notes: 5. For packaging details, go to our website at http://www.diodes.com/datasheets/ap02007.pdf.

## Marking Information




= Manufacturer's code marking
KP1 = 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** | | | |

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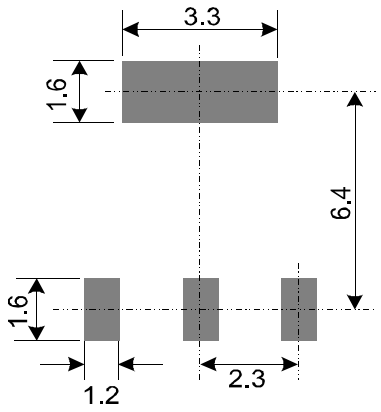
## Suggested Pad Layout: (Based on IPC-SM-782)




(Unit: mm)

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