

Features

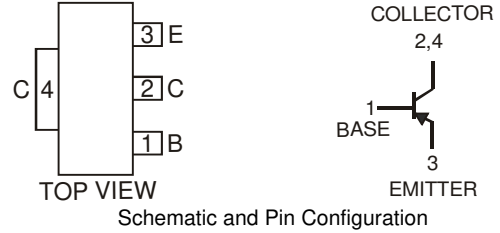
- Epitaxial Planar Die Construction
- Ideally Suited for Automated Assembly Processes
- Ideal for Medium Power Switching or Amplification Applications
- **Lead Free By Design/RoHS Compliant (Note 1)**
- **"Green" Device (Note 2)**



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)



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

| Characteristic | Symbol | Value | Unit |
|------------------------------|-----------|-------|------|
| Collector-Base Voltage | V_{CBO} | -180 | V |
| Collector-Emitter Voltage | V_{CEO} | -140 | V |
| Emitter-Base Voltage | V_{EBO} | -6 | V |
| Continuous Collector Current | I_C | -4 | A |
| Peak Pulse Current | I_{CM} | -10 | A |

Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|---|-----------------|-------------|--------------------|
| Power Dissipation (Note 3) @ $T_A = 25^\circ\text{C}$ | 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 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>.

Electrical Characteristics @ $T_A = 25^\circ\text{C}$ unless otherwise specified

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|--------------------------------------|-----------------------|-----------------------|-------------------|-----------------------------|---------------------|---|
| OFF CHARACTERISTICS (Note 4) | | | | | | |
| Collector-Base Breakdown Voltage | $V_{(BR)CBO}$ | -180 | — | — | V | $I_C = -100\mu\text{A}, I_E = 0$ |
| Collector-Emitter Breakdown Voltage | $V_{(BR)CEO}$ | -140 | — | — | V | $I_C = -10\text{mA}, I_B = 0$ |
| Emitter-Base Breakdown Voltage | $V_{(BR)EBO}$ | -6 | — | — | V | $I_E = -100\mu\text{A}, I_C = 0$ |
| Collector Cutoff Current | I_{CBO} | — | — | -50 -1 | nA μA | $V_{CB} = -150\text{V}, I_E = 0$ $V_{CB} = -150\text{V}, I_E = 0$ $T_A = 100^\circ\text{C}$ |
| Emitter Cutoff Current | I_{EBO} | — | — | -10 | nA | $V_{EB} = -6\text{V}, I_C = 0$ |
| ON CHARACTERISTICS (Note 4) | | | | | | |
| Collector-Emitter Saturation Voltage | $V_{CE(SAT)}$ | — | — | -60 -120 -150 -370 | mV | $I_C = -100\text{mA}, I_B = -5\text{mA}$ $I_C = -500\text{mA}, I_B = -50\text{mA}$ $I_C = -1\text{A}, I_B = -100\text{mA}$ $I_C = -3\text{A}, I_B = -300\text{mA}$ |
| Base-Emitter Saturation Voltage | $V_{BE(SAT)}$ | — | — | -1110 | mV | $I_C = -3\text{A}, I_B = -300\text{mA}$ |
| Base-Emitter Turn-On Voltage | $V_{BE(ON)}$ | — | — | -950 | mV | $I_C = -3\text{A}, V_{CE} = -5\text{V}$ |
| DC Current Gain | h_{FE} | 100 100 75 — | — — — 10 | — 300 — — | — | $I_C = -10\text{mA}, V_{CE} = -5\text{V}$ $I_C = -1\text{A}, V_{CE} = -5\text{V}$ $I_C = -3\text{A}, V_{CE} = -5\text{V}$ $I_C = -10\text{A}, V_{CE} = -5\text{V}$ |
| SMALL SIGNAL CHARACTERISTICS | | | | | | |
| Current Gain-Bandwidth Product | f_T | — | 150 | — | MHz | $I_C = -100\text{mA}, V_{CE} = -10\text{V}$, $f = 100\text{MHz}$ |
| Output Capacitance | C_{obo} | — | 40 | — | pF | $V_{CB} = -20\text{V}, f = 1\text{MHz}$ |
| SWITCHING CHARACTERISTICS | | | | | | |
| Switching Times | t_{on} t_{off} | — — | 85 430 | — — | ns | $I_C = -1\text{A}, I_{B1} = -100\text{mA}$ $I_{B2} = 100\text{mA}, V_{CC} = -50\text{V}$ |

Notes: 4. Measured under pulsed conditions. Pulse width = 300 μs . Duty cycle $\leq 2\%$.

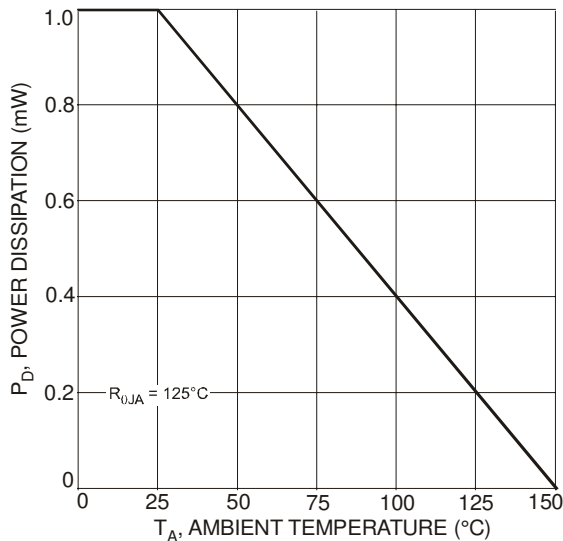


Fig. 1 Max Power Dissipation vs. Ambient Temperature

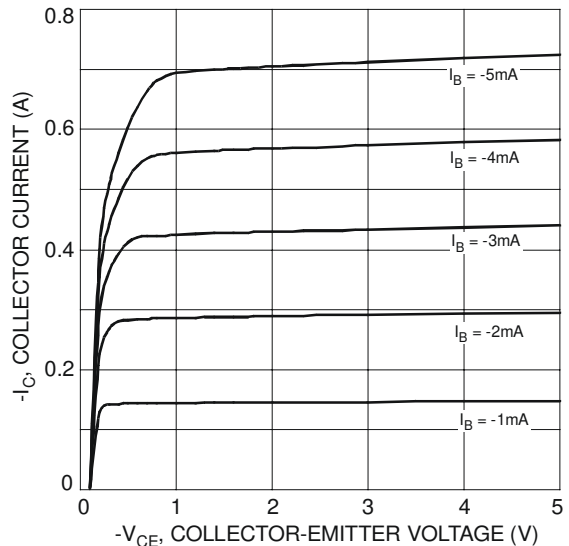


Fig. 2 Typical Collector Current vs. Collector-Emitter Voltage

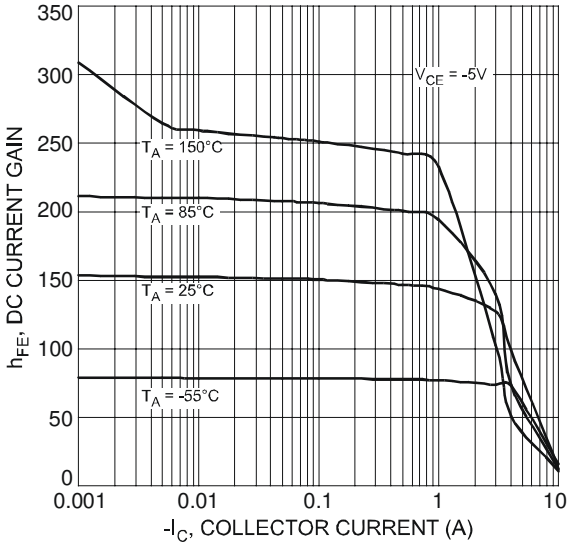


Fig. 3 Typical DC Current Gain vs. Collector Current

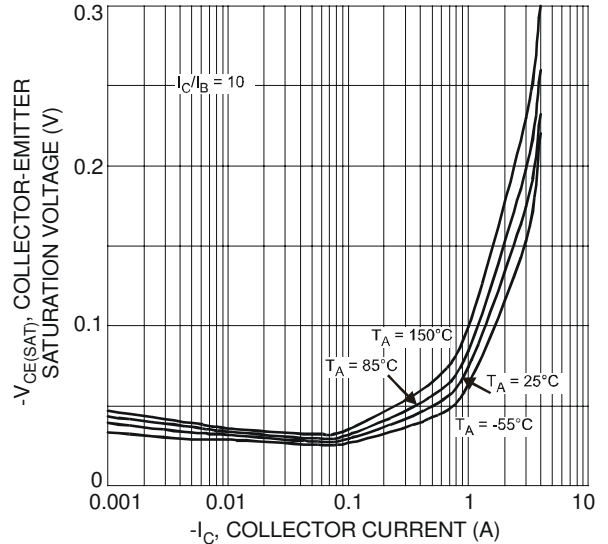


Fig. 4 Typical Collector-Emitter Saturation Voltage vs. Collector Current

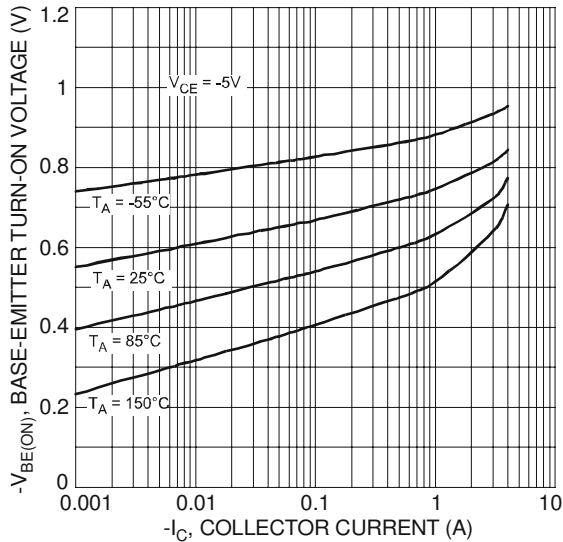


Fig. 5 Typical Base-Emitter Turn-On Voltage vs. Collector Current

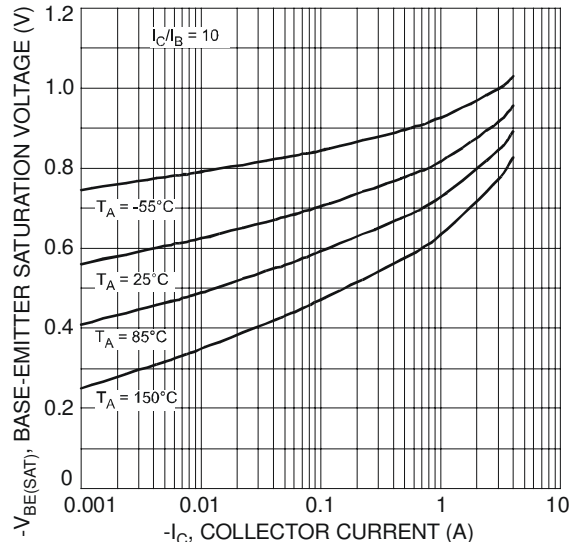


Fig. 6 Typical Base-Emitter Saturation Voltage vs. Collector Current

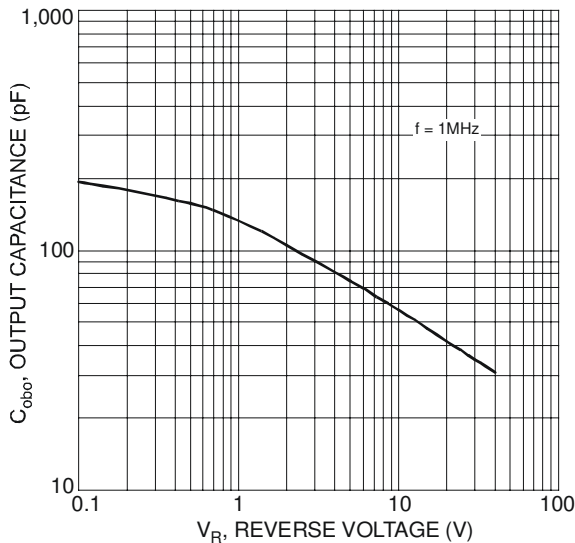


Fig. 7 Typical Output Capacitance Characteristics

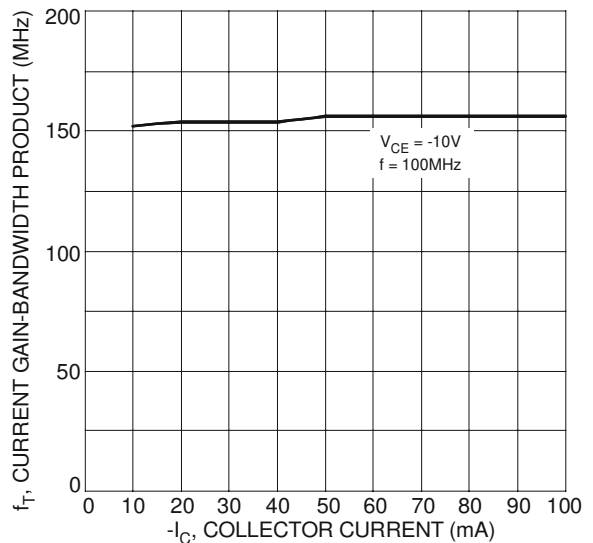


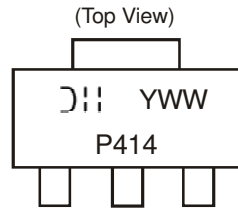
Fig. 8 Typical Gain-Bandwidth Product vs. Collector Current

Ordering Information (Note 5)

| Device | Packaging | Shipping |
|-----------|-----------|------------------|
| DZT955-13 | SOT-223 | 2500/Tape & Reel |

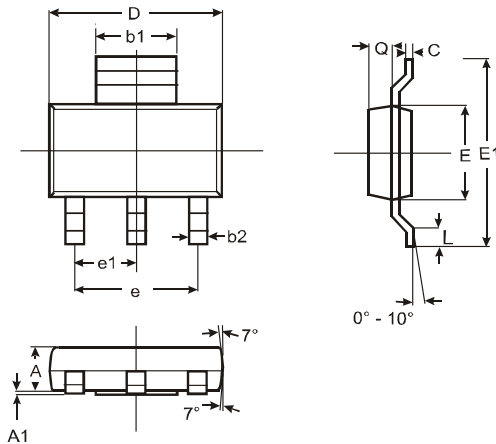
Notes: 5. For packaging details, go to our website at <http://www.diodes.com/ap02007.pdf>.

Marking Information



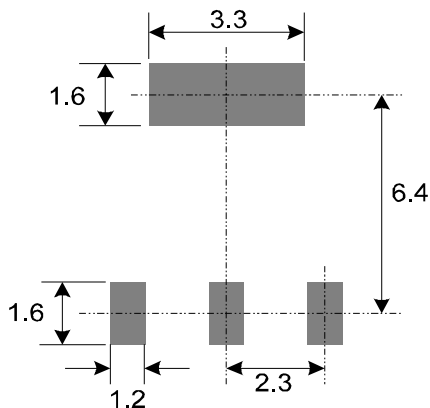
P414 = Product Type Marking Code
 YWW = Date Code Marking
 Y = Last digit of year ex: 7 = 2007
 WW = Week code 01 - 52

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: (Dimensions in mm)



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