

Features

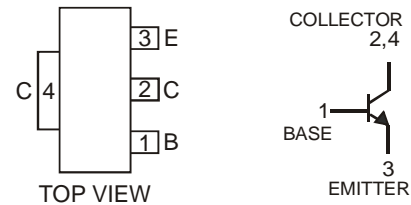
- Epitaxial Planar Die Construction
- Complementary PNP Type Available (DCP53)
- Ideally Suited for Automated Assembly Processes
- Ideal for Medium Power Switching or Amplification Applications
- **Lead Free By Design/RoHS Compliant (Note 1)**
- **"Green" Device (Note 2)**



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



Schematic and Pin Configuration

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

| Characteristic | Symbol | Value | Units |
|---------------------------|-----------|-------|-------|
| Collector-Base Voltage | V_{CB0} | 100 | V |
| Collector-Emitter Voltage | V_{CEO} | 80 | V |
| Emitter-Base Voltage | V_{EBO} | 5 | V |
| Collector Current | I_C | 1 | A |

Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|---|-----------------|------------|--------------------|
| Power Dissipation @ $T_A = 25^\circ\text{C}$ (Note 3) | P_d | 1 | W |
| 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 3) | $R_{\theta JA}$ | 125 | $^\circ\text{C/W}$ |

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 | $V_{(BR)CBO}$ | 100 | — | — | V | $I_C = 100\mu\text{A}, I_E = 0$ |
| Collector-Emitter Breakdown Voltage | $V_{(BR)CEO}$ | 80 | — | — | V | $I_C = 10\text{mA}, I_B = 0$ |
| Emitter-Base Breakdown Voltage | $V_{(BR)EBO}$ | 5.0 | — | — | V | $I_E = 10\mu\text{A}, I_C = 0$ |
| Collector-Base Cutoff Current | I_{CBO} | — | — | 0.1 20 | μA | $V_{CB} = 30\text{V}, I_E = 0$ $V_{CB} = 30\text{V}, I_E = 0, T_A = 150^\circ\text{C}$ |
| Emitter-Base Cutoff Current | I_{EBO} | — | — | 10 | μA | $V_{EB} = 5.0\text{V}, I_C = 0$ |
| ON CHARACTERISTICS (Note 4) | | | | | | |
| DC Current Gain | h_{FE} | 25 | — | — | — | $I_C = 5.0\text{mA}, V_{CE} = 2.0\text{V}$ $I_C = 150\text{mA}, V_{CE} = 2.0\text{V}$ $I_C = 500\text{mA}, V_{CE} = 2.0\text{V}$ |
| | | 40 | — | 250 | | |
| | | 25 | — | — | | |
| | | 100 | 160 | 250 | | |
| Collector-Emitter Saturation Voltage | $V_{CE(SAT)}$ | — | — | 0.5 | V | $I_C = 500\text{mA}, I_B = 50\text{mA}$ |
| Base-Emitter Turn-On Voltage | $V_{BE(ON)}$ | — | — | 1.0 | V | $I_C = 500\text{mA}, V_{CE} = 2.0\text{V}$ |
| SMALL SIGNAL CHARACTERISTICS | | | | | | |
| Current-Gain-Bandwidth Product | f_T | — | 200 | — | MHz | $I_C = 50\text{mA}, V_{CE} = 5.0\text{V}, f = 100\text{MHz}$ |

- 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. Pulse Test: Pulse width = $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$.

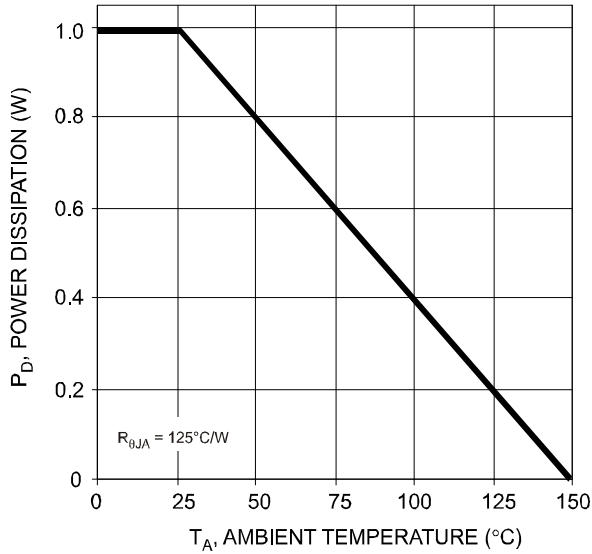


Fig. 1 Power Dissipation vs. Ambient Temperature

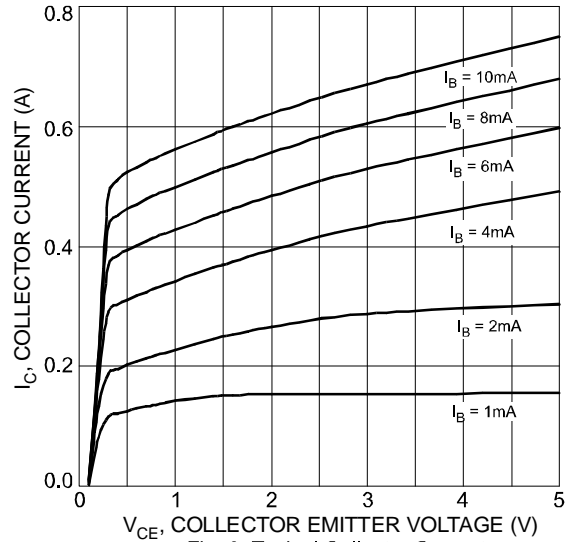


Fig. 2 Typical Collector Current vs. Collector Emitter Voltage

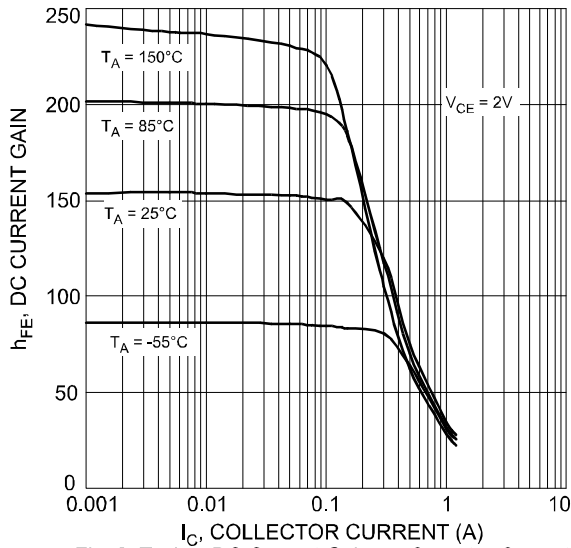


Fig. 3 Typical DC Current Gain vs. Collector Current

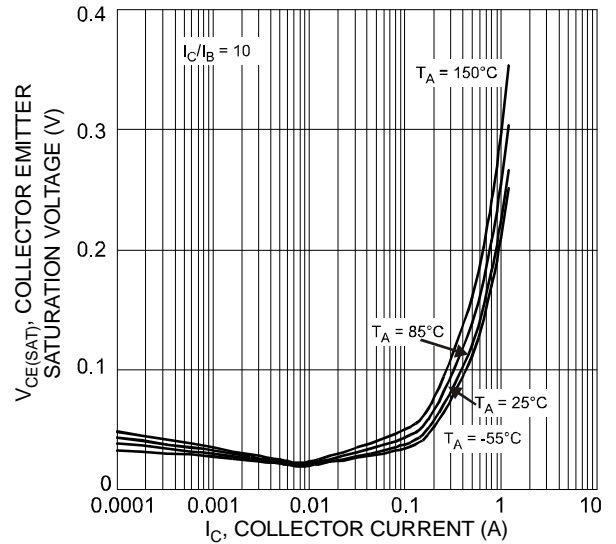


Fig. 4 Typical Collector Emitter Saturation Voltage vs. Collector Current

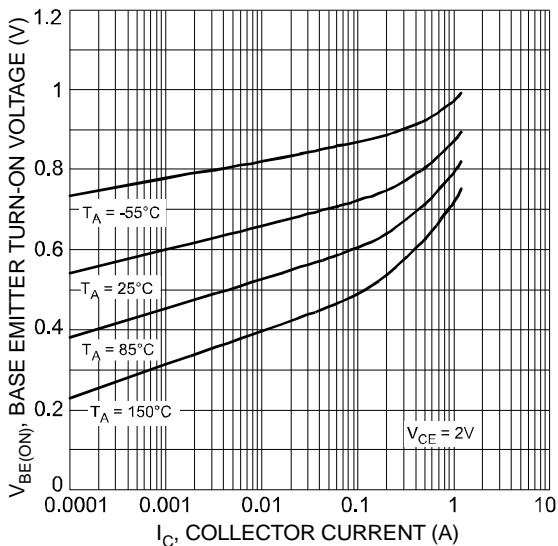


Fig. 5 Typical Base Emitter Turn-On Voltage vs. Collector Current

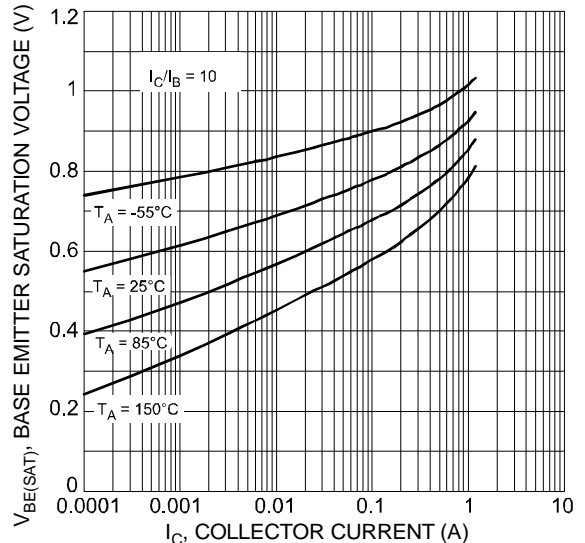


Fig. 6 Typical Base Emitter Saturation Voltage vs. Collector Current

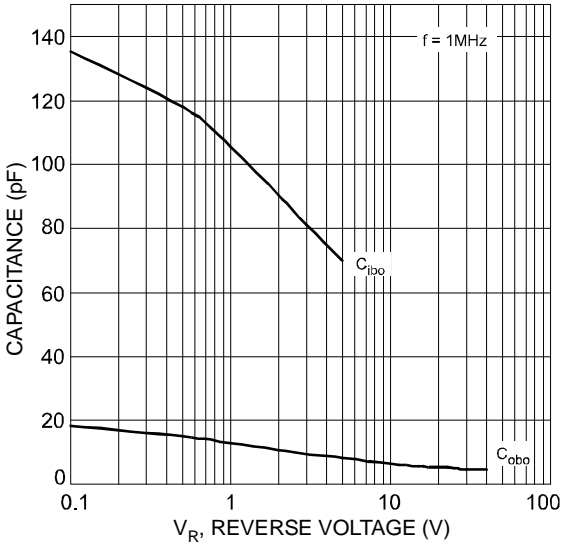


Fig. 7 Typical Capacitance Characteristics

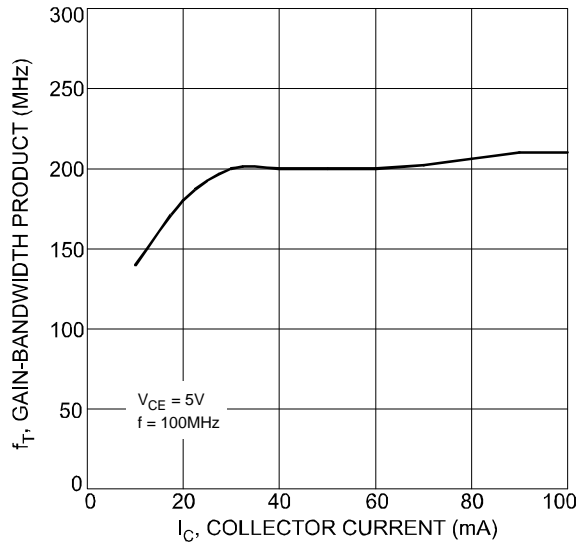


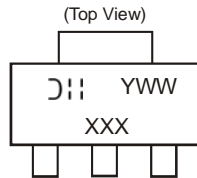
Fig. 8 Typical Gain-Bandwidth Product vs. Collector Current

Ordering Information (Note 5)

| Device | Packaging | Shipping |
|-------------|-----------|------------------|
| DCP56-13 | SOT-223 | 2500/Tape & Reel |
| DCP56-16-13 | SOT-223 | 2500/Tape & Reel |

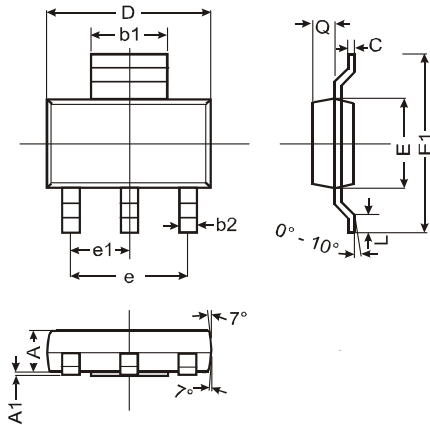
Notes: 5. For packaging details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

Marking Information



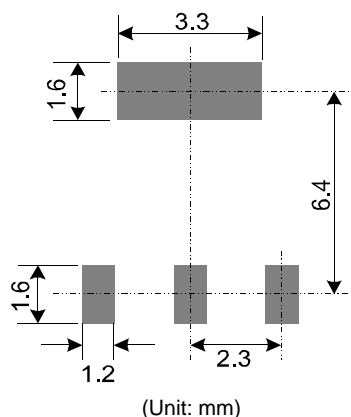
XXX = Product Type Marking Code ex. N18 = DCP56
N18-16 = DCP56-16
 $\text{D}||$ = Manufacturer's Marking Code
YWW = Date Code Marking
Y = Last Digit of Year ex: 7 = 2007
WW = Week Code 01-52

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)**IMPORTANT NOTICE**

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