

Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from Europe, America and south Asia, supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of "Quality Parts, Customers Priority, Honest Operation, and Considerate Service", our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip, ALPS, ROHM, Xilinx, Pulse, ON, Everlight and Freescale. Main products comprise IC, Modules, Potentiometer, IC Socket, Relay, Connector. Our parts cover such applications as commercial, industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



Contact us

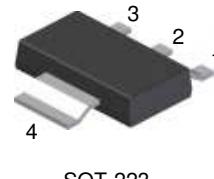
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Features

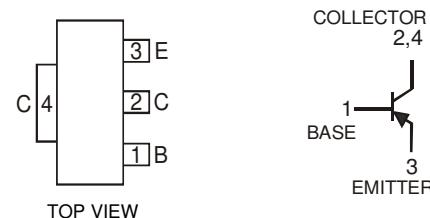
- Epitaxial Planar Die Construction
- Complementary NPN Type Available (DCP54)
- Ideally Suited for Automated Assembly Processes
- Ideal for Medium Power Switching or Amplification Applications
- Lead Free By Design/ROHS Compliant (Note 1)
- "Green" Device (Note 2)



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



Schematic and Pin Configuration

Maximum Ratings

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

| Characteristic | Symbol | Value | Unit |
|------------------------------|-----------|-------|------|
| Collector-Base Voltage | V_{CBO} | -45 | V |
| Collector-Emitter Voltage | V_{CEO} | -45 | V |
| Emitter-Base Voltage | V_{EBO} | -5 | V |
| Peak Pulse Current | I_{CM} | -1.5 | A |
| Continuous 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 (Note 3) | W |
| Operating and Storage Temperature Range | T_j, T_{STG} | -55 to +150 | °C |
| Thermal Resistance Junction to Ambient Air @ $T_A = 25^\circ\text{C}$ (Note 3) | $R_{\theta JA}$ | 125 | °C/W |

Electrical Characteristics

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

| Characteristic | Symbol | Min | Typ | Max | Unit | Conditions |
|--------------------------------------|----------------------|-----|-----|------|---------------|--|
| OFF CHARACTERISTICS (Note 4) | | | | | | |
| Collector-Base Breakdown Voltage | $V_{(BR)CBO}$ | -45 | — | — | V | $I_C = -100\mu\text{A}, I_E = 0\text{A}$ |
| Collector-Emitter Breakdown Voltage | $V_{(BR)CEO}$ | -45 | — | — | V | $I_C = -10\text{mA}, I_B = 0\text{A}$ |
| Emitter-Base Breakdown Voltage | $V_{(BR)EBO}$ | -5 | — | — | V | $I_E = -10\mu\text{A}, I_C = 0\text{A}$ |
| Collector Cut-Off Current | I_{CBO} | — | — | -100 | nA | $V_{CB} = -30\text{V}, I_E = 0\text{A}$ |
| | | — | — | -10 | μA | $V_{CB} = -30\text{V}, I_E = 0\text{A}, T_A = 150^\circ\text{C}$ |
| Emitter Cut-Off Current | I_{EBO} | — | — | -10 | μA | $V_{EB} = -5\text{V}, I_C = 0\text{A}$ |
| ON CHARACTERISTICS (Note 4) | | | | | | |
| Collector-Emitter Saturation Voltage | $V_{CE(\text{SAT})}$ | — | — | -0.5 | V | $I_C = -500\text{mA}, I_B = -50\text{mA}$ |
| Base-Emitter Turn-On Voltage | $V_{BE(\text{ON})}$ | — | — | -1.0 | V | $I_C = -500\text{mA}, V_{CE} = -2\text{V}$ |
| DC Current Gain DCP51-16 | h_{FE} | 40 | — | 250 | — | $I_C = -150\text{mA}, V_{CE} = -2\text{V}$ |
| | | 25 | — | — | | $I_C = -500\text{mA}, V_{CE} = -2\text{V}$ |
| | | 100 | — | 250 | | $I_C = -150\text{mA}, V_{CE} = -2\text{V}$ |
| SMALL SIGNAL CHARACTERISTICS | | | | | | |
| Transition Frequency | f_T | — | 200 | — | MHz | $I_C = -50\text{mA}, V_{CE} = -5\text{V}, f = 100\text{MHz}$ |

Note:

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 on 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 = 300 μs . Duty cycle $\leq 2\%$

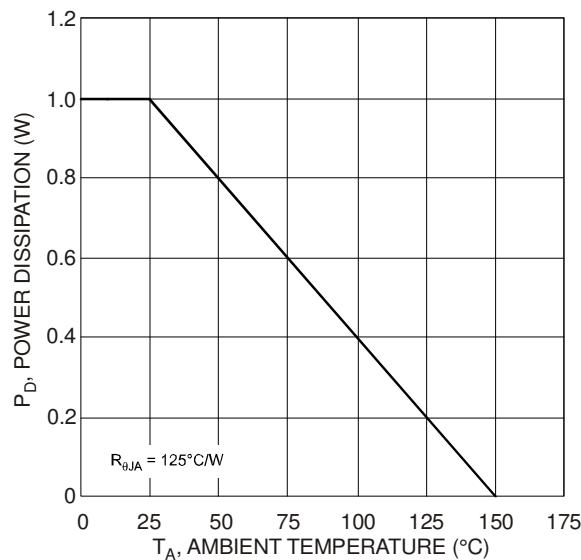


Fig. 1 Power Dissipation vs. Ambient Temperature (Note 3)

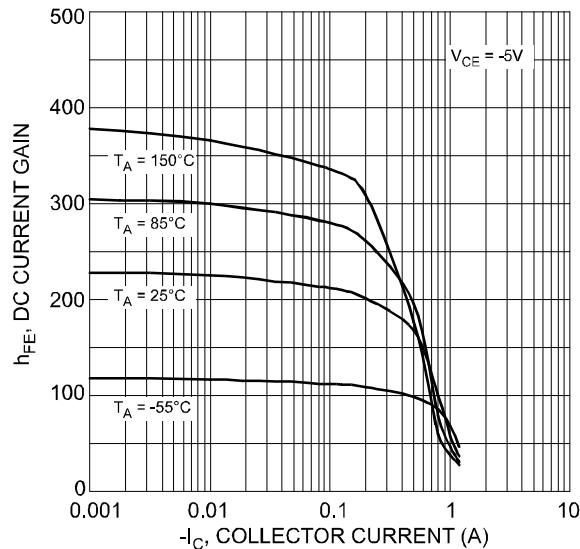


Fig. 3 Typical DC Current Gain vs. Collector Current

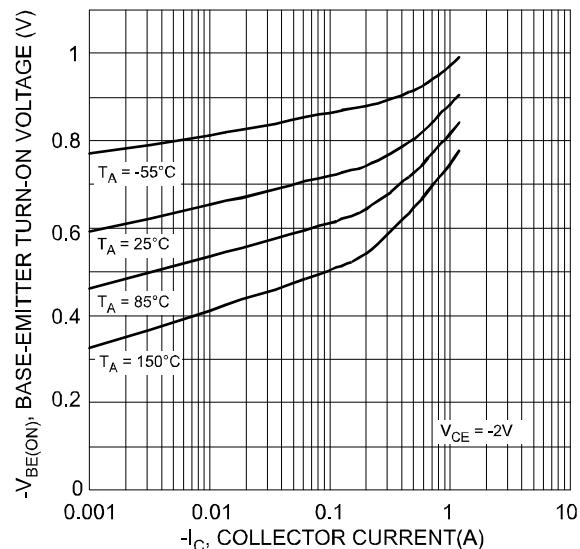


Fig. 5. Typical Base-Emitter Turn-On Voltage vs. Collector Current

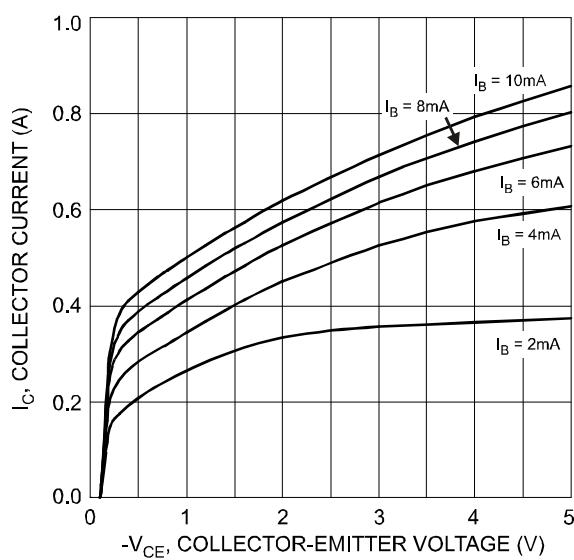


Fig. 2 Typical Collector Current vs. Collector-Emitter Voltage

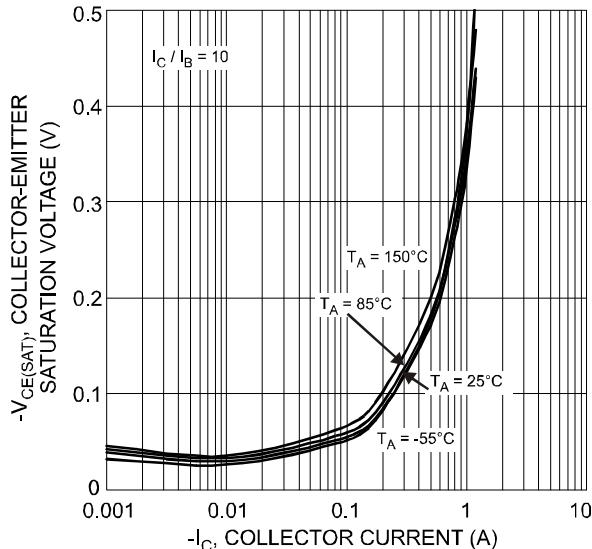


Fig. 4 Typical Collector-Emitter Saturation Voltage vs. Collector Current

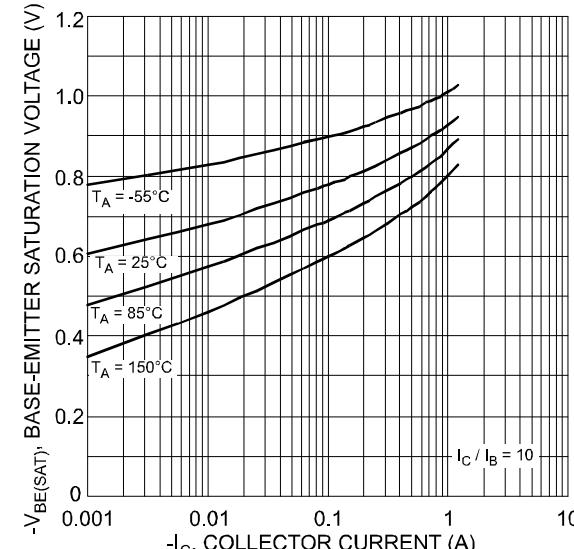


Fig. 6 Typical Base-Emitter Saturation Voltage vs. Collector Current

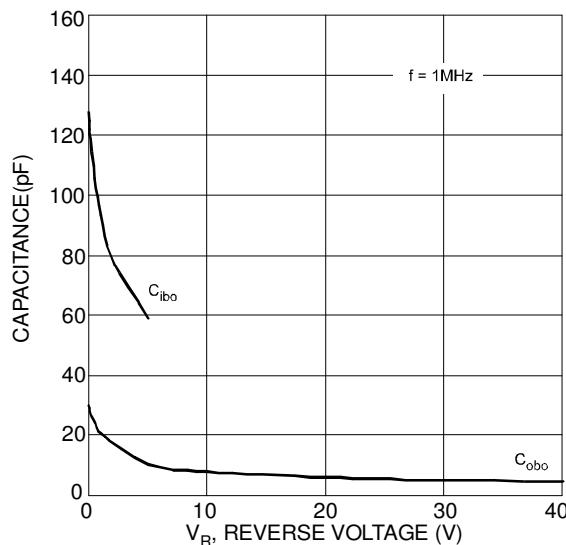


Fig. 7 Typical Capacitance Characteristics

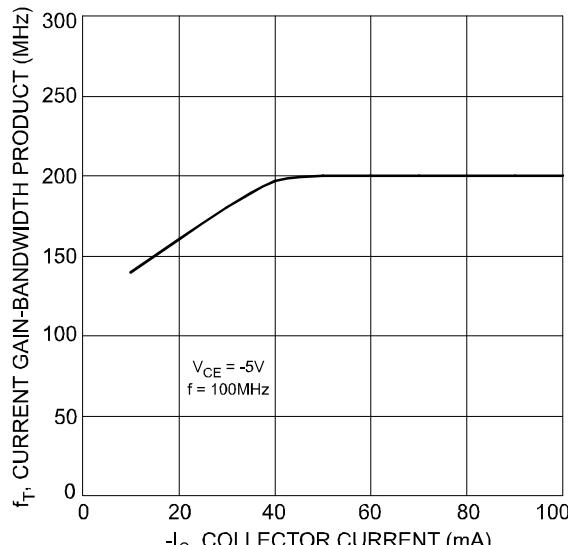


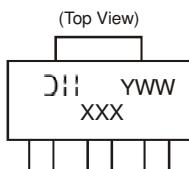
Fig. 8 Typical Gain-Bandwidth Product vs. Collector Current

Ordering Information (Note 5)

| Part Number | Case | Packaging |
|-------------|---------|--------------------|
| DCP51-13 | SOT-223 | 2500 / Tape & Reel |
| DCP51-16-13 | SOT-223 | 2500 / Tape & Reel |

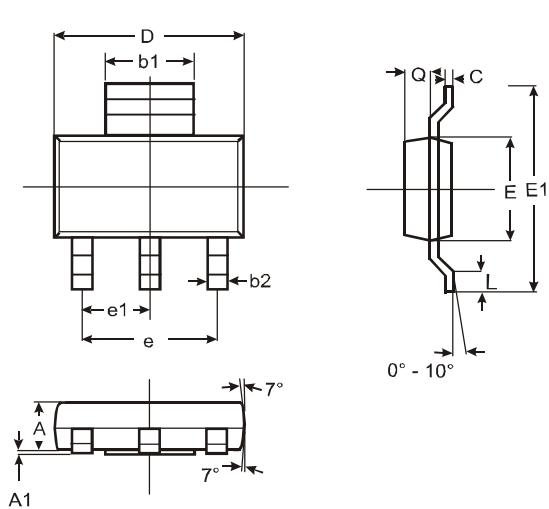
Notes: 5. For packaging details, please visit our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

Marking Information

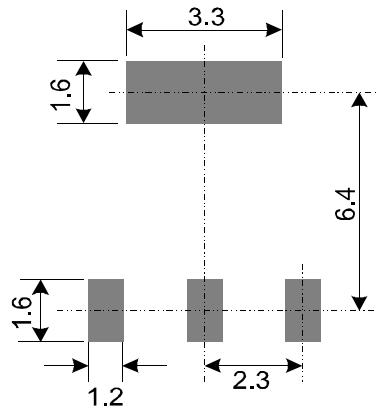


DII = Manufacturer's code marking
XXX = Product type marking code Ex: P14 = DCP51
P14-16 = DCP51-16
YWW = Date code marking
Y = Last digit of year ex: 7 = 2007
WW = Week code 01 - 52

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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