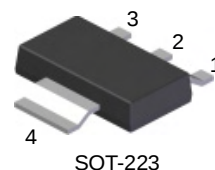


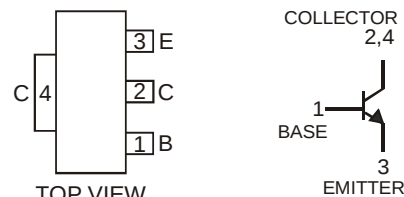
## Features

- Epitaxial Planar Die Construction
- Complementary PNP Type Available (DCP69A)
- 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)



## 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



## Maximum Ratings @T<sub>A</sub> = 25°C unless otherwise specified

| Characteristic            | Symbol           | Value | Units |
|---------------------------|------------------|-------|-------|
| Collector-Base Voltage    | V <sub>CBO</sub> | 25    | V     |
| Collector-Emitter Voltage | V <sub>CEO</sub> | 20    | V     |
| Emitter-Base Voltage      | V <sub>EBO</sub> | 5.0   | V     |
| Collector Current         | I <sub>C</sub>   | 1.0   | A     |

## Thermal Characteristics

| Characteristic                                                               | Symbol                            | Value      | Unit |
|------------------------------------------------------------------------------|-----------------------------------|------------|------|
| Power Dissipation @ T <sub>A</sub> = 25°C (Note 3)                           | P <sub>d</sub>                    | 1          | W    |
| Thermal Resistance, Junction to Ambient Air @ T <sub>A</sub> = 25°C (Note 3) | R <sub>θJA</sub>                  | 125        | °C/W |
| Operating and Storage Temperature Range                                      | T <sub>j</sub> , T <sub>STG</sub> | -55 to 150 | °C   |

## Electrical Characteristics @T<sub>A</sub> = 25°C unless otherwise specified

| Characteristic                       | Symbol               | Min            | Typ         | Max           | Unit | Test Condition                                                                                                                                   |
|--------------------------------------|----------------------|----------------|-------------|---------------|------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>OFF CHARACTERISTICS (Note 4)</b>  |                      |                |             |               |      |                                                                                                                                                  |
| Collector-Emitter Breakdown Voltage  | V <sub>(BR)CES</sub> | 25             | —           | —             | V    | I <sub>C</sub> = 100μA, I <sub>E</sub> = 0                                                                                                       |
| Collector-Emitter Breakdown Voltage  | V <sub>(BR)CEO</sub> | 20             | —           | —             | V    | I <sub>C</sub> = 1.0mA, I <sub>B</sub> = 0                                                                                                       |
| Collector-Base Breakdown Voltage     | V <sub>(BR)CBO</sub> | 25             | —           | —             | V    | I <sub>C</sub> = 10μA, I <sub>E</sub> = 0                                                                                                        |
| Emitter-Base Breakdown Voltage       | V <sub>(BR)EBO</sub> | 5.0            | —           | —             | V    | I <sub>E</sub> = 10μA, I <sub>C</sub> = 0                                                                                                        |
| Collector-Base Cutoff Current        | I <sub>CBO</sub>     | —              | —           | 100           | nA   | V <sub>CB</sub> = 25V, I <sub>E</sub> = 0                                                                                                        |
| Emitter-Base Cutoff Current          | I <sub>EBO</sub>     | —              | —           | 10            | μA   | V <sub>EB</sub> = 5.0V, I <sub>C</sub> = 0                                                                                                       |
| <b>ON CHARACTERISTICS (Note 4)</b>   |                      |                |             |               |      |                                                                                                                                                  |
| DC Current Gain                      | h <sub>FE</sub>      | 50<br>85<br>60 | —<br>—<br>— | —<br>375<br>— | —    | I <sub>C</sub> = 5.0mA, V <sub>CE</sub> = 10V<br>I <sub>C</sub> = 500mA, V <sub>CE</sub> = 1.0V<br>I <sub>C</sub> = 1.0A, V <sub>CE</sub> = 1.0V |
| Collector-Emitter Saturation Voltage | V <sub>CE(SAT)</sub> | —              | —           | 0.5           | V    | I <sub>C</sub> = 1.0A, I <sub>B</sub> = 100mA                                                                                                    |
| Base-Emitter Turn-On Voltage         | V <sub>BE(ON)</sub>  | —              | —           | 1.0           | V    | I <sub>C</sub> = 1.0A, V <sub>CE</sub> = 1.0V                                                                                                    |
| <b>SMALL SIGNAL CHARACTERISTICS</b>  |                      |                |             |               |      |                                                                                                                                                  |
| Current Gain-Bandwidth Product       | f <sub>T</sub>       | —              | 330         | —             | MHz  | I <sub>C</sub> = 100mA, V <sub>CE</sub> = 5.0V<br>f = 100MHz                                                                                     |

- 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](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 = 300μs. Duty cycle ≤2%.

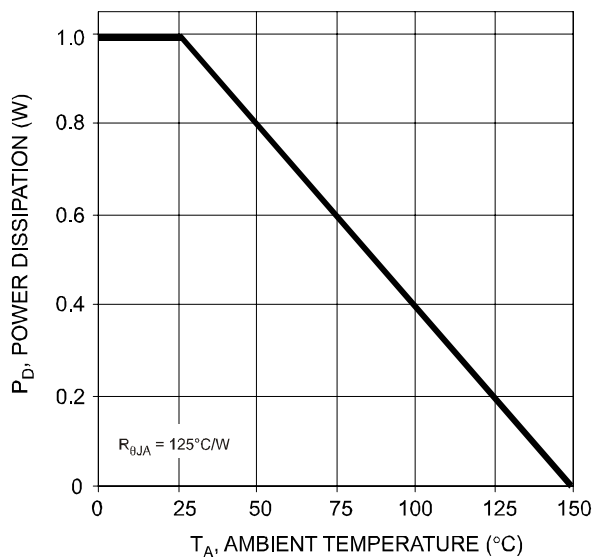


Fig. 1 Power Dissipation vs. Ambient Temperature

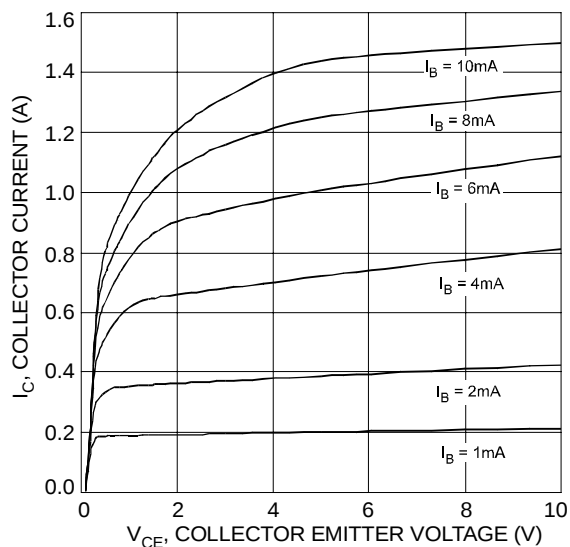


Fig. 2 Typical Collector Current vs. Collector Emitter Voltage

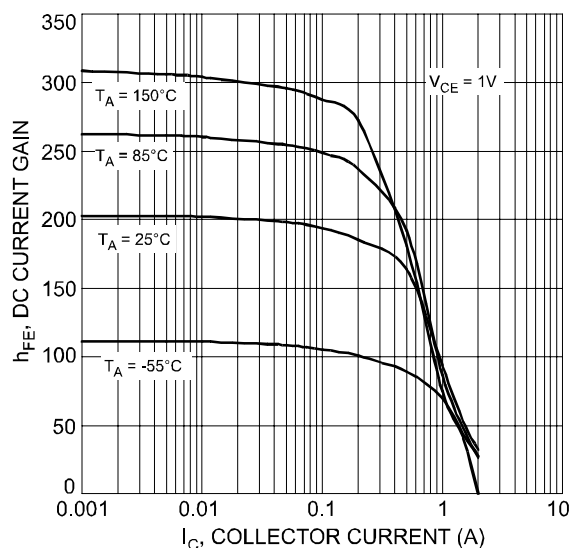


Fig. 3 Typical DC Current Gain vs. Collector Current

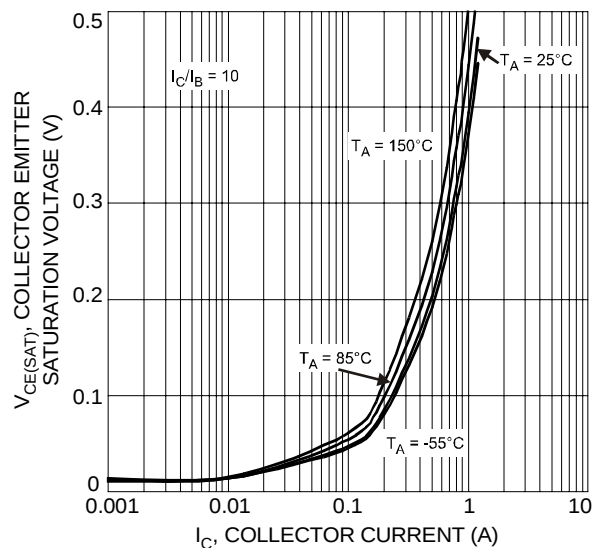


Fig. 4 Typical Collector Emitter Saturation Voltage vs. Collector Current

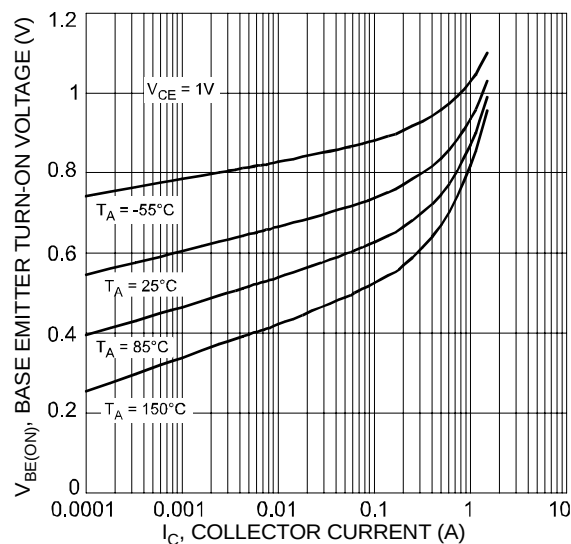


Fig. 5 Typical Base Emitter Turn-On Voltage vs. Collector Current

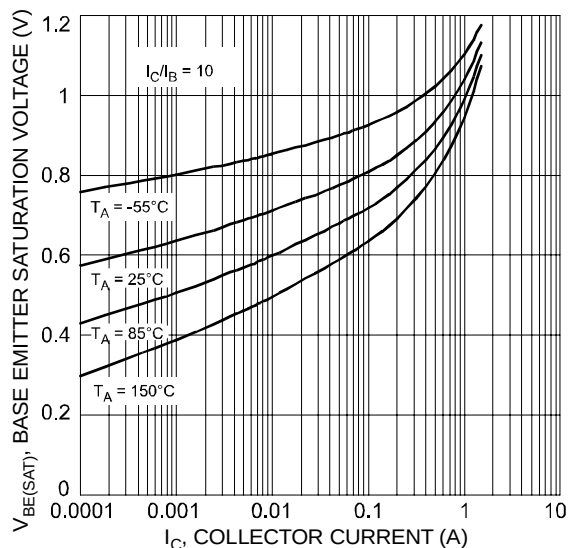


Fig. 6 Typical Base Emitter Saturation Voltage vs. Collector Current

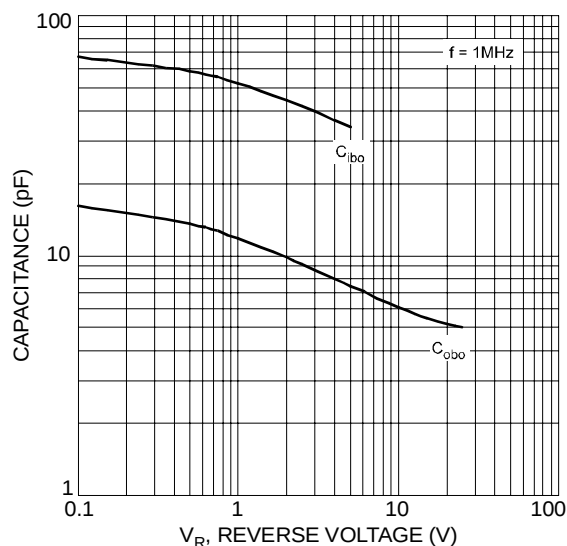


Fig. 7 Typical Capacitance Characteristics

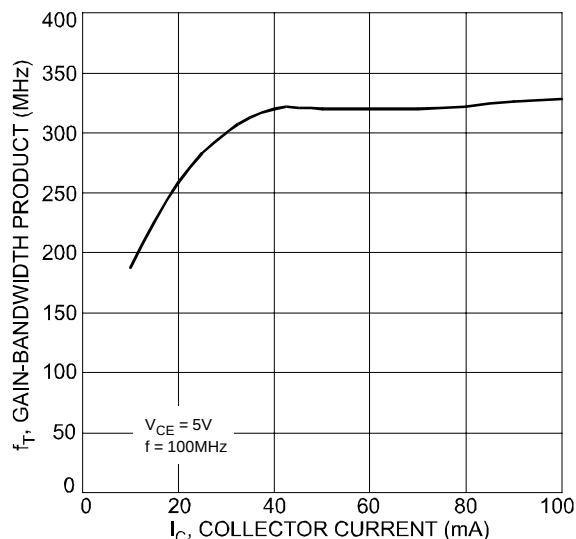


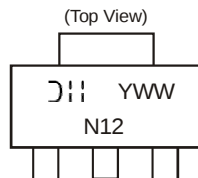
Fig. 8 Typical Gain-Bandwidth Product vs. Collector Current

## Ordering Information (Note 5)

| Device   | Packaging | Shipping         |
|----------|-----------|------------------|
| DCP68-13 | SOT-223   | 2500/Tape & Reel |

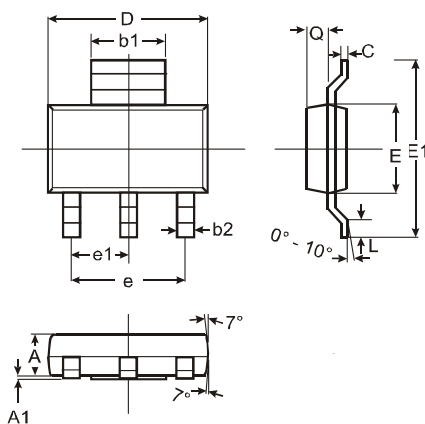
Notes: 5. For packaging details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

## Marking Information

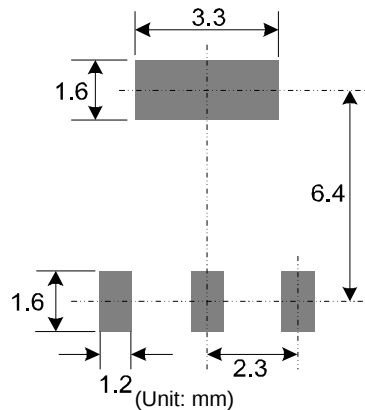


N12 = Product Type Marking Code  
YWW = Date Code Marking  
Y = Last digit of year ex: 7 = 2007  
WW = Week code 01 - 52

## 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: (Based on IPC-SM-782)****IMPORTANT NOTICE**

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