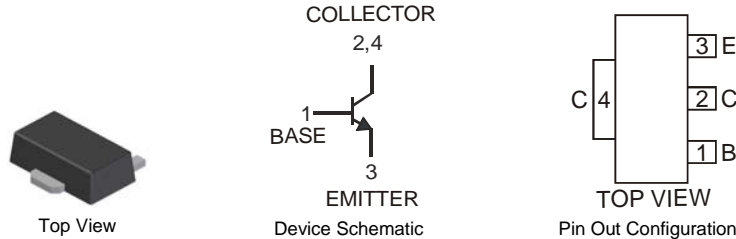


Features

- 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)**

Mechanical Data

- Case: SOT89-3L
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020D
- Terminals: Finish — Matte Tin annealed over Copper leadframe (Lead Free Plating). Solderable per MIL-STD-202, Method 208
- Marking Information: See Page 3
- Ordering Information: See Page 3
- Weight: 0.072 grams (approximate)



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

| Characteristic | Symbol | Value | Unit |
|------------------------------|-----------|-------|------|
| Collector-Base Voltage | V_{CBO} | 15 | V |
| Collector-Emitter Voltage | V_{CEO} | 12 | V |
| Emitter-Base Voltage | V_{EBO} | 6 | V |
| Peak Pulse Current | I_{CM} | 6 | A |
| Continuous Collector Current | I_C | 3 | A |

Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|---|-----------------|-------------|--------------------|
| Power Dissipation (Note 3) @ $T_A = 25^\circ\text{C}$ | P_D | 0.9 | W |
| Thermal Resistance, Junction to Ambient Air (Note 3) @ $T_A = 25^\circ\text{C}$ | $R_{\theta JA}$ | 139 | $^\circ\text{C/W}$ |
| Power Dissipation (Note 4) @ $T_A = 25^\circ\text{C}$ | P_D | 2 | W |
| Thermal Resistance, Junction to Ambient Air (Note 4) @ $T_A = 25^\circ\text{C}$ | $R_{\theta JA}$ | 62.5 | $^\circ\text{C/W}$ |
| Operating and Storage Temperature Range | T_J, T_{STG} | -55 to +150 | $^\circ\text{C}$ |

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

| Characteristic | Symbol | Min | Typ | Max | Unit | Conditions |
|--|---------------|-----|-----|-----|---------------|---|
| OFF CHARACTERISTICS | | | | | | |
| Collector-Base Breakdown Voltage | $V_{(BR)CBO}$ | 15 | — | — | V | $I_C = 10\mu\text{A}, I_E = 0$ |
| Collector-Emitter Breakdown Voltage (Note 5) | $V_{(BR)CEO}$ | 12 | — | — | V | $I_C = 1\text{mA}, I_B = 0$ |
| Emitter-Base Breakdown Voltage | $V_{(BR)EBO}$ | 6 | — | — | V | $I_E = 10\mu\text{A}, I_C = 0$ |
| Collector Cut-Off Current | I_{CBO} | — | — | 0.1 | μA | $V_{CB} = 15\text{V}, I_E = 0$ |
| Emitter Cut-Off Current | I_{EBO} | — | — | 0.1 | μA | $V_{EB} = 6\text{V}, I_C = 0$ |
| ON CHARACTERISTICS (Note 5) | | | | | | |
| Collector-Emitter Saturation Voltage | $V_{CE(SAT)}$ | — | 90 | 250 | mV | $I_C = 1.5\text{A}, I_B = 30\text{mA}$ |
| DC Current Gain | h_{FE} | 270 | — | 680 | — | $V_{CE} = 2\text{V}, I_C = 500\text{mA}$ |
| SMALL SIGNAL CHARACTERISTICS | | | | | | |
| Output Capacitance | C_{obo} | — | 26 | — | pF | $V_{CB} = 10\text{V}, I_E = 0, f = 1\text{MHz}$ |
| Current Gain-Bandwidth Product | f_T | — | 170 | — | MHz | $V_{CE} = 2\text{V}, I_C = 100\text{mA}, f = 100\text{MHz}$ |

- 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 with minimum recommended pad layout.
 4. Device mounted on FR-4 PCB with 1 inch² copper pad layout.
 5. Measured under pulsed conditions. Pulse width = 300 μs . Duty cycle $\leq 2\%$.

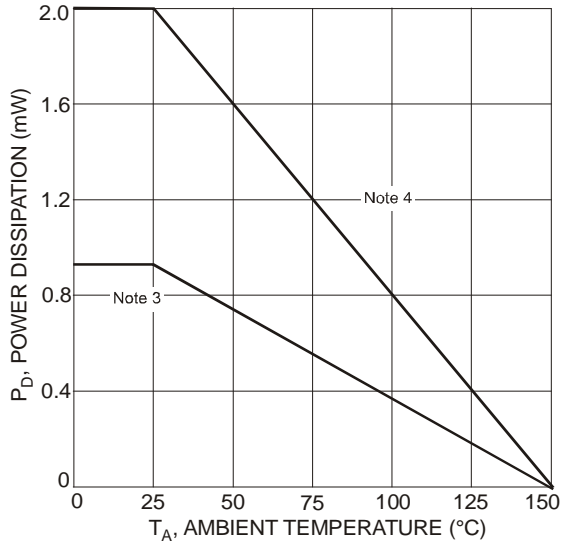


Fig. 1 Power Dissipation vs. Ambient Temperature

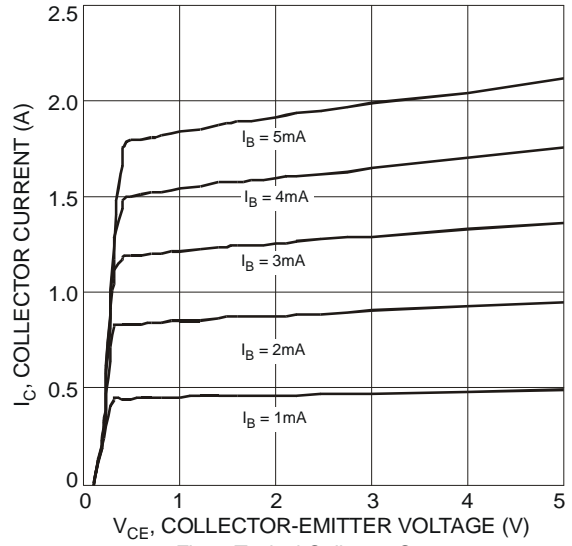


Fig. 2 Typical Collector Current vs. Collector-Emitter Voltage

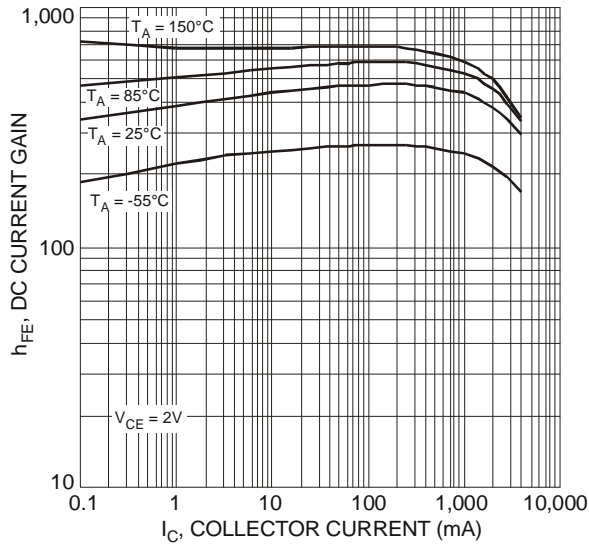


Fig. 3 Typical DC Current Gain vs. Collector Current

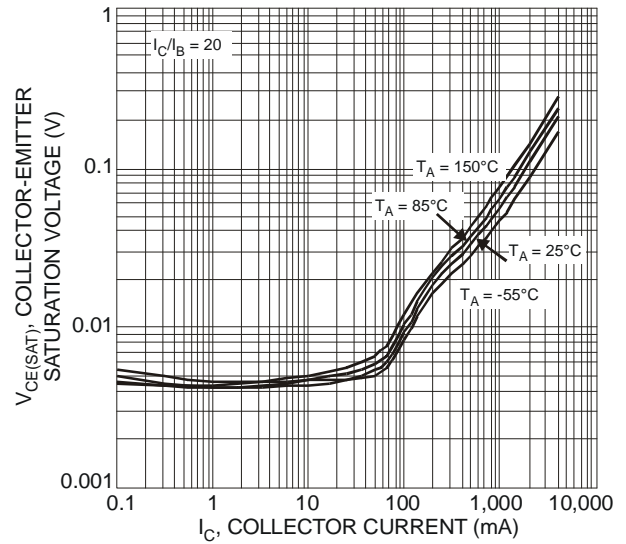


Fig. 4 Typical Collector-Emitter Saturation Voltage vs. Collector Current

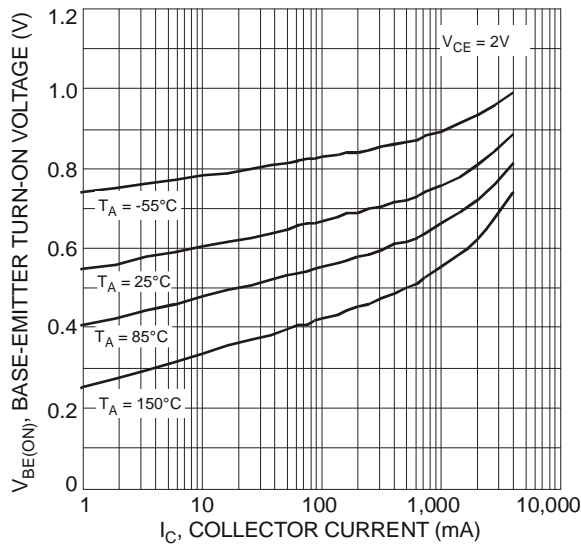


Fig. 5 Typical Base-Emitter Turn-On Voltage vs. Collector Current

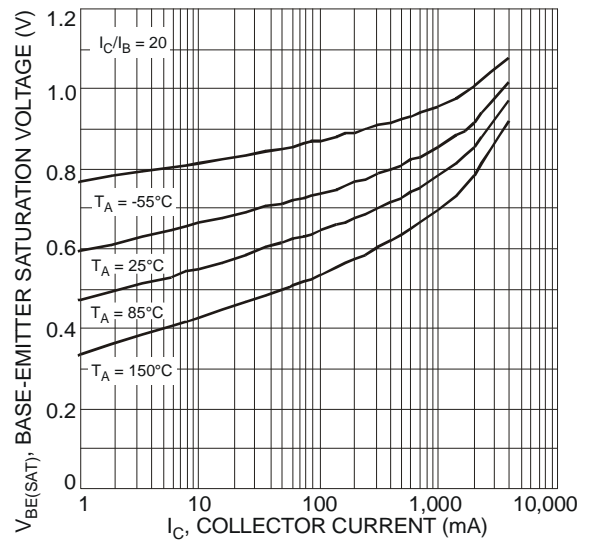


Fig. 6 Typical Base-Emitter Saturation Voltage vs. Collector Current

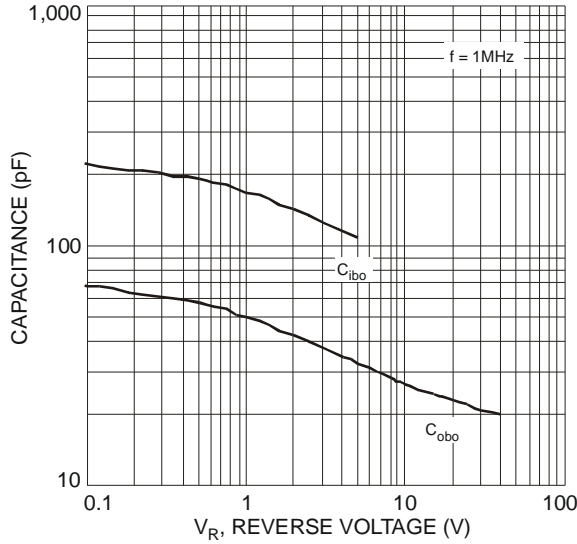


Fig. 7 Typical Capacitance Characteristics

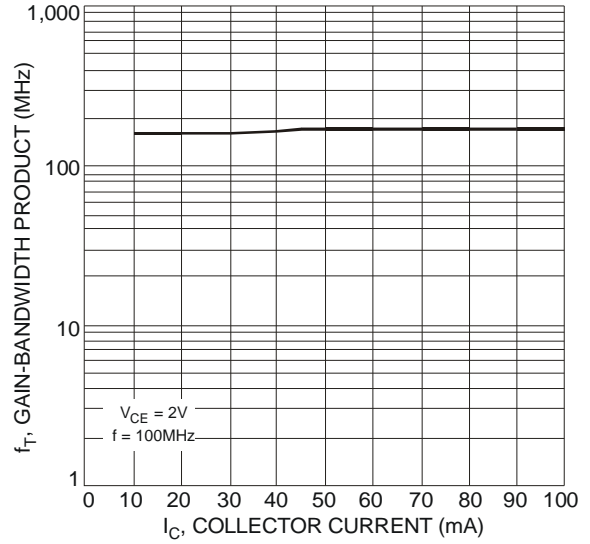


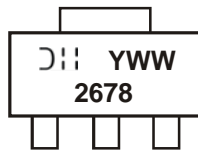
Fig. 8 Typical Gain-Bandwidth Product vs. Collector Current

Ordering Information (Note 6)

| Part Number | Case | Packaging |
|-------------|----------|------------------|
| 2DD2678-13 | SOT89-3L | 2500/Tape & Reel |

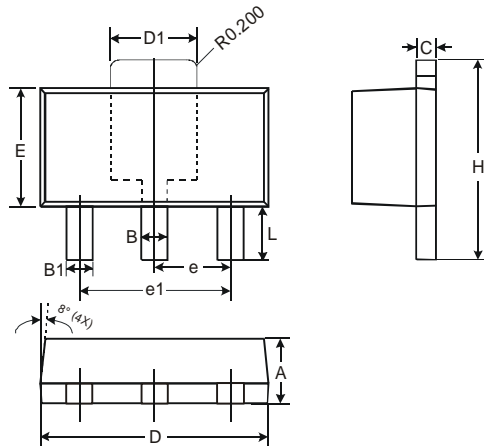
Notes: 6. For packaging details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

Marking Information



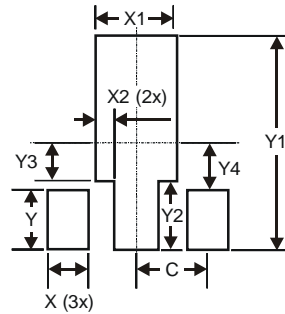
2678 = Product Type Marking Code
 YWW = Date Code Marking
 Y = Last digit of year (ex: 8 = 2008)
 WW = Week code (01 – 53)

Package Outline Dimensions



| SOT89-3L | | |
|----------------------|----------|------|
| Dim | Min | Max |
| A | 1.40 | 1.60 |
| B | 0.44 | 0.62 |
| B1 | 0.35 | 0.54 |
| C | 0.35 | 0.43 |
| D | 4.40 | 4.60 |
| D1 | 1.52 | 1.83 |
| E | 2.29 | 2.60 |
| e | 1.50 Typ | |
| e1 | 3.00 Typ | |
| H | 3.94 | 4.25 |
| L | 0.89 | 1.20 |
| All Dimensions in mm | | |

Suggested Pad Layout



| Dimensions | Value (in mm) |
|------------|---------------|
| X | 0.900 |
| X1 | 1.733 |
| X2 | 0.416 |
| Y | 1.300 |
| Y1 | 4.600 |
| Y2 | 1.475 |
| Y3 | 0.950 |
| Y4 | 1.125 |
| C | 1.500 |

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