

Features

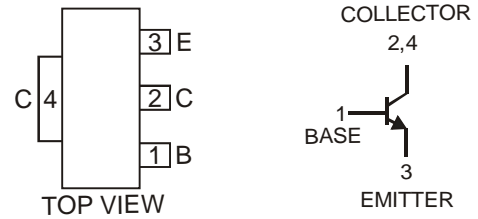
- Epitaxial Planar Die Construction
- Low Collector-Emitter Saturation Resistance $R_{CE(SAT)} = 75m\Omega$ at 4A
- Complementary PNP Type Available (2DB1386)
- Ideally Suited for Automated Assembly Processes
- Ideal for Medium Power Switching or Amplification Applications
- **Lead Free By Design/RoHS Compliant (Note 1)**
- **"Green" Device (Note 2)**



SOT89-3L

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)



Schematic and Pin Configuration

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

| Characteristic | Symbol | Value | Unit |
|------------------------------|-----------|-------|------|
| Collector-Base Voltage | V_{CBO} | 50 | V |
| Collector-Emitter Voltage | V_{CEO} | 20 | V |
| Emitter-Base Voltage | V_{EBO} | 6 | V |
| Peak Pulse Current | I_{CM} | 10 | A |
| Continuous Collector Current | I_C | 5 | A |

Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|---|-----------------|-------------|--------------|
| Power Dissipation (Note 3) @ $T_A = 25^\circ C$ | P_D | 1 | W |
| Thermal Resistance, Junction to Ambient Air (Note 3) @ $T_A = 25^\circ C$ | $R_{\theta JA}$ | 125 | $^\circ C/W$ |
| Operating and Storage Temperature Range | T_J, T_{STG} | -55 to +150 | $^\circ C$ |

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

| Characteristic | Symbol | Min | Typ | Max | Unit | Conditions |
|--------------------------------------|---------------|-----|-----|-----|---------|--|
| OFF CHARACTERISTICS (Note 4) | | | | | | |
| Collector-Base Breakdown Voltage | $V_{(BR)CBO}$ | 50 | — | — | V | $I_C = 50\mu A, I_E = 0$ |
| Collector-Emitter Breakdown Voltage | $V_{(BR)CEO}$ | 20 | — | — | V | $I_C = 1mA, I_B = 0$ |
| Emitter-Base Breakdown Voltage | $V_{(BR)EBO}$ | 6 | — | — | V | $I_E = 50\mu A, I_C = 0$ |
| Collector Cut-Off Current | I_{CBO} | — | — | 0.5 | μA | $V_{CB} = 40V, I_E = 0$ |
| Emitter Cut-Off Current | I_{EBO} | — | — | 0.5 | μA | $V_{EB} = 5V, I_C = 0$ |
| ON CHARACTERISTICS (Note 4) | | | | | | |
| Collector-Emitter Saturation Voltage | $V_{CE(SAT)}$ | — | 0.3 | 1.0 | V | $I_C = 4A, I_B = 0.1A$ |
| DC Current Gain | h_{FE} | 180 | — | 390 | — | $I_C = 0.5A, V_{CE} = 2V$ |
| SMALL SIGNAL CHARACTERISTICS | | | | | | |
| Transition Frequency | f_T | — | 220 | — | MHz | $V_{CE} = 6V, I_E = -50mA, f = 100MHz$ |
| Output Capacitance | C_{ob} | — | 14 | — | pF | $V_{CB} = 20V, I_E = 0, f = 1MHz$ |

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

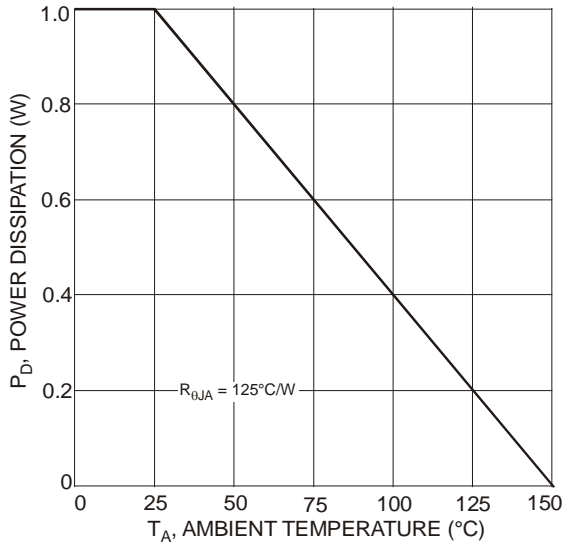


Fig. 1 Power Dissipation vs. Ambient Temperature (Note 3)

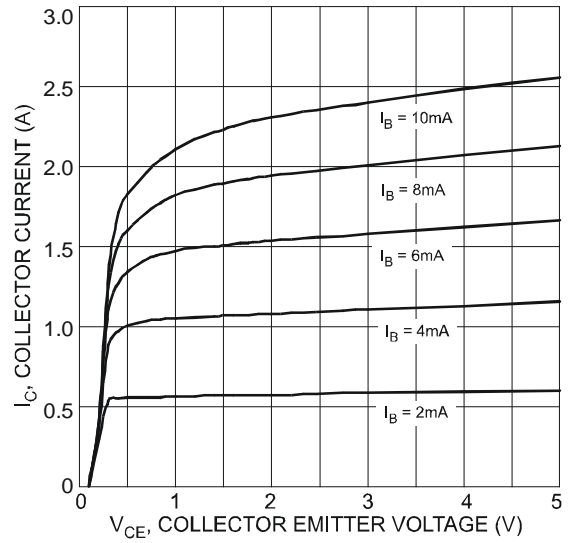


Fig. 2 Typical Collector Current vs. Collector-Emitter Voltage

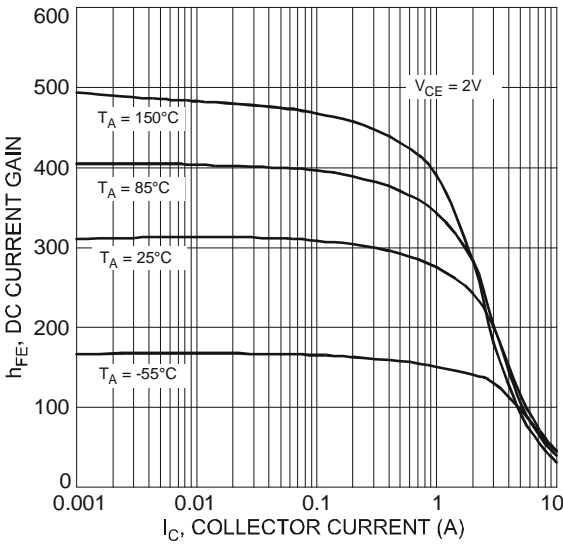


Fig. 3 Typical DC Current Gain vs. Collector Current

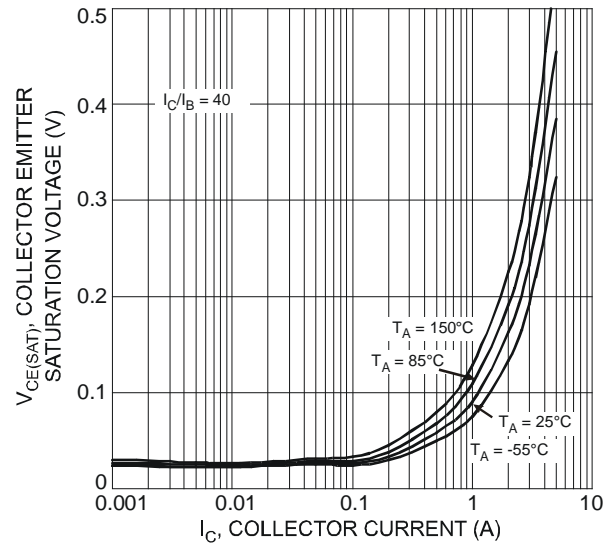


Fig. 4 Typical Collector-Emitter Saturation Voltage vs. Collector Current

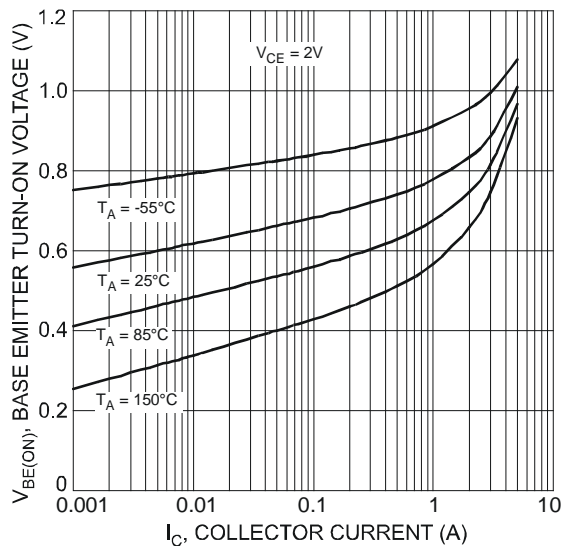


Fig. 5 Typical Base-Emitter Turn-On Voltage vs. Collector Current

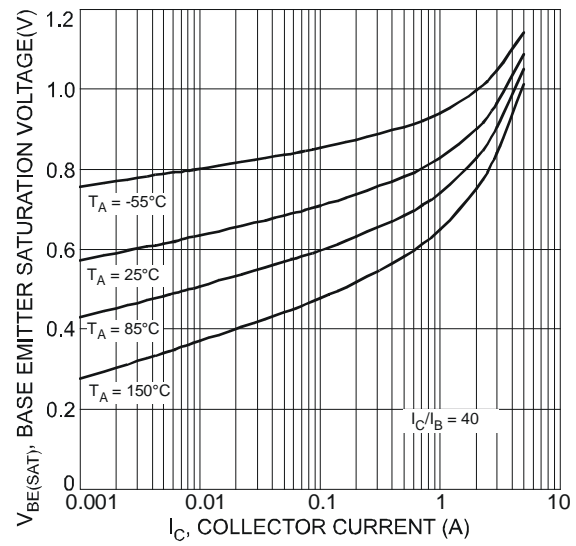


Fig. 6 Typical Base-Emitter Saturation Voltage vs. Collector Current

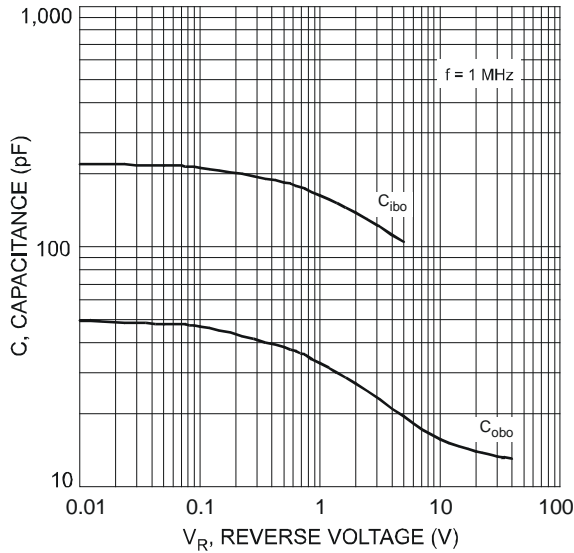


Fig. 7 Typical Junction Capacitance Characteristics

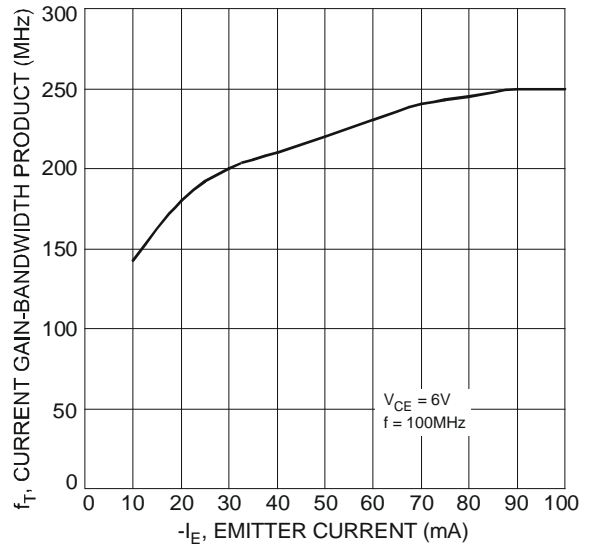


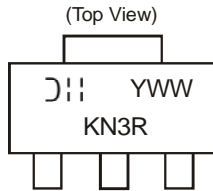
Fig. 8 Typical Gain-Bandwidth Product vs. Emitter Current

Ordering Information (Note 5)

| Device | Packaging | Shipping |
|-------------|-----------|------------------|
| 2DD2098R-13 | SOT89-3L | 2500/Tape & Reel |

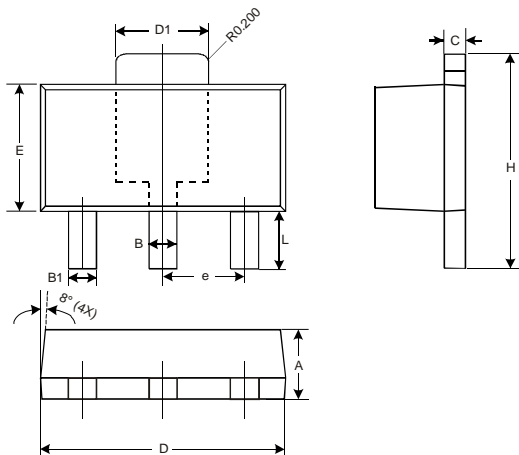
Notes: 5. For packaging details, please see below or go to our website at <http://www.diodes.com/ap02007.pdf>.

Marking Information



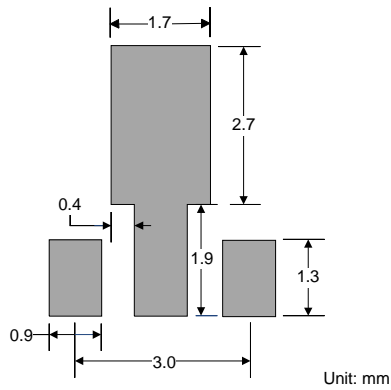
KN3R = Product Type Marking Code
 DII = Manufacturer's Marking Code
 YWW = Date Code Marking
 Y = Last digit of year ex: 7 = 2007
 WW = Week code 01 - 52

Package Outline Dimensions



| SOT89-3L | | | |
|----------------------|------|------|------|
| Dim | Min | Max | Typ |
| A | 1.40 | 1.60 | 1.50 |
| B | 0.45 | 0.55 | 0.50 |
| B1 | 0.37 | 0.47 | 0.42 |
| C | 0.35 | 0.43 | 0.38 |
| D | 4.40 | 4.60 | 4.50 |
| D1 | 1.50 | 1.70 | 1.60 |
| E | 2.40 | 2.60 | 2.50 |
| e | — | — | 1.50 |
| H | 3.95 | 4.25 | 4.10 |
| L | 0.90 | 1.20 | 1.05 |
| All Dimensions in mm | | | |

Suggested Pad Layout



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Наши контакты:

Телефон: +7 812 627 14 35

Электронная почта: sales@st-electron.ru

Адрес: 198099, Санкт-Петербург,
Промышленная ул, дом № 19, литера Н,
помещение 100-Н Офис 331