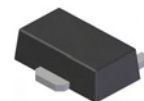


## Features

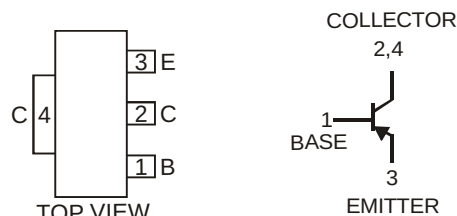
- Epitaxial Planar Die Construction
- Complementary NPN Type Available (DXT651)
- Ideally Suited for Automated Assembly Processes
- Ideal for Medium Power Switching or Amplification Applications
- **Lead Free By Design/RoHS Compliant (Note 1)**
- "Green" Device (Note 2)



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-020C
- Terminals: Finish — Matte Tin annealed over Copper leadframe  
(Lead Free Plating). Solderable per MIL-STD-202, Method 208
- Marking Information: See Page 4
- Ordering Information: See Page 4
- Weight: 0.072 grams (approximate)



Schematic and Pin Configuration

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

| Characteristic               | Symbol    | Value | Unit |
|------------------------------|-----------|-------|------|
| Collector-Base Voltage       | $V_{CBO}$ | -80   | V    |
| Collector-Emitter Voltage    | $V_{CEO}$ | -60   | V    |
| Emitter-Base Voltage         | $V_{EBO}$ | -5    | V    |
| Continuous Collector Current | $I_C$     | -3    | A    |
| Peak Pulse Collector Current | $I_{CM}$  | -6    | A    |

## Thermal Characteristics

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

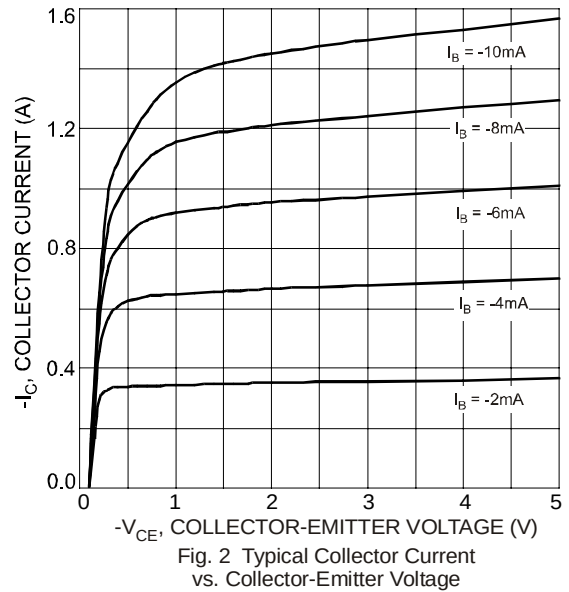
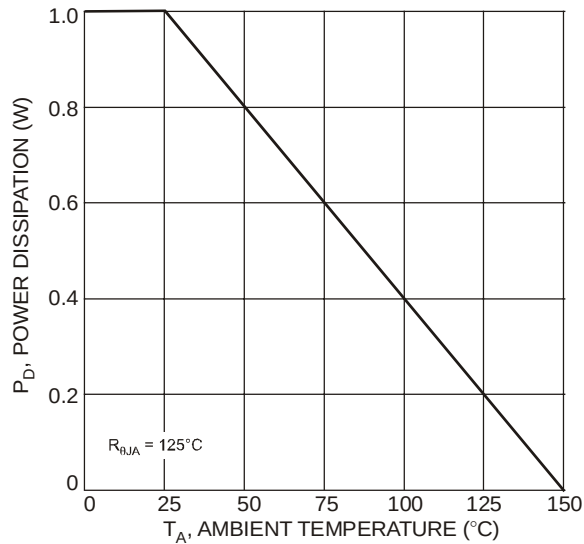
Notes:

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>.

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

| Characteristic                       | Symbol                              | Min                   | Typ                      | Max                | Unit     | Test Conditions                                                                                                                                                                               |
|--------------------------------------|-------------------------------------|-----------------------|--------------------------|--------------------|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>OFF CHARACTERISTICS (Note 4)</b>  |                                     |                       |                          |                    |          |                                                                                                                                                                                               |
| Collector-Base Breakdown Voltage     | V <sub>(BR)CBO</sub>                | -80                   | —                        | —                  | V        | I <sub>C</sub> = -100μA, I <sub>E</sub> = 0                                                                                                                                                   |
| Collector-Emitter Breakdown Voltage  | V <sub>(BR)CEO</sub>                | -60                   | —                        | —                  | V        | I <sub>C</sub> = -10mA, I <sub>B</sub> = 0                                                                                                                                                    |
| Emitter-Base Breakdown Voltage       | V <sub>(BR)EBO</sub>                | -5                    | —                        | —                  | V        | I <sub>E</sub> = -100μA, I <sub>C</sub> = 0                                                                                                                                                   |
| Collector Cutoff Current             | I <sub>CBO</sub>                    | —                     | —                        | -0.1<br>-10        | μA       | V <sub>CB</sub> = -60V, I <sub>E</sub> = 0                                                                                                                                                    |
| Emitter Cutoff Current               | I <sub>EBO</sub>                    | —                     | —                        | -0.1               | μA       | V <sub>CB</sub> = -60V, I <sub>E</sub> = 0, T <sub>A</sub> = 100°C                                                                                                                            |
| <b>ON CHARACTERISTICS (Note 4)</b>   |                                     |                       |                          |                    |          |                                                                                                                                                                                               |
| Collector-Emitter Saturation Voltage | V <sub>CE(SAT)</sub>                | —                     | -0.08<br>-0.2            | -0.3<br>-0.6       | V        | I <sub>C</sub> = -1A, I <sub>B</sub> = -100mA<br>I <sub>C</sub> = -3A, I <sub>B</sub> = -300mA                                                                                                |
| Base-Emitter Saturation Voltage      | V <sub>BE(SAT)</sub>                | —                     | -0.9                     | -1.25              | V        | I <sub>C</sub> = -1A, I <sub>B</sub> = -100mA                                                                                                                                                 |
| Base-Emitter Turn-On Voltage         | V <sub>BE(ON)</sub>                 | —                     | -0.8                     | -1                 | V        | V <sub>CE</sub> = -2V, I <sub>C</sub> = -1A                                                                                                                                                   |
| DC Current Gain                      | h <sub>FE</sub>                     | 70<br>100<br>80<br>40 | 200<br>180<br>160<br>140 | —<br>300<br>—<br>— | —        | V <sub>CE</sub> = -2V, I <sub>C</sub> = -50mA<br>V <sub>CE</sub> = -2V, I <sub>C</sub> = -500mA<br>V <sub>CE</sub> = -2V, I <sub>C</sub> = -1A<br>V <sub>CE</sub> = -2V, I <sub>C</sub> = -2A |
| <b>AC CHARACTERISTICS</b>            |                                     |                       |                          |                    |          |                                                                                                                                                                                               |
| Transition Frequency                 | f <sub>T</sub>                      | 100                   | 145                      | —                  | MHz      | V <sub>CE</sub> = -10V, I <sub>C</sub> = -50mA, f = 100MHz                                                                                                                                    |
| Output Capacitance                   | C <sub>obo</sub>                    | —                     | —                        | 30                 | pF       | V <sub>CB</sub> = -10V, f = 1MHz                                                                                                                                                              |
| Switching Times                      | t <sub>on</sub><br>t <sub>off</sub> | —<br>—                | 45<br>200                | —<br>—             | ns<br>ns | I <sub>C</sub> = -500mA, V <sub>CC</sub> = -10V<br>I <sub>B1</sub> = I <sub>B2</sub> = -50mA                                                                                                  |

Notes: 4. Measured under pulsed conditions. Pulse width = 300μs. Duty cycle ≤2%.



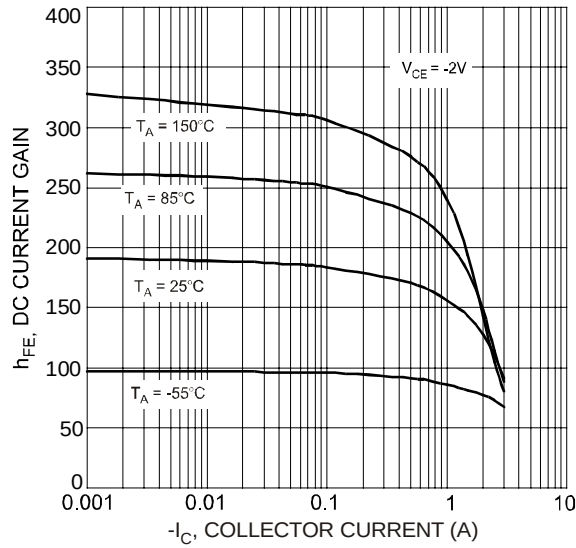


Fig. 3 Typical DC Current Gain vs. Collector Current

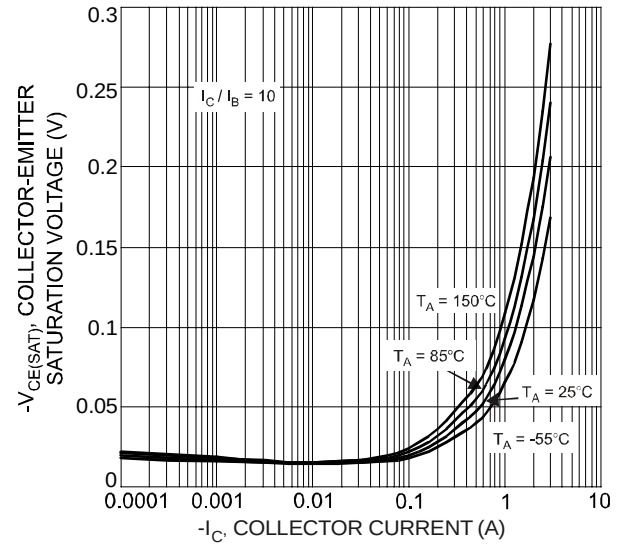


Fig. 4 Typical Collector-Emitter Saturation Voltage vs. Collector Current

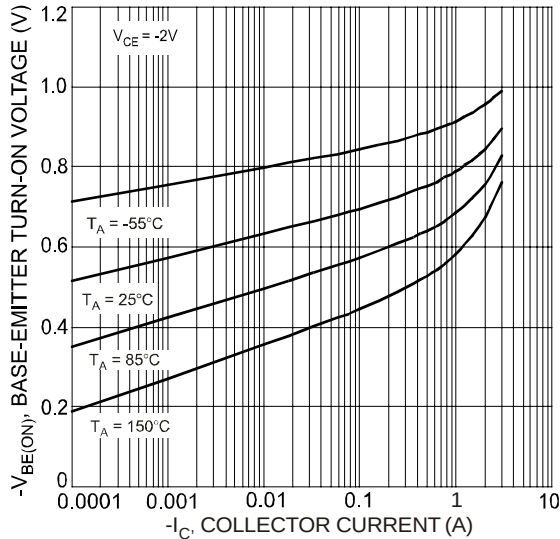


Fig. 5 Typical Base-Emitter Turn-On Voltage vs. Collector Current

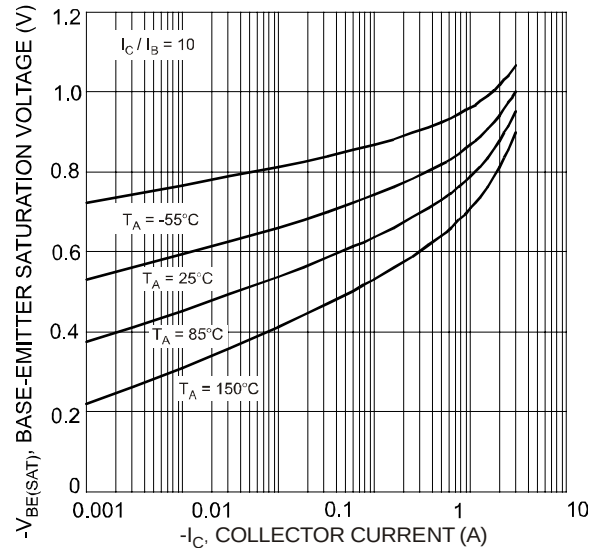


Fig. 6 Typical Base-Emitter Saturation Voltage vs. Collector Current

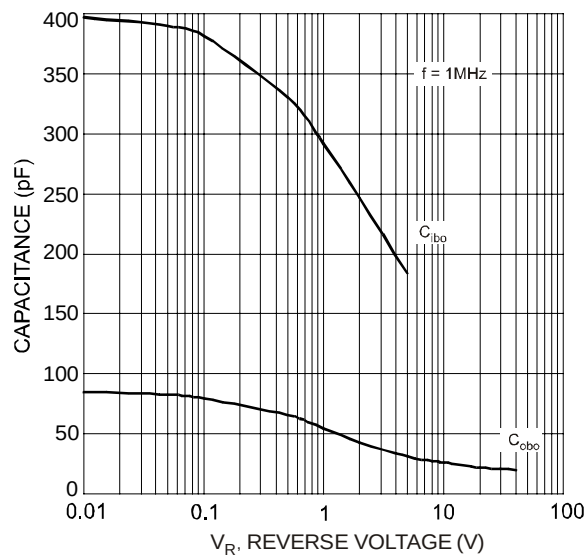


Fig. 7 Typical Capacitance Characteristics

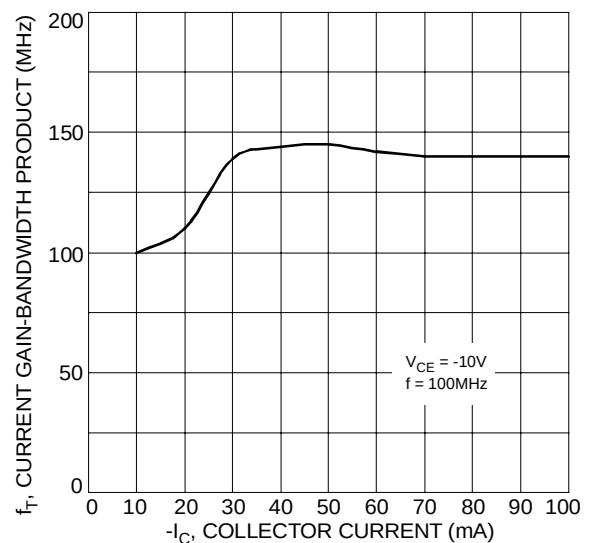


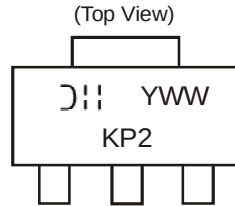
Fig. 8 Typical Gain-Bandwidth Product vs. Collector Current

## Ordering Information (Note 5)

| Device    | Packaging | Shipping         |
|-----------|-----------|------------------|
| DXT751-13 | SOT89-3L  | 2500/Tape & Reel |

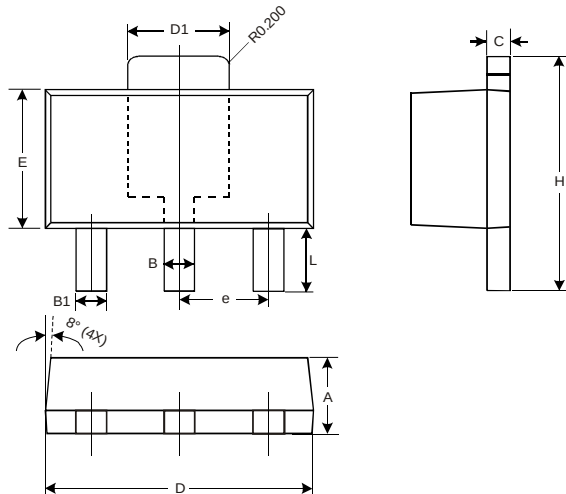
Notes: 5. For packaging details, go to our website at <http://www.diodes.com/ap02007.pdf>.

## Marking Information



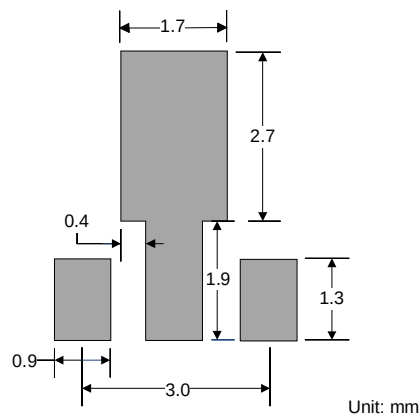
KP2 = Product Type Marking Code  
YWW = Date Code Marking  
Y = Last digit of year ex: 7 = 2007  
WW = Week code 01 - 52

## 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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