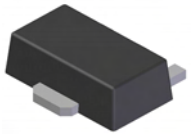
NEW PRODUCT

# DXT2222A

**NPN SURFACE MOUNT TRANSISTOR**

## Features

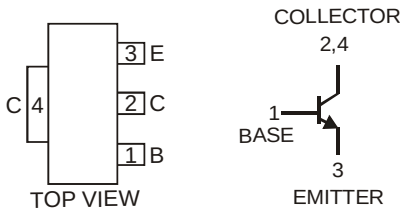
- Epitaxial Planar Die Construction
- Complementary PNP Type Available (DXT2907A)
- Ideally Suited for Automated Assembly Processes
- Ideal for Medium Power Switching or Amplification Applications
- **Lead Free By Design/RoHS Compliant (Note 1)**
- **"Green" Device (Note 2)**



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 & Type Code Information: See Page 4
- Ordering Information: See Page 4
- Weight: 0.072 grams (approximate)




Schematic and Pin Configuration

## Maximum Ratings @$T_A$ = 25°C unless otherwise specified

| Characteristic | Symbol | Value | Unit |
|---|---|---|---|
| Collector-Base Voltage | $V_{CBO}$ | 75 | V |
| Collector-Emitter Voltage | $V_{CEO}$ | 40 | V |
| Emitter-Base Voltage | $V_{EBO}$ | 6 | V |
| Peak Pulse Current | $I_{CM}$ | 800 | mA |
| Continuous Collector Current | $I_C$ | 600 | mA |

## Thermal Characteristics

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


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## Electrical Characteristics @$T_A$ = 25°C unless otherwise specified

| Characteristic | Symbol | Min | Max | Unit | Test Conditions |
|---|---|---|---|---|---|
| **OFF CHARACTERISTICS (Note 4)** | | | | | |
| Collector-Base Breakdown Voltage | $V_{(BR)CBO}$ | 75 | — | V | $I_C$ = 10μA, $I_E$ = 0 |
| Collector-Emitter Breakdown Voltage | $V_{(BR)CEO}$ | 40 | — | V | $I_C$ = 10mA, $I_B$ = 0 |
| Emitter-Base Breakdown Voltage | $V_{(BR)EBO}$ | 6.0 | — | V | $I_E$ = 10μA, $I_C$ = 0 |
| Collector Cutoff Current | $I_{CBO}$ | — | 10 | nA<br>μA | $V_{CB}$ = 60V, $I_E$ = 0<br>$V_{CB}$ = 60V, $I_E$ = 0, $T_A$ = 150°C |
| Collector Cutoff Current | $I_{CEX}$ | — | 10 | nA | $V_{CE}$ = 60V, $V_{EB(OFF)}$ = 3.0V |
| Emitter Cutoff Current | $I_{EBO}$ | — | 10 | nA | $V_{EB}$ = 3.0V, $I_C$ = 0 |
| Base Cutoff Current | $I_{BL}$ | — | 20 | nA | $V_{CE}$ = 60V, $V_{EB(OFF)}$ = 3.0V |
| **ON CHARACTERISTICS (Note 4)** | | | | | |
| DC Current Gain | $h_{FE}$ | 35<br>50<br>75<br>100<br>40<br>35<br>50 | —<br>—<br>—<br>300<br>—<br>—<br>— | — | $I_C$ = 100μA, $V_{CE}$ = 10V<br>$I_C$ = 1.0mA, $V_{CE}$ = 10V<br>$I_C$ = 10mA, $V_{CE}$ = 10V<br>$I_C$ = 150mA, $V_{CE}$ = 10V<br>$I_C$ = 500mA, $V_{CE}$ = 10V<br>$I_C$ = 10mA, $V_{CE}$ = 10V, $T_A$ = -55°C<br>$I_C$ = 150mA, $V_{CE}$ = 1.0V |
| Collector-Emitter Saturation Voltage | $V_{CE(SAT)}$ | —<br>— | 0.3<br>1.0 | V | $I_C$ = 150mA, $I_B$ = 15mA<br>$I_C$ = 500mA, $I_B$ = 50mA |
| Base-Emitter Saturation Voltage | $V_{BE(SAT)}$ | 0.6<br>— | 1.2<br>2.0 | V | $I_C$ = 150mA, $I_B$ = 15mA<br>$I_C$ = 500mA, $I_B$ = 50mA |
| **SMALL SIGNAL CHARACTERISTICS** | | | | | |
| Output Capacitance | $C_{obo}$ | — | 8 | pF | $V_{CB}$ = 10V, f = 1.0MHz, $I_E$ = 0 |
| Input Capacitance | $C_{ibo}$ | — | 25 | pF | $V_{EB}$ = 0.5V, f = 1.0MHz, $I_C$ = 0 |
| Current Gain-Bandwidth Product | $f_T$ | 300 | — | MHz | $V_{CE}$ = 20V, $I_C$ = 20mA, f = 100MHz |
| Noise Figure | NF | — | 4.0 | dB | $V_{CE}$ = 10V, $I_C$ = 150μA,<br>$R_S$ = 1.0kΩ, f = 1.0kHz |
| **SWITCHING CHARACTERISTICS** | | | | | |
| Delay Time | $t_d$ | — | 10 | ns | $V_{CC}$ = 30V, $I_C$ = 150mA, |
| Rise Time | $t_r$ | — | 25 | ns | $V_{EB(off)}$ = 0.5V, $I_{B1}$ = 15mA |
| Storage Time | $t_s$ | — | 225 | ns | $V_{CC}$ = 30V, $I_C$ = 150mA, |
| Fall Time | $t_f$ | — | 60 | ns | $I_{B1}$ = $I_{B2}$ = 15mA |

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

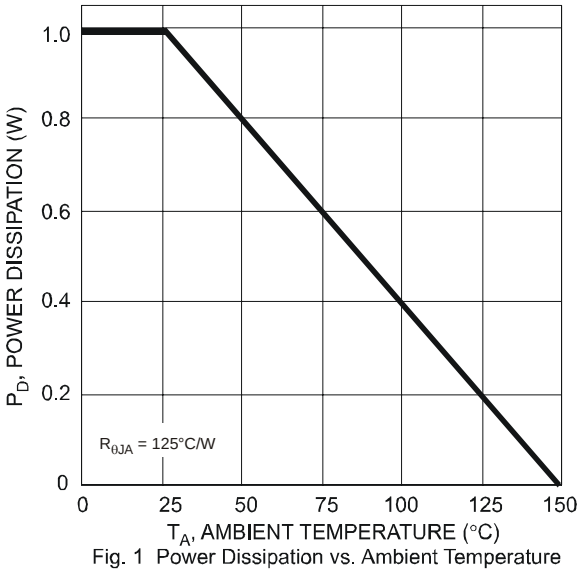


Fig. 1 Power Dissipation vs. Ambient Temperature

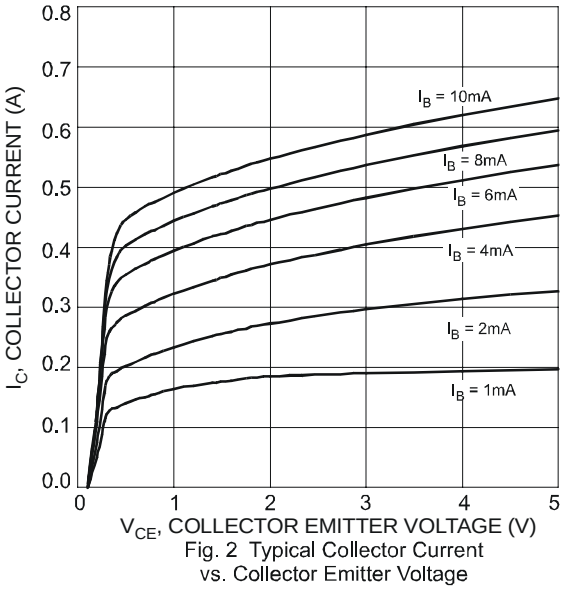


Fig. 2 Typical Collector Current vs. Collector Emitter Voltage


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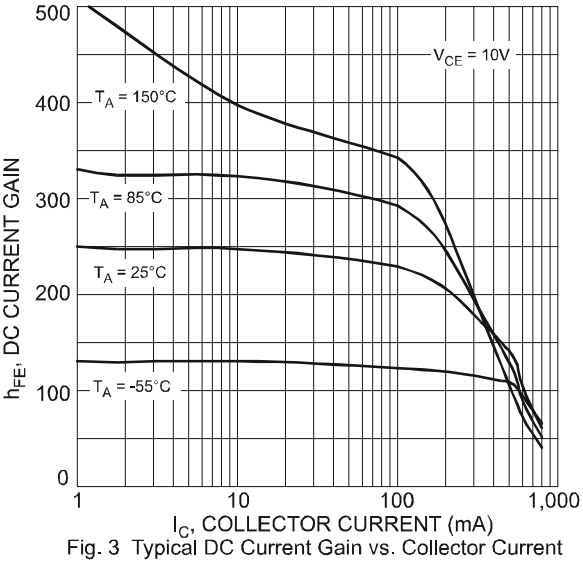



Fig. 3 Typical DC Current Gain vs. Collector Current

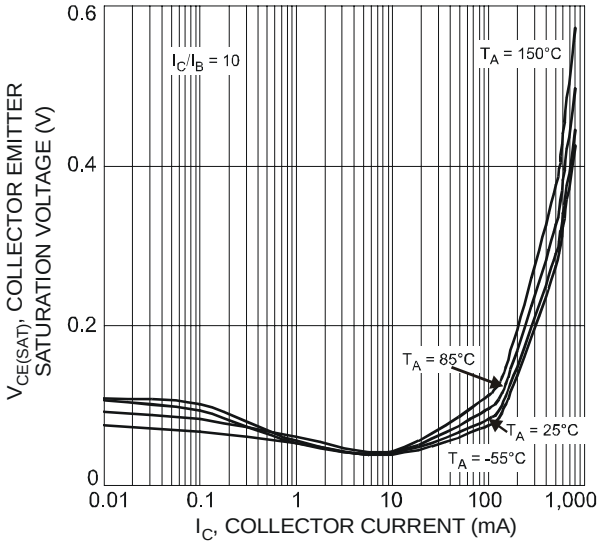



Fig. 4 Typical Collector Emitter Saturation Voltage vs. Collector Current

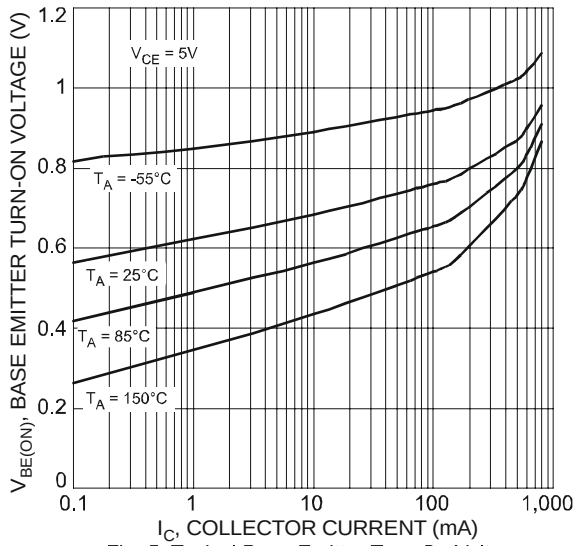



Fig. 5 Typical Base Emitter Turn-On Voltage vs. Collector Current

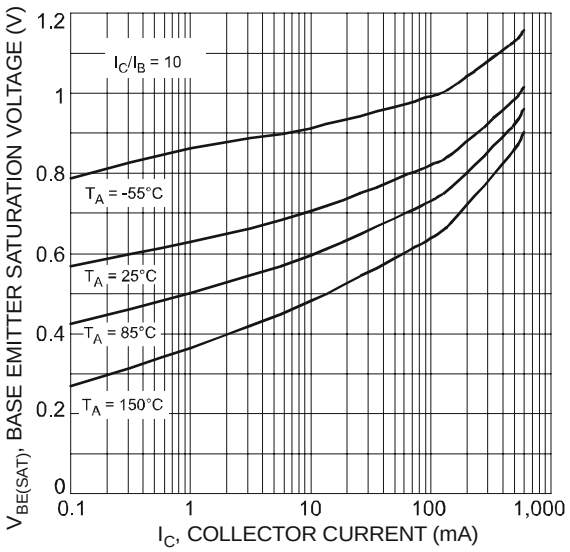



Fig. 6 Typical Base Emitter Saturation Voltage vs. Collector Current

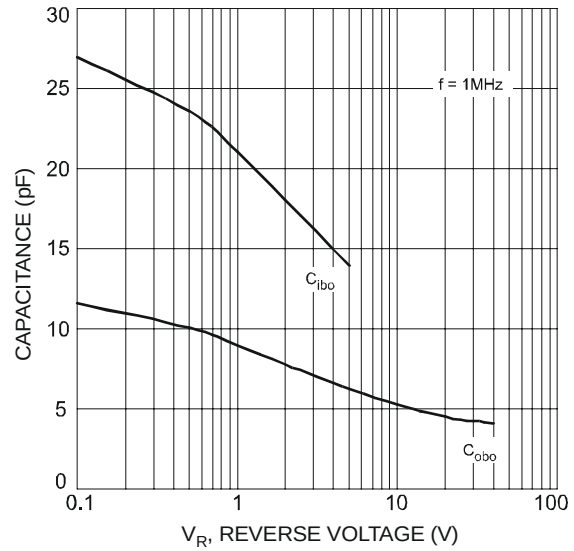



Fig. 7 Typical Capacitance Characteristics

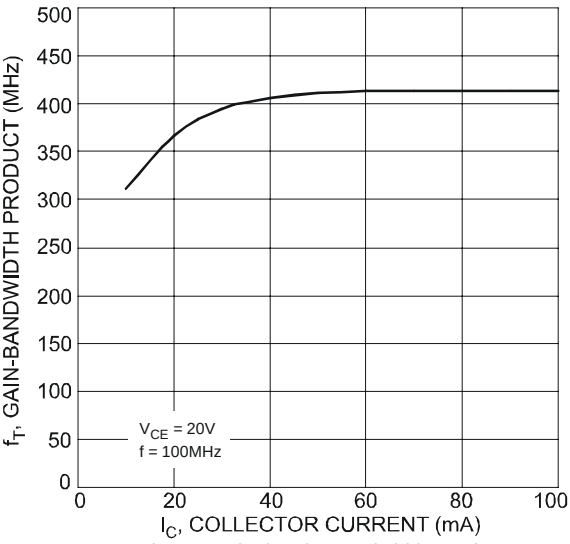



Fig. 8 Typical Gain-Bandwidth Product vs. Collector Current


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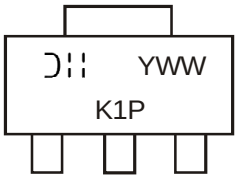
## Ordering Information (Note 5)

| Device | Packaging | Shipping |
|---|---|---|
| DXT2222A-13 | SOT89-3L | 2500/Tape & Reel |

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

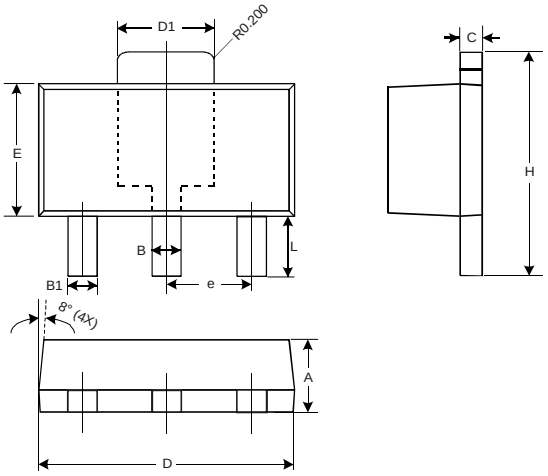
## Marking Information

(Top View)



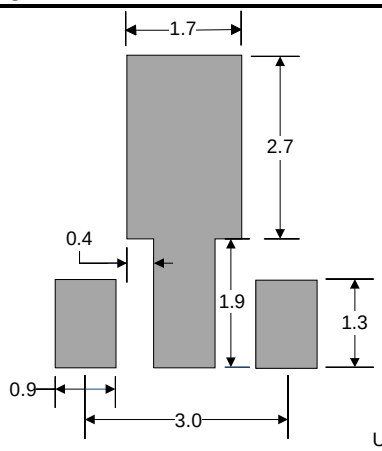

= Manufacturer's code marking
K1P = Product Type Marking Code
YWW = Date Code Marking
Y = Last digit of year ex: 7 = 2007
WW = Week code 01 - 52

## 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




Unit: mm

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