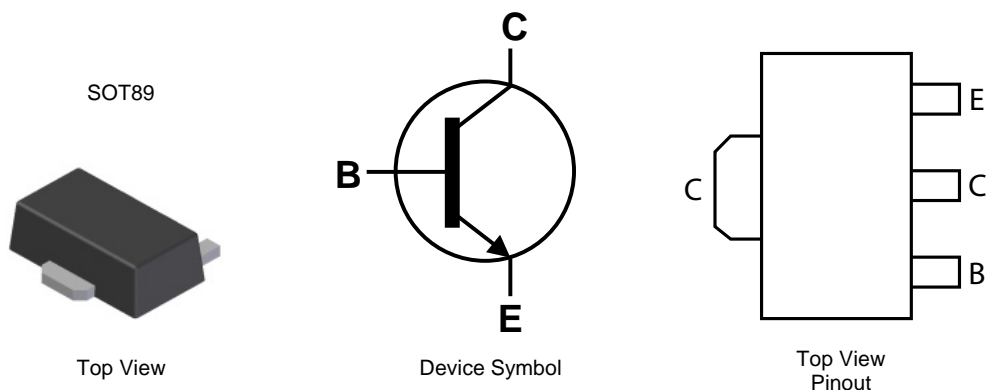


## Features

- $BV_{CE0} > 60V$
- $I_C = 3A$  high Continuous Current
- Low saturation voltage  $V_{CE(sat)} < 300mV @ 1A$
- Complementary PNP Type: DXT751
- **Totally Lead-Free & Fully RoHS compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

## Mechanical Data

- Case: SOT89
- Case material: Molded Plastic. "Green" Molding Compound.
- UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208
- Weight: 0.052 grams (Approximate)



## Ordering Information (Note 4)

| Product    | Marking | Reel size (inches) | Tape width (mm) | Quantity per reel |
|------------|---------|--------------------|-----------------|-------------------|
| DXT651-13  | KN2     | 13                 | 12              | 2,500             |
| DXT651-13R | KN2     | 13                 | 12              | 4,000             |

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
  2. See [http://www.diodes.com/quality/lead\\_free.html](http://www.diodes.com/quality/lead_free.html) for more information about Diodes Incorporated's definitions of Halogen and Antimony free, "Green" and Lead-Free.
  3. Halogen and Antimony free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
  4. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

## Marking Information



KN2 = 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 – 53)

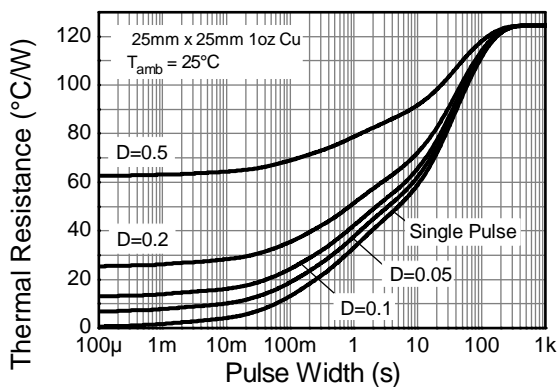
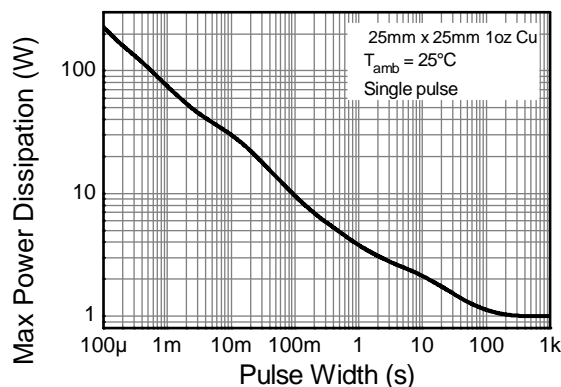
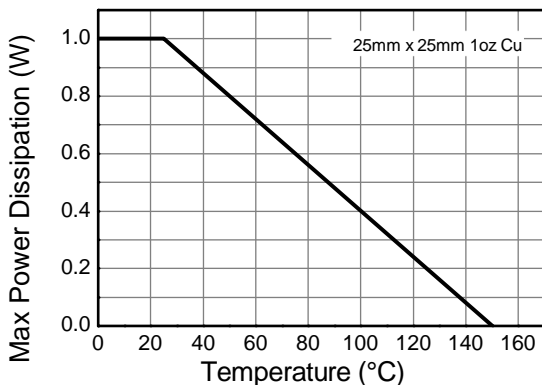
**Maximum Ratings** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

| 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    |
| Collector Current            | $I_C$     | 3     | A    |
| Peak Pulse Collector Current | $I_{CM}$  | 6     | A    |
| Base Current                 | $I_B$     | 500   | mA   |

**Thermal Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

| Characteristic                                       | Symbol          | Value       | Unit               |
|--|-----------------|-------------|--------------------|
| Power Dissipation (Note 5)                           | $P_D$           | 1           | W                  |
| Thermal Resistance, Junction to Ambient Air (Note 5) | $R_{\theta JA}$ | 125         | $^\circ\text{C/W}$ |
| Thermal Resistance, Junction to Leads (Note 6)       | $R_{\theta JL}$ | 18.2        | $^\circ\text{C/W}$ |
| Operating and Storage Temperature Range              | $T_J, T_{STG}$  | -55 to +150 | $^\circ\text{C}$   |

- Notes:
- For a device surface mounted on 25mm X 25mm FR4 PCB with high coverage of single sided 1 oz copper, in still air conditions; the device is measured when operating in a steady-state condition.
  - Thermal resistance from junction to solder-point (on the exposed collector pad).

**Thermal Characteristics and Derating Information**

**Transient Thermal Impedance**

**Pulse Power Dissipation**

**Derating Curve**

**Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

| Characteristic                       | Symbol                | Min                   | Typ                      | Max                | Unit          | Test Conditions   |
|--------------------------------------|-----------------------|-----------------------|--------------------------|--------------------|---------------|---|
| <b>OFF CHARACTERISTICS (Note 7)</b>  |                       |                       |                          |                    |               |   |
| Collector-Base Breakdown Voltage     | $BV_{CBO}$            | 80                    | —                        | —                  | V             | $I_C = 100\mu\text{A}, I_E = 0$   |
| Collector-Emitter Breakdown Voltage  | $BV_{CEO}$            | 60                    | —                        | —                  | V             | $I_C = 10\text{mA}, I_B = 0$  |
| Emitter-Base Breakdown Voltage       | $BV_{EBO}$            | 5                     | —                        | —                  | V             | $I_E = 100\mu\text{A}, I_C = 0$   |
| Collector-Base Cutoff Current        | $I_{CBO}$             | —                     | —                        | 0.1<br>10          | $\mu\text{A}$ | $V_{CB} = 60\text{V}, I_E = 0$<br>$V_{CB} = 60\text{V}, I_E = 0, T_A = +100^\circ\text{C}$  |
| Emitter-Base Cutoff Current          | $I_{EBO}$             | —                     | —                        | 0.1                | $\mu\text{A}$ | $V_{EB} = 4\text{V}, I_C = 0$   |
| <b>ON CHARACTERISTICS (Note 7)</b>   |                       |                       |                          |                    |               |   |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$         | —                     | 0.08<br>0.23             | 0.3<br>0.6         | V             | $I_C = 1\text{A}, I_B = 100\text{mA}$<br>$I_C = 3\text{A}, I_B = 300\text{mA}$  |
| Base-Emitter Saturation Voltage      | $V_{BE(sat)}$         | —                     | 0.85                     | 1.25               | V             | $I_C = 1\text{A}, I_B = 100\text{mA}$   |
| Base-Emitter Turn-On Voltage         | $V_{BE(on)}$          | —                     | 0.8                      | 1                  | V             | $V_{CE} = 2\text{V}, I_C = 1\text{A}$   |
| DC Current Gain                      | $h_{FE}$              | 70<br>100<br>80<br>40 | 200<br>200<br>185<br>120 | —<br>300<br>—<br>— | —             | $V_{CE} = 2\text{V}, I_C = 50\text{mA}$<br>$V_{CE} = 2\text{V}, I_C = 500\text{mA}$<br>$V_{CE} = 2\text{V}, I_C = 1\text{A}$<br>$V_{CE} = 2\text{V}, I_C = 2\text{A}$ |
| <b>AC CHARACTERISTICS</b>            |                       |                       |                          |                    |               |   |
| Transition Frequency                 | $f_T$                 | 140                   | 200                      | —                  | MHz           | $V_{CE} = 5\text{V}, I_C = 100\text{mA}, f = 100\text{MHz}$   |
| Output Capacitance                   | $C_{obo}$             | —                     | —                        | 30                 | pF            | $V_{CB} = 10\text{V}, f = 1\text{MHz}$  |
| Switching Times                      | $t_{on}$<br>$t_{off}$ | —<br>—                | 35<br>230                | —<br>—             | ns<br>ns      | $V_{CC} = 10\text{V}, I_C = 500\text{mA}, I_{B1} = I_{B2} = 50\text{mA}$  |

Notes: 7. Measured under pulsed conditions. Pulse width  $\leq 300\mu\text{s}$ . Duty cycle  $\leq 2\%$ .

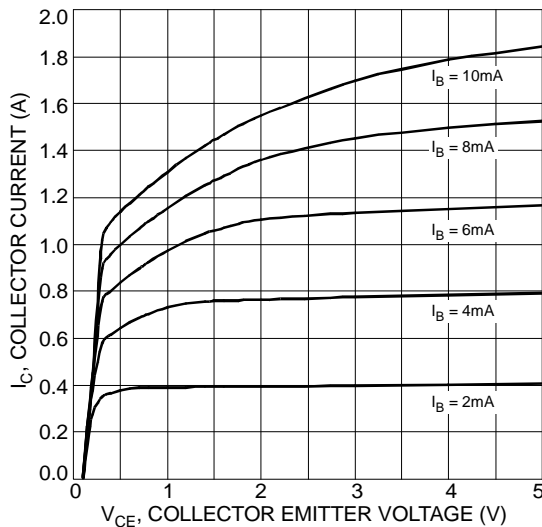


Fig. 2 Typical Collector Current vs. Collector-Emitter Voltage

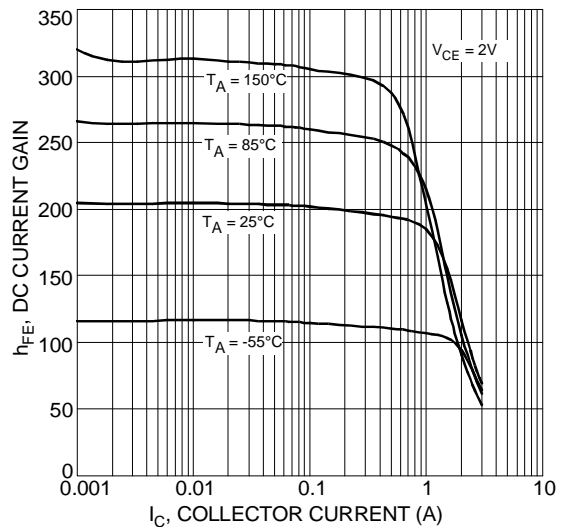


Fig. 3 Typical DC Current Gain vs. Collector Current

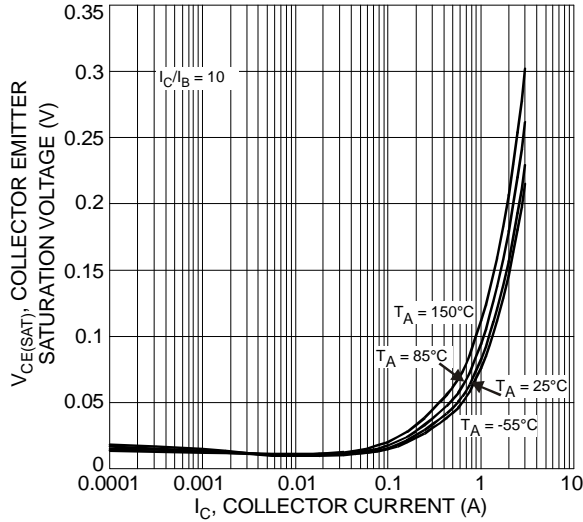


Fig. 4 Typical Collector-Emitter Saturation Voltage vs. Collector Current

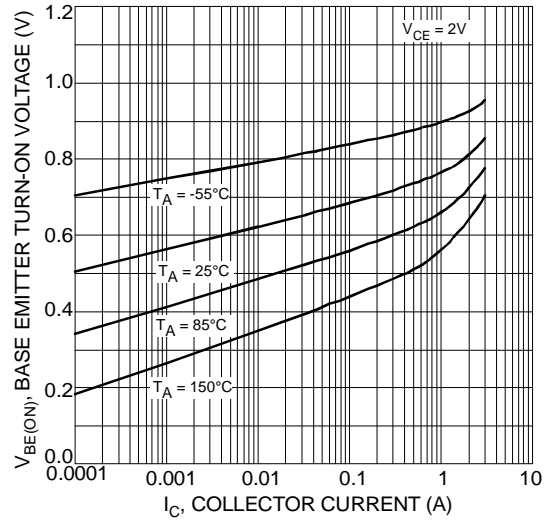


Fig. 5 Typical Base-Emitter Turn-On Voltage vs. Collector Current

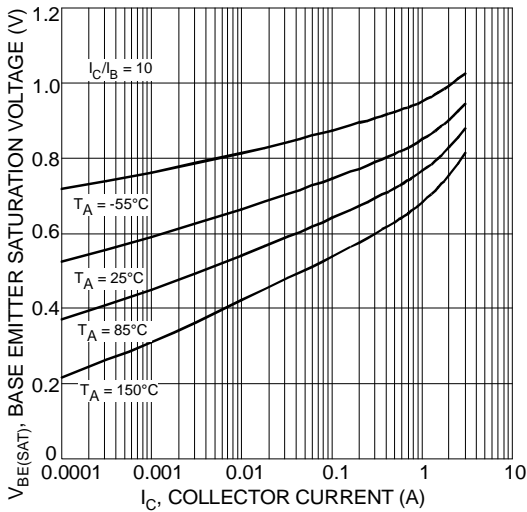


Fig. 6 Typical Base-Emitter Saturation Voltage vs. Collector Current

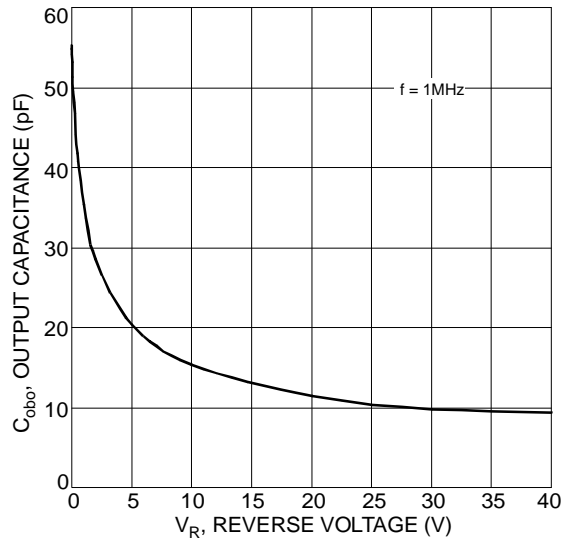


Fig. 7 Typical Output Capacitance Characteristics

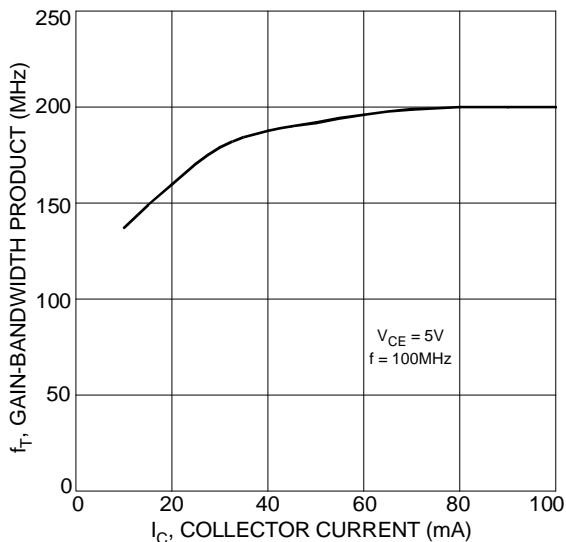
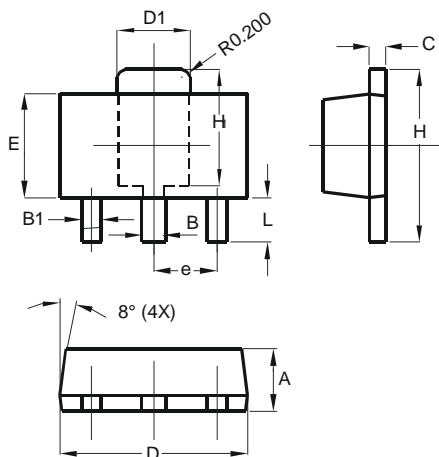


Fig. 8 Typical Gain-Bandwidth Product vs. Collector Current

## Package Outline Dimensions

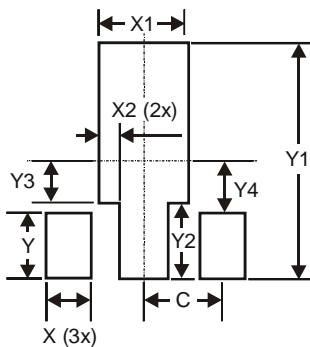
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



| SOT89                |          |      |
|----------------------|----------|------|
| Dim                  | Min      | Max  |
| A                    | 1.40     | 1.60 |
| B                    | 0.44     | 0.62 |
| B1                   | 0.35     | 0.54 |
| C                    | 0.35     | 0.44 |
| D                    | 4.40     | 4.60 |
| D1                   | 1.62     | 1.83 |
| E                    | 2.29     | 2.60 |
| e                    | 1.50 Typ |      |
| H                    | 3.94     | 4.25 |
| H1                   | 2.63     | 2.93 |
| L                    | 0.89     | 1.20 |
| All Dimensions in mm |          |      |

## Suggested Pad Layout

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.



| 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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