

Features

- $BV_{CEO} > -150V$
- $I_C = -600mA$ high Collector Current
- Ideal for Medium Power Switching or Amplification Applications
- Complementary NPN Type: DXT5551
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

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^{Ⓔ3}
- Weight: 0.055 grams (Approximate)

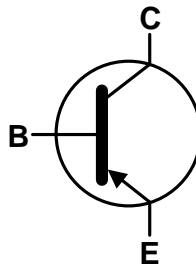
Applications

- Amplifiers
- Power Supplies

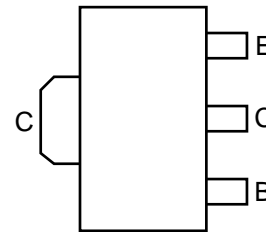
SOT89



Top View



Device Symbol

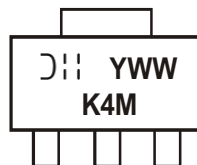

 Top View
Pin-Out

Ordering Information (Note 4)

| Part Number | Compliance | Marking | Reel Size (inches) | Tape Width (mm) | Quantity per Reel |
|-------------|------------|---------|--------------------|-----------------|-------------------|
| DXT5401-13 | Standard | K4M | 13 | 12 | 3,000 |

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
 2. See <https://www.diodes.com/quality/lead-free/> 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 <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information



K4M = Product Type Marking Code
 D11 = Manufacturer's Code Marking
 YWW = Date Code Marking
 Y = Last Digit of Year (ex: 8 = 2018)
 WW = Week Code (01 to 53)

Absolute Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

| Characteristic | Symbol | Value | Unit |
|---------------------------|------------------|-------|------|
| Collector-Base Voltage | V _{CBO} | -160 | V |
| Collector-Emitter Voltage | V _{CEO} | -150 | V |
| Emitter-Base Voltage | V _{EBO} | -5.0 | V |
| Collector Current | I _C | -600 | mA |

Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|--|-----------------------------------|-------------|------|
| Power Dissipation @T _A = +25°C (Note 5) | P _D | 1 | W |
| Thermal Resistance, Junction to Ambient @T _A = +25°C (Note 5) | R _{θJA} | 125 | °C/W |
| Operating and Storage Temperature Range | T _J , T _{STG} | -55 to +150 | °C |

ESD Ratings (Note 6)

| Characteristic | Symbol | Value | Unit | JEDEC Class |
|--|---------|-------|------|-------------|
| Electrostatic Discharge - Human Body Model | ESD HBM | 4,000 | V | 3A |
| Electrostatic Discharge - Machine Model | ESD MM | 400 | V | C |

- Notes:
5. For a device mounted with the collector lead on minimum recommended pad (MRP) layout 1oz copper that is on a single-sided 1.6mm FR-4 PCB; device is measured under still air conditions whilst operating in a steady-state.
 6. Refer to JEDEC specification JESD22-A114 and JESD22-A115.

Thermal Characteristics and Derating Information

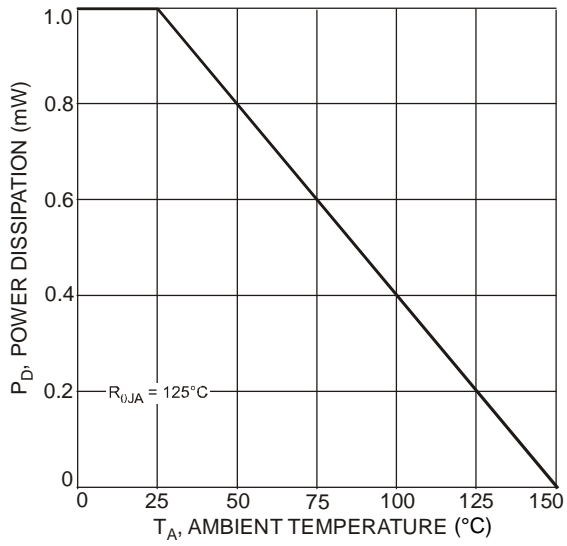


Fig. 1 Max Power Dissipation vs. Ambient Temperature

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

| Characteristic | Symbol | Min | Max | Unit | Test Condition |
|--------------------------------------|----------------------|----------------|---------------|----------|--|
| OFF CHARACTERISTICS (Note 7) | | | | | |
| Collector-Base Breakdown Voltage | V _{(BR)CBO} | -160 | — | V | I _C = -100μA, I _E = 0 |
| Collector-Emitter Breakdown Voltage | V _{(BR)CEO} | -150 | — | V | I _C = -1.0mA, I _B = 0 |
| Emitter-Base Breakdown Voltage | V _{(BR)EBO} | -5.0 | — | V | I _E = -10μA, I _C = 0 |
| Collector Cutoff Current | I _{CBO} | — | -50 | nA μA | V _{CB} = -120V, I _E = 0 V _{CB} = -120V, I _E = 0, T _A = +100°C |
| Emitter Cutoff Current | I _{EBO} | — | -50 | nA | V _{EB} = -3.0V, I _C = 0 |
| ON CHARACTERISTICS (Note 7) | | | | | |
| DC Current Gain | h _{FE} | 50 60 50 | — 240 — | — | V _{CE} = -5.0V, I _C = -1.0mA V _{CE} = -5.0V, I _C = -10mA V _{CE} = -5.0V, I _C = -50mA |
| Collector-Emitter Saturation Voltage | V _{CE(SAT)} | — | -0.2 -0.5 | V | I _C = -10mA, I _B = -1.0mA I _C = -50mA, I _B = -5.0mA |
| Base-Emitter Saturation Voltage | V _{BE(SAT)} | — | -1.0 | V | I _C = -10mA, I _B = -1.0mA I _C = -50mA, I _B = -5.0mA |
| SMALL SIGNAL CHARACTERISTICS | | | | | |
| Output Capacitance | C _{obo} | — | 6.0 | pF | V _{CB} = -10V, f = 1.0MHz, I _E = 0 |
| Small Signal Current Gain | h _{fe} | 40 | 260 | — | V _{CE} = -10V, I _C = -1.0mA, f = 1.0kHz |
| Current Gain-Bandwidth Product | f _T | 100 | 300 | MHz | V _{CE} = -10V, I _C = -10mA, f = 100MHz |
| Noise Figure | NF | — | 8.0 | dB | V _{CE} = -5.0V, I _C = -200μA, R _S = 10Ω, f = 1.0kHz |

Notes: 7. Measured under pulsed conditions. Pulse width = 300μs. Duty cycle ≤ 2%.

Typical Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

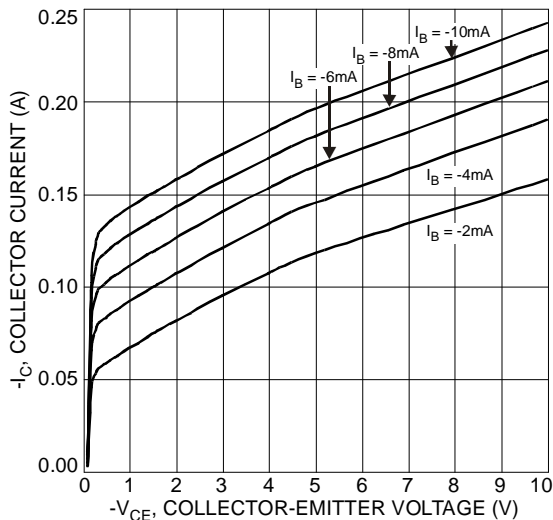


Fig. 2 Typical Collector Current vs. Collector-Emitter Voltage

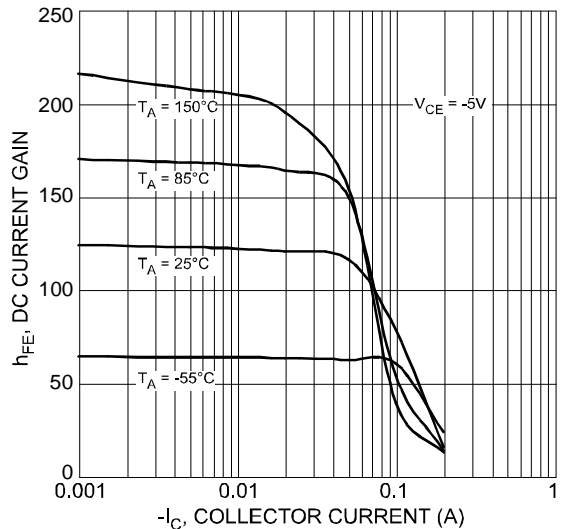


Fig. 3 Typical DC Current Gain vs. Collector Current

Typical Electrical Characteristics (Continued)

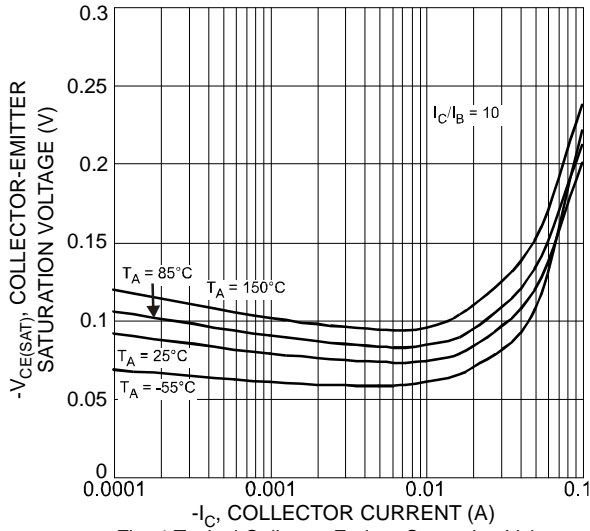


Fig. 4 Typical Collector-Emitter Saturation Voltage vs. Collector Current

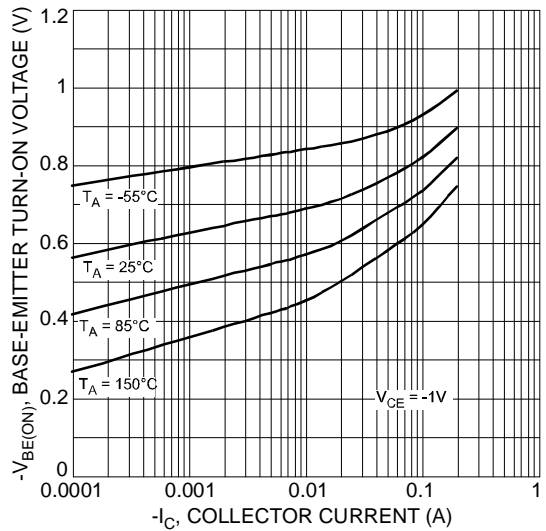


Fig. 5 Typical Base-Emitter Turn-On Voltage vs. Collector Current

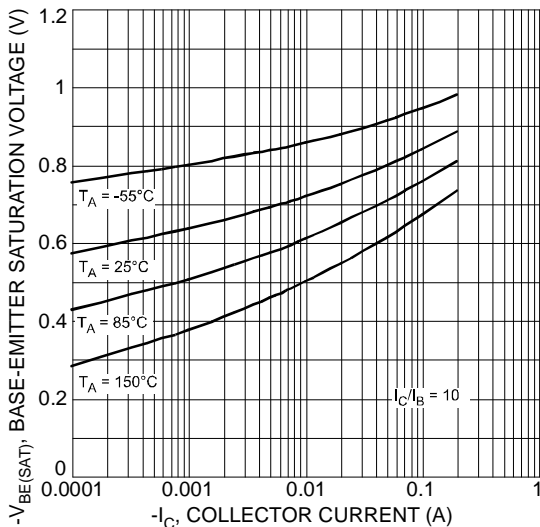


Fig. 6 Typical Base-Emitter Saturation Voltage vs. Collector Current

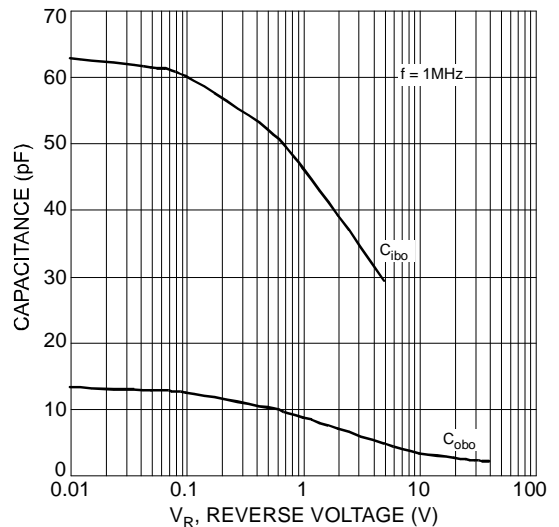


Fig. 7 Typical Capacitance Characteristics

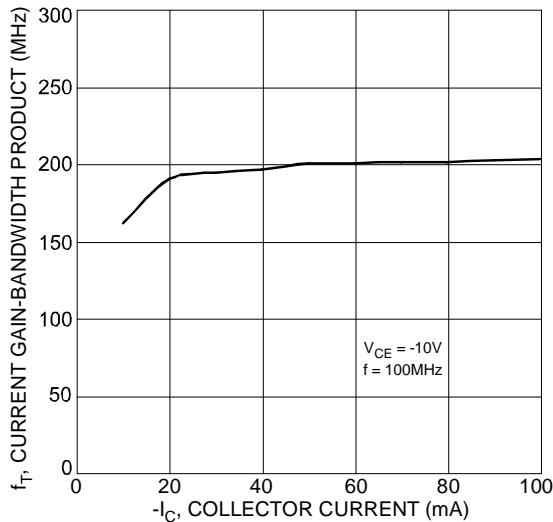
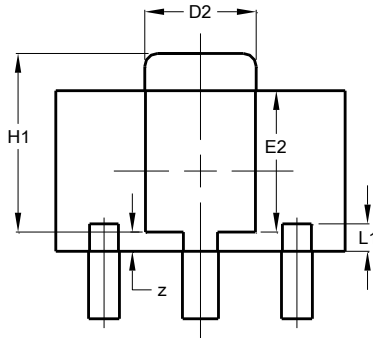
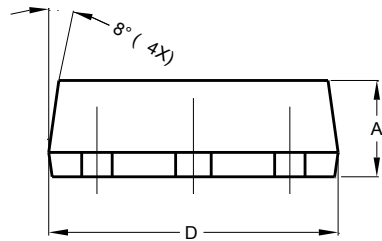
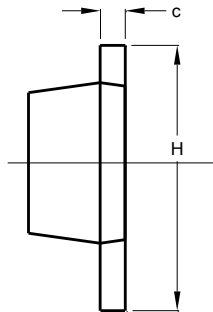
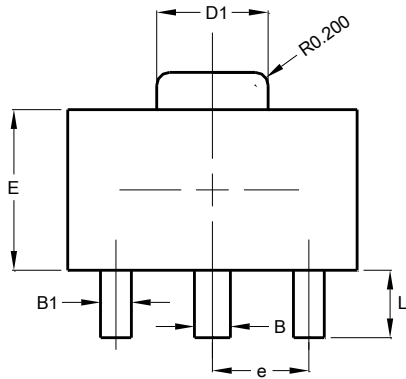


Fig. 8 Typical Gain-Bandwidth Product vs. Collector Current

Package Outline Dimensions

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

SOT89

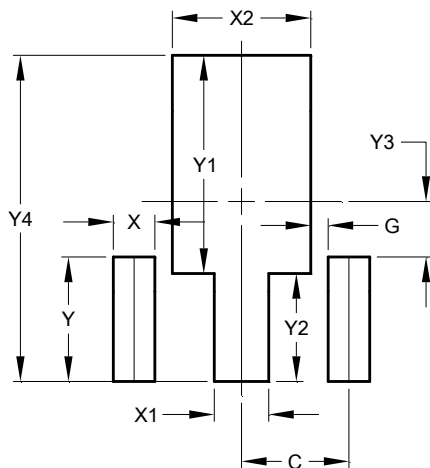


| SOT89 | | | |
|-----------------------------|-------|-------|-------|
| Dim | Min | Max | Typ |
| A | 1.40 | 1.60 | 1.50 |
| B | 0.50 | 0.62 | 0.56 |
| B1 | 0.42 | 0.54 | 0.48 |
| c | 0.35 | 0.43 | 0.38 |
| D | 4.40 | 4.60 | 4.50 |
| D1 | 1.62 | 1.83 | 1.733 |
| D2 | 1.61 | 1.81 | 1.71 |
| E | 2.40 | 2.60 | 2.50 |
| E2 | 2.05 | 2.35 | 2.20 |
| e | - | - | 1.50 |
| H | 3.95 | 4.25 | 4.10 |
| H1 | 2.63 | 2.93 | 2.78 |
| L | 0.90 | 1.20 | 1.05 |
| L1 | 0.327 | 0.527 | 0.427 |
| z | 0.20 | 0.40 | 0.30 |
| All Dimensions in mm | | | |

Suggested Pad Layout

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

SOT89



| Dimensions | Value (in mm) |
|------------|---------------|
| C | 1.500 |
| G | 0.244 |
| X | 0.580 |
| X1 | 0.760 |
| X2 | 1.933 |
| Y | 1.730 |
| Y1 | 3.030 |
| Y2 | 1.500 |
| Y3 | 0.770 |
| Y4 | 4.530 |

Note: For high voltage applications, the appropriate industry sector guidelines should be considered with regards to creepage and clearance distances between device Terminals and PCB tracking.

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