

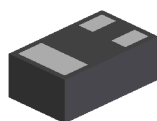
Features

- $BV_{CEO} > 50V$
- $I_C = 100mA$ High Collector Current
- $P_D = 1000mW$ Power Dissipation
- $0.60mm^2$ Package Footprint, 13 times Smaller than SOT23
- 0.4mm Height Package Minimizing Off-Board Profile
- Complementary PNP Type: DP0150ALP4/DP0150BLP4
- **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**

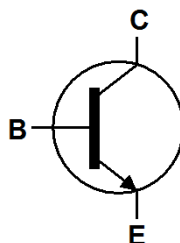
Mechanical Data

- Case: X2-DFN1006-3
- Case Material: Molded Plastic, "Green" Molding Compound.
UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
Terminals: Finish — NiPdAu.
- Solderable per MIL-STD-202, Method 208e4
- Weight: 0.0008 grams (Approximate)

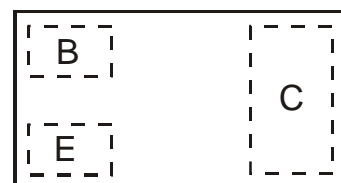
X2-DFN1006-3



Bottom View



Device Symbol

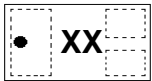
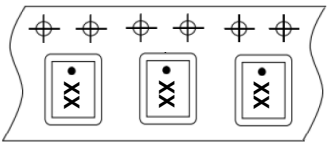
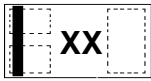
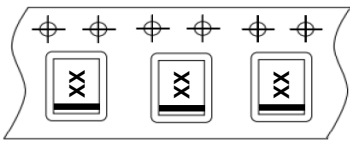
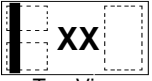
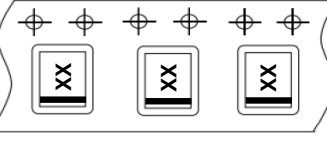

 Top View
Pin Configuration

Ordering Information (Note 4)

| Product | Marking | Reel size (inches) | Tape width (mm) | Quantity per reel |
|---------------|---------|--------------------|-----------------|-------------------|
| DN0150ALP4-7 | T3 | 7 | 8 | 3,000 |
| DN0150ALP4-7B | T3 | 7 | 8 | 10,000 |
| DN0150BLP4-7 | T4 | 7 | 8 | 3,000 |
| DN0150BLP4-7B | T4 | 7 | 8 | 10,000 |

- 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 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

| | |
|--|--|
| DN0150ALP4-7 DN0150BLP4-7 | <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>Top View Dot Denotes Collector Side</p>  </div> <div style="text-align: center;"> <p>From date code 1527 (YYWW), this changes to:</p>  <p>Top View Bar Denotes Base and Emitter Side</p>  </div> </div> |
| DN0150ALP4-7B DN0150BLP4-7B | <div style="text-align: center;">  <p>Top View Bar Denotes Base and Emitter Side</p>  </div> <p style="text-align: right;">XX = Product Type Marking Code (See Ordering Information)</p> |

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

| Characteristic | Symbol | Value | Unit |
|--------------------------------|------------------|-------|------|
| Collector-Base Voltage | V _{CBO} | 60 | V |
| Collector-Emitter Voltage | V _{CEO} | 50 | V |
| Emitter-Base Voltage | V _{EBO} | 5 | V |
| Collector Current – Continuous | I _C | 100 | mA |
| Peak Pulse Collector Current | I _{CM} | 200 | mA |
| Base Current | I _B | 30 | mA |

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

| Characteristic | Symbol | Value | Unit |
|---|-----------------------------------|-------------|------|
| Power Dissipation | P _D | 400 | mW |
| (Note 5) | | 1000 | |
| Thermal Resistance, Junction to Ambient | R _{θJA} | 310 | °C/W |
| (Note 6) | | 120 | |
| Thermal Resistance, Junction to Lead | R _{θJL} | 120 | °C/W |
| Operating and Storage and Temperature Range | T _J , T _{STG} | -55 to +150 | °C |

ESD Ratings (Note 8)

| 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 |

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

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|--|----------------------|-----|------|------|------|---|
| OFF CHARACTERISTICS | | | | | | |
| Collector-Base Breakdown Voltage | BV _{CBO} | 60 | — | — | V | I _C = 10μA, I _E = 0 |
| Collector-Emitter Breakdown Voltage (Note 8) | BV _{CEO} | 50 | — | — | V | I _C = 1mA, I _B = 0 |
| Emitter-Base Breakdown Voltage | BV _{EBO} | 5 | — | — | V | I _E = 10μA, I _C = 0 |
| Collector Cut-Off Current | I _{CBO} | — | — | 0.1 | μA | V _{CB} = 60V, I _E = 0 |
| Emitter Cut-Off Current | I _{EBO} | — | — | 0.1 | μA | V _{EB} = 5V, I _C = 0 |
| ON CHARACTERISTICS (Note 9) | | | | | | |
| Collector-Emitter Saturation Voltage | V _{CE(SAT)} | — | 0.10 | 0.25 | V | I _C = 100mA, I _B = 10mA |
| DC Current Gain | DN0150ALP4 | 120 | — | 240 | — | V _{CE} = 6V, I _C = 2mA |
| | DN0150BLP4 | 200 | — | 400 | | |
| SMALL SIGNAL CHARACTERISTICS | | | | | | |
| Transition Frequency | f _T | 60 | — | — | MHz | V _{CE} = 10V, I _E = -1mA f = 30MHz |
| Output Capacitance | C _{ob} | — | 1.3 | — | pF | V _{CB} = 10V, I _E = 0, f = 1MHz |

- Notes:
- For the device mounted on minimum recommended pad layout 1oz copper that is on a single-sided 1.6mm FR4 PCB; device is measured under still air conditions whilst operating in steady state condition. The entire exposed collector pad is attached to the heatsink.
 - Same as Note 5, except the exposed collector pad is mounted on 25mm x 25mm 2oz copper.
 - Thermal resistance from junction to solder-point (on the exposed collector pad).
 - Refer to JEDEC specification JESD22-A114 and JESD22-A115.
 - Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

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

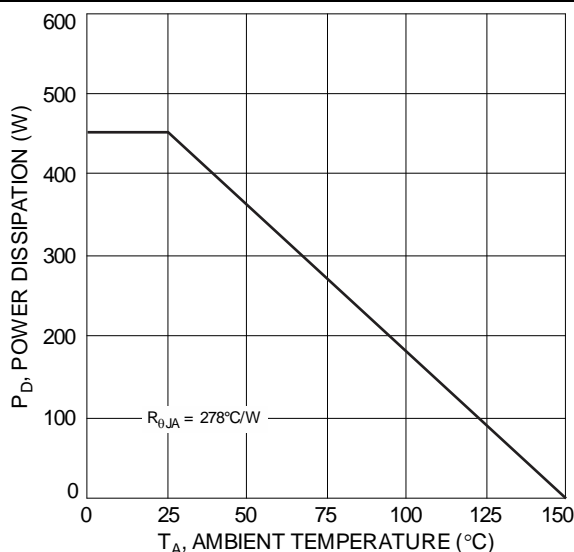


Fig. 1 Power Dissipation vs. Ambient Temperature (Note 3)

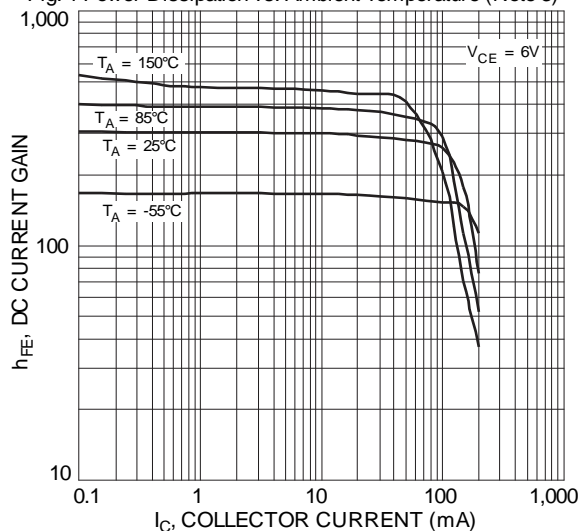


Fig. 3 Typical DC Current Gain vs. Collector Current (DN0150BLP4)

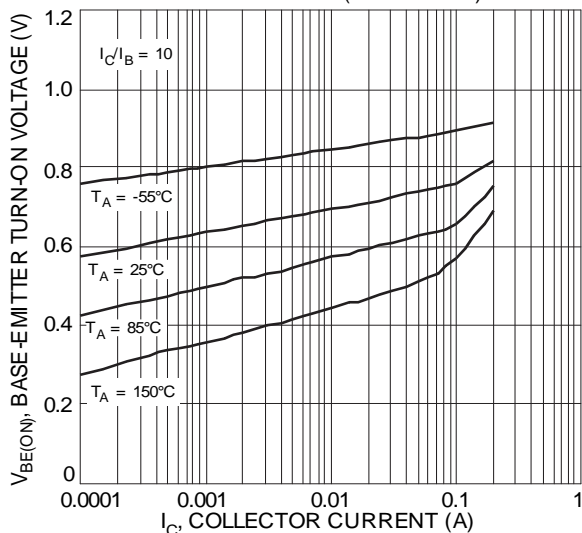


Fig. 5 Typical Base-Emitter Turn-On Voltage vs. Collector Current

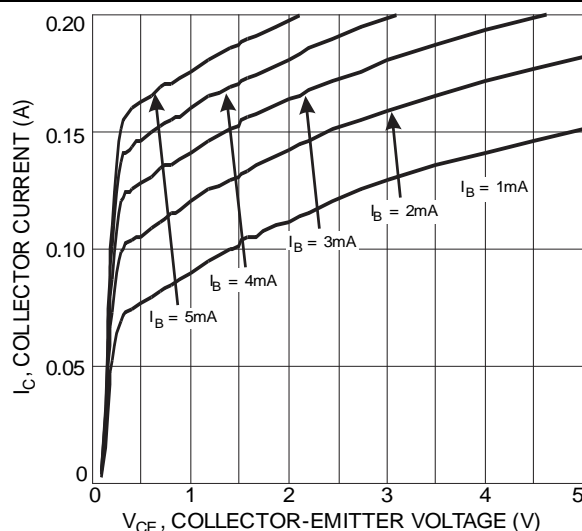


Fig. 2 Typical Collector Current vs. Collector-Emitter Voltage (DN0150BLP4)

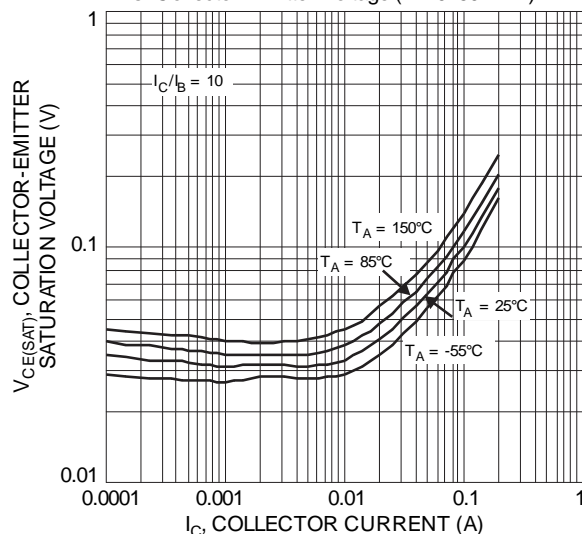


Fig. 4 Typical Collector-Emitter Saturation Voltage vs. Collector Current

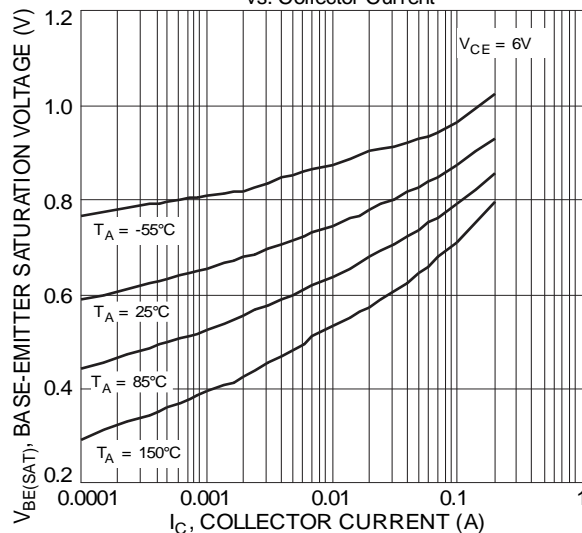


Fig. 6 Typical Base-Emitter Saturation Voltage vs. Collector Current

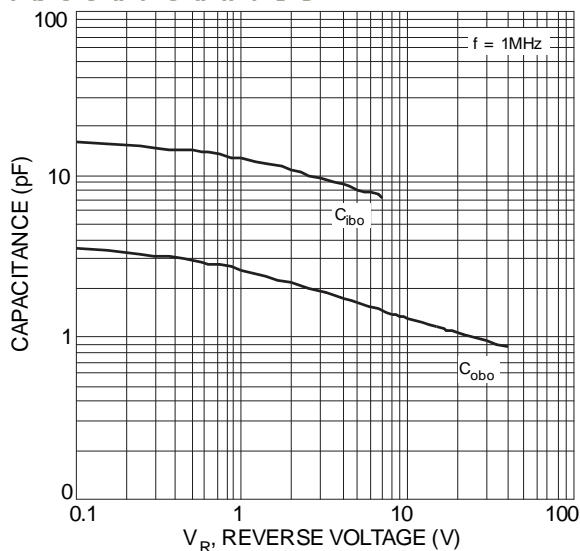


Fig. 7 Typical Capacitance Characteristics

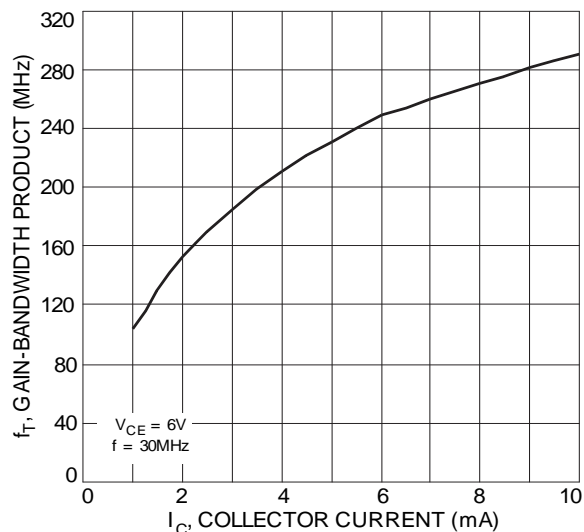
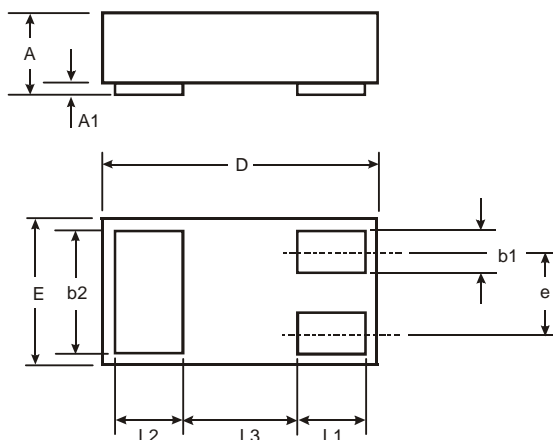


Fig. 8 Typical Gain-Bandwidth Product vs. Collector Current

Package Outline Dimensions

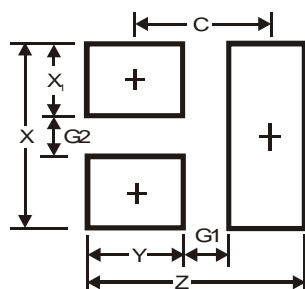
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



| X2-DFN1006-3 | | | |
|----------------------|------|------|------|
| Dim | Min | Max | Typ |
| A | — | 0.40 | — |
| A1 | 0 | 0.05 | 0.02 |
| b1 | 0.10 | 0.20 | 0.15 |
| b2 | 0.45 | 0.55 | 0.50 |
| D | 0.95 | 1.05 | 1.00 |
| E | 0.55 | 0.65 | 0.60 |
| e | — | — | 0.35 |
| L1 | 0.20 | 0.30 | 0.25 |
| L2 | 0.20 | 0.30 | 0.25 |
| L3 | — | — | 0.40 |
| 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) |
|------------|---------------|
| Z | 1.1 |
| G1 | 0.3 |
| G2 | 0.2 |
| X | 0.7 |
| X1 | 0.25 |
| Y | 0.4 |
| C | 0.7 |

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