

## Features

- $BV_{CEO} > 50V$
- $I_C = 100mA$  High Collector Current
- $P_D = 100mW$  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**

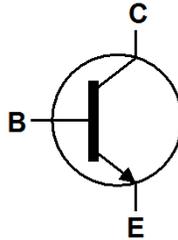
## Mechanical Data

- 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 208@4
- Weight: 0.0008 grams (Approximate)

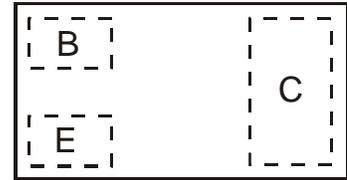
X2-DFN1006-3



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](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

<b>DN0150ALP4-7</b> <b>DN0150BLP4-7</b>	<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>
<b>DN0150ALP4-7B</b> <b>DN0150BLP4-7B</b>	<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<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V <sub>CBO</sub>	60	V
Collector-Emitter Voltage	V <sub>CEO</sub>	50	V
Emitter-Base Voltage	V <sub>EBO</sub>	5	V
Collector Current – Continuous	I <sub>C</sub>	100	mA
Peak Pulse Collector Current	I <sub>CM</sub>	200	mA
Base Current	I <sub>B</sub>	30	mA

**Thermal Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Power Dissipation	P <sub>D</sub>	(Note 5)	400
		(Note 6)	1000
Thermal Resistance, Junction to Ambient	R <sub>θJA</sub>	(Note 5)	310
		(Note 6)	120
Thermal Resistance, Junction to Lead	R <sub>θJL</sub>	120	°C/W
Operating and Storage and Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-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<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition	
<b>OFF CHARACTERISTICS</b>							
Collector-Base Breakdown Voltage	BV <sub>CBO</sub>	60	—	—	V	I <sub>C</sub> = 10μA, I <sub>E</sub> = 0	
Collector-Emitter Breakdown Voltage (Note 8)	BV <sub>CEO</sub>	50	—	—	V	I <sub>C</sub> = 1mA, I <sub>B</sub> = 0	
Emitter-Base Breakdown Voltage	BV <sub>EBO</sub>	5	—	—	V	I <sub>E</sub> = 10μA, I <sub>C</sub> = 0	
Collector Cut-Off Current	I <sub>CBO</sub>	—	—	0.1	μA	V <sub>CB</sub> = 60V, I <sub>E</sub> = 0	
Emitter Cut-Off Current	I <sub>EBO</sub>	—	—	0.1	μA	V <sub>EB</sub> = 5V, I <sub>C</sub> = 0	
<b>ON CHARACTERISTICS (Note 9)</b>							
Collector-Emitter Saturation Voltage	V <sub>CE(SAT)</sub>	—	0.10	0.25	V	I <sub>C</sub> = 100mA, I <sub>B</sub> = 10mA	
DC Current Gain	h <sub>FE</sub>	DN0150ALP4	120	—	240	—	V <sub>CE</sub> = 6V, I <sub>C</sub> = 2mA
		DN0150BLP4	200	—	400		
<b>SMALL SIGNAL CHARACTERISTICS</b>							
Transition Frequency	f <sub>T</sub>	60	—	—	MHz	V <sub>CE</sub> = 10V, I <sub>E</sub> = -1mA f = 30MHz	
Output Capacitance	C <sub>ob</sub>	—	1.3	—	pF	V <sub>CB</sub> = 10V, I <sub>E</sub> = 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.)

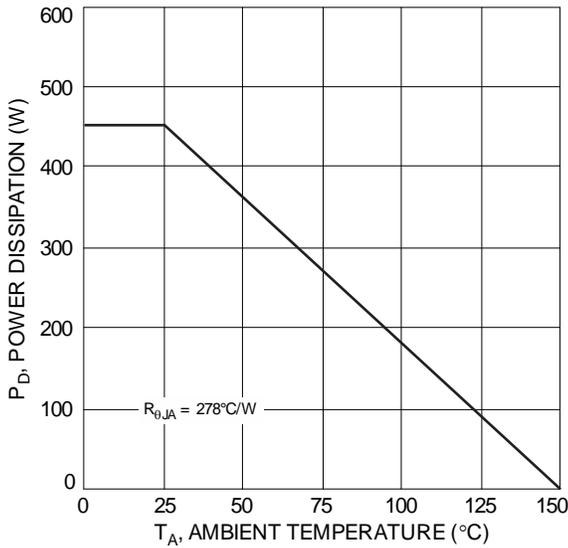


Fig. 1 Power Dissipation vs. Ambient Temperature (Note 3)

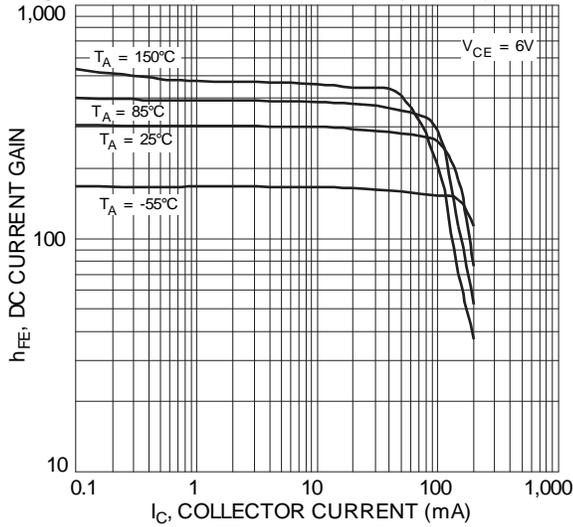


Fig. 3 Typical DC Current Gain vs. Collector Current (DN0150BLP4)

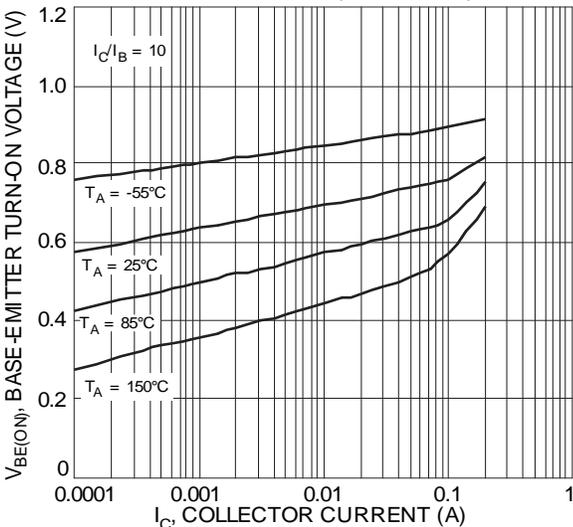


Fig. 5 Typical Base-Emitter Turn-On Voltage vs. Collector Current

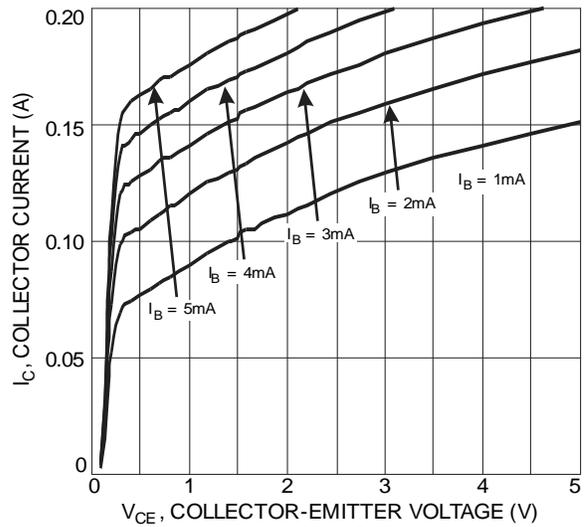


Fig. 2 Typical Collector Current vs. Collector-Emitter Voltage (DN0150BLP4)

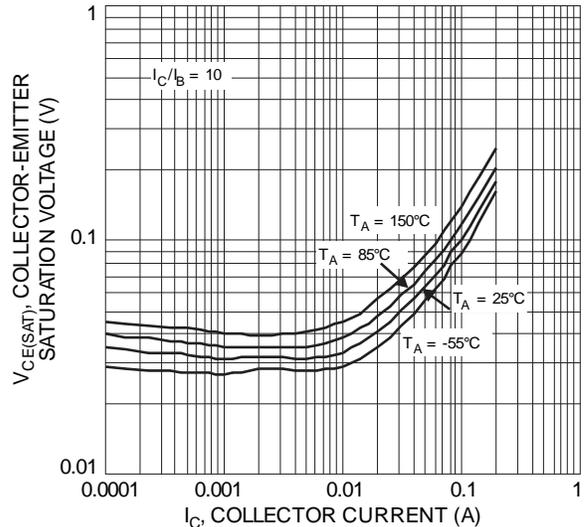


Fig. 4 Typical Collector-Emitter Saturation Voltage vs. Collector Current

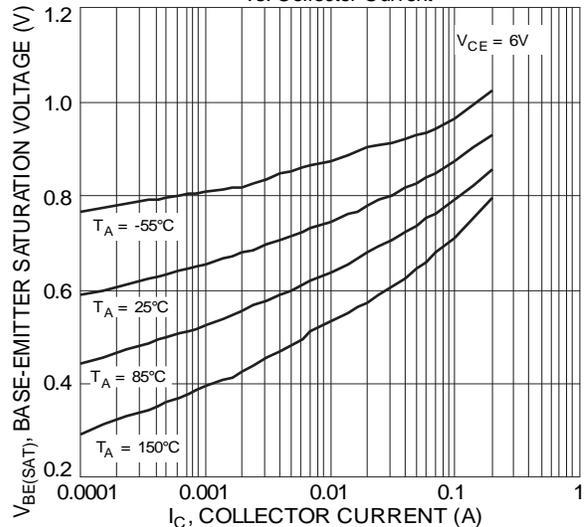


Fig. 6 Typical Base-Emitter Saturation Voltage vs. Collector Current

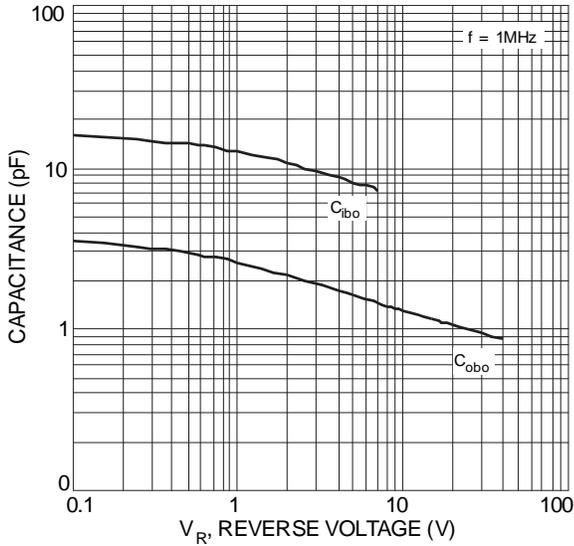


Fig. 7 Typical Capacitance Characteristics

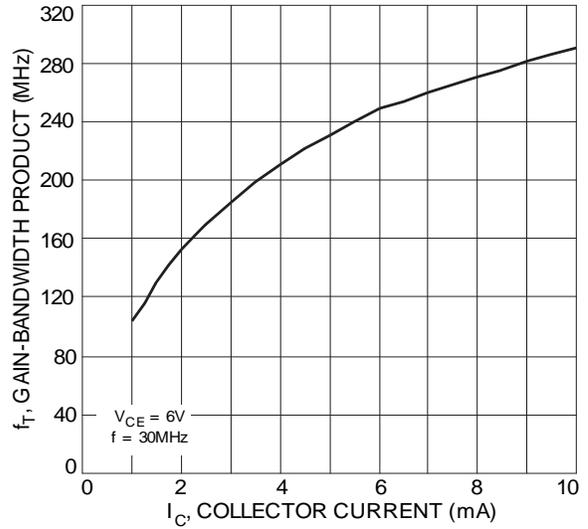
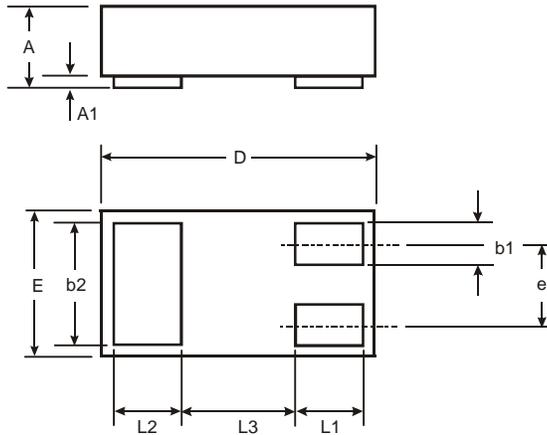


Fig. 8 Typical Gain-Bandwidth Product vs. Collector Current

### Package Outline Dimensions

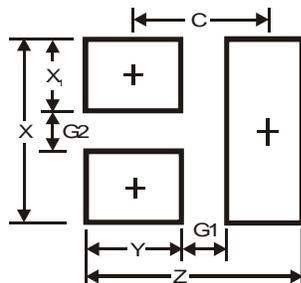
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



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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