

**50V PRE-BIASED SMALL SIGNAL SURFACE MOUNT PNP TRANSISTOR**

**Features**

- Epitaxial Planar Die Construction
- Ultra-Small Leadless Surface Mount Package
- Ideally Suited for Automated Assembly Processes
- "Lead Free", RoHS Compliant (Note 1)
- Halogen and Antimony Free "Green" Device (Note 2)
- Qualified to AEC-Q101 Standards for High Reliability

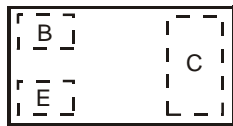
**Mechanical Data**

- Case: 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 over Copper leadframe. Solderable per MIL-STD-202, Method 208
- Weight: 0.0009 grams (approximate)

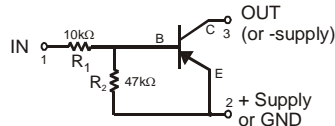
DFN1006-3



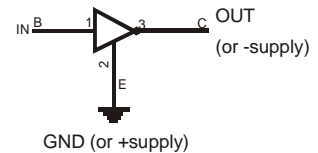
Bottom View



Top View  
Pin-Out



Device Symbol



Equivalent Inverter  
Circuit

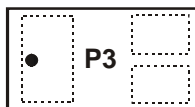
**Ordering Information** (Note 3)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
DDTA114YLP-7	P3	7	8	3,000
DDTA114YLP-7B	P3	7	8	10,000

- Notes:
1. No purposefully added lead.
  2. Diodes Inc's "Green" policy can be found on our website at <http://www.diodes.com>.
  3. For packaging details, go to our website at <http://www.diodes.com>.

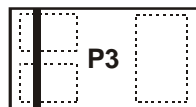
**Marking Information**

DDTC113TLP-7



Top View  
Dot Denotes  
Collector Side

DDTC113TLP-7B



Top View  
Bar Denotes Base  
and Emitter Side

P3 = Product Type Marking Code

**Maximum Ratings** @T<sub>A</sub> = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Supply Voltage	V <sub>CC</sub>	-50	V
Input Voltage	V <sub>IN</sub>	+6 to -40	V
Output Current	I <sub>O</sub>	-70	mA
Output (Collector) Current	I <sub>C(MAX)</sub>	-100	mA

**Thermal Characteristics** @T<sub>A</sub> = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 4)	P <sub>D</sub>	250	mW
Power Derating above 25°C	P <sub>der</sub>	2	mW/°C
Thermal Resistance, Junction to Ambient Air (Note 4) (Equivalent to one heated junction of PNP)	R <sub>θJA</sub>	500	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

**Electrical Characteristics: Discrete PNP Transistor (Q1)** @T<sub>A</sub> = 25°C unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>Off Characteristics (Note 5)</b>						
Collector-Base Breakdown Voltage	BV <sub>CBO</sub>	-50	—	—	V	I <sub>C</sub> = -10μA, I <sub>E</sub> = 0
Collector-Emitter Breakdown Voltage	BV <sub>CEO</sub>	-50	—	—	V	I <sub>C</sub> = -1.0mA, I <sub>B</sub> = 0
Collector-Base Cut Off Current	I <sub>CBO</sub>	—	—	-0.1	μA	V <sub>CB</sub> = -50V, I <sub>E</sub> = 0
Collector-Emitter Cut Off Current, I <sub>O(off)</sub>	I <sub>CEO</sub>	—	—	-0.5	μA	V <sub>CB</sub> = -50V, I <sub>B</sub> = 0
Emitter-Base Cut Off Current	I <sub>EBO</sub>	—	—	-0.2	mA	V <sub>EB</sub> = 4V, I <sub>C</sub> = 0
Input Off Voltage	V <sub>I(off)</sub>	—	—	-0.3	V	V <sub>CC</sub> = -5V, I <sub>O</sub> = -100uA
<b>On Characteristics (Note 5)</b>						
Input-On Voltage	V <sub>I(on)</sub>	-1.4	—	—	V	V <sub>O</sub> = -0.3V, I <sub>O</sub> = I <sub>C</sub> = 1mA
Input Current	I <sub>I</sub>	—	—	-0.88	mA	V <sub>I</sub> = -5V
DC Current Gain	h <sub>FE</sub>	80	—	—	—	V <sub>CE</sub> = -5V, I <sub>C</sub> = -5mA
Collector-Emitter Saturation Voltage	V <sub>CE(sat)</sub>	—	—	-0.25	V	I <sub>C</sub> = -50mA, I <sub>B</sub> = -2.5mA
Output On Voltage	V <sub>O(on)</sub>	—	-0.1	-0.3	V	I <sub>I</sub> = -0.25mA, I <sub>O</sub> = -5mA
Input Resistance	R <sub>1</sub>	7	10	13	KΩ	—
Resistance Ratio	(R <sub>2</sub> /R <sub>1</sub> )	3.7	4.7	5.7	—	—
<b>Small Signal Characteristics</b>						
Current Gain-Bandwidth Product	f <sub>T</sub>	—	250	—	MHz	V <sub>CE</sub> = -10V, I <sub>E</sub> = -5mA, f = 100 MHz

- Notes:
- Device mounted on FR-4 PCB, 1" x 0.85" x 0.062".
  - Short duration pulse test used to minimize self-heating effect. Pulse width t<sub>p</sub> < 300μs, Duty Cycle, d ≤ 2%.

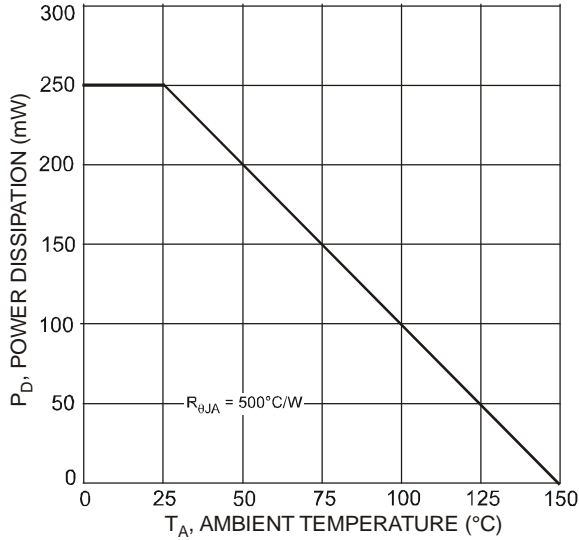


Fig. 1 Power Dissipation vs. Ambient Temperature (Note 4)

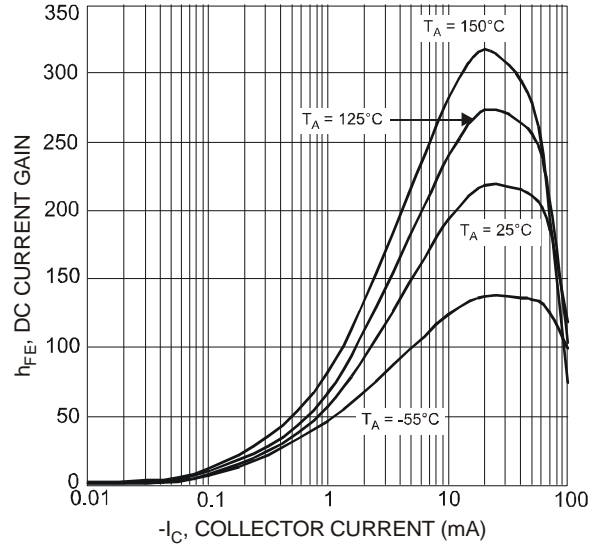


Fig. 2 Typical DC Current Gain vs. Collector Current

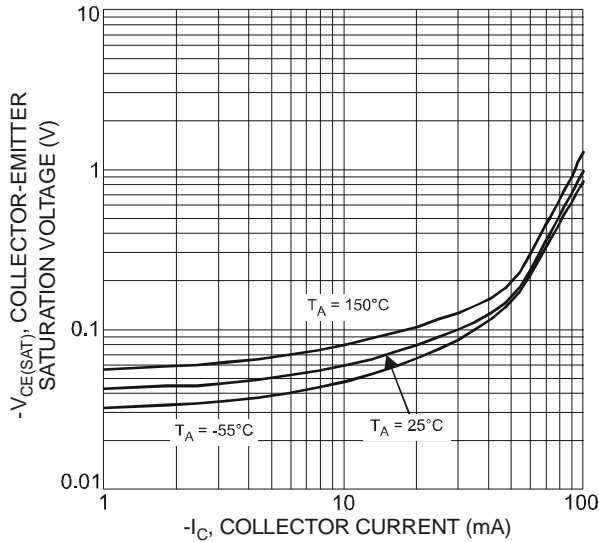


Fig. 3 Typical Collector-Emitter Saturation Voltage vs. Collector Current

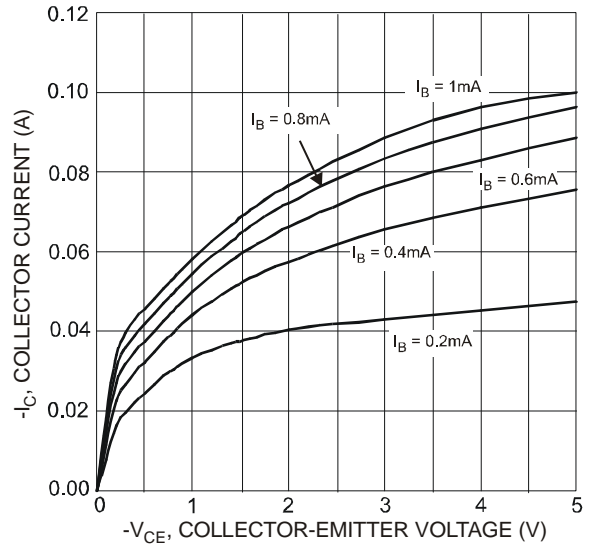


Fig. 4 Typical Collector Current vs. Collector-Emitter Voltage

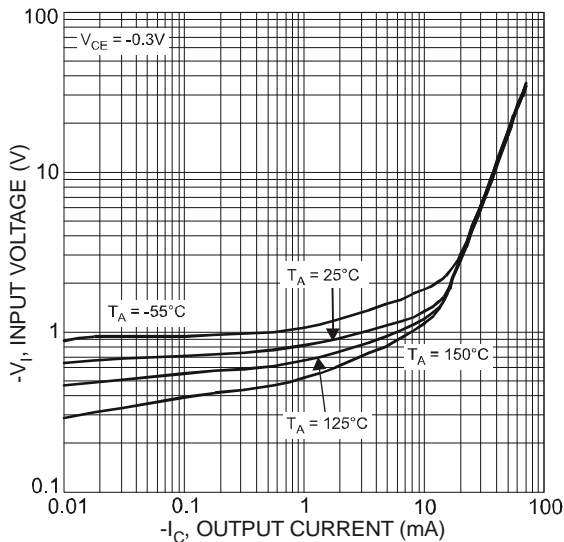


Fig. 5 Typical Input Voltage vs. Output Current (On Characteristics)

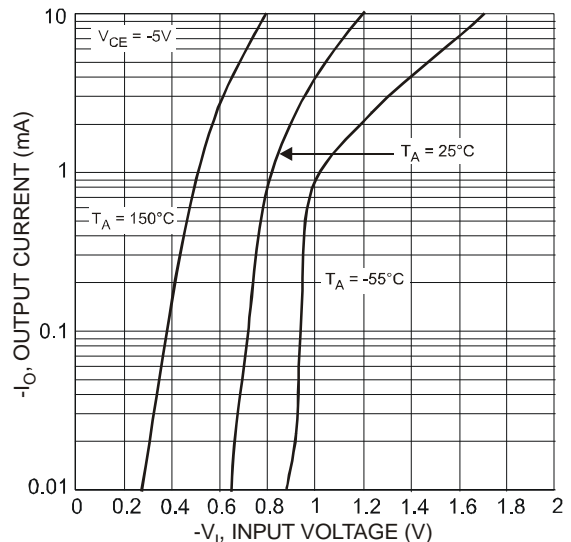
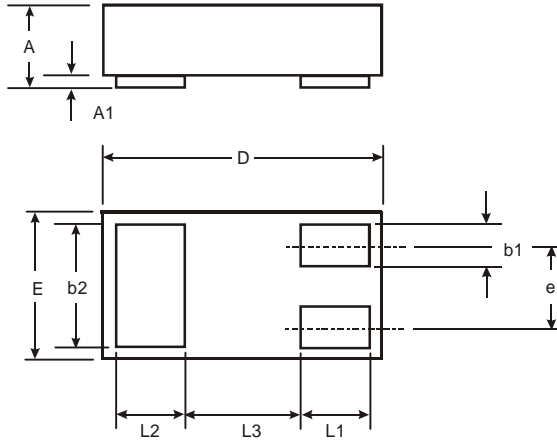


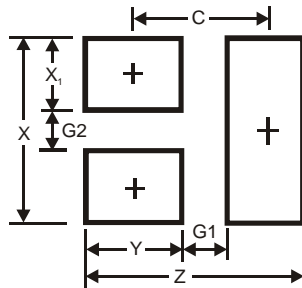
Fig. 6 Typical Output Current vs. Input Voltage (Off Characteristics)

**Package Outline Dimensions**



DFN1006-3			
Dim	Min	Max	Typ
A	0.47	0.53	0.50
A1	0	0.05	0.03
b1	0.10	0.20	0.15
b2	0.45	0.55	0.50
D	0.95	1.075	1.00
E	0.55	0.675	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**



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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