

**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

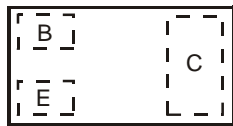
**Mechanical Data**

- 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)

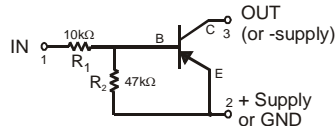
DFN1006-3



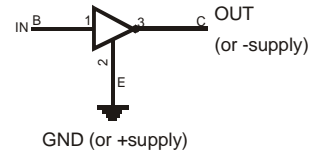
Bottom View



Top View  
Pin-Out



Device Symbol



Equivalent Inverter  
Circuit

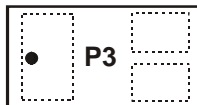
**Ordering Information** (Note 3)

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>.

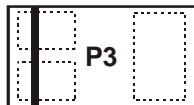
**Marking Information**

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** @ $T_A = 25^\circ\text{C}$  unless otherwise specified

Characteristic	Symbol	Value	Unit
Supply Voltage	$V_{CC}$	-50	V
Input Voltage	$V_{IN}$	+6 to -40	V
Output Current	$I_O$	-70	mA
Output (Collector) Current	$I_{C(MAX)}$	-100	mA

**Thermal Characteristics** @ $T_A = 25^\circ\text{C}$  unless otherwise specified

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 4)	$P_D$	250	mW
Power Derating above $25^\circ\text{C}$	$P_{der}$	2	mW/ $^\circ\text{C}$
Thermal Resistance, Junction to Ambient Air (Note 4) (Equivalent to one heated junction of PNP)	$R_{\theta JA}$	500	$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	$^\circ\text{C}$

**Electrical Characteristics: Discrete PNP Transistor (Q1)** @ $T_A = 25^\circ\text{C}$  unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>Off Characteristics (Note 5)</b>						
Collector-Base Breakdown Voltage	$BV_{CBO}$	-50	—	—	V	$I_C = -10\mu\text{A}, I_E = 0$
Collector-Emitter Breakdown Voltage	$BV_{CEO}$	-50	—	—	V	$I_C = -1.0\text{mA}, I_B = 0$
Collector-Base Cut Off Current	$I_{CBO}$	—	—	-0.1	$\mu\text{A}$	$V_{CB} = -50\text{V}, I_E = 0$
Collector-Emitter Cut Off Current, $I_{O(off)}$	$I_{CEO}$	—	—	-0.5	$\mu\text{A}$	$V_{CB} = -50\text{V}, I_B = 0$
Emitter-Base Cut Off Current	$I_{EBO}$	—	—	-0.2	mA	$V_{EB} = 4\text{V}, I_C = 0$
Input Off Voltage	$V_{I(off)}$	—	—	-0.3	V	$V_{CC} = -5\text{V}, I_O = -100\mu\text{A}$
<b>On Characteristics (Note 5)</b>						
Input-On Voltage	$V_{I(on)}$	-1.4	—	—	V	$V_O = -0.3\text{V}, I_O = I_C = 1\text{mA}$
Input Current	$I_i$	—	—	-0.88	mA	$V_i = -5\text{V}$
DC Current Gain	$h_{FE}$	80	—	—	—	$V_{CE} = -5\text{V}, I_C = -5\text{mA}$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	—	—	-0.25	V	$I_C = -50\text{mA}, I_B = -2.5\text{mA}$
Output On Voltage	$V_{O(on)}$	—	-0.1	-0.3	V	$I_i = -0.25\text{mA}, I_O = -5\text{mA}$
Input Resistance	R1	7	10	13	$\text{K}\Omega$	—
Resistance Ratio	(R2/R1)	3.7	4.7	5.7	—	—
<b>Small Signal Characteristics</b>						
Current Gain-Bandwidth Product	$f_T$	—	250	—	MHz	$V_{CE} = -10\text{V}, I_E = -5\text{mA}, f = 100\text{MHz}$

- 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  $t_p < 300\mu\text{s}$ , Duty Cycle,  $d \leq 2\%$ .

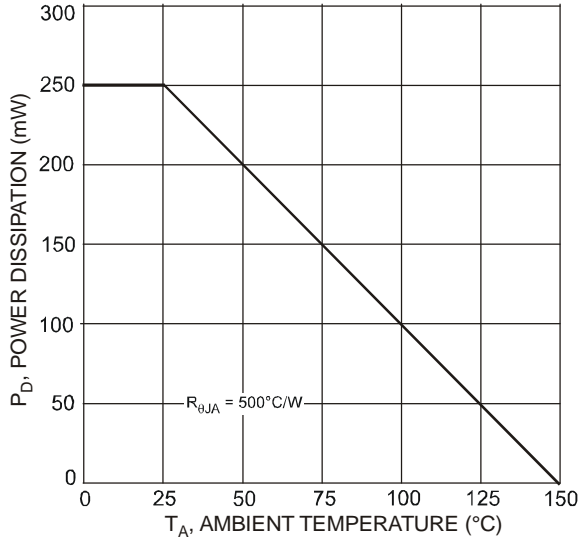


Fig. 1 Power Dissipation vs. Ambient Temperature (Note 4)

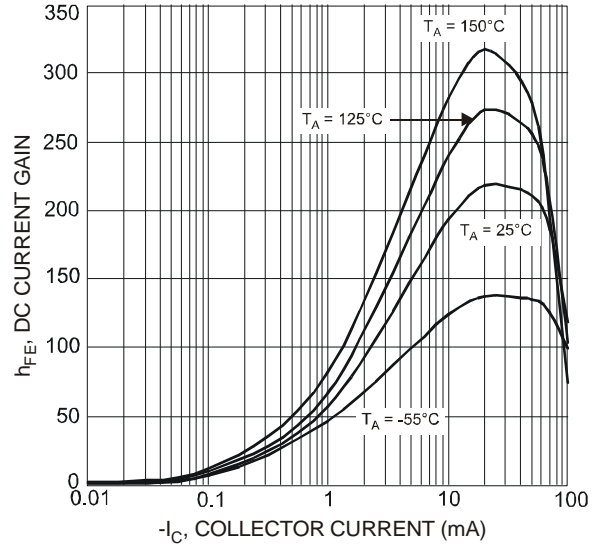


Fig. 2 Typical DC Current Gain vs. Collector Current

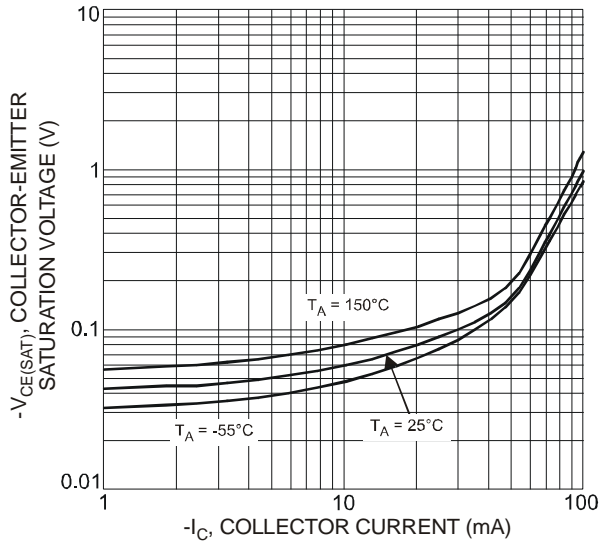


Fig. 3 Typical Collector-Emitter Saturation Voltage vs. Collector Current

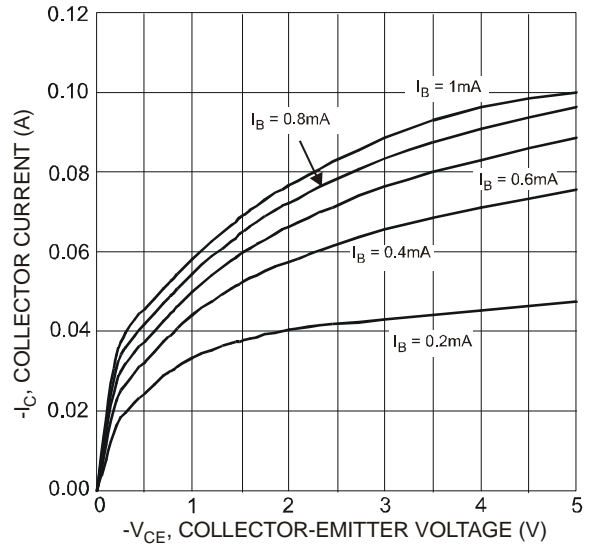


Fig. 4 Typical Collector Current vs. Collector-Emitter Voltage

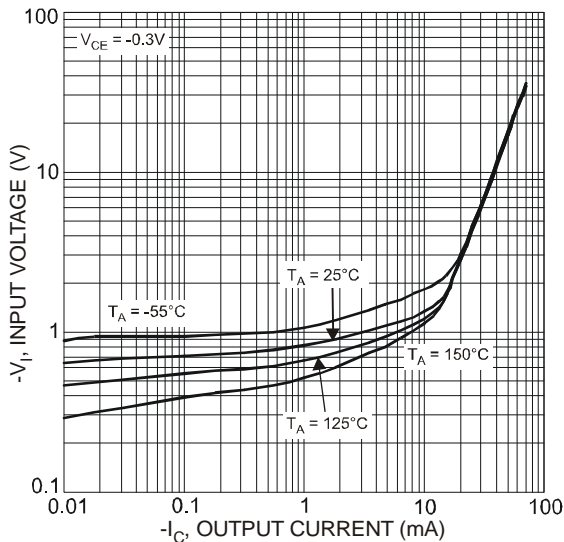


Fig. 5 Typical Input Voltage vs. Output Current (On Characteristics)

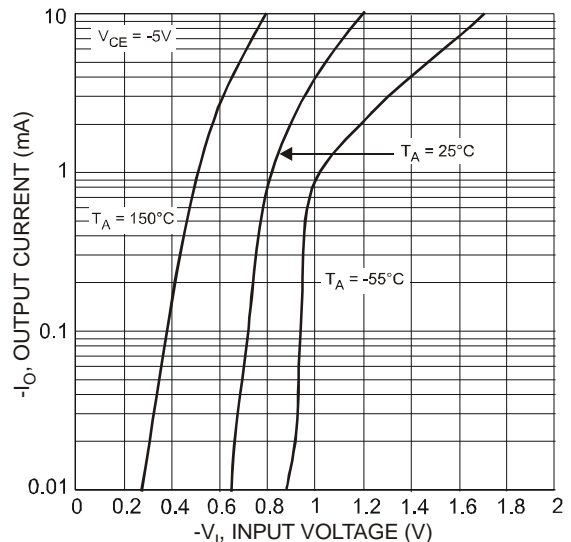
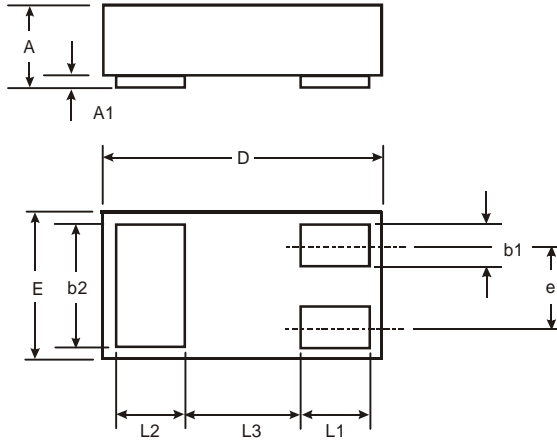


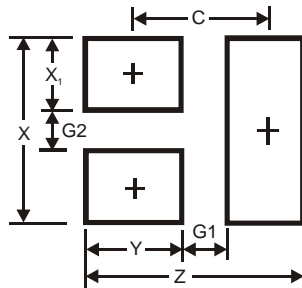
Fig. 6 Typical Output Current vs. Input Voltage (Off Characteristics)

**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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