DDTC113TLP

PRE-BIASED SMALL SIGNAL SURFACE MOUNT NPN TRANSISTOR

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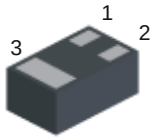
NEW PRODUCT

Features

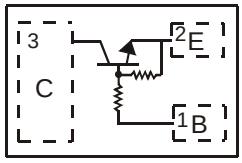
- Epitaxial Planar Die Construction
- Ultra-Small Leadless Surface Mount Package
- Ideally Suited for Automated Assembly Processes
- **Lead Free By Design/RoHS Compliant (Note 1)**
- **"Green" Device (Note 2)**
- **Qualified to AEC-Q101 Standards for High Reliability**

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-020D
- Terminal Connections: Collector Dot (See Diagram and Marking Information)
- Terminals: Finish - NiPdAu over Copper leadframe. Solderable per MIL-STD-202, Method 208
- Marking Code N4, Dot denotes Collector Side
- Ordering Information: See Page 3
- Weight: 0.0009 grams (approx.)

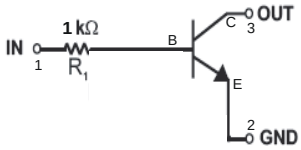


Bottom View

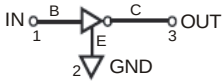


Top View

DFN1006-3



Schematic and Pin Configuration



Equivalent Inverter Circuit

Maximum Ratings @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Supply Voltage	V_{CC}	50	V
Input Voltage	V_{IN}	-5 to +10	V
Output Current (I_O)	$I_{C(max)}$	100	mA

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 3) @T_A = 25	P_D	250	mW
Power Derating above 25°C	P_{der}	2	mW/°C
Thermal Resistance, Junction to Ambient Air (Note 3) @T_A = 25 (Equivalent to one heated junction of NPN)	$R_{\theta JA}$	500	°C/W
Operating and Storage Temperature Range	T_j, T_{STG}	-55 to +150	°C

Electrical Characteristics @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 4)						
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	50	—	—	V	I_C = 10μA, I_E = 0
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	50	—	—	V	I_C = 1.0mA, I_B = 0
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	5	—	—	V	I_E = 50μA, I_C = 0
Collector-Base Cutoff Current	I_{CBO}	—	—	0.5	μA	V_{CB} = 50V, I_E = 0
Emitter-Base Cutoff Current	I_{EBO}	—	—	0.5	μA	V_{EB} = 4V, I_C = 0
ON CHARACTERISTICS (Note 4)						
DC Current Gain	h_{FE}	100	380	600	—	V_{CE} = 5V, I_C = 1mA
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	—	—	0.25	V	I_C = 50mA, I_B = 2.5mA
Input Resistance	R1	0.7	1	1.3	KΩ	—
SMALL SIGNAL CHARACTERISTICS						
Current Gain-Bandwidth Product	f_T	—	250	—	MHz	V_{CE} = 10V, I_E = 5mA, f = 100MHz

Notes:
1. No purposefully added lead.
2. Diodes Inc.'s "Green" policy can be found on our website at http://www.diodes.com/products/lead_free/index.php.
3. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch; pad layout as shown on page 3 or Diodes Inc. suggested pad layout document AP02001 on our website at http://www.diodes.com/datasheets/ap02001.pdf.
4. Short duration pulse test used to minimize self-heating effect.

NEW PRODUCT

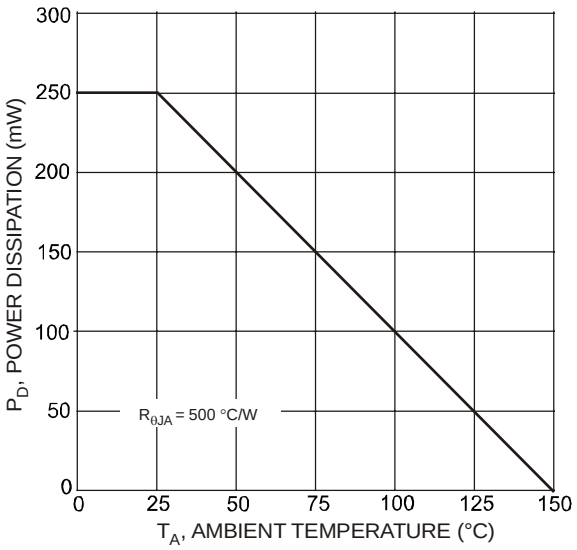


Fig. 1 Power Dissipation vs. Ambient Temperature (Note 3)

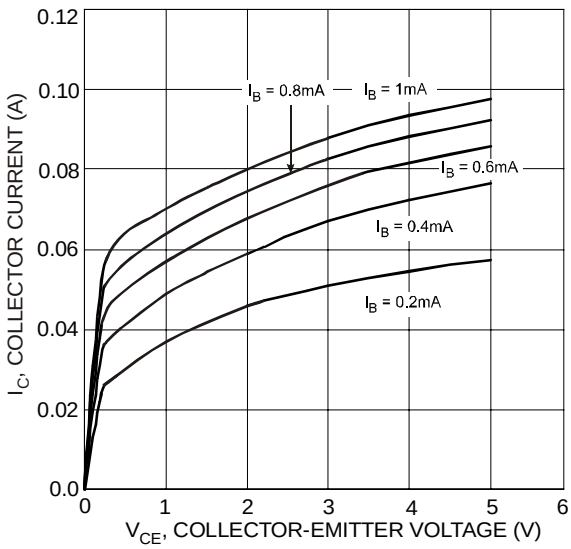


Fig. 2 Typical Collector Current vs. Collector-Emitter Voltage

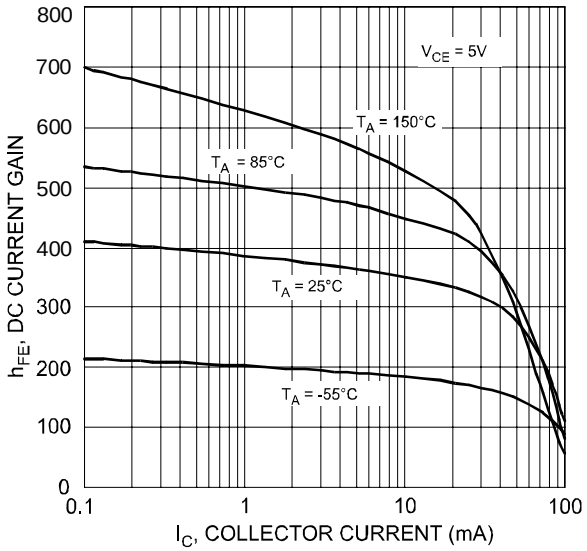


Fig. 3 Typical DC Current Gain vs. Collector Current

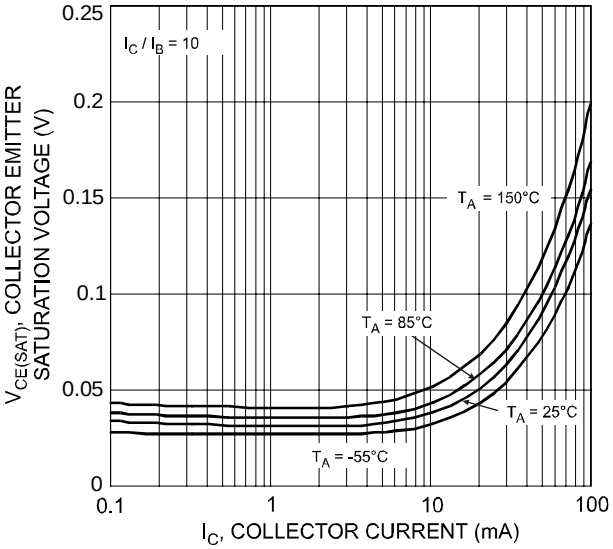


Fig. 4 Typical Collector Emitter Saturation Voltage vs. Collector Current

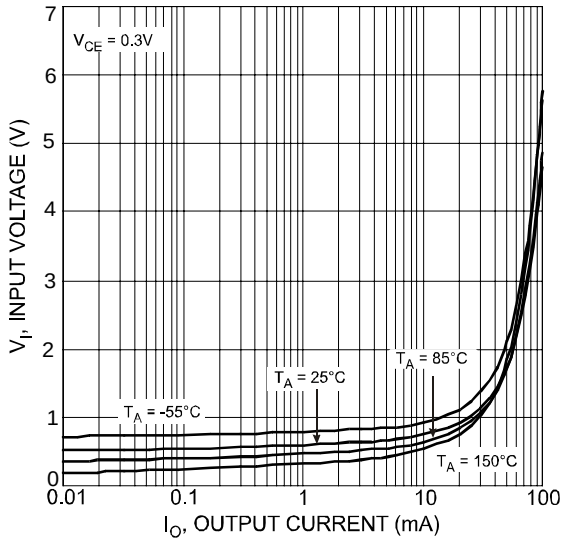


Fig. 5 Typical Input Voltage vs. Output Current (On Characteristics)

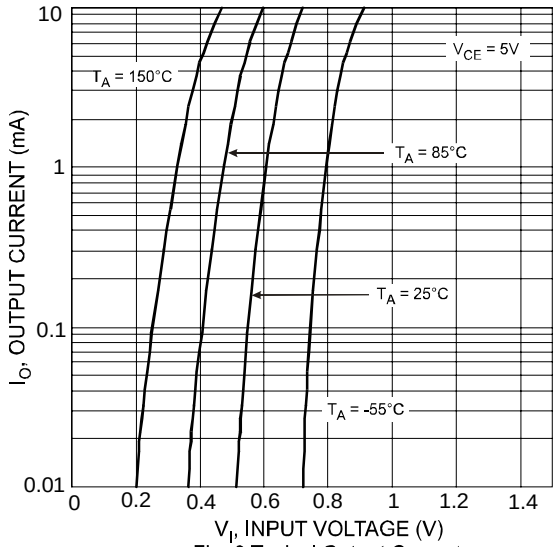


Fig. 6 Typical Output Current vs. Input Voltage (Off Characteristics)

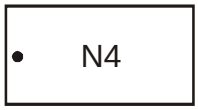
NEW PRODUCT

Ordering Information (Note 5)

Device	Packaging	Shipping
DDTC113TLP-7	DFN1006-3	3000/Tape & Reel

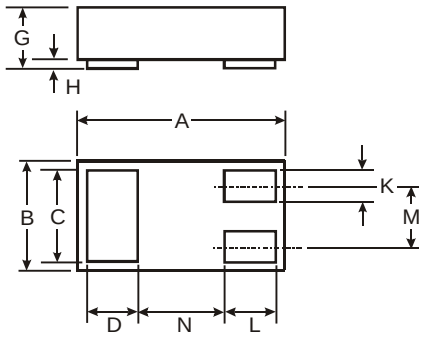
Notes: 5. For packaging details, go to our website at http://www.diodes.com/datasheets/ap02007.pdf.

Marking Information



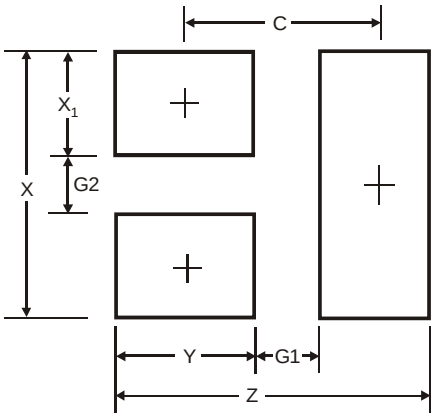
N4 = Product Type Marking Code
Dot Denotes Collector, Pin 3

Mechanical Details



DFN1006-3			
Dim	**Min**	**Max**	**Typ**
A	0.95	1.075	1.00
B	0.55	0.675	0.60
C	0.45	0.55	0.50
D	0.20	0.30	0.25
G	0.47	0.53	0.50
H	0	0.05	0.03
K	0.10	0.20	0.15
L	0.20	0.30	0.25
M	—	—	0.35
N	—	—	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