

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)**

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-020C
- Terminal Connections: Collector Dot (See Diagram)
- Terminals: Finish — NiPdAu annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208
- Marking Code P2, Dot denotes Collector Side
- Ordering Information: See Page 4
- Weight: 0.001 grams (approximate)

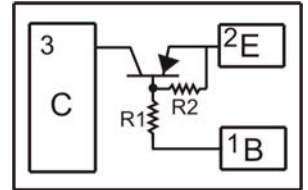
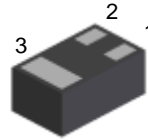
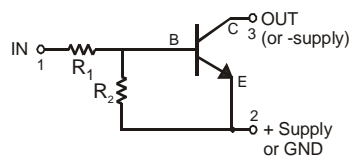
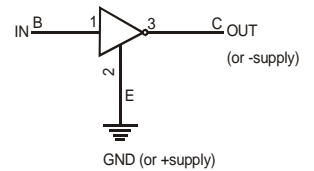


Fig. 1



Schematic and Pin Configuration



Equivalent Inverter Circuit

Fig. 2

Component P/N	R1(NOM)	R2(NOM)	Figure
DDTA144ELP	47K	47K	2

Maximum Ratings @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Supply Voltage	V _{CC}	-50	V
Input Voltage	V _{IN}	+10 to -40	V
Output Current (I _o)	I _{C(max)}	-100	mA
Power Dissipation (Note 3)	P _d	250	mW
Power Deration above 25°C	P _{der}	2	mW/°C

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Junction Operation and Storage Temperature Range	T _j , T _{stg}	-55 to +150	°C
Thermal Resistance, Junction to Ambient Air (Note 3) (Equivalent to one heated junction of NPN)	R _{θJA}	400	°C/W

- 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" x 0.85" x 0.062"; pad layout as shown on page 5 or Diodes Inc. suggested pad layout document AP02001, which can be found on our website at <http://www.diodes.com/datasheets/ap02001.pdf>.

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}	-4.5	—	—	V	I _E = -50μA, I _C = 0
Collector Cutoff Current*	I _{CEX}	—	—	-0.5	μA	V _{CE} = -50V, V _{EB(OFF)} = 3.0V
Base Cutoff Current (I _{BEX})	I _{BL}	—	—	-0.5	μA	V _{CE} = -50V, V _{EB(OFF)} = 3.0V
Collector-Base Cut Off Current	I _{CBO}	—	—	-0.5	μA	V _{CB} = -50V, I _E = 0
Collector-Emitter Cut Off Current, I _{O(OFF)}	I _{CEO}	—	—	-0.5	μA	V _{CE} = -50V, I _B = 0
Emitter-Base Cut Off Current	I _{EBO}	—	—	-0.5	mA	V _{EB} = 4V, I _C = 0
Input Off Voltage	V _{I(OFF)}	—	—	-0.3	V	V _{CC} = -5V, I _O = -100uA
On Characteristics (Note 4)						
Base-Emitter Turn-On Voltage*	V _{BE(ON)}	—	—	-0.69	V	V _{CE} = -5V, I _C = -2mA
		—	—	-0.78	V	V _{CE} = -5V, I _C = -10mA
Base-Emitter Saturation Voltage*	V _{BE(SAT)}	—	—	-0.88	V	I _C = -10mA, I _B = -1mA, V _{CE} = -5V
		—	—	-0.98	V	I _C = -50mA, I _B = -5mA, V _{CE} = -5V
Input-On Voltage	V _{I(ON)}	-3	—	—	V	V _O = -0.3V, I _O = -20mA
Input Current	I _I	—	—	-7.2	mA	V _I = -5V
DC Current Gain	h _{FE}	90	—	—	—	V _{CE} = -5V, I _C = -2mA
		120	—	—	—	V _{CE} = -5V, I _C = -5mA
		150	—	—	—	V _{CE} = -5V, I _C = -10mA
		100	—	—	—	V _{CE} = -5V, I _C = -100mA
		180	—	—	—	V _{CE} = -5V, I _C = -200mA
		250	—	—	—	V _{CE} = -5V, I _C = -300mA
Collector-Emitter Saturation Voltage*	V _{CE(SAT)}	—	—	-0.15	V	I _B = -1mA, I _C = -10mA
		—	—	-0.85	V	I _B = -5mA, I _C = -50mA
Output On Voltage (Same as V _{CE(SAT)})	V _{O(ON)}	—	—	-0.3	V	I _I = -0.5mA, I _O = -50mA
Input Resistance	R ₁	1.54	2.2	2.86	KΩ	—
Resistance Ratio	(R ₂ /R ₁)	17	21	26	—	—
Small Signal Characteristics						
Current Gain-Bandwidth Product	f _T	—	250	—	MHz	V _{CE} = -10V, I _E = -5mA, f = 100 MHz

* Guaranteed by design.

Notes: 4. Short duration test pulse used to minimize self-heating effect.
Pulse Test: Pulse width tp < 300 uS, Duty Cycle, d <= 2%.

Typical Characteristics

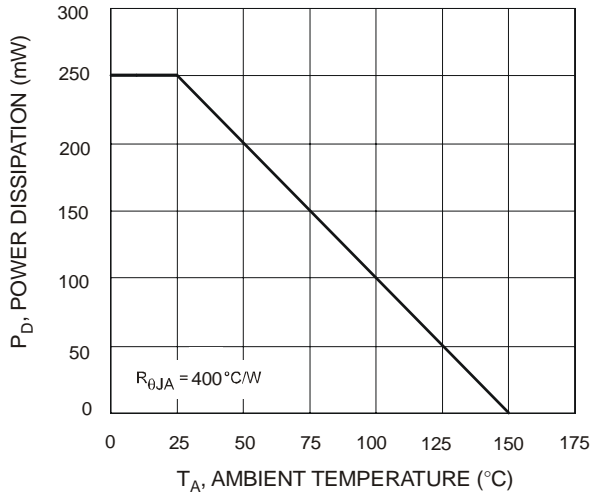


Fig. 3 Power Derating Curve

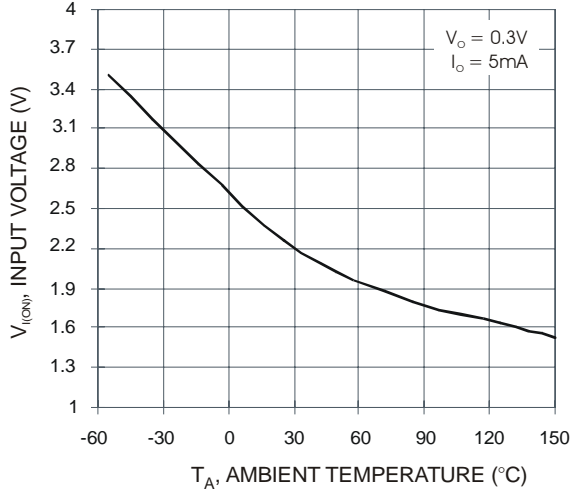


Fig. 5 Input Voltage vs. T_A

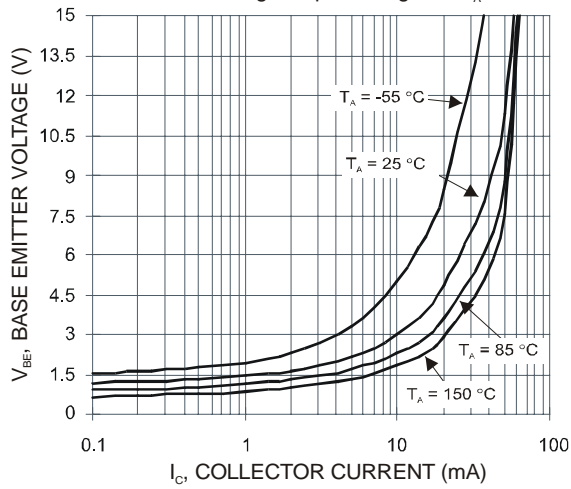


Fig. 7 I_C vs. $V_{BE(ON)}$

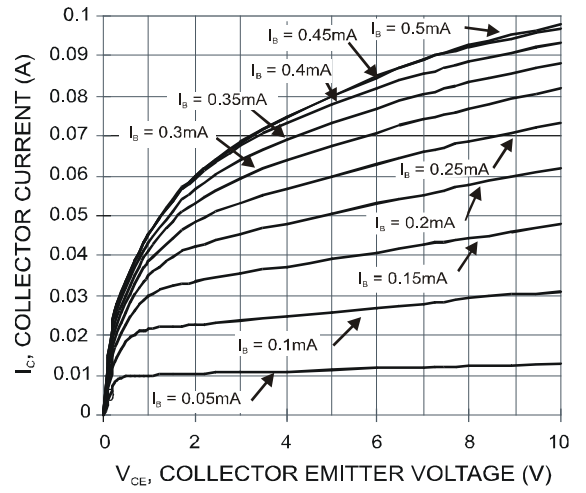


Fig. 4 V_{CE} vs. I_C

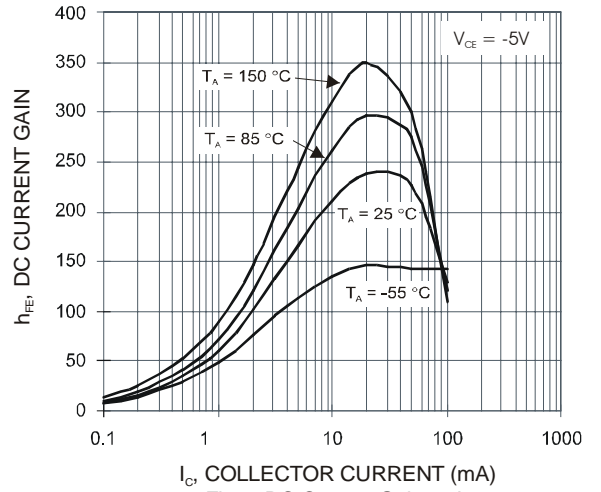


Fig. 6 DC Current Gain vs I_C

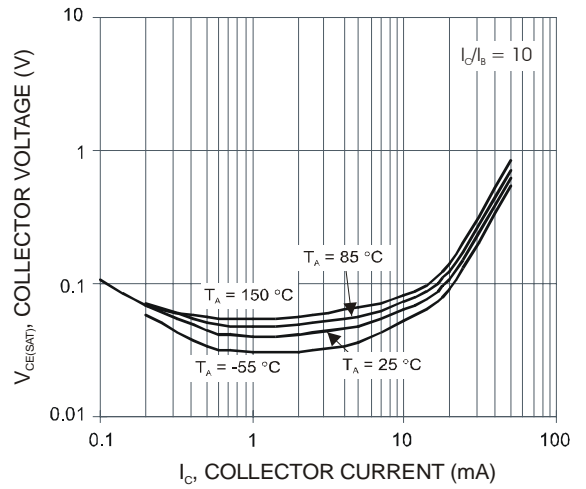
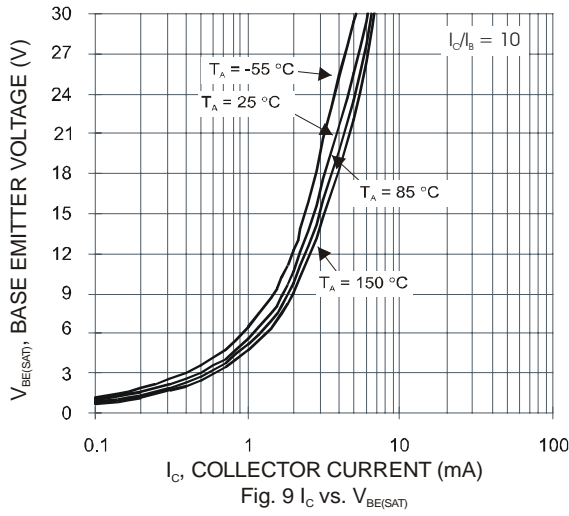


Fig. 8 I_C vs. $V_{CE(SAT)}$

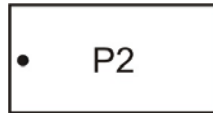


Ordering Information (Note 6)

Device	Marking Code	Packaging	Shipping
DDTA144ELP-7	P2	DFN1006-3	3000/Tape & Reel

Notes: 6. For packaging details, please see page 5 or go to our website at <http://www.diodes.com/ap2007.pdf>.

Marking Information



P2 = Product Type Marking Code
 YM = Date Code Marking
 Y = Year ex: T = 2007
 M = Month e.g. 9 = September

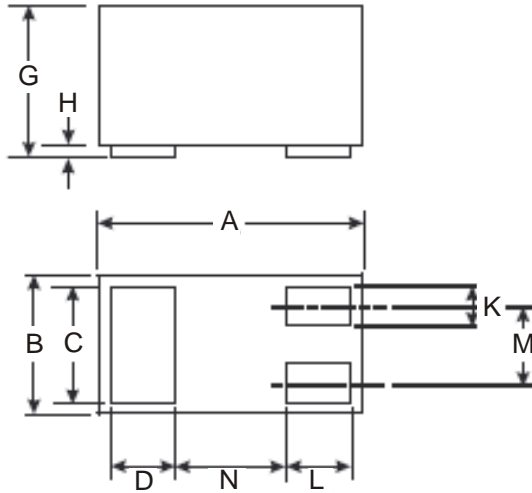
Fig. 10

Date Code Key

Year	2007	2008	2009	2010	2011	2012
Code	U	V	W	X	Y	Z

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

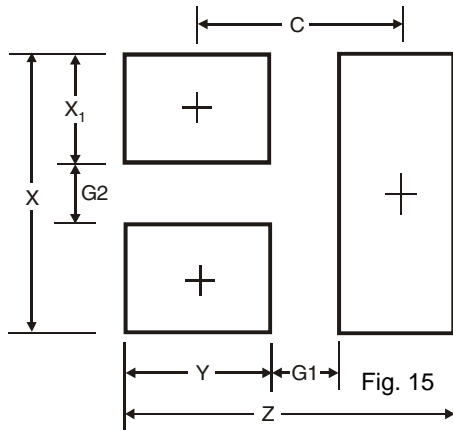
Mechanical Details



DFN1006-3			
Dim	Min	Max	Typ
A	0.95	1.05	1.00
B	0.55	0.65	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			

Fig. 11

Suggested Pad Layout: (Based on IPC-SM-782)



DFN1006-3	
Z	1.1
G1	0.3
G2	0.2
X	0.7
X1	0.25
Y	0.4
C	0.7
All Dimensions in mm	

Fig. 12

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