DIODES INCORPORATED

Lead-free Green

DDTA144ELP

PNP PRE-BIASED (R1=R2) SMALL SIGNAL TRANSISTOR IN DFN1006

Product Summary

Part Number	R1 (NOM)	R2 (NOM)	Marking
DDTA144ELP	47kΩ	47kΩ	P2

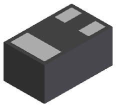
Features

- Epitaxial Planar Die Construction
- Ultra-Small Leadless Surface Mount Package
- Ideally Suited for Automated Assembly Processes
- **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**

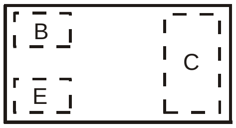
Mechanical Data

- Case: X1-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: 0.0009 grams (Approximate)

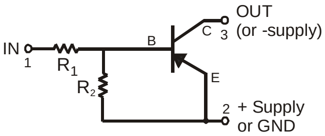
X1-DFN1006-3



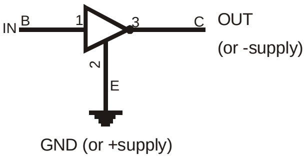
Bottom View



Top View
Pin-Out



Device Symbol



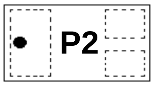
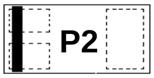
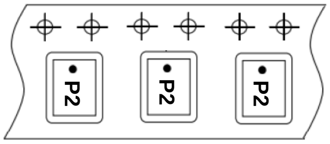
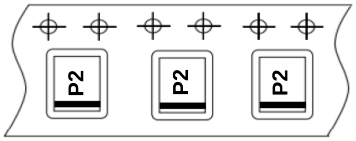
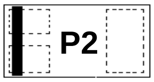
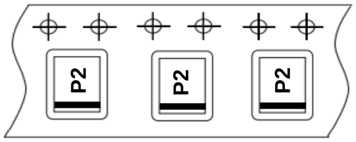
Equivalent Inverter Circuit

Ordering Information (Note 4)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
DDTA144ELP-7	P2	7	8	3,000
DDTA144ELP-7B	P2	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 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.

Marking Information

DDTA144ELP-7	 Top View Dot Denotes Collector Side From date code 1527 (YYWW), this changes to:  Top View Bar Denotes Base and Emitter Side  
DDTA144ELP-7B	 Top View Bar Denotes Base and Emitter Side  P2 = Product Type Marking Code

Absolute 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)	$I_{C(MAX)}$	-200	mA

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P_D	250	mW
Power Deration above +25°C	P_{der}	2	mW/°C
Thermal Resistance, Junction to Ambient Air (Note 5) (Equivalent to one heated junction of PNP)	$R_{\theta JA}$	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 (Notes 6 & 7)						
Collector-Base Breakdown Voltage	BV_{CBO}	-50	—	—	V	I_C = -10µA, I_E = 0
Collector-Emitter Breakdown Voltage	BV_{CEO}	-50	—	—	V	I_C = -1mA, I_B = 0
Emitter-Base Breakdown Voltage	BV_{EBO}	-4.5	—	—	V	I_E = -100µA, I_C = 0
Collector Cutoff Current	I_{CEX}	—	—	-100	nA	V_{CE} = -50V, $V_{EB(OFF)}$ = 3V
Base Cutoff Current (I_{BEX})	I_{BL}	—	—	-60	µA	V_{CE} = -50V, $V_{EB(OFF)}$ = 3V
Collector-Base Cut Off Current	I_{CBO}	—	—	-100	nA	V_{CB} = -50V, I_E = 0
Collector-Emitter Cut Off Current, $I_{O(off)}$	I_{CES}	—	—	-100	nA	V_{CE} = -50V, I_B = 0
Emitter-Base Cut Off Current	I_{EBO}	—	—	-100	µA	V_{EB} = -4V, I_C = 0
Input Off Voltage	$V_{I(off)}$	-300	—	—	mV	V_{CC} = -5V, I_O = -100uA
On Characteristics (Notes 6 & 7)						
Input-On Voltage	$V_{I(on)}$	—	—	-3	V	V_O = -0.3V, I_O = -5mA
Input Current	I_I	—	—	-180	µA	V_I = -5V
DC Current Gain	h_{FE}	90	—	—	—	V_{CE} =-5V, I_C = -2.5mA
		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
Output On Voltage (Collector-Emitter Saturation Voltage)	$V_{O(on)}$	—	—	-150	mV	I_I = -1mA, I_O = -10mA
		—	—	-800	mV	I_I = -1mA, I_O = -40mA
Input Resistance	R1	33	47	61	kΩ	—
Resistance Ratio	(R2/R1)	0.8	1	1.2	—	—
Small Signal Characteristics						
Current Gain-Bandwidth Product	f_T	—	250	—	MHz	V_{CE} = -10V, I_E = -5mA, f = 100 MHz

Notes: 5. 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.
6. Measured under pulsed conditions. Pulse width ≤ 300µs. Duty cycle ≤ 2%.
7. Guaranteed by design.

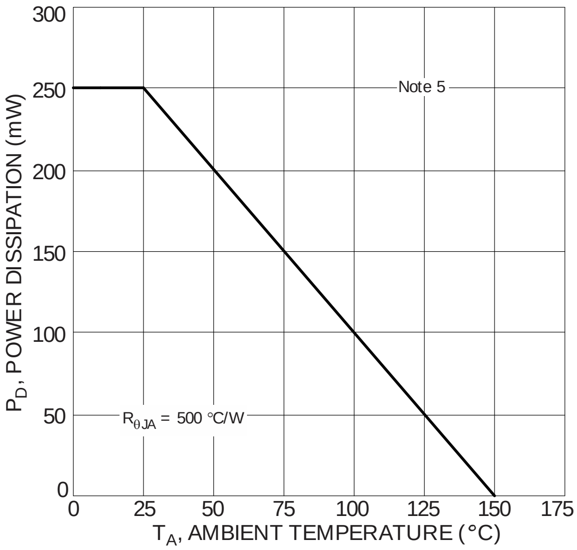


Fig. 1 Power Dissipation vs. Ambient Temperature

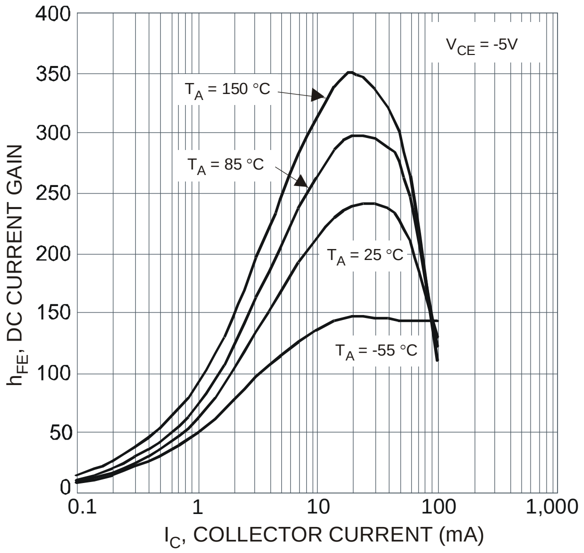


Fig. 2 Typical DC Current Gain vs. Collector Current

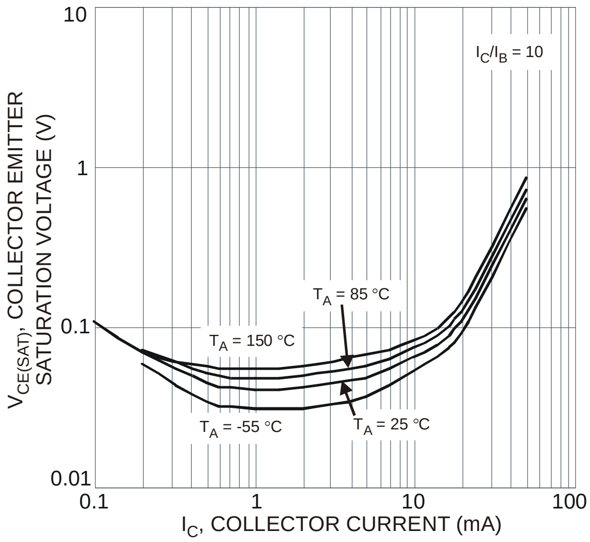


Fig. 3 Typical Collector Emitter Saturation Voltage vs. Collector Current

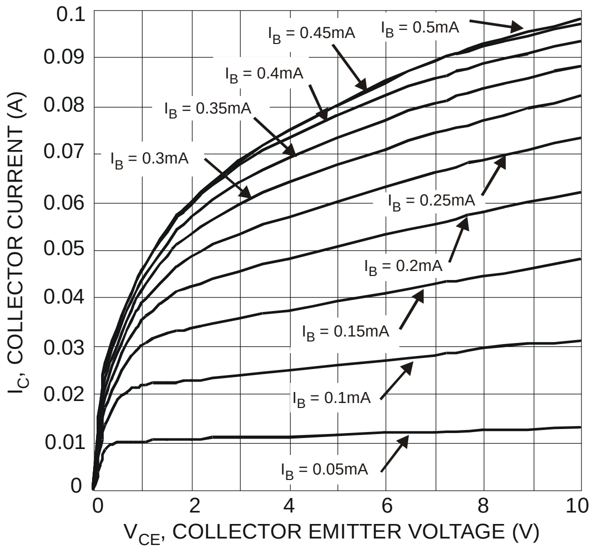


Fig. 4 Typical Collector Emitter Voltage vs. Collector Current

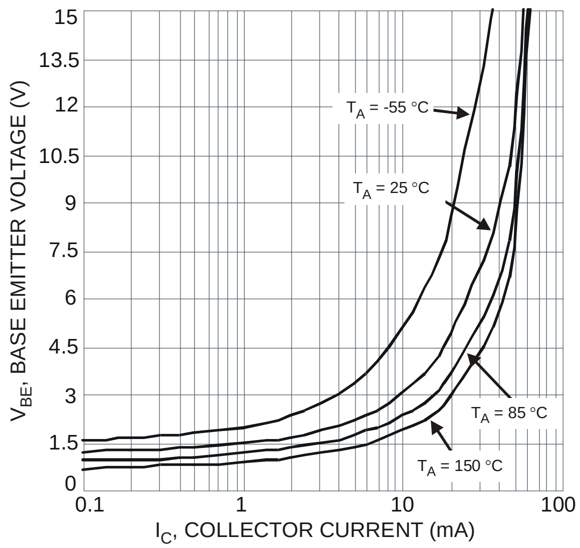


Fig. 5 Typical Base Emitter Voltage vs. Collector Current

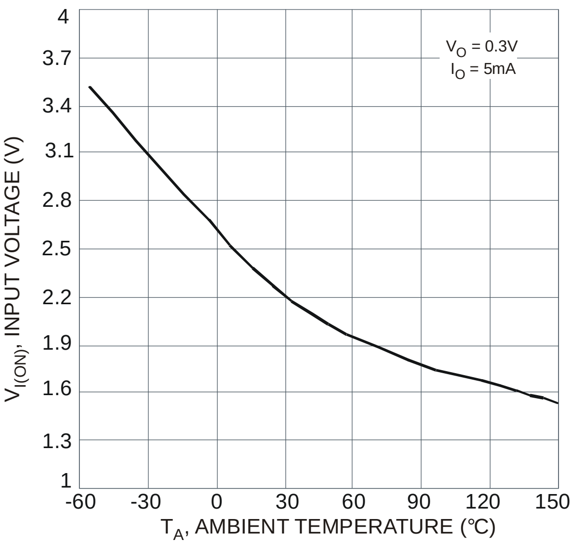


Fig. 6 Typical Input Voltage vs. Ambient Temperature

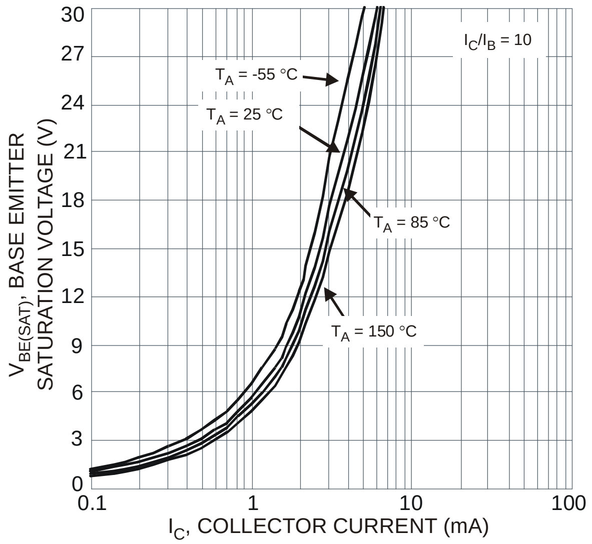
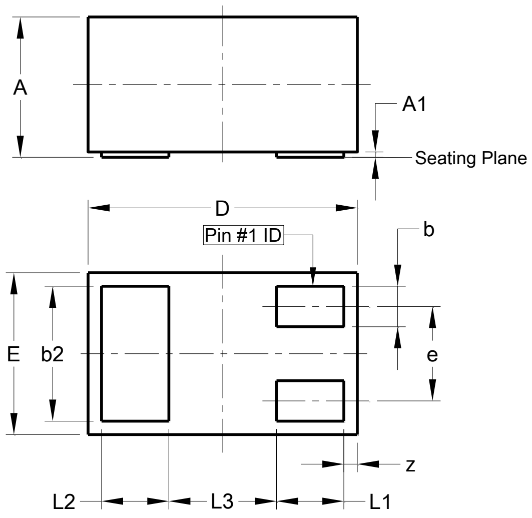


Fig. 7 Typical Base Emitter Saturation Voltage vs. Collector Current

Package Outline Dimensions

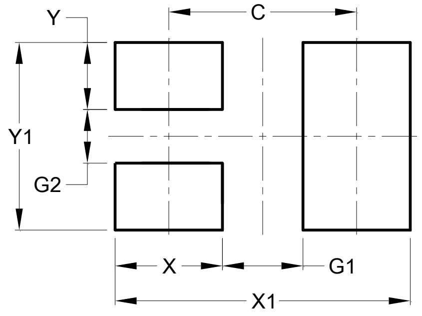
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.



X1-DFN1006-3			
Dim	**Min**	**Max**	**Typ**
A	0.47	0.53	0.50
A1	0.00	0.05	0.03
b	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
z	0.02	0.08	0.05
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)
C	0.70
G1	0.30
G2	0.20
X	0.40
X1	1.10
Y	0.25
Y1	0.70

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