# PNP 100mA PRE-BIASED TRANSISTOR IN DFN1006-3/SWP

## Features

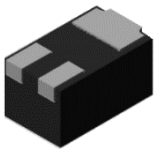
- Built-In Biasing Resistors
- $P_D$ = 0.89W Power Dissipation
- 0.6mm$^2$ Package Footprint, 13 Times Smaller than SOT23
- 0.5mm-High Package Minimizing Off-Board Profile
- Sidewall Tin Plating for Wettable Flanks in AOI
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **The ADTA144ELP4WQ is suitable for automotive applications requiring specific change control; this part are AEC-Q101 qualified, PPAP capable, and manufactured in IATF16949 certified facilities.**
  **https://www.diodes.com/quality/product-definitions/**

## Mechanical Data

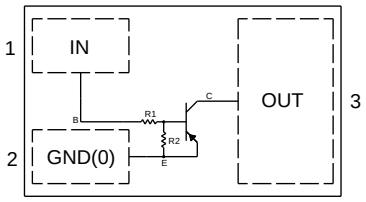
- Package: U-DFN1006-3/SWP (Type UX)
- Package Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Plated Leads Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.0008 grams (Approximate)

| R1, R2 (NOM) |
|---|
| 47kΩ |

U-DFN1006-3/SWP
(Type UX)



Bottom View




Device Schematic

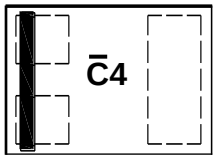
## Ordering Information (Note 4)

| Orderable Part Number | Package | Marking | Reel Size (inches) | Tape Width (mm) | Packing | |
|---|---|---|---|---|---|---|
| | | | | | Qty. | Carrier |
| ADTA144ELP4WQ-7 | U-DFN1006-3/SWP (Type UX) | C4 | 7 | 8 | 3,000 | Reel |
| ADTA144ELP4WQ-7B | U-DFN1006-3/SWP (Type UX) | C4 | 7 | 8 | 10,000 | Reel |

Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
2. See https://www.diodes.com/quality/lead-free/ 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 https://www.diodes.com/design/support/packaging/diodes-packaging/.

## Marking Information

U-DFN1006-3/SWP
(Type UX)




$\bar{C}4$ = Product Type Marking Code

## Absolute Maximum Ratings (@$T_A$ = +25°C, unless otherwise specified.)

| Characteristic | Symbol | Value | Unit |
|---|---|---|---|
| Supply Voltage <Pin: (3) to (2)> | $V_{CC}$ | -50 | V |
| Input Voltage <Pin: (1) to (2)> | $V_{IN}$ | +10 to –40 | V |
| Output Current | $I_O$ | -30 | mA |
| Output Current | $I_C$ (Max) | -100 | mA |

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

| Characteristic | | Symbol | Value | Unit |
|---|---|---|---|---|
| Power Dissipation | (Note 5) | $P_D$ | 0.255 | W |
| | (Note 6) | | 0.890 | |
| Thermal Resistance, Junction to Ambient | (Note 5) | $R_{\theta JA}$ | 490 | °C/W |
| | (Note 6) | | 140 | |
| Thermal Resistance, Junction to Lead | (Note 7) | $R_{\theta JL}$ | 49 | °C/W |
| Operating and Storage and Temperature Range | | $T_J$, $T_{STG}$ | -55 to +150 | °C |

Notes:
5. For a device mounted on the minimum recommended pad layout of 2oz copper on a single-sided 1.6mm FR4 PCB; device is measured under still-air conditions whilst operating in steady-state condition.
6. Same as Note 5, except the exposed collector pad is mounted on 25mm x 25mm 2oz copper.
7. Thermal resistance from junction to solder-point (on the exposed collector pad).

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

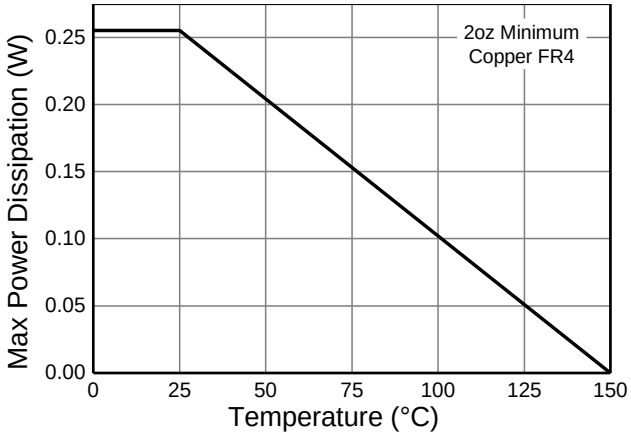



**Fig.1 Derating Curve**

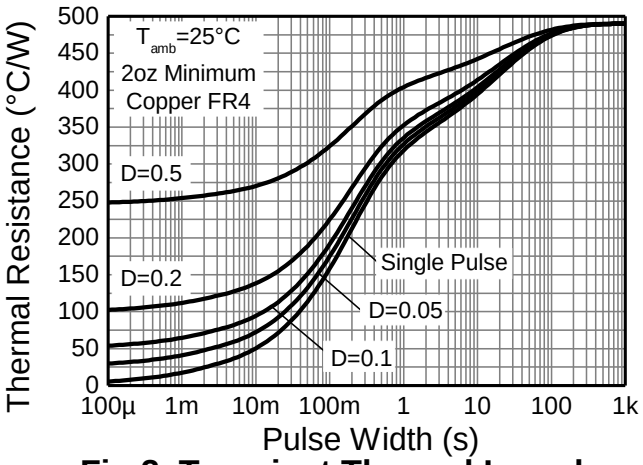



**Fig.2 Transient Thermal Impedance**

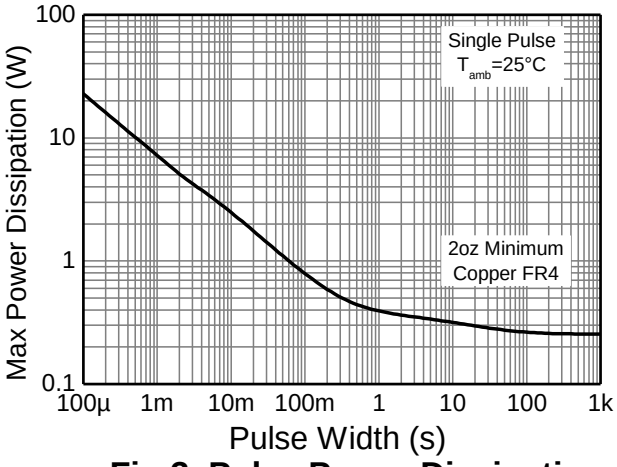



**Fig.3 Pulse Power Dissipation**

## Electrical Characteristics (@$T_A$ = +25°C, unless otherwise specified.)

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|---|---|---|---|---|---|---|
| Input Voltage | $V_{I(off)}$ (Note 8) | -0.8 | -1.1 | — | V | $V_{CC}$ = -5V, $I_O$ = -100μA |
| | $V_{I(on)}$ (Note 9) | — | -1.9 | -3 | | $V_O$ = -0.3V, $I_O$ = -2mA |
| Output Voltage | $V_{O(on)}$ | — | — | -150 | mV | $I_O/I_I$ = -10mA/-0.5mA |
| Input Current | $I_I$ | — | — | -180 | μA | $V_I$ = -5V |
| Output Current | $I_{O(off)}$ | — | — | -0.1 | μA | $V_{CC}$ = -50V, $V_I$ = 0V |
| DC Current Gain | $G_I$ | 80 | — | — | — | $V_O$ = -5V, $I_O$ = -5mA |
| Input Resistor Tolerance | $\Delta R_1$ | -30 | — | +30 | % | — |
| Resistance Ratio Tolerance | $\Delta R_2/R_1$ | -20 | 1 | +20 | % | — |
| Gain-Bandwidth Product (Note 10) | $f_T$ | — | 250 | — | MHz | $V_{CE}$ = -10V, $I_E$ = -5mA, f = 100MHz |

Notes: 8. Guarantees that the device will be switched OFF if the Input Voltage is less than -0.8V.
9. Guarantees that the device will be switched ON if the Input Voltage is more than -3V.
10. Transistor - For Reference Only.

## Typical Electrical Characteristics (@$T_A$ = +25°C, unless otherwise specified.)

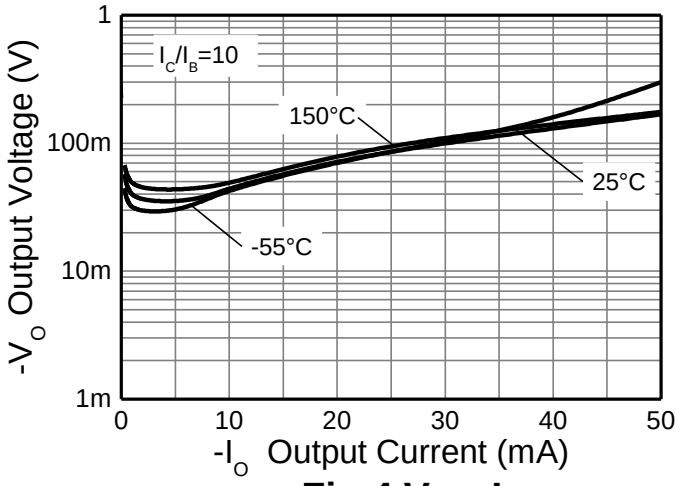



**Fig.4 $V_o$ v $I_o$**

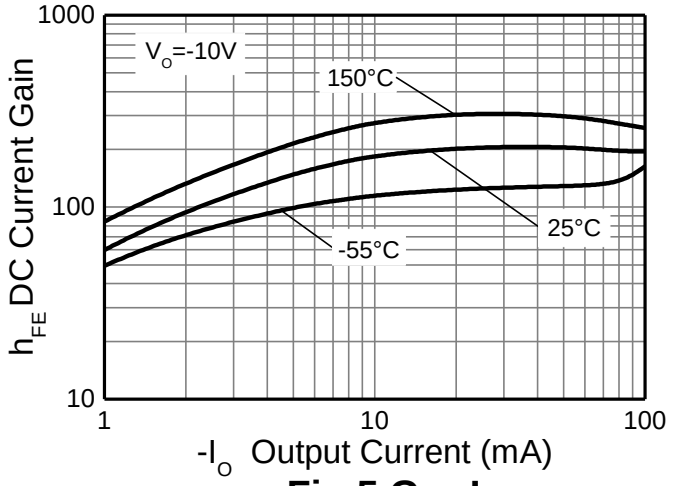



**Fig.5 $G_I$ v $I_o$**

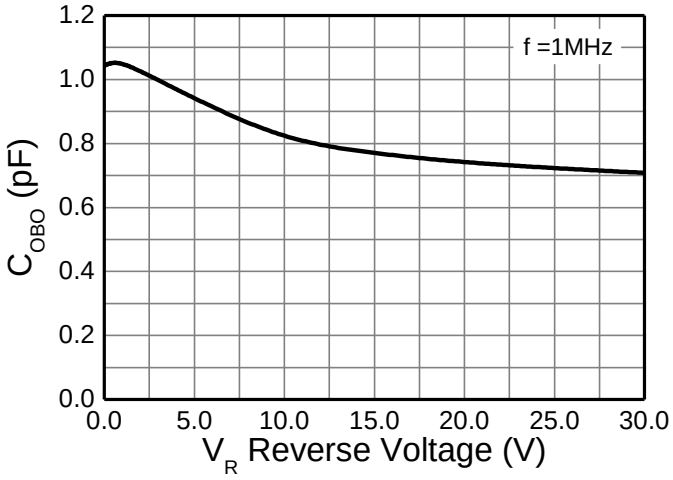



**Fig.6 Output Capacitance**

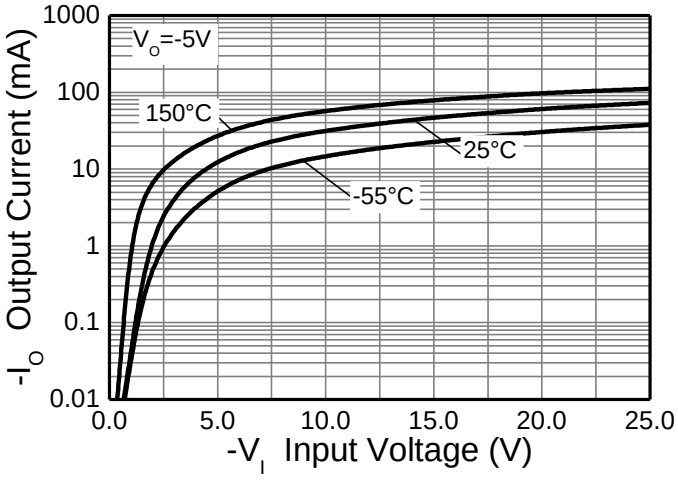



**Fig.7 $I_o$ v $V_I$**

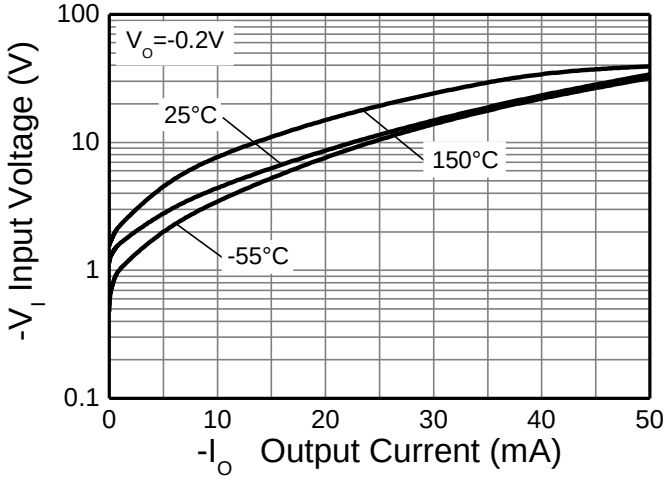
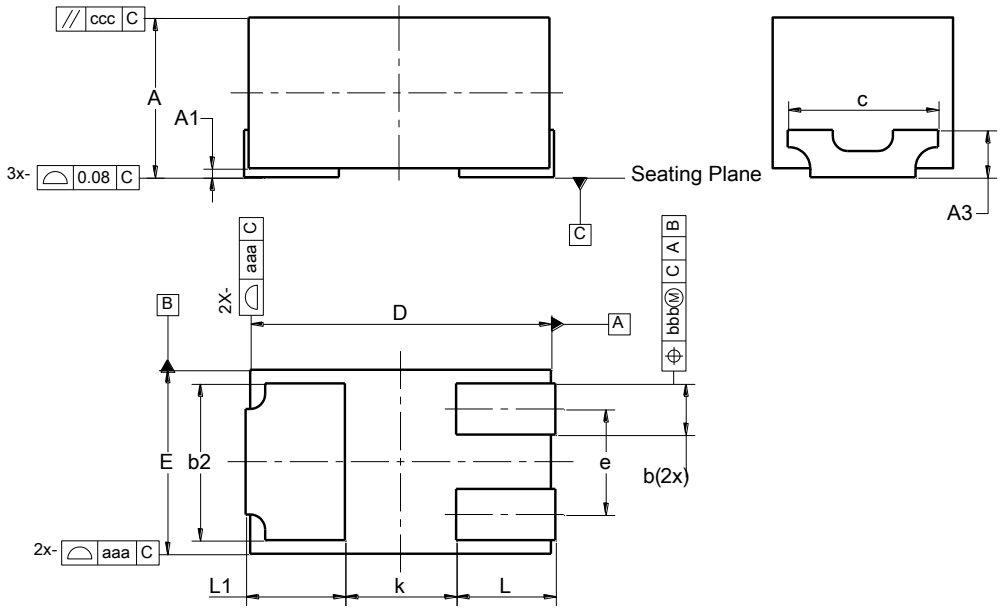



**Fig.8 $V_I$ v $I_o$**

## Package Outline Dimensions

Please see http://www.diodes.com/package-outlines.html for the latest version.

**U-DFN1006-3/SWP (Type UX)**

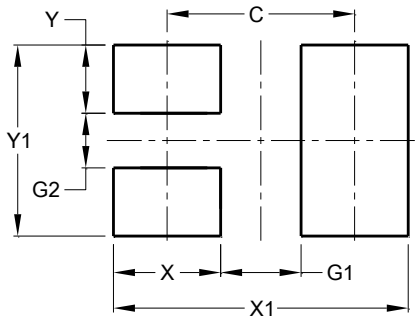



| U-DFN1006-3/SWP (Type UX) | | | |
|---|---|---|---|
| **Dim** | **Min** | **Max** | **Typ** |
| **A** | 0.47 | 0.53 | 0.50 |
| **A1** | 0.00 | 0.05 | 0.03 |
| **A3** | 0.17 REF | | |
| **b** | 0.12 | 0.22 | 0.17 |
| **b2** | 0.47 | 0.57 | 0.52 |
| **D** | 0.95 | 1.05 | 1.00 |
| **E** | 0.55 | 0.65 | 0.60 |
| **e** | -- | -- | 0.35 |
| **k** | 0.37 REF | | |
| **L** | 0.28 | 0.38 | 0.33 |
| **L1** | 0.28 | 0.38 | 0.33 |
| **c** | 0.50 REF | | |
| **aaa** | 0.15 | | |
| **bbb** | 0.05 | | |
| **ccc** | 0.05 | | |
| **All Dimensions in mm** | | | |

## Suggested Pad Layout

Please see http://www.diodes.com/package-outlines.html for the latest version.

**U-DFN1006-3/SWP (Type UX)**




| Dimensions | Value (in mm) |
|---|---|
| **C** | 0.700 |
| **G** | 0.300 |
| **G1** | 0.200 |
| **X** | 0.400 |
| **X1** | 1.100 |
| **Y** | 0.250 |
| **Y1** | 0.700 |

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