

## Description

The Advanced Ultra Low Power (AUP) CMOS logic family is designed for low power and extended battery life in portable applications.

The AUP1G14 is a single 1-input Schmitt-trigger inverter gate with a standard push-pull output designed for operation over a power supply range of 0.8V to 3.6V. The device is fully specified for partial power down applications using  $I_{OFF}$ . The  $I_{OFF}$  circuitry disables the output preventing damaging current backflow when the device is powered down.

The gate performs the positive Boolean function:

$$Y = \overline{A}$$

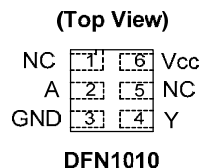
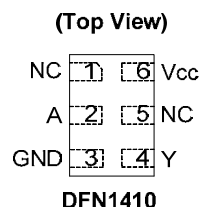
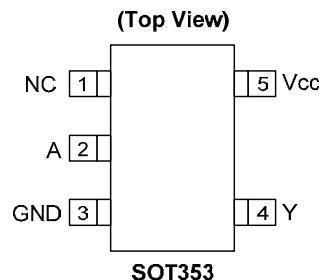
## Features

- Advanced Ultra Low Power (AUP) CMOS
- Supply Voltage Range from 0.8V to 3.6V
- $\pm 4\text{mA}$  Output Drive at 3.0V
- Low Static power consumption
  - $I_{CC} < 0.9\mu\text{A}$
- Low Dynamic Power Consumption
  - $C_{PD} = 6.2\text{pF}$  (Typical at 3.6V)
- Schmitt Trigger Action at All Inputs Make the Circuit Tolerant for Slower Input Rise and Fall Time. The hysteresis is typically 250mV at  $V_{CC} = 3.0\text{V}$
- $I_{OFF}$  Supports Partial-Power-Down Mode Operation
- ESD Protection Exceeds JESD 22
  - 2000-V Human Body Model (A114-A)
  - Exceeds 1000-V Charged Device Model (C101C)
- Latch-Up Exceeds 100mA per JESD 78, Class II
- Range of Package Options SOT353, DFN1410, and DFN1010
- Leadless packages per JESD30E
  - DFN1010 denoted as X2-DFN1010-6
  - DFN1014 denoted as X2-DFN1014-6
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- Halogen and Antimony Free. "Green" Device (Note 3)**

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> 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.

## Pin Assignments



## Applications

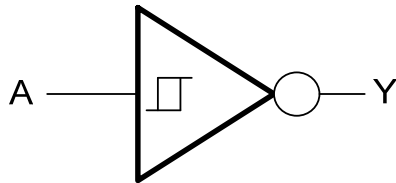
- Suited for battery and low power needs
- Wide array of products such as:
  - Tablets, E-readers
  - Cell Phones, Personal Navigation / GPS
  - MP3 players, Cameras, Video Recorders
  - PCs ultrabooks, notebooks, netbooks,
  - Computer peripherals, hard drives, CD/DVD ROM
  - TV, DVD, DVR, set top box

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## Pin Descriptions

| Pin Name        | Function       |
|-----------------|----------------|
| NC              | No Connection  |
| A               | Data Input     |
| GND             | Ground         |
| Y               | Data Output    |
| V <sub>CC</sub> | Supply Voltage |

## Logic Diagram



## Function Table

| Inputs | Output |
|--------|--------|
| A      | Y      |
| H      | L      |
| L      | H      |

## Absolute Maximum Ratings (Note 4) (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Symbol           | Parameter                                                          | Rating                       | Unit |
|------------------|--------------------------------------------------------------------|------------------------------|------|
| ESD HBM          | Human Body Model ESD Protection                                    | 2                            | KV   |
| ESD CDM          | Charged Device Model ESD Protection                                | 1                            | KV   |
| V <sub>CC</sub>  | Supply Voltage Range                                               | -0.5 to +4.6                 | V    |
| V <sub>I</sub>   | Input Voltage Range                                                | -0.5 to +4.6                 | V    |
| V <sub>O</sub>   | Voltage applied to output in high or low state                     | -0.5 to V <sub>CC</sub> +0.5 | V    |
| I <sub>IK</sub>  | Input Clamp Current V <sub>I</sub> < 0                             | 50                           | mA   |
| I <sub>OK</sub>  | Output Clamp Current (V <sub>O</sub> < 0)                          | 50                           | mA   |
| I <sub>O</sub>   | Continuous Output Current (V <sub>O</sub> = 0 to V <sub>CC</sub> ) | ±20                          | mA   |
| I <sub>CC</sub>  | Continuous Current Through V <sub>CC</sub>                         | 50                           | mA   |
| I <sub>GND</sub> | Continuous Current Through GND                                     | -50                          | mA   |
| T <sub>J</sub>   | Operating Junction Temperature                                     | -40 to +150                  | °C   |
| T <sub>STG</sub> | Storage Temperature                                                | -65 to 1+50                  | °C   |

Note: 4. Stresses beyond the absolute maximum may result in immediate failure or reduced reliability. These are stress values and device operation should be within recommend values.

## Recommended Operating Conditions (Note 5) (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Symbol          | Parameter                      | Min                     | Max             | Unit |
|-----------------|--------------------------------|-------------------------|-----------------|------|
| V <sub>CC</sub> | Operating Voltage              | 0.8                     | 3.6             | V    |
| V <sub>I</sub>  | Input Voltage                  | 0                       | 3.6             | V    |
| V <sub>O</sub>  | Output Voltage                 | 0                       | V <sub>CC</sub> | V    |
| I <sub>OH</sub> | High-Level Output Current      | V <sub>CC</sub> = 0.8V  | -20             | μA   |
|                 |                                | V <sub>CC</sub> = 1.1V  | -1.1            | mA   |
|                 |                                | V <sub>CC</sub> = 1.4V  | -1.7            |      |
|                 |                                | V <sub>CC</sub> = 1.65V | -1.9            |      |
|                 |                                | V <sub>CC</sub> = 2.3V  | -3.1            |      |
|                 |                                | V <sub>CC</sub> = 3.0V  | -4              |      |
| I <sub>OL</sub> | Low-Level Output Current       | V <sub>CC</sub> = 0.8V  | 20              | uA   |
|                 |                                | V <sub>CC</sub> = 1.1V  | 1.1             | mA   |
|                 |                                | V <sub>CC</sub> = 1.4V  | 1.7             |      |
|                 |                                | V <sub>CC</sub> = 1.65V | 1.9             |      |
|                 |                                | V <sub>CC</sub> = 2.3V  | 3.1             |      |
|                 |                                | V <sub>CC</sub> = 3.0V  | 4               |      |
| T <sub>A</sub>  | Operating Free-Air Temperature | -40                     | 125             | °C   |

Note: 5. Unused inputs should be held at V<sub>CC</sub> or Ground.

# Electrical Characteristics (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Symbol            | Parameter                                       | Test Conditions                                              | V <sub>CC</sub> | T <sub>A</sub> = +25°C |                       | T <sub>A</sub> = -40°C to +85°C |                       | Unit |
|-------------------|-------------------------------------------------|--------------------------------------------------------------|-----------------|------------------------|-----------------------|---------------------------------|-----------------------|------|
|                   |                                                 |                                                              |                 | Min                    | Max                   | Min                             | Max                   |      |
| V <sub>T+</sub>   | Positive-going input threshold voltage          |                                                              | 0.8V            | 0.4                    | 0.65                  | 0.4                             | 0.65                  | V    |
|                   |                                                 |                                                              | 1.1V            | 0.53                   | 0.9                   | 0.53                            | 0.9                   |      |
|                   |                                                 |                                                              | 1.4V            | 0.74                   | 1.11                  | 0.74                            | 1.11                  |      |
|                   |                                                 |                                                              | 1.65V           | 0.91                   | 1.29                  | 0.91                            | 1.29                  |      |
|                   |                                                 |                                                              | 2.3V            | 1.37                   | 1.77                  | 1.37                            | 1.77                  |      |
|                   |                                                 |                                                              | 3.0V            | 1.61                   | 2.32                  | 1.61                            | 2.32                  |      |
| V <sub>T-</sub>   | Negative-going input threshold voltage          |                                                              | 0.8V            | 0.15                   | 0.4                   | 0.15                            | 0.4                   | V    |
|                   |                                                 |                                                              | 1.1V            | 0.26                   | 0.65                  | 0.26                            | 0.65                  |      |
|                   |                                                 |                                                              | 1.4V            | 0.39                   | 0.75                  | 0.39                            | 0.75                  |      |
|                   |                                                 |                                                              | 1.65V           | 0.47                   | 0.84                  | 0.47                            | 0.84                  |      |
|                   |                                                 |                                                              | 2.3V            | 0.69                   | 1.04                  | 0.69                            | 1.04                  |      |
|                   |                                                 |                                                              | 3.0V            | 0.88                   | 1.24                  | 0.88                            | 1.24                  |      |
| ΔV <sub>T</sub>   | Hysteresis (V <sub>T+</sub> - V <sub>T-</sub> ) |                                                              | 0.8V            | 0.07                   | 0.5                   | 0.07                            | 0.5                   | V    |
|                   |                                                 |                                                              | 1.1V            | 0.08                   | 0.46                  | 0.08                            | 0.46                  |      |
|                   |                                                 |                                                              | 1.4V            | 0.18                   | 0.56                  | 0.18                            | 0.56                  |      |
|                   |                                                 |                                                              | 1.65V           | 0.27                   | 0.66                  | 0.27                            | 0.66                  |      |
|                   |                                                 |                                                              | 2.3V            | 0.53                   | 0.92                  | 0.53                            | 0.92                  |      |
|                   |                                                 |                                                              | 3.0V            | 0.79                   | 1.31                  | 0.79                            | 1.31                  |      |
| V <sub>OH</sub>   | High-Level Output Voltage                       | I <sub>OH</sub> = -20μA                                      | 0.8V to 3.6 V   | V <sub>CC</sub> - 0.1  |                       | V <sub>CC</sub> - 0.1           |                       | V    |
|                   |                                                 | I <sub>OH</sub> = -1.1mA                                     | 1.1V            | 0.75 X V <sub>CC</sub> |                       | 0.7 X V <sub>CC</sub>           |                       |      |
|                   |                                                 | I <sub>OH</sub> = -1.7mA                                     | 1.4V            | 1.11                   |                       | 1.03                            |                       |      |
|                   |                                                 | I <sub>OH</sub> = -1.9mA                                     | 1.65V           | 1.32                   |                       | 1.30                            |                       |      |
|                   |                                                 | I <sub>OH</sub> = -2.3mA                                     | 2.3V            | 2.05                   |                       | 1.97                            |                       |      |
|                   |                                                 | I <sub>OH</sub> = -3.1mA                                     |                 | 1.9                    |                       | 1.85                            |                       |      |
|                   |                                                 | I <sub>OH</sub> = -2.7mA                                     | 3V              | 2.72                   |                       | 2.67                            |                       |      |
|                   |                                                 | I <sub>OH</sub> = -4mA                                       |                 | 2.6                    |                       | 2.55                            |                       |      |
| V <sub>OL</sub>   | High-Level Input Voltage                        | I <sub>OL</sub> = 20μA                                       | 0.8V to 3.6V    |                        | 0.1                   |                                 | 0.1                   | V    |
|                   |                                                 | I <sub>OL</sub> = 1.1mA                                      | 1.1V            |                        | 0.3 X V <sub>CC</sub> |                                 | 0.3 X V <sub>CC</sub> |      |
|                   |                                                 | I <sub>OL</sub> = 1.7mA                                      | 1.4V            |                        | 0.31                  |                                 | 0.37                  |      |
|                   |                                                 | I <sub>OL</sub> = 1.9mA                                      | 1.65V           |                        | 0.31                  |                                 | 0.35                  |      |
|                   |                                                 | I <sub>OL</sub> = 2.3mA                                      | 2.3V            |                        | 0.31                  |                                 | 0.33                  |      |
|                   |                                                 | I <sub>OL</sub> = 3.1mA                                      |                 |                        | 0.44                  |                                 | 0.45                  |      |
|                   |                                                 | I <sub>OL</sub> = 2.7mA                                      | 3V              |                        | 0.31                  |                                 | 0.33                  |      |
|                   |                                                 | I <sub>OL</sub> = 4 mA                                       |                 |                        | 0.44                  |                                 | 0.45                  |      |
| I <sub>I</sub>    | Input Current                                   | V <sub>I</sub> = GND to 3.6V                                 | 0V to 3.6V      |                        | ± 0.1                 |                                 | ± 0.5                 | μA   |
| I <sub>OFF</sub>  | Power Down Leakage Current                      | V <sub>I</sub> or V <sub>O</sub> = 0V to 3.6V                | 0               |                        | ± 0.2                 |                                 | 0.6                   | μA   |
| ΔI <sub>OFF</sub> | Delta Power Down Leakage Current                | V <sub>I</sub> or V <sub>O</sub> = 0V to 3.6V                | 0V to 0.2V      |                        | ± 0.2                 |                                 | 0.6                   | μA   |
| I <sub>CC</sub>   | Supply Current                                  | V <sub>I</sub> = GND or V <sub>CC</sub> , I <sub>O</sub> = 0 | 0.8V to 3.6V    |                        | 0.5                   |                                 | 0.9                   | μA   |
| ΔI <sub>CC</sub>  | Additional Supply Current                       | Input at V <sub>CC</sub> -0.6V                               | 3.3V            |                        | 40                    |                                 | 50                    | μA   |

**Electrical Characteristics** (cont.) (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Symbol            | Parameter                                       | Test Conditions                                              | V <sub>CC</sub> | T <sub>A</sub> = -40 to 125 °C |                        | Unit |
|-------------------|-------------------------------------------------|--------------------------------------------------------------|-----------------|--------------------------------|------------------------|------|
|                   |                                                 |                                                              |                 | Min                            | Max                    |      |
| V <sub>T+</sub>   | Positive-going input threshold voltage          |                                                              | 0.8V            | 0.4                            | 0.65                   | V    |
|                   |                                                 |                                                              | 1.1V            | 0.53                           | 0.9                    |      |
|                   |                                                 |                                                              | 1.4V            | 0.74                           | 1.11                   |      |
|                   |                                                 |                                                              | 1.65V           | 0.91                           | 1.29                   |      |
|                   |                                                 |                                                              | 2.3V            | 1.37                           | 1.77                   |      |
|                   |                                                 |                                                              | 3.0V            | 1.61                           | 2.32                   |      |
| V <sub>T-</sub>   | Negative-going input threshold voltage          |                                                              | 0.8V            | 0.15                           | 0.4                    | V    |
|                   |                                                 |                                                              | 1.1V            | 0.26                           | 0.65                   |      |
|                   |                                                 |                                                              | 1.4V            | 0.39                           | 0.75                   |      |
|                   |                                                 |                                                              | 1.65V           | 0.47                           | 0.84                   |      |
|                   |                                                 |                                                              | 2.3V            | 0.69                           | 1.04                   |      |
|                   |                                                 |                                                              | 3.0V            | 0.88                           | 1.24                   |      |
| ΔV <sub>T</sub>   | Hysteresis (V <sub>T+</sub> - V <sub>T-</sub> ) |                                                              | 0.8V            | 0.07                           | 0.5                    | V    |
|                   |                                                 |                                                              | 1.1V            | 0.08                           | 0.46                   |      |
|                   |                                                 |                                                              | 1.4V            | 0.18                           | 0.56                   |      |
|                   |                                                 |                                                              | 1.65V           | 0.27                           | 0.66                   |      |
|                   |                                                 |                                                              | 2.3V            | 0.53                           | 0.92                   |      |
|                   |                                                 |                                                              | 3.0V            | 0.79                           | 1.31                   |      |
| V <sub>OH</sub>   | High-Level Output Voltage                       | I <sub>OH</sub> = -20μA                                      | 0.8V to 3.6V    | V <sub>CC</sub> - 0.11         |                        | V    |
|                   |                                                 | I <sub>OH</sub> = -1.1mA                                     | 1.1V            | 0.6 X V <sub>CC</sub>          |                        |      |
|                   |                                                 | I <sub>OH</sub> = -1.7mA                                     | 1.4V            | 0.93                           |                        |      |
|                   |                                                 | I <sub>OH</sub> = -1.9mA                                     | 1.65V           | 1.17                           |                        |      |
|                   |                                                 | I <sub>OH</sub> = -2.3mA                                     | 2.3V            | 1.77                           |                        |      |
|                   |                                                 | I <sub>OH</sub> = -3.1mA                                     |                 | 1.67                           |                        |      |
|                   |                                                 | I <sub>OH</sub> = -2.7mA                                     | 3V              | 2.40                           |                        |      |
|                   |                                                 | I <sub>OH</sub> = -4mA                                       |                 | 2.30                           |                        |      |
| V <sub>OL</sub>   | High-Level Input Voltage                        | I <sub>OL</sub> = 20μA                                       | 0.8V to 3.6V    |                                | 0.11                   | V    |
|                   |                                                 | I <sub>OL</sub> = 1.1mA                                      | 1.1V            |                                | 0.33 X V <sub>CC</sub> |      |
|                   |                                                 | I <sub>OL</sub> = 1.7mA                                      | 1.4V            |                                | 0.41                   |      |
|                   |                                                 | I <sub>OL</sub> = 1.9mA                                      | 1.65V           |                                | 0.39                   |      |
|                   |                                                 | I <sub>OL</sub> = 2.3mA                                      | 2.3V            |                                | 0.36                   |      |
|                   |                                                 | I <sub>OL</sub> = 3.1mA                                      |                 |                                | 0.50                   |      |
|                   |                                                 | I <sub>OL</sub> = 2.7mA                                      | 3V              |                                | 0.36                   |      |
|                   |                                                 | I <sub>OL</sub> = 4mA                                        |                 |                                | 0.50                   |      |
| I <sub>I</sub>    | Input Current                                   | V <sub>I</sub> = GND to 3.6V                                 | 0V to 3.6V      |                                | ± 0.75                 | μA   |
| I <sub>OFF</sub>  | Power Down Leakage Current                      | V <sub>I</sub> or V <sub>O</sub> = 0V to 3.6V                | 0               |                                | ± 3.5                  | μA   |
| ΔI <sub>OFF</sub> | Delta Power Down Leakage Current                | V <sub>I</sub> or V <sub>O</sub> = 0V to 3.6V                | 0V to 0.2V      |                                | ± 2.5                  | μA   |
| I <sub>CC</sub>   | Supply Current                                  | V <sub>I</sub> = GND or V <sub>CC</sub> , I <sub>O</sub> = 0 | 0.8V to 3.6V    |                                | 3.0                    | μA   |
| ΔI <sub>CC</sub>  | Additional Supply Current                       | Input at V <sub>CC</sub> -0.6V                               | 3.3V            |                                | 75                     | μA   |

## Switching Characteristics

 $C_L=5\text{pF}$  see Figure 1

| Parameter | From Input | TO OUTPUT | $V_{CC}$                       | $T_A = +25^\circ\text{C}$ |      |      | $T_A = -40^\circ\text{C to } +85^\circ\text{C}$ |      | $T_A = -40^\circ\text{C to } +125^\circ\text{C}$ |      | Unit |
|-----------|------------|-----------|--------------------------------|---------------------------|------|------|-------------------------------------------------|------|--------------------------------------------------|------|------|
|           |            |           |                                | Min                       | Typ  | Max  | Min                                             | Max  | Min                                              | Max  |      |
| $t_{pd}$  | A or B     | Y         | 0.8V                           |                           | 19.9 |      |                                                 |      |                                                  |      | ns   |
|           |            |           | $1.2\text{V} \pm 0.1\text{V}$  | 2.0                       | 8.5  | 12.0 | 2.0                                             | 13.1 | 2.0                                              | 13.1 |      |
|           |            |           | $1.5\text{V} \pm 0.1\text{V}$  | 1.5                       | 4.3  | 6.6  | 1.5                                             | 7.1  | 1.5                                              | 7.4  |      |
|           |            |           | $1.8\text{V} \pm 0.15\text{V}$ | 1.2                       | 3.7  | 5.4  | 1.2                                             | 6.0  | 1.2                                              | 6.2  |      |
|           |            |           | $2.5\text{V} \pm 0.2\text{V}$  | 1.0                       | 3.0  | 4.1  | 1.0                                             | 4.5  | 1.0                                              | 4.7  |      |
|           |            |           | $3.3\text{V} \pm 0.3\text{V}$  | 0.8                       | 2.8  | 3.6  | 0.8                                             | 3.9  | 0.8                                              | 4.0  |      |

 $C_L=10\text{pF}$  see Figure 1

| Parameter | From Input | TO OUTPUT | $V_{CC}$                       | $T_A = +25^\circ\text{C}$ |      |      | $T_A = -40^\circ\text{C to } +85^\circ\text{C}$ |      | $T_A = -40^\circ\text{C to } +125^\circ\text{C}$ |      | Unit |
|-----------|------------|-----------|--------------------------------|---------------------------|------|------|-------------------------------------------------|------|--------------------------------------------------|------|------|
|           |            |           |                                | Min                       | Typ  | Max  | Min                                             | Max  | Min                                              | Max  |      |
| $t_{pd}$  | A or B     | Y         | 0.8V                           |                           | 23.4 |      |                                                 |      |                                                  |      | ns   |
|           |            |           | $1.2\text{V} \pm 0.1\text{V}$  | 2.5                       | 8.7  | 13.7 | 2.5                                             | 13.8 | 2.5                                              | 13.9 |      |
|           |            |           | $1.5\text{V} \pm 0.1\text{V}$  | 2.0                       | 5.0  | 7.7  | 2.0                                             | 8.2  | 2.0                                              | 8.6  |      |
|           |            |           | $1.8\text{V} \pm 0.15\text{V}$ | 1.7                       | 4.2  | 6.2  | 1.7                                             | 6.7  | 1.7                                              | 7.1  |      |
|           |            |           | $2.5\text{V} \pm 0.2\text{V}$  | 1.4                       | 3.6  | 4.8  | 1.4                                             | 5.2  | 1.4                                              | 5.5  |      |
|           |            |           | $3.3\text{V} \pm 0.3\text{V}$  | 1.2                       | 3.3  | 4.3  | 1.2                                             | 4.5  | 1.2                                              | 4.7  |      |

 $C_L=15\text{pF}$  see Figure 1

| Parameter | From Input | TO OUTPUT | $V_{CC}$                       | $T_A = +25^\circ\text{C}$ |      |      | $T_A = -40^\circ\text{C to } +85^\circ\text{C}$ |     | $T_A = -40^\circ\text{C to } +125^\circ\text{C}$ |     | Unit |
|-----------|------------|-----------|--------------------------------|---------------------------|------|------|-------------------------------------------------|-----|--------------------------------------------------|-----|------|
|           |            |           |                                | Min                       | Typ  | Max  | Min                                             | Max | Min                                              | Max |      |
| $t_{pd}$  | A or B     | Y         | 0.8V                           |                           | 26.9 |      |                                                 |     |                                                  |     | ns   |
|           |            |           | $1.2\text{V} \pm 0.1\text{V}$  | 2.9                       | 9.2  | 15.3 | 2.9                                             | 17  | 2.9                                              | 17  |      |
|           |            |           | $1.5\text{V} \pm 0.1\text{V}$  | 2.3                       | 5.5  | 8.6  | 2.3                                             | 9.4 | 2.3                                              | 9.8 |      |
|           |            |           | $1.8\text{V} \pm 0.15\text{V}$ | 2.1                       | 4.7  | 7    | 2.1                                             | 7.7 | 2.1                                              | 8.1 |      |
|           |            |           | $2.5\text{V} \pm 0.2\text{V}$  | 1.7                       | 4    | 5.5  | 1.7                                             | 5.9 | 1.7                                              | 6.2 |      |
|           |            |           | $3.3\text{V} \pm 0.3\text{V}$  | 1.5                       | 3.8  | 4.8  | 1.5                                             | 5.2 | 1.5                                              | 5.4 |      |

 $C_L=30\text{pF}$  see Figure 1

| Parameter | From Input | TO OUTPUT | $V_{CC}$                       | $T_A = +25^\circ\text{C}$ |      |      | $T_A = -40^\circ\text{C to } +85^\circ\text{C}$ |      | $T_A = -40^\circ\text{C to } +125^\circ\text{C}$ |      | Unit |
|-----------|------------|-----------|--------------------------------|---------------------------|------|------|-------------------------------------------------|------|--------------------------------------------------|------|------|
|           |            |           |                                | Min                       | Typ  | Max  | Min                                             | Max  | Min                                              | Max  |      |
| $t_{pd}$  | A or B     | Y         | 0.8V                           |                           | 37.3 |      |                                                 |      |                                                  |      | ns   |
|           |            |           | $1.2\text{V} \pm 0.1\text{V}$  | 3.9                       | 11.2 | 20.7 | 3.9                                             | 22.5 | 3.9                                              | 22.5 |      |
|           |            |           | $1.5\text{V} \pm 0.1\text{V}$  | 3.2                       | 7.1  | 11.2 | 3.2                                             | 12.3 | 3.2                                              | 12.9 |      |
|           |            |           | $1.8\text{V} \pm 0.15\text{V}$ | 2.9                       | 6.0  | 9.1  | 2.9                                             | 10.0 | 2.9                                              | 10.6 |      |
|           |            |           | $2.5\text{V} \pm 0.2\text{V}$  | 2.5                       | 5.2  | 6.9  | 2.5                                             | 7.5  | 2.5                                              | 7.9  |      |
|           |            |           | $3.3\text{V} \pm 0.3\text{V}$  | 2.3                       | 4.8  | 6.1  | 2.3                                             | 7.1  | 2.3                                              | 7.4  |      |

## Operating and Package Characteristics (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Parameter       |                                        | Test Conditions                         | V <sub>CC</sub> | Typ | Unit |
|-----------------|----------------------------------------|-----------------------------------------|-----------------|-----|------|
| C <sub>pd</sub> | Power Dissipation Capacitance          | f = 1MHz<br>No Load                     | 0.8V            | 6.5 | pF   |
|                 |                                        |                                         | 1.2V ± 0.1V     | 6.5 |      |
|                 |                                        |                                         | 1.5V ± 0.1V     | 6.4 |      |
|                 |                                        |                                         | 1.8V ± 0.15V    | 6.4 |      |
|                 |                                        |                                         | 2.5V ± 0.2V     | 6.3 |      |
|                 |                                        |                                         | 3.3V ± 0.3V     | 6.3 |      |
| C <sub>i</sub>  | Input Capacitance                      | V <sub>i</sub> = V <sub>CC</sub> or GND | 0V or 3.3V      | 1.5 | pF   |
| θ <sub>JA</sub> | Thermal Resistance Junction-to-Ambient | SOT353                                  | (Note 6)        | 371 | °C/W |
|                 |                                        | X2-DFN1410-6                            |                 | 430 |      |
|                 |                                        | X2-DFN1010-6                            |                 | 445 |      |
| θ <sub>JC</sub> | Thermal Resistance Junction-to-Case    | SOT353                                  | (Note 6)        | 143 | °C/W |
|                 |                                        | X2-DFN1410-6                            |                 | 190 |      |
|                 |                                        | X2-DFN1010-6                            |                 | 250 |      |

Notes: 6. Test condition for SOT353, X2-DFN1410-6, and X2-DFN1010-6 devices mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.

## Parameter Measurement Information

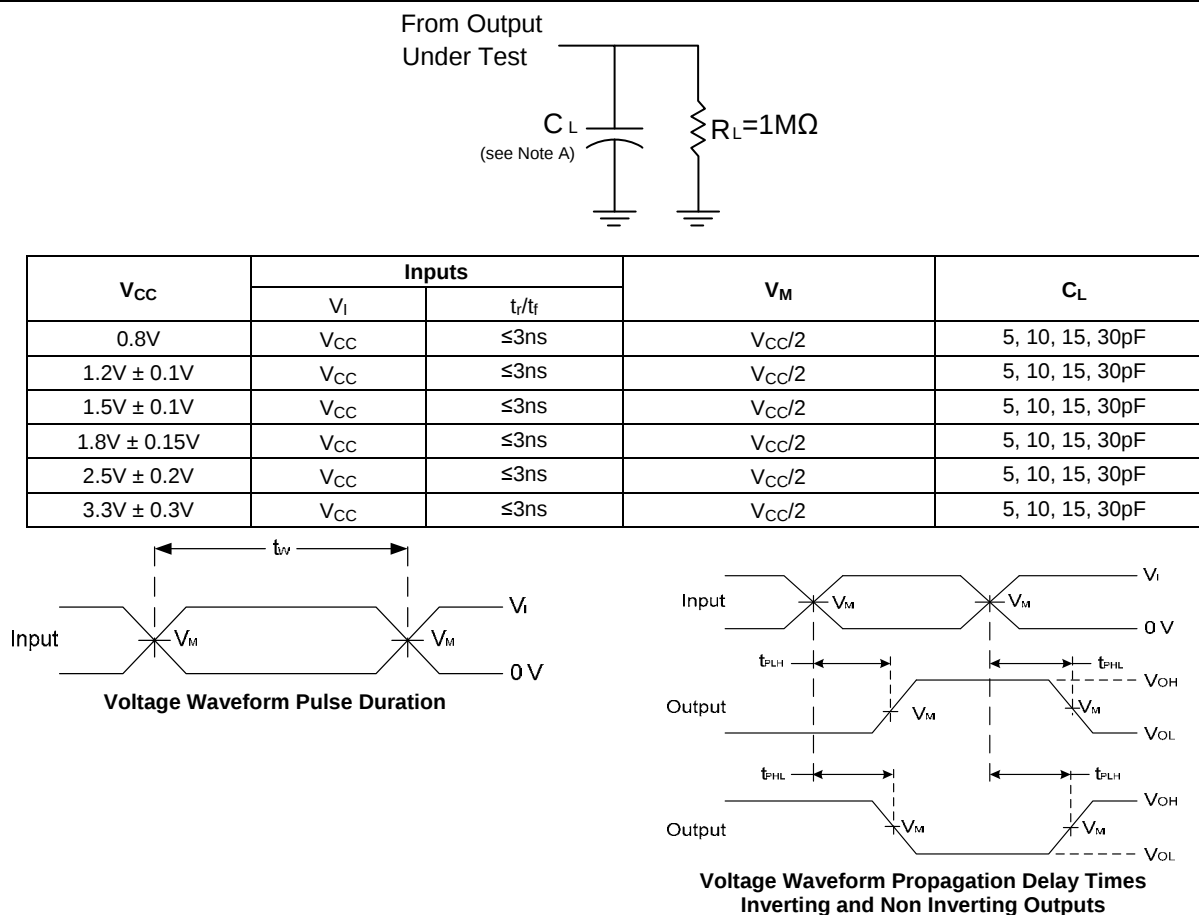
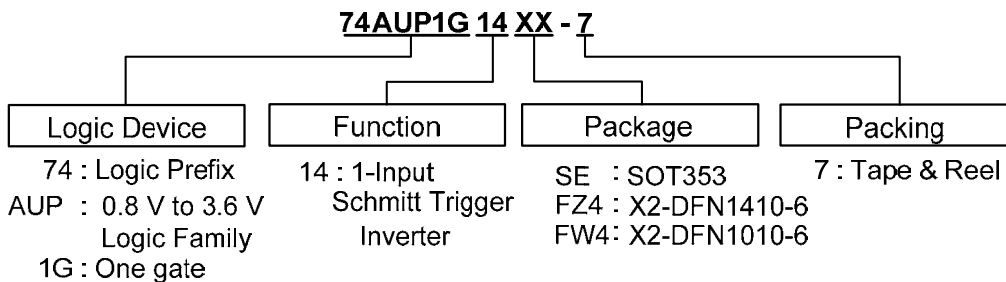


Figure 1. Load Circuit and Voltage Waveforms

Notes: A. Includes test lead and test apparatus capacitance.  
 B. All pulses are supplied at pulse repetition rate ≤ 10 MHz.  
 C. Inputs are measured separately one transition per measurement.  
 D. t<sub>PLH</sub> and t<sub>PHL</sub> are the same as t<sub>PD</sub>.

## Ordering Information

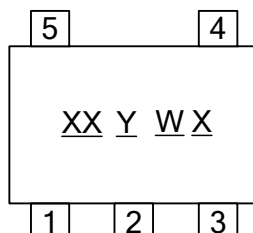


| Part Number    | Package Code | Packaging    | 7" Tape and Reel |                    |
|----------------|--------------|--------------|------------------|--------------------|
|                |              |              | Quantity         | Part Number Suffix |
| 74AUP1G14SE-7  | SE           | SOT353       | 3000/Tape & Reel | -7                 |
| 74AUP1G14FZ4-7 | FZ4          | X2-DFN1410-6 | 5000/Tape & Reel | -7                 |
| 74AUP1G14FW4-7 | FW4          | X2-DFN1010-6 | 5000/Tape & Reel | -7                 |

## Marking Information

### (1) SOT353

(Top View)

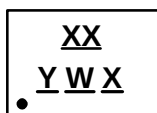


XX : Identification code  
Y : Year 0~9  
W : Week : A~Z : 1~26 week;  
           a~z : 27~52 week; z represents  
           52 and 53 week  
X : A~Z : Internal code

| Part Number | Package | Identification Code |
|-------------|---------|---------------------|
| 74AUP1G14SE | SOT353  | XS                  |

### (2) X2-DFN1410-6 and X2-DFN1010-6

(Top View)



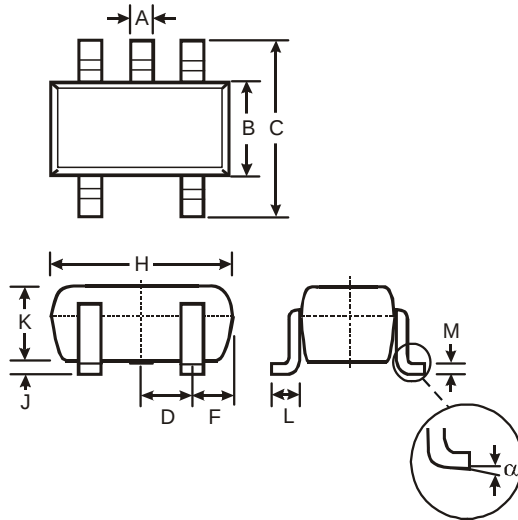
XX : Identification Code  
Y : Year : 0~9  
W : Week : A~Z : 1~26 week;  
           a~z : 27~52 week; z represents  
           52 and 53 week  
X : A~Z : Internal code

| Part Number  | Package      | Identification Code |
|--------------|--------------|---------------------|
| 74AUP1G14FZ4 | X2-DFN1410-6 | XS                  |
| 74AUP1G14FW4 | X2-DFN1010-6 | XS                  |

## Package Outline Dimensions (All dimensions in mm.)

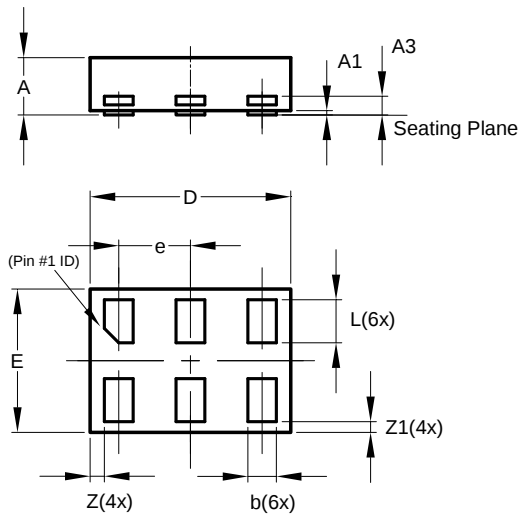
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.

### (1) SOT353



| SOT353               |          |      |       |
|----------------------|----------|------|-------|
| Dim                  | Min      | Max  | Typ   |
| A                    | 0.10     | 0.30 | 0.25  |
| B                    | 1.15     | 1.35 | 1.30  |
| C                    | 2.00     | 2.20 | 2.10  |
| D                    | 0.65 Typ |      |       |
| F                    | 0.40     | 0.45 | 0.425 |
| H                    | 1.80     | 2.20 | 2.15  |
| J                    | 0        | 0.10 | 0.05  |
| K                    | 0.90     | 1.00 | 1.00  |
| L                    | 0.25     | 0.40 | 0.30  |
| M                    | 0.10     | 0.22 | 0.11  |
| $\alpha$             | 0°       | 8°   | -     |
| All Dimensions in mm |          |      |       |

### (2) X2-DFN1410-6

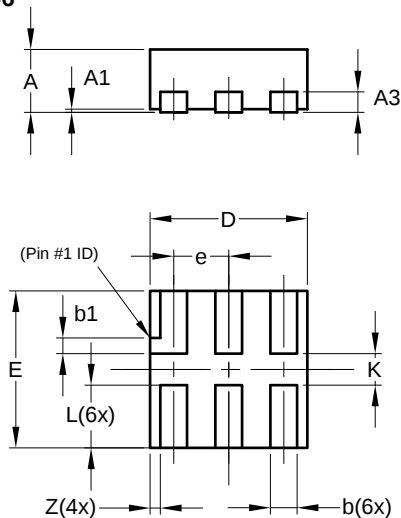


| X2-DFN1410-6         |       |       |       |
|----------------------|-------|-------|-------|
| Dim                  | Min   | Max   | Typ   |
| A                    | —     | 0.40  | 0.39  |
| A1                   | 0.00  | 0.05  | 0.02  |
| A3                   | —     | —     | 0.13  |
| b                    | 0.15  | 0.25  | 0.20  |
| D                    | 1.35  | 1.45  | 1.40  |
| E                    | 0.95  | 1.05  | 1.00  |
| e                    | —     | —     | 0.50  |
| L                    | 0.25  | 0.35  | 0.30  |
| Z                    | —     | —     | 0.10  |
| Z1                   | 0.045 | 0.105 | 0.075 |
| All Dimensions in mm |       |       |       |

## Package Outline Dimensions (cont.) (All dimensions in mm.)

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

### (3) X2-DFN1010-6

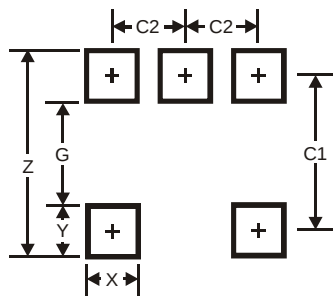


| X2-DFN1010-6         |      |      |       |
|----------------------|------|------|-------|
| Dim                  | Min  | Max  | Typ   |
| A                    | —    | 0.40 | 0.39  |
| A1                   | 0.00 | 0.05 | 0.02  |
| A3                   | —    | —    | 0.13  |
| b                    | 0.14 | 0.20 | 0.17  |
| b1                   | 0.05 | 0.15 | 0.10  |
| D                    | 0.95 | 1.05 | 1.00  |
| E                    | 0.95 | 1.05 | 1.00  |
| e                    | —    | —    | 0.35  |
| L                    | 0.35 | 0.45 | 0.40  |
| K                    | 0.15 | —    | —     |
| Z                    | —    | —    | 0.065 |
| All Dimensions in mm |      |      |       |

## Suggested Pad Layout

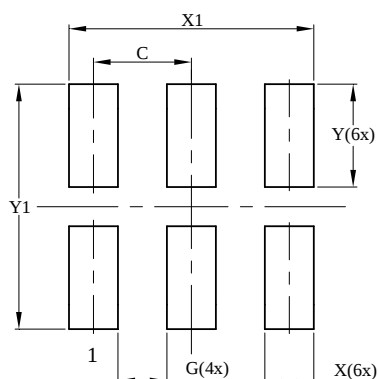
Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.

### (1) SOT353



| Dimensions | Value (in mm) |
|------------|---------------|
| Z          | 2.5           |
| G          | 1.3           |
| X          | 0.42          |
| Y          | 0.6           |
| C1         | 1.9           |
| C2         | 0.65          |

### (2) X2-DFN1410-6

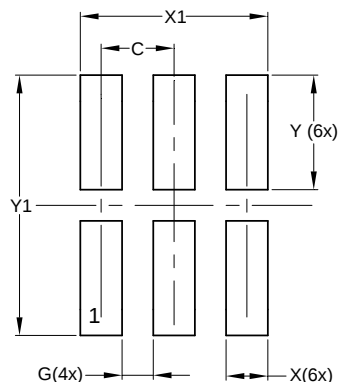


| Dimensions | Value (in mm) |
|------------|---------------|
| C          | 0.500         |
| G          | 0.250         |
| X          | 0.250         |
| X1         | 1.250         |
| Y          | 0.525         |
| Y1         | 1.250         |

## Suggested Pad Layout (cont.)

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.

### (3) X2-DFN1010-6



| Dimensions | Value<br>(in mm) |
|------------|------------------|
| C          | 0.350            |
| G          | 0.150            |
| X          | 0.200            |
| X1         | 0.900            |
| Y          | 0.550            |
| Y1         | 1.250            |

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