# SINGLE BUFFER GATE WITH 3-STATE OUTPUT

## Description

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

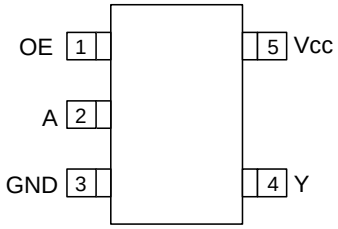
The 74AUP1G126 is a single non-inverting buffer/bus driver designed for operation over a power supply range of 0.8V to 3.6V. The device has a 3-state output that enters a high impedance state when a LOW-level is applied to the output enable (OE) pin. The device is fully specified for partial power down applications using $I_{OFF}$. The $I_{OFF}$ circuitry disables the output preventing damaging current backflow when the device is powered down

## Features

- Advanced Ultra Low Power (AUP) CMOS
- Supply Voltage Range from 0.8V to 3.6V
- ±4mA Output Drive at 3.0V
- Low Static power consumption
  - $I_{CC}$ < 0.9µA
- Low Dynamic Power Consumption
  - $C_{PD}$ = 6.3pF (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 $V_{CC}$ = 3.0V
- $I_{OFF}$ 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)**

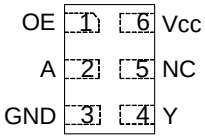
## Pin Assignments

**(Top View)**



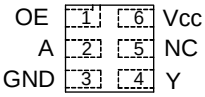

**SOT353**

**(Top View)**




**DFN1410**

**(Top View)**




**DFN1010**

## 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

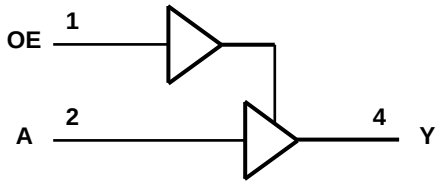
Notes: 1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
2. See http://www.diodes.com for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.

**Click here for ordering information, located at the end of datasheet**

## Pin Descriptions

| Pin Name | Function |
|---|---|
| OE | Output Enable |
| A | Data Input |
| GND | Ground |
| Y | Data Output |
| $V_{CC}$ | Supply Voltage |

## Logic Diagram




## Function Table

| Inputs | | Output |
|---|---|---|
| **OE** | **A** | **Y** |
| H | H | H |
| H | L | L |
| L | X | Z |

## Absolute Maximum Ratings (Note 4) (@$T_A$ = +25°C, unless otherwise specified.)

| Symbol | Description | Rating | Unit |
|---|---|---|---|
| ESD HBM | Human Body Model ESD Protection | 2 | KV |
| ESD CDM | Charged Device Model ESD Protection | 1 | KV |
| $V_{CC}$ | Supply Voltage Range | -0.5 to +4.6 | V |
| $V_I$ | Input Voltage Range | -0.5 to +4.6 | V |
| $V_o$ | Voltage applied to output in high or low state | -0.5 to $V_{CC}$ +0.5 | V |
| $I_{IK}$ | Input Clamp Current $V_I$ < 0 | 50 | mA |
| $I_{OK}$ | Output Clamp Current ($V_O$ < 0 ) | 50 | mA |
| $I_O$ | Continuous Output current ($V_O$ = 0 to $V_{CC}$) | ±20 | mA |
| $I_{CC}$ | Continuous Current Through $V_{CC}$ | 50 | mA |
| $I_{GND}$ | Continuous Current Through GND | -50 | mA |
| $T_J$ | Operating Junction Temperature | -40 to +150 | °C |
| $T_{STG}$ | Storage Temperature | -65 to +150 | °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) (@$T_A$ = +25°C, unless otherwise specified.)

| Symbol | Parameter | | Min | Max | Unit |
|---|---|---|---|---|---|
| $V_{CC}$ | Operating Voltage | | 0.8 | 3.6 | V |
| $V_I$ | Input Voltage | | 0 | 3.6 | V |
| $V_O$ | Output Voltage | | 0 | $V_{CC}$ | V |
| $I_{OH}$ | High-Level Output Current | $V_{CC}$ = 0.8V | | -20 | µA |
| | | $V_{CC}$ = 1.1V | | -1.1 | mA |
| | | $V_{CC}$ = 1.4V | | -1.7 | |
| | | $V_{CC}$ = 1.65V | | -1.9 | |
| | | $V_{CC}$ = 2.3V | | -3.1 | |
| | | $V_{CC}$ = 3.0V | | -4 | |
| $I_{OL}$ | Low-Level Output Current | $V_{CC}$ = 0.8V | | 20 | µA |
| | | $V_{CC}$ = 1.1V | | 1.1 | mA |
| | | $V_{CC}$ = 1.4V | | 1.7 | |
| | | $V_{CC}$ = 1.65V | | 1.9 | |
| | | $V_{CC}$ = 2.3V | | 3.1 | |
| | | $V_{CC}$ = 3.0V | | 4 | |
| Δt/ΔV | Input Transition Rise or Fall Rate | $V_{CC}$ = 0.8V to 3.6V | | 200 | ns/V |
| $T_A$ | Operating Free-Air Temperature | | -40 | +125 | °C |

Note: 5. Unused inputs should be held at $V_{CC}$ or Ground.

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

| Symbol | Parameter | Test Conditions | $V_{CC}$ | $T_A$ = +25°C | | $T_A$ = -40°C to +85°C | | Unit |
|---|---|---|---|---|---|---|---|---|
| | | | | Min | Max | Min | Max | |
| $V_{IH}$ | High-Level Input Voltage | | 0.8V to 1.65V | 0.80 X $V_{CC}$ | | 0.80 X $V_{CC}$ | | V |
| | | | 1.65V to 1.95V | 0.65 X $V_{CC}$ | | 0.65 X $V_{CC}$ | | |
| | | | 2.3V to 2.7V | 1.6 | | 1.6 | | |
| | | | 3.0V to 3.6V | 2.0 | | 2.0 | | |
| $V_{IL}$ | Low-Level Input Voltage | | 0.8V to 1.65V | | 0.30 X $V_{CC}$ | | 0.30 X $V_{CC}$ | V |
| | | | 1.65V to 1.95V | | 0.35 X $V_{CC}$ | | 0.35 X $V_{CC}$ | |
| | | | 2.3V to 2.7V | | 0.7 | | 0.7 | |
| | | | 3.0V to 3.6V | | 0.9 | | 0.9 | |
| $V_{OH}$ | High-Level Output Voltage | $I_{OH}$ = -20µA | 0.8V to 3.6V | $V_{CC}$ – 0.1 | | $V_{CC}$ – 0.1 | | V |
| | | $I_{OH}$ = -1.1mA | 1.1V | 0.75 X $V_{CC}$ | | 0.7 X $V_{CC}$ | | |
| | | $I_{OH}$ = -1.7mA | 1.4V | 1.11 | | 1.03 | | |
| | | $I_{OH}$ = -1.9mA | 1.65V | 1.32 | | 1.3 | | |
| | | $I_{OH}$ = -2.3mA | 2.3V | 2.05 | | 1.97 | | |
| | | $I_{OH}$ = -3.1mA | | 1.9 | | 1.85 | | |
| | | $I_{OH}$ = -2.7mA | 3V | 2.72 | | 2.67 | | |
| | | $I_{OH}$ = -4mA | | 2.6 | | 2.55 | | |
| $V_{OL}$ | High-Level Input Voltage | $I_{OL}$ = 20µA | 0.8V to 3.6V | | 0.1 | | 0.1 | V |
| | | $I_{OL}$ = 1.1mA | 1.1V | | 0.3 X $V_{CC}$ | | 0.3 X $V_{CC}$ | |
| | | $I_{OL}$ = 1.7mA | 1.4V | | 0.31 | | 0.37 | |
| | | $I_{OL}$ = 1.9mA | 1.65V | | 0.31 | | 0.35 | |
| | | $I_{OL}$ = 2.3mA | 2.3V | | 0.31 | | 0.33 | |
| | | $I_{OL}$ = 3.1mA | | | 0.44 | | 0.45 | |
| | | $I_{OL}$ = 2.7mA | 3V | | 0.31 | | 0.33 | |
| | | $I_{OL}$ = 4mA | | | 0.44 | | 0.45 | |
| $I_I$ | Input Current | A or B Input $V_I$ = GND to 3.6V | 0 to 3.6V | | ±0.1 | | ±0.5 | µA |
| $I_{OFF}$ | Power Down Leakage Current | $V_I$ or $V_O$ = 0V to 3.6V | 0 | | ±0.2 | | ±0.5 | µA |
| $I_{OZ}$ | Z State Leakage Current | $V_O$ = 3.6V<br>$V_i$ = 3.6V | 3.6V | | ±0.2 | | ±0.5 | µA |
| $\Delta I_{OFF}$ | Delta Power Down Leakage Current | $V_I$ or $V_O$ = 0V to 3.6V | 0 to 0.2V | | 0.2 | | 0.6 | µA |
| $I_{CC}$ | Supply Current | $V_I$ = GND or $V_{CC}$, $I_O$ = 0 | 0.8V to 3.6V | | 0.5 | | 0.9 | µA |
| $\Delta I_{CC}$ | Additional Supply Current | Data input at $V_{CC}$ -0.6V<br>OE = GND $I_O$ = 0A | 3.3V | | 40 | | 50 | µA |
| | | OE input at $V_{CC}$ -0.6V<br>Data Input = GND or Vcc, $I_O$ = 0A | 3.3V | | 110 | | 120 | µA |
| | | OE input at GND<br>Data Input = GND to 3.6V, $I_O$ = 0A | 0.8V to 3.6V | | 1 | | 1 | µA |

## Electrical Characteristics (Note 4) (@$T_A$ = +25°C, unless otherwise specified.)

| Symbol | Parameter | Test Conditions | $V_{CC}$ | $T_A$ = -40°C to +125°C | | Unit |
|---|---|---|---|---|---|---|
| | | | | Min | Max | |
| $V_{IH}$ | High-Level Input Voltage | | 0.8V to 1.65V | 0.80 X $V_{CC}$ | | V |
| | | | 1.65V to 1.95V | 0.70 X $V_{CC}$ | | |
| | | | 2.3V to 2.7V | 1.6 | | |
| | | | 3.0V to 3.6V | 2.0 | | |
| $V_{IL}$ | Low-Level nput Voltage | | 0.8V to 1.65V | | 0.25X $V_{CC}$ | V |
| | | | 1.65V to 1.95V | | 0.35 X $V_{CC}$ | |
| | | | 2.3V to 2.7V | | 0.7 | |
| | | | 3.0V to 3.6V | | 0.9 | |
| $V_{OH}$ | High-Level Output Voltage | $I_{OH}$ = -20µA | 0.8V to 3.6V | $V_{CC}$ – 0.11 | | V |
| | | $I_{OH}$ = -1.1mA | 1.1V | 0.6 X $V_{CC}$ | | |
| | | $I_{OH}$ = -1.7mA | 1.4V | 0.93 | | |
| | | $I_{OH}$ = -1.9mA | 1.65V | 1.17 | | |
| | | $I_{OH}$ = -2.3mA | 2.3V | 1.77 | | |
| | | $I_{OH}$ = -3.1mA | | 1.67 | | |
| | | $I_{OH}$ = -2.7mA | 3V | 2.40 | | |
| | | $I_{OH}$ = -4mA | | 2.30 | | |
| $V_{OL}$ | High-Level Input Voltage | $I_{OL}$ = 20µA | 0.8V to 3.6V | | 0.11 | V |
| | | $I_{OL}$ = 1.1mA | 1.1V | | 0.3 X $V_{CC}$ | |
| | | $I_{OL}$ = 1.7mA | 1.4V | | 0.41 | |
| | | $I_{OL}$ = 1.9mA | 1.65V | | 0.39 | |
| | | $I_{OL}$ = 2.3mA | 2.3V | | 0.36 | |
| | | $I_{OL}$ = 3.1mA | | | 0.50 | |
| | | $I_{OL}$ = 2.7mA | 3V | | 0.36 | |
| | | $I_{OL}$ = 4mA | | | 0.50 | |
| $I_I$ | Input Current | A or B Input $V_I$ = GND to 3.6V | 0 to 3.6V | | ±0.75 | µA |
| $I_{OFF}$ | Power Down Leakage Current | $V_I$ or $V_O$ = 0V to 3.6V | 0 | | ±3.5 | µA |
| $I_{OZ}$ | Z State Leakage Current | $V_O$ = 3.6V<br>$V_i$ = 3.6V | 3.6V | | ±1.5 | µA |
| $\Delta I_{OFF}$ | Delta Power Down Leakage Current | $V_I$ or $V_O$ = 0V to 3.6V | 0V to 0.2V | | ±2.5 | µA |
| $I_{CC}$ | Supply Current | $V_I$ = GND or $V_{CC}$, $I_O$ = 0 | 0.8V to 3.6V | | 3.0 | µA |
| $\Delta I_{CC}$ | Additional Supply Current | Data input at $V_{CC}$ -0.6V<br>OE = GND $I_O$ = 0A | 3.3V | | 75 | µA |
| | | OE input at $V_{CC}$ -0.6V<br>Data Input = GND or Vcc, $I_O$ = 0A | 3.3V | | 180 | µA |
| | | OE input at GND<br>Data Input = GND to 3.6V, $I_O$ = 0A | 0.8V to 3.6V | | 1 | µA |

## Switching Characteristics

$C_L$=5pF see Figure 1

| Parameter | From Input | TO OUTPUT | $V_{CC}$ | $T_A$ = +25°C | | | $T_A$ = -40°C to +85°C | | $T_A$ = -40°C to +125°C | | Unit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Min | Typ | Max | Min | Max | Min | Max | |
| $t_{pd}$ | A | Y | 0.8V | | 20.6 | | | | | | ns |
| | | | 1.2V ± 0.1V | 2.5 | 5.5 | 10.5 | 2.5 | 11.7 | 2.5 | 12.9 | |
| | | | 1.5V ± 0.1V | 2.0 | 3.9 | 6.1 | 2.0 | 7.3 | 2.0 | 8.1 | |
| | | | 1.8V ± 0.15V | 1.9 | 3.2 | 4.8 | 1.7 | 6.1 | 1.7 | 6.7 | |
| | | | 2.5V ± 0.2V | 1.6 | 2.6 | 3.6 | 1.4 | 4.3 | 1.4 | 4.9 | |
| | | | 3.3V ± 0.3V | 1.4 | 2.4 | 3.1 | 1.2 | 3.9 | 1.2 | 4.4 | |
| $t_{en}$ | OE | Y | 0.8V | | 71.6 | | | | | | ns |
| | | | 1.2V ± 0.1V | 2.8 | 6.2 | 12.4 | 2.6 | 13.6 | 2.6 | 13.6 | |
| | | | 1.5V ± 0.1V | 2.1 | 4.2 | 6.9 | 2.1 | 7.4 | 2.1 | 7.7 | |
| | | | 1.8V ± 0.15V | 1.7 | 3.3 | 5.3 | 1.7 | 5.9 | 1.7 | 6.2 | |
| | | | 2.5V ± 0.2V | 1.4 | 2.4 | 3.6 | 1.4 | 3.8 | 1.4 | 4.1 | |
| | | | 3.3V ± 0.3V | 1.3 | 2.0 | 2.9 | 1.2 | 3.2 | 1.2 | 3.4 | |
| $t_{dis}$ | OE | Y | 0.8V | | 10.3 | | | | | | ns |
| | | | 1.2V ± 0.1V | 2.6 | 4.2 | 8.2 | 2.6 | 8.9 | 2.6 | 8.9 | |
| | | | 1.5V ± 0.1V | 2.1 | 3.2 | 6.7 | 2.1 | 7.0 | 2.1 | 7.0 | |
| | | | 1.8V ± 0.15V | 1.7 | 3.1 | 6.2 | 1.7 | 6.5 | 1.7 | 6.5 | |
| | | | 2.5V ± 0.2V | 1.3 | 2.9 | 5.7 | 1.3 | 5.8 | 1.3 | 5.8 | |
| | | | 3.3V ± 0.3V | 1.2 | 2.8 | 4.5 | 1.2 | 4.7 | 1.2 | 4.7 | |

$C_L$=10pF see Figure 1

| Parameter | From Input | TO OUTPUT | $V_{CC}$ | $T_A$ = +25°C | | | $T_A$ = -40°C to +85°C | | $T_A$ = -40°C to +125°C | | Unit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Min | Typ | Max | Min | Max | Min | Max | |
| $t_{pd}$ | A | Y | 0.8V | | 24.0 | | | | | | ns |
| | | | 1.2V ± 0.1V | 2.6 | 6.4 | 12.3 | 2.6 | 13.8 | 2.6 | 15.2 | |
| | | | 1.5V ± 0.1V | 2.1 | 4.5 | 7.3 | 2.1 | 8.5 | 2.1 | 9.4 | |
| | | | 1.8V ± 0.15V | 1.9 | 3.8 | 5.5 | 1.9 | 6.8 | 1.9 | 7.6 | |
| | | | 2.5V ± 0.2V | 1.7 | 3.2 | 4.2 | 1.7 | 5.3 | 1.7 | 5.9 | |
| | | | 3.3V ± 0.3V | 1.6 | 3.0 | 3.8 | 1.6 | 4.6 | 1.6 | 5.2 | |
| $t_{en}$ | OE | Y | 0.8V | | 75.3 | | | | | | ns |
| | | | 1.2V ± 0.1V | 3.0 | 7.1 | 14.1 | 3.0 | 15.4 | 3.0 | 15.4 | |
| | | | 1.5V ± 0.1V | 2.1 | 4.8 | 8.0 | 2.1 | 8.3 | 2.1 | 8.6 | |
| | | | 1.8V ± 0.15V | 1.7 | 3.9 | 5.9 | 1.7 | 6.5 | 1.7 | 6.8 | |
| | | | 2.5V ± 0.2V | 1.4 | 2.9 | 4.2 | 1.4 | 4.5 | 1.4 | 4.8 | |
| | | | 3.3V ± 0.3V | 1.3 | 2.6 | 3.6 | 1.3 | 3.8 | 1.3 | 4.0 | |
| $t_{dis}$ | OE | Y | 0.8V | | 12.2 | | | | | | ns |
| | | | 1.2V ± 0.1V | 3.3 | 7.9 | 10.1 | 3.3 | 11.1 | 3.3 | 11.1 | |
| | | | 1.5V ± 0.1V | 2.1 | 7.0 | 9.3 | 2.1 | 10.1 | 2.1 | 10.1 | |
| | | | 1.8V ± 0.15V | 1.7 | 6.3 | 8.7 | 1.7 | 9.1 | 1.7 | 9.1 | |
| | | | 2.5V ± 0.2V | 1.4 | 4.9 | 7.6 | 1.4 | 7.8 | 1.4 | 7.8 | |
| | | | 3.3V ± 0.3V | 1.3 | 4.1 | 5.7 | 1.3 | 5.8 | 1.3 | 5.8 | |

## Switching Characteristics (cont.)

$C_L$=15pF see Figure 1

| Parameter | From Input | TO OUTPUT | $V_{CC}$ | $T_A$ = +25°C | | | $T_A$ = -40°C to +85°C | | $T_A$ = -40°C to +125°C | | Unit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Min | Typ | Max | Min | Max | Min | Max | |
| $t_{pd}$ | A | Y | 0.8V | | 27.4 | | | | | | ns |
| | | | 1.2V ± 0.1V | 3.6 | 7.2 | 14.1 | 3.3 | 15.8 | 3.3 | 17.5 | |
| | | | 1.5V ± 0.1V | 3.0 | 5.1 | 8.1 | 2.5 | 9.8 | 2.5 | 10.9 | |
| | | | 1.8V ± 0.15V | 2.2 | 4.3 | 6.3 | 2.0 | 7.9 | 2.0 | 8.8 | |
| | | | 2.5V ± 0.2V | 2.0 | 3.7 | 4.9 | 1.8 | 6.0 | 1.8 | 6.7 | |
| | | | 3.3V ± 0.3V | 2.0 | 3.5 | 4.4 | 1.8 | 5.4 | 1.8 | 6.1 | |
| $t_{en}$ | OE | Y | 0.8V | | 79.2 | | | | | | ns |
| | | | 1.2V ± 0.1V | 3.6 | 7.8 | 15.8 | 3.3 | 17.1 | 3.3 | 17.1 | |
| | | | 1.5V ± 0.1V | 3.0 | 5.4 | 8.8 | 2.9 | 9.4 | 2.9 | 9.7 | |
| | | | 1.8V ± 0.15V | 2.1 | 4.3 | 6.7 | 2.0 | 7.3 | 2.0 | 7.7 | |
| | | | 2.5V ± 0.2V | 1.8 | 3.4 | 4.8 | 1.7 | 5.2 | 1.7 | 5.6 | |
| | | | 3.3V ± 0.3V | 1.6 | 3.1 | 4.3 | 1.5 | 4.5 | 1.5 | 4.7 | |
| $t_{dis}$ | OE | Y | 0.8V | | 14.9 | | | | | | ns |
| | | | 1.2V ± 0.1V | 3.7 | 9.0 | 12.7 | 3.7 | 13.0 | 3.7 | 13.0 | |
| | | | 1.5V ± 0.1V | 2.5 | 8.1 | 11.5 | 2.5 | 12.0 | 2.5 | 12.0 | |
| | | | 1.8V ± 0.15V | 2.0 | 7.9 | 10.1 | 2.0 | 10.4 | 2.0 | 10.4 | |
| | | | 2.5V ± 0.2V | 1.7 | 7.7 | 9.7 | 1.7 | 9.9 | 1.7 | 9.9 | |
| | | | 3.3V ± 0.3V | 1.5 | 7.2 | 9.0 | 1.5 | 9.3 | 1.5 | 9.3 | |

$C_L$=30pF see Figure 1

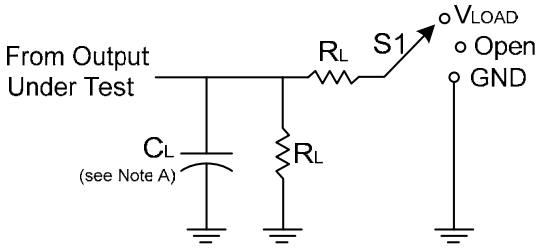
| Parameter | From Input | TO OUTPUT | $V_{CC}$ | $T_A$ = +25°C | | | $T_A$ = -40°C to +85°C | | $T_A$ = -40°C to +125°C | | Unit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Min | Typ | Max | Min | Max | Min | Max | |
| $t_{pd}$ | A | Y | 0.8V | | 37.4 | | | | | | ns |
| | | | 1.2V ± 0.1V | 4.8 | 9.5 | 18.7 | 4.4 | 21.4 | 4.4 | 24.0 | |
| | | | 1.5V ± 0.1V | 4.0 | 6.7 | 10.8 | 3.0 | 13.0 | 3.0 | 14.5 | |
| | | | 1.8V ± 0.15V | 2.5 | 5.6 | 8.4 | 2.5 | 10.3 | 2.5 | 11.5 | |
| | | | 2.5V ± 0.2V | 2.2 | 4.8 | 6.3 | 2.2 | 7.8 | 2.2 | 8.7 | |
| | | | 3.3V ± 0.3V | 2.0 | 4.6 | 5.8 | 2.0 | 7.0 | 2.0 | 8.3 | |
| $t_{en}$ | OE | Y | 0.8V | | 90.6 | | | | | | ns |
| | | | 1.2V ± 0.1V | 4.7 | 10.0 | 20.4 | 4.3 | 22.0 | 4.3 | 22.0 | |
| | | | 1.5V ± 0.1V | 3.5 | 6.9 | 11.3 | 3.5 | 12.0 | 3.5 | 12.5 | |
| | | | 1.8V ± 0.15V | 2.6 | 5.6 | 8.6 | 3.2 | 9.5 | 3.2 | 10.1 | |
| | | | 2.5V ± 0.2V | 2.3 | 4.5 | 6.3 | 2.9 | 6.8 | 2.9 | 7.3 | |
| | | | 3.3V ± 0.3V | 2.2 | 4.2 | 5.8 | 2.7 | 6.4 | 2.7 | 6.7 | |
| $t_{dis}$ | OE | Y | 0.8V | | 51.6 | | | | | | ns |
| | | | 1.2V ± 0.1V | 4.7 | 12.8 | 15.0 | 4.7 | 15.5 | 4.7 | 15.5 | |
| | | | 1.5V ± 0.1V | 3.0 | 11.8 | 13.5 | 3.0 | 13.9 | 3.0 | 13.9 | |
| | | | 1.8V ± 0.15V | 2.6 | 10.8 | 12.7 | 2.6 | 13.2 | 2.6 | 12.7 | |
| | | | 2.5V ± 0.2V | 2.3 | 10.1 | 12.0 | 2.3 | 12.5 | 2.3 | 12.5 | |
| | | | 3.3V ± 0.3V | 2.2 | 9.0 | 11.5 | 2.2 | 12.0 | 2.2 | 12.0 | |

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

| Parameter | | Test Conditions | | $V_{CC}$ | Typ | Unit |
|---|---|---|---|---|---|---|
| $C_{pd}$ | Power Dissipation Capacitance | f = 1MHz No Load | | 0.8V | 6.9 | pF |
| | | | | 1.2V ± 0.1V | 6.7 | |
| | | | | 1.5V ± 0.1V | 6.6 | |
| | | | | 1.8V ± 0.15V | 6.5 | |
| | | | | 2.5V ± 0.2V | 6.4 | |
| | | | | 3.3V ± 0.3V | 6.3 | |
| $C_i$ | Input Capacitance | $V_i = V_{CC}$ or GND | | 0 or 3.3V | 1.5 | pF |
| $\theta_{JA}$ | Thermal Resistance Junction-to-Ambient | SOT353 | (Note 6) | | 371 | °C/W |
| | | X2-DFN1410-6 | | | 430 | |
| | | X2-DFN1010-6 | | | 445 | |
| $\theta_{JC}$ | Thermal Resistance Junction-to-Case | SOT353 | (Note 6 | | 143 | °C/W |
| | | X2-DFN1410-6 | | | 190 | |
| | | X2-DFN1010-6 | | | 250 | |

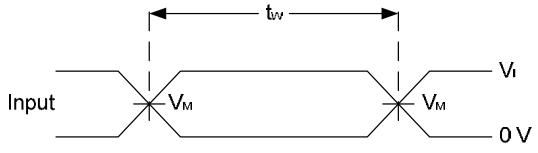
Notes: 6. Test condition for SOT353, DFN1410, and DFN1010 devices mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.

## Parameter Measurement Information

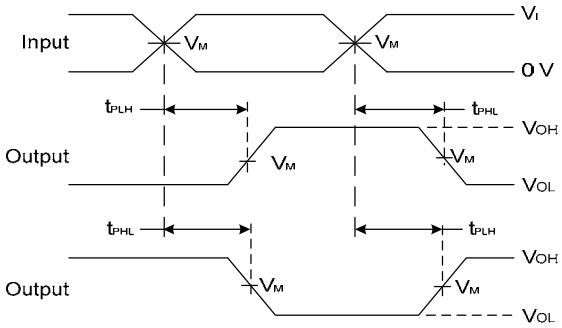



| TEST | S1 | $R_L$ |
|---|---|---|
| $t_{PLH}/t_{PHL}$ | Open | 1MΩ |
| $t_{PLZ}/t_{PZL}$ | Vload | 5KΩ |
| $t_{PHZ}/t_{PZH}$ | GND | 5KΩ |

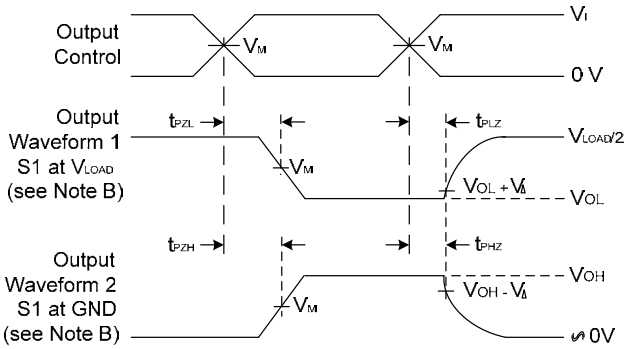
| $V_{CC}$ | Inputs | | $V_M$ | $V_{LOAD}$ | $C_L$ | $V\Delta$ |
|---|---|---|---|---|---|---|
| | $V_I$ | $t_r/t_f$ | | | | |
| 0.8V | $V_{CC}$ | ≤3ns | $V_{CC}/2$ | 2 X $V_{CC}$ | 5, 10, 15, 30pF | 0.1V |
| 1.2V ± 0.1V | $V_{CC}$ | ≤3ns | $V_{CC}/2$ | 2 X $V_{CC}$ | 5, 10, 15, 30pF | 0.1V |
| 1.5V ± 0.1V | $V_{CC}$ | ≤3ns | $V_{CC}/2$ | 2 X $V_{CC}$ | 5, 10, 15, 30pF | 0.1V |
| 1.8V ± 0.15V | $V_{CC}$ | ≤3ns | $V_{CC}/2$ | 2 X $V_{CC}$ | 5, 10, 15, 30pF | 0.15V |
| 2.5V ± 0.2V | $V_{CC}$ | ≤3ns | $V_{CC}/2$ | 2 X $V_{CC}$ | 5, 10, 15, 30pF | 0.15V |
| 3.3V ± 0.3V | $V_{CC}$ | ≤3ns | $V_{CC}/2$ | 2 X $V_{CC}$ | 5, 10, 15, 30pF | 0.3V |




**Voltage Waveform Pulse Duration**




**Voltage Waveform Propagation Delay Times**
**Inverting and Non Inverting Outputs**

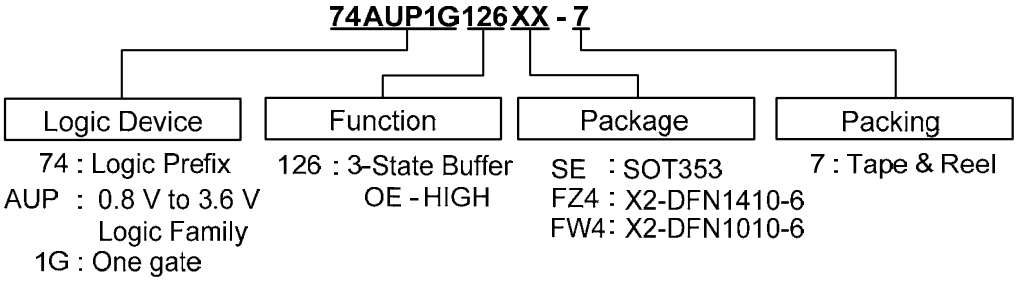



**Voltage Waveform Enable and Disable Times**
**Low and High Level Enabling**

**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. $t_{PLZ}$ and $t_{PHZ}$ are the same as $t_{dis}$.
E. $t_{PZL}$ and $t_{PZH}$ are the same as $t_{EN}$.
F. $t_{PLH}$ and $t_{PHL}$ are the same as $t_{PD}$.

## Ordering Information

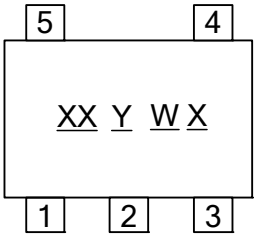



| Device | Package Code | Packaging | 7" Tape and Reel | |
|---|---|---|---|---|
| | | | Quantity | Part Number Suffix |
| 74AUP1G126SE-7 | SE | SOT353 | 3000/Tape & Reel | -7 |
| 74AUP1G126FZ4-7 | FZ4 | X2-DFN1410-6 | 5000/Tape & Reel | -7 |
| 74AUP1G126FW4-7 | FW4 | X2-DFN1010-6 | 5000/Tape & Reel | -7 |

## Marking Information

**(1) SOT353**

(Top View)

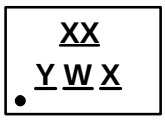



XX : Identification code
Y : Year 0~9
W : Week : A~Z : 1~26 week;
a~z : 27~52 week; z represents 52 and 53 week
X : A~Z : Internal code

| Part Number | Package | Identification Code |
|---|---|---|
| 74AUP1G126SE | SOT353 | XZ |

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

(Top View)



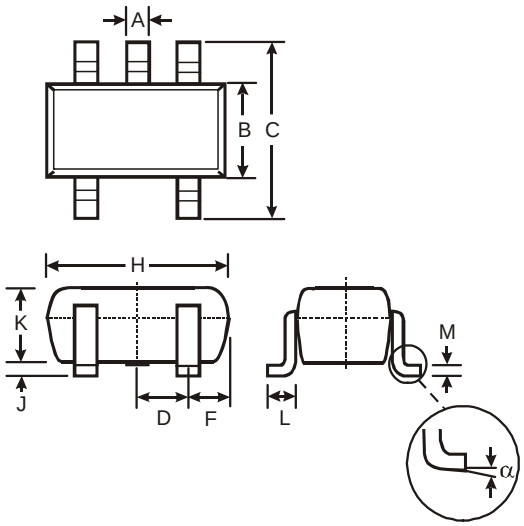

XX : Identification Code
Y : Year : 0~9
W : Week : A~Z : 1~26 week;
a~z : 27~52 week; z represents 52 and 53 week
X : A~Z : Internal code

| Part Number | Package | Identification Code |
|---|---|---|
| 74AUP1G126FZ4 | X2-DFN1410-6 | XZ |
| 74AUP1G126FW4 | X2-DFN1010-6 | XZ |

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

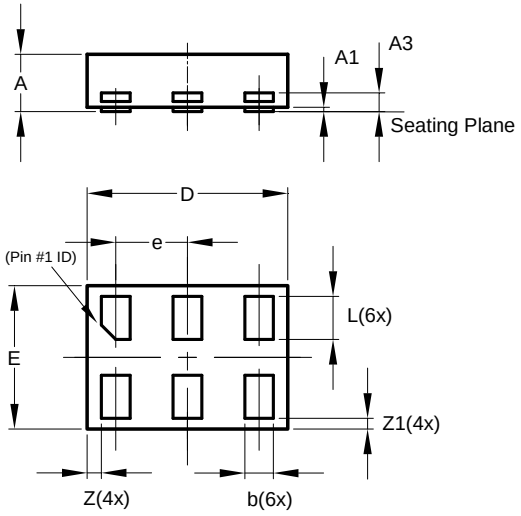
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for latest version.

### (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 |
| **α** | 0° | 8° | - |
| **All Dimensions in mm** | | | |

### (2) X2-DFN1410-6

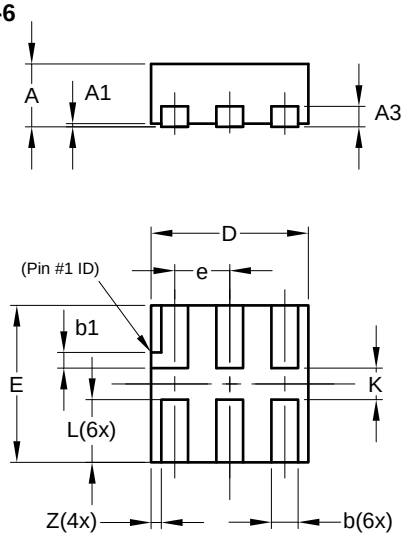



| X2-DFN1410-6 | | | |
|---|---|---|---|
| **Dim** | **Min** | **Max** | **Typ** |
| **A** | — | 0.40 | 0.39 |
| **A1** | 0.00 | 0.05 | 0.02 |
| **A3** | — | — | 0.13 |
| **b** | 0.15 | 0.25 | 0.20 |
| **D** | 1.35 | 1.45 | 1.40 |
| **E** | 0.95 | 1.05 | 1.00 |
| **e** | — | — | 0.50 |
| **L** | 0.25 | 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**

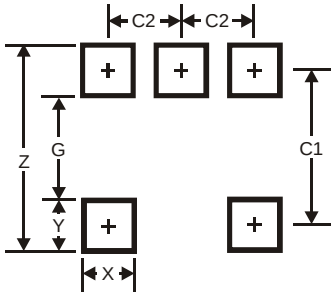



| X2-DFN1010-6 | | | |
|---|---|---|---|
| **Dim** | **Min** | **Max** | **Typ** |
| **A** | — | 0.40 | 0.39 |
| **A1** | 0.00 | 0.05 | 0.02 |
| **A3** | — | — | 0.13 |
| **b** | 0.14 | 0.20 | 0.17 |
| **b1** | 0.05 | 0.15 | 0.10 |
| **D** | 0.95 | 1.05 | 1.00 |
| **E** | 0.95 | 1.05 | 1.00 |
| **e**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

## Suggested Pad Layout

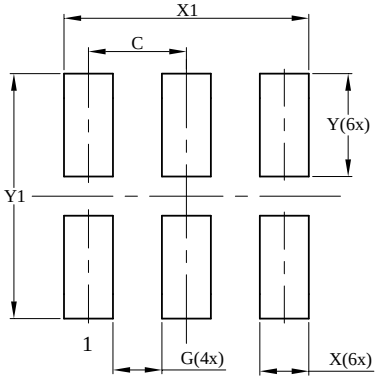
Please see AP02001 at http://www.diodes.com/datasheets/ap02001.pdf for the latest version

**(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**

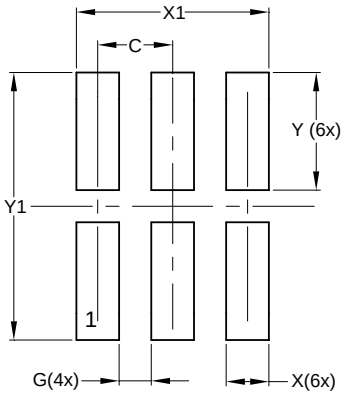



| Dimensions | Value (in mm) |
|---|---|
| **C** | 0.500 |
| **G** | 0.250 |
| **X** | 0.250 |
| **X1** | 1.250 |
| **Y** | 0.525 |
| **Y1** | 1.250 |

## 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 (in mm) |
|---|---|
| C | 0.350 |
| G | 0.150 |
| X | 0.200 |
| X1 | 0.900 |
| Y | 0.550 |
| Y1 | 1.250 |

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**Телефон:** +7 812 627 14 35

**Электронная почта:** sales@st-electron.ru

**Адрес:** 198099, Санкт-Петербург,
Промышленная ул, дом № 19, литера Н,
помещение 100-Н Офис 331