

## Description

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

The 74AUP1G08 is a single 2-input positive AND 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<sub>OFF</sub>. The I<sub>OFF</sub> circuitry disables the output preventing damaging current backflow when the device is powered down. The gate performs the positive Boolean function:

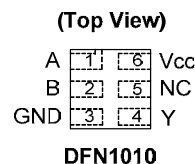
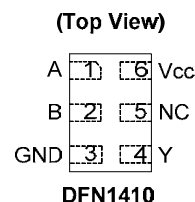
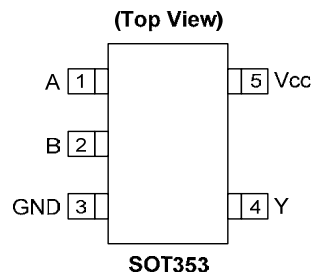
$$Y = A \cdot B \text{ or } Y = \overline{A} + \overline{B}$$

## 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<sub>CC</sub> < 0.9µA
- Low Dynamic Power Consumption
  - C<sub>PD</sub> = 6.3 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<sub>CC</sub> = 3.0V
- I<sub>OFF</sub> 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

[Click here for ordering information, located at the end of datasheet](#)

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## Pin Descriptions

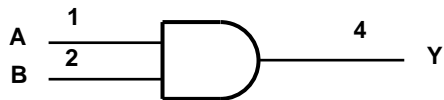
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| Pin Name | Function       |
|----------|----------------|
| A        | Data Input     |
| B        | Data Input     |
| GND      | Ground         |
| Y        | Data Output    |
| Vcc      | Supply Voltage |

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## Logic Diagram

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## Function Table

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

**Absolute Maximum Ratings** (Note 4) (@ $T_A = +25^\circ\text{C}$ , 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               |
| $V_{CC}$  | 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 $V_{CC}$ ) | $\pm 20$               | 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            | $^\circ\text{C}$ |
| $T_{STG}$ | Storage Temperature                                 | -65 to +150            | $^\circ\text{C}$ |

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) (@ $T_A = +25^\circ\text{C}$ , 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          | $V_{CC} = 0.8\text{V}$                  |     | -20      | $\mu\text{A}$    |
|                     |                                    | $V_{CC} = 1.1\text{V}$                  |     | -1.1     | mA               |
|                     |                                    | $V_{CC} = 1.4\text{V}$                  |     | -1.7     |                  |
|                     |                                    | $V_{CC} = 1.65\text{V}$                 |     | -1.9     |                  |
|                     |                                    | $V_{CC} = 2.3\text{V}$                  |     | -3.1     |                  |
|                     |                                    | $V_{CC} = 3.0\text{V}$                  |     | -4       |                  |
| $I_{OL}$            | Low-Level Output Current           | $V_{CC} = 0.8\text{V}$                  |     | 20       | $\mu\text{A}$    |
|                     |                                    | $V_{CC} = 1.1\text{V}$                  |     | 1.1      | mA               |
|                     |                                    | $V_{CC} = 1.4\text{V}$                  |     | 1.7      |                  |
|                     |                                    | $V_{CC} = 1.65\text{V}$                 |     | 1.9      |                  |
|                     |                                    | $V_{CC} = 2.3\text{V}$                  |     | 3.1      |                  |
|                     |                                    | $V_{CC} = 3.0\text{V}$                  |     | 4        |                  |
| $\Delta t/\Delta V$ | Input Transition Rise or Fall Rate | $V_{CC} = 0.8\text{V}$ to $3.6\text{V}$ |     | 200      | ns/V             |
| $T_A$               | Operating Free-Air Temperature     |   | -40 | +125     | $^\circ\text{C}$ |

Note: 5. Unused inputs should be held at  $V_{CC}$  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>IH</sub>   | High-Level Input Voltage         |  | 0.8V to 1.65V   | 0.80 X V <sub>CC</sub> |                        | 0.80 X V <sub>CC</sub>          |                        | V    |      |
|                   |                                  |  | 1.65V to 1.95V  | 0.65 X V <sub>CC</sub> |                        | 0.65 X V <sub>CC</sub>          |                        |      |      |
|                   |                                  |  | 2.3V to 2.7V    | 1.6                    |                        | 1.6                             |                        |      |      |
|                   |                                  |  | 3.0V to 3.6V    | 2.0                    |                        | 2.0                             |                        |      |      |
| V <sub>IL</sub>   | Low-Level Input Voltage          |  | 0.8V to 1.65 V  |                        | 0.30 X V <sub>CC</sub> |                                 | 0.30 X V <sub>CC</sub> | V    |      |
|                   |                                  |  | 1.65V to 1.95V  |                        | 0.35 X V <sub>CC</sub> |                                 | 0.35 X V <sub>CC</sub> |      |      |
|                   |                                  |  | 2.3V to 2.7V    |                        | 0.7                    |                                 | 0.7                    |      |      |
|                   |                                  |  | 3.0V to 3.6V    |                        | 0.9                    |                                 | 0.9                    |      |      |
| V <sub>OH</sub>   | High-Level Output Voltage        | I <sub>OH</sub> = -20μA  | 0.8V to 3.6V    | 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                   |                        | 1.3                             |                        |      |      |
|                   |                                  | 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 3.6 V   |                        | 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> = 4mA  |                 |                        |                        | 0.44                            |                        |      | 0.45 |
| I <sub>I</sub>    | Input Current                    | A or B Input<br>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        | One input at V <sub>CC</sub> -0.6V<br>Other inputs at V <sub>CC</sub> or GND | 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°C to +125°C |                        | Unit |
|-------------------|----------------------------------|--|-----------------|----------------------------------|------------------------|------|
|                   |                                  |  |                 | Min                              | Max                    |      |
| V <sub>IH</sub>   | High-Level Input Voltage         |  | 0.8V to 1.65V   | 0.80 X V <sub>CC</sub>           |                        | V    |
|                   |                                  |  | 1.65V to 1.95V  | 0.70 X V <sub>CC</sub>           |                        |      |
|                   |                                  |  | 2.3V to 2.7V    | 1.6                              |                        |      |
|                   |                                  |  | 3.0V to 3.6V    | 2.0                              |                        |      |
| V <sub>IL</sub>   | Low-Level input voltage          |  | 0.8V to 1.65 V  |                                  | 0.25 X V <sub>CC</sub> | V    |
|                   |                                  |  | 1.65V to 1.95V  |                                  | 0.30 X V <sub>CC</sub> |      |
|                   |                                  |  | 2.3V to 2.7V    |                                  | 0.7                    |      |
|                   |                                  |  | 3.0V to 3.6V    |                                  | 0.9                    |      |
| V <sub>OH</sub>   | High-Level Output Voltage        | I <sub>OH</sub> = -20 μA   | 0.8V to 3.6V    | V <sub>CC</sub> - 0.11           |                        | V    |
|                   |                                  | I <sub>OH</sub> = -1.1 mA  | 1.1V            | 0.6 X V <sub>CC</sub>            |                        |      |
|                   |                                  | I <sub>OH</sub> = -1.7 mA  | 1.4V            | 0.93                             |                        |      |
|                   |                                  | I <sub>OH</sub> = -1.9 mA  | 1.65V           | 1.17                             |                        |      |
|                   |                                  | I <sub>OH</sub> = -2.3 mA  | 2.3V            | 1.77                             |                        |      |
|                   |                                  | I <sub>OH</sub> = -3.1 mA  |                 | 1.67                             |                        |      |
|                   |                                  | I <sub>OH</sub> = -2.7 mA  | 3V              | 2.40                             |                        |      |
|                   |                                  | I <sub>OH</sub> = -4 mA  |                 | 2.30                             |                        |      |
| V <sub>OL</sub>   | High-Level Input Voltage         | I <sub>OL</sub> = 20 μA  | 0.8 V to 3.6V   |                                  | 0.11                   | V    |
|                   |                                  | I <sub>OL</sub> = 1.1 mA   | 1.1V            |                                  | 0.33 X V <sub>CC</sub> |      |
|                   |                                  | I <sub>OL</sub> = 1.7 mA   | 1.4V            |                                  | 0.41                   |      |
|                   |                                  | I <sub>OL</sub> = 1.9 mA   | 1.65V           |                                  | 0.39                   |      |
|                   |                                  | I <sub>OL</sub> = 2.3 mA   | 2.3V            |                                  | 0.36                   |      |
|                   |                                  | I <sub>OL</sub> = 3.1 mA   |                 |                                  | 0.50                   |      |
|                   |                                  | I <sub>OL</sub> = 2.7 mA   | 3V              |                                  | 0.36                   |      |
|                   |                                  | I <sub>OL</sub> = 4 mA   |                 |                                  | 0.50                   |      |
| I <sub>I</sub>    | Input Current                    | A or B Input<br>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<br>Other inputs at V <sub>CC</sub> or GND | 3.3V            |                                  | 75                     | μA   |

## Switching Characteristics

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

| Parameter       | From Input | TO OUTPUT | V <sub>CC</sub> | T <sub>A</sub> = +25°C |      |      | T <sub>A</sub> = -40°C to +85°C |      | T <sub>A</sub> = -40°C to +125°C |      | Unit |
|-----------------|------------|-----------|-----------------|------------------------|------|------|---------------------------------|------|----------------------------------|------|------|
|                 |            |           |                 | Min                    | Typ  | Max  | Min                             | Max  | Min                              | Max  |      |
| t <sub>pd</sub> | A or B     | Y         | 0.8V            |                        | 17.0 |      |                                 |      |                                  |      | ns   |
|                 |            |           | 1.2V ± 0.1V     | 2.4                    | 5.1  | 10.8 | 2.1                             | 11.7 | 2.1                              | 12.9 |      |
|                 |            |           | 1.5V ± 0.1V     | 1.6                    | 3.7  | 6.5  | 1.5                             | 7.5  | 1.5                              | 8.3  |      |
|                 |            |           | 1.8V ± 0.15V    | 1.3                    | 3.0  | 5.2  | 1.3                             | 6.1  | 1.3                              | 6.7  |      |
|                 |            |           | 2.5V ± 0.2V     | 1.1                    | 2.4  | 4.0  | 1.0                             | 4.8  | 1.0                              | 5.3  |      |
|                 |            |           | 3.3V ± 0.3V     | 1.0                    | 2.2  | 3.5  | 0.9                             | 4.3  | 0.9                              | 4.8  |      |

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

| Parameter       | From Input | TO OUTPUT | V <sub>CC</sub> | T <sub>A</sub> = +25°C |      |      | T <sub>A</sub> = -40°C to +85°C |      | T <sub>A</sub> = -40°C to +125°C |      | Unit |
|-----------------|------------|-----------|-----------------|------------------------|------|------|---------------------------------|------|----------------------------------|------|------|
|                 |            |           |                 | Min                    | Typ  | Max  | Min                             | Max  | Min                              | Max  |      |
| t <sub>pd</sub> | A or B     | Y         | 0.8V            |                        | 20.6 |      |                                 |      |                                  |      | ns   |
|                 |            |           | 1.2V ± 0.1V     | 2.4                    | 6.0  | 12.5 | 2.2                             | 13.6 | 2.2                              | 15.0 |      |
|                 |            |           | 1.5V ± 0.1V     | 2.0                    | 4.3  | 7.6  | 1.8                             | 8.9  | 1.8                              | 9.8  |      |
|                 |            |           | 1.8V ± 0.15V    | 1.7                    | 3.6  | 6.1  | 1.6                             | 7.2  | 1.6                              | 7.9  |      |
|                 |            |           | 2.5V ± 0.2V     | 1.4                    | 2.9  | 4.7  | 1.3                             | 5.7  | 1.3                              | 6.3  |      |
|                 |            |           | 3.3V ± 0.3V     | 1.3                    | 2.7  | 4.2  | 1.2                             | 4.7  | 1.2                              | 5.2  |      |

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

| Parameter       | From Input | TO OUTPUT | V <sub>CC</sub> | T <sub>A</sub> = +25°C |      |      | T <sub>A</sub> = -40°C to +85°C |      | T <sub>A</sub> = -40°C to +125°C |      | Unit |
|-----------------|------------|-----------|-----------------|------------------------|------|------|---------------------------------|------|----------------------------------|------|------|
|                 |            |           |                 | Min                    | Typ  | Max  | Min                             | Max  | Min                              | Max  |      |
| t <sub>pd</sub> | A or B     | Y         | 0.8V            |                        | 24.1 |      |                                 |      |                                  |      | ns   |
|                 |            |           | 1.2V ± 0.1V     | 3.4                    | 6.8  | 14.2 | 3.1                             | 15.7 | 3.1                              | 17.3 |      |
|                 |            |           | 1.5V ± 0.1V     | 2.3                    | 4.9  | 8.6  | 2.1                             | 10.1 | 2.1                              | 11.2 |      |
|                 |            |           | 1.8V ± 0.15V    | 1.9                    | 4.0  | 6.9  | 1.8                             | 8.2  | 1.8                              | 9.0  |      |
|                 |            |           | 2.5V ± 0.2V     | 1.7                    | 3.4  | 5.5  | 1.6                             | 6.5  | 1.6                              | 7.2  |      |
|                 |            |           | 3.3V ± 0.3V     | 1.5                    | 3.1  | 4.8  | 1.5                             | 5.9  | 1.5                              | 6.5  |      |

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

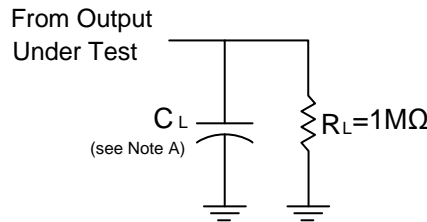
| Parameter       | From Input | TO OUTPUT | V <sub>CC</sub> | T <sub>A</sub> = +25°C |      |      | T <sub>A</sub> = -40°C to +85°C |      | T <sub>A</sub> = -40°C to +125°C |      | Unit |
|-----------------|------------|-----------|-----------------|------------------------|------|------|---------------------------------|------|----------------------------------|------|------|
|                 |            |           |                 | Min                    | TYP  | Max  | Min                             | Max  | Min                              | Max  |      |
| t <sub>pd</sub> | A or B     | Y         | 0.8V            |                        | 34.4 |      |                                 |      |                                  |      | ns   |
|                 |            |           | 1.2V ± 0.1V     | 4.0                    | 9.1  | 19.4 | 4.0                             | 21.8 | 4.0                              | 24.0 |      |
|                 |            |           | 1.5V ± 0.1V     | 3.2                    | 6.4  | 11.5 | 2.9                             | 13.6 | 2.9                              | 15.0 |      |
|                 |            |           | 1.8V ± 0.15V    | 2.6                    | 5.3  | 9.1  | 2.4                             | 10.9 | 2.4                              | 12.1 |      |
|                 |            |           | 2.5V ± 0.2V     | 2.3                    | 4.5  | 7.2  | 2.2                             | 8.6  | 2.2                              | 9.5  |      |
|                 |            |           | 3.3V ± 0.3V     | 2.1                    | 4.2  | 6.2  | 2.1                             | 7.5  | 2.1                              | 8.3  |      |

**Operating and Package Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

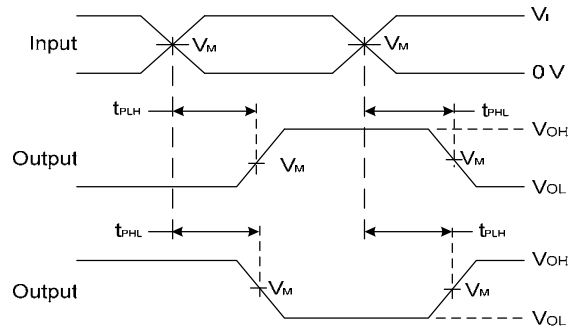
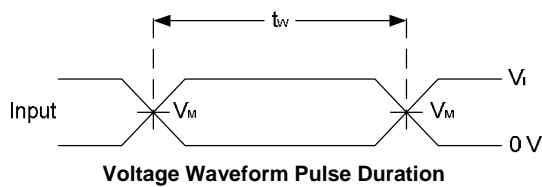
| Parameter       |  | Test Conditions                         | V <sub>CC</sub> | Typ | Unit |
|-----------------|--|---|-----------------|-----|------|
| C <sub>pd</sub> | Power Dissipation Capacitance          | f = 1MHz<br>No Load                     | 0.8V            | 6.7 | pF   |
|                 |  |   | 1.2V ± 0.1V     | 6.6 |      |
|                 |  |   | 1.5V ± 0.1V     | 6.5 |      |
|                 |  |   | 1.8V ± 0.15V    | 6.5 |      |
|                 |  |   | 2.5V ± 0.2V     | 6.4 |      |
|                 |  |   | 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**



| V <sub>CC</sub> | Inputs          |                                | V <sub>M</sub>     | C <sub>L</sub>  |
|-----------------|-----------------|--------------------------------|--------------------|-----------------|
|                 | V <sub>I</sub>  | t <sub>r</sub> /t <sub>f</sub> |                    |                 |
| 0.8V            | V <sub>CC</sub> | ≤3ns                           | V <sub>CC</sub> /2 | 5, 10, 15, 30pF |
| 1.2V ± 0.1V     | V <sub>CC</sub> | ≤3ns                           | V <sub>CC</sub> /2 | 5, 10, 15, 30pF |
| 1.5V ± 0.1V     | V <sub>CC</sub> | ≤3ns                           | V <sub>CC</sub> /2 | 5, 10, 15, 30pF |
| 1.8V ± 0.15V    | V <sub>CC</sub> | ≤3ns                           | V <sub>CC</sub> /2 | 5, 10, 15, 30pF |
| 2.5V ± 0.2V     | V <sub>CC</sub> | ≤3ns                           | V <sub>CC</sub> /2 | 5, 10, 15, 30pF |
| 3.3V ± 0.3V     | V <sub>CC</sub> | ≤3ns                           | V <sub>CC</sub> /2 | 5, 10, 15, 30pF |

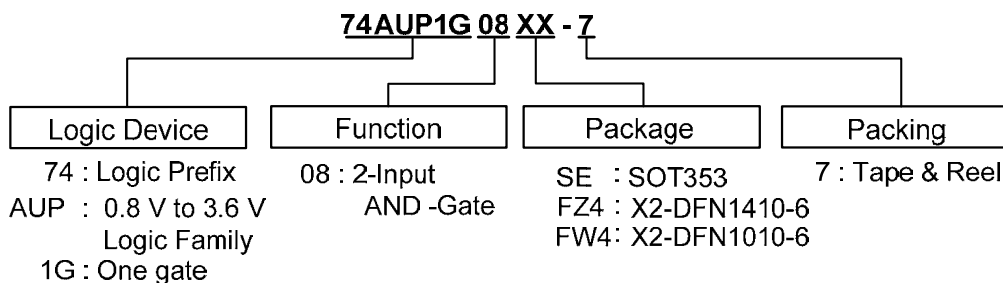


**Voltage Waveform Propagation Delay Times  
Inverting and Non Inverting Outputs**

**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

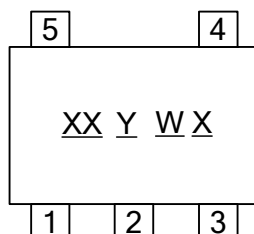


| Part Number    | Package Code | Packaging    | 7" Tape and Reel |                    |
|----------------|--------------|--------------|------------------|--------------------|
|                |              |              | Quantity         | Part Number Suffix |
| 74AUP1G08SE-7  | SE           | SOT353       | 3000/Tape & Reel | -7                 |
| 74AUP1G08FZ4-7 | FZ4          | X2-DFN1410-6 | 5000/Tape & Reel | -7                 |
| 74AUP1G08FW4-7 | FW4          | X2-DFN1010-6 | 5000/Tape & Reel | -7                 |

## Marking Information

### (1) SOT353

(Top View)

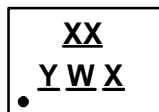


XX : Identification code  
Y : Year 0~9  
W : Week : A~Z : 1~26 week;  
a~z : 27~52 week; z represents  
52 and 53 week  
X : A~Z : Internal code

| Part Number | Package | Identification Code |
|-------------|---------|---------------------|
| 74AUP1G08SE | SOT353  | XP                  |

### (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 |
|--------------|--------------|---------------------|
| 74AUP1G08FZ4 | X2-DFN1410-6 | XP                  |
| 74AUP1G08FW4 | X2-DFN1010-6 | XP                  |



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

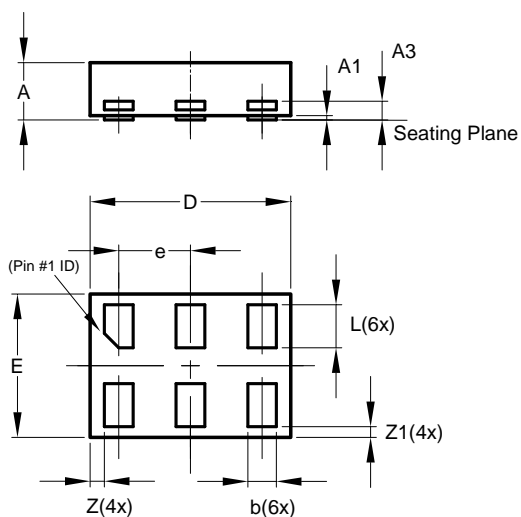
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.

(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

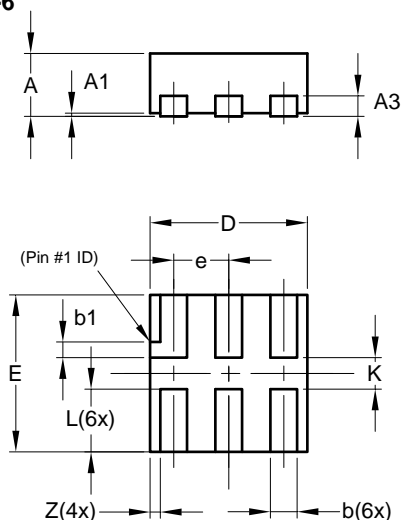


| X2-DFN1410-6         |       |       |       |
|----------------------|-------|-------|-------|
| Dim                  | Min   | Max   | Typ   |
| A                    | —     | 0.40  | 0.39  |
| A1                   | 0.00  | 0.05  | 0.02  |
| A3                   | —     | —     | 0.13  |
| b                    | 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**

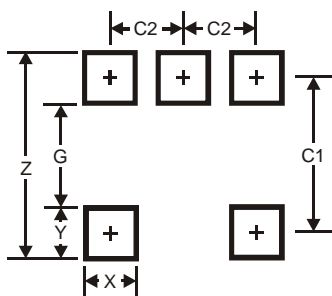


| X2-DFN1010-6         |      |      |       |
|----------------------|------|------|-------|
| Dim                  | Min  | Max  | Typ   |
| A                    | —    | 0.40 | 0.39  |
| A1                   | 0.00 | 0.05 | 0.02  |
| A3                   | —    | —    | 0.13  |
| b                    | 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**

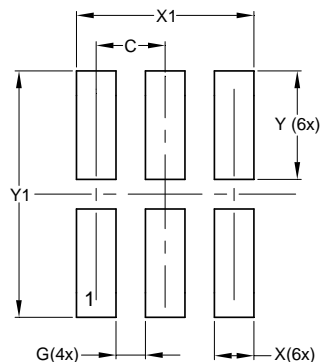


| Dimensions | Value (in mm) |
|------------|---------------|
| C          | 0.500         |
| G          | 0.250         |
| X          | 0.250         |
| X1         | 1.250         |
| Y          | 0.525         |
| Y1         | 1.250         |

## 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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