

## Description

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

The AUP1G09 is a single AND gate with an open drain 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:

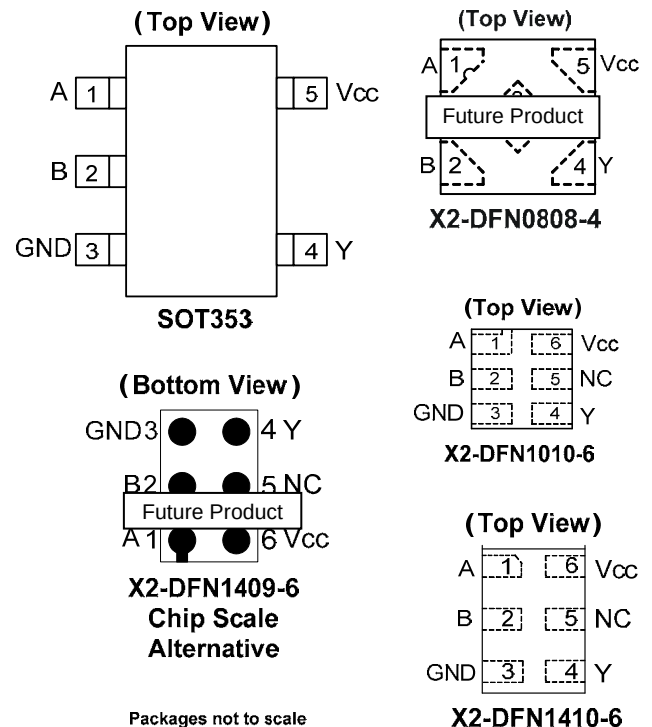
$$Y = A \bullet B \text{ or } Y = \overline{A + B}$$

## 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
  - $I_{CC} < 0.9\mu A$
- Low Dynamic Power Consumption
  - $C_{PD} = 6 \text{ pF}$  (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 250 mV 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
- Leadless packages named per JESD30E
- 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

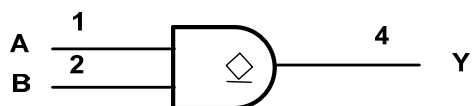
- Suited for battery and low power needs
- Wide array of products such as:
  - Tablets, E-readers
  - Cell Phones, Personal Navigation / GPS
  - MP3 players, Cameras, Video Recorders
  - PCs ultrabooks, notebooks, netbooks,
  - Computer peripherals, hard drives, CD/DVD ROM
  - TV, DVD, DVR, set top box

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## Pin Descriptions

| Pin Name        | Function       |
|-----------------|----------------|
| A               | Data Input     |
| B               | Data Input     |
| GND             | Ground         |
| Y               | Data Output    |
| V <sub>CC</sub> | Supply Voltage |

## Logic Diagram



## Function Table

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

**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 +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<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>OL</sub> | Low-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               |      |
| Δt/ΔV           | Input Transition Rise or Fall Rate | V <sub>CC</sub> = 0.8V to 3.6V | 200             | ns/V |
| 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>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 1.65V   |                        | 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>OL</sub>   | Low-Level Output 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> = 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                  |                                | ± 0.5                  | μA   |
| I <sub>OZ</sub>   | Z State Leakage Current          | V <sub>O</sub> = 3.6V<br>V <sub>I</sub> = 3.6V                | 3.6V            |                        | ± 0.2                  |                                | ± 0.5                  | 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      |                        | 0.2                    |                                | 0.6                    | μA   |
| I <sub>CC</sub>   | Supply Current                   | V <sub>I</sub> = GND or V <sub>CC</sub><br>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°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 1.65V   |                                  | 0.25X V <sub>CC</sub>  | V    |
|                   |                                  |                                                              | 1.65V to 1.95V  |                                  | 0.35 X V <sub>CC</sub> |      |
|                   |                                  |                                                              | 2.3V to 2.7V    |                                  | 0.7                    |      |
|                   |                                  |                                                              | 3.0V to 3.6V    |                                  | 0.9                    |      |
| V <sub>OL</sub>   | Low-Level Output Voltage         | I <sub>OL</sub> = 20 μA                                      | 0.8V to 3.6V    |                                  | 0.11                   | V    |
|                   |                                  | I <sub>OL</sub> = 1.1 mA                                     | 1.1V            |                                  | 0.3 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   |
| I <sub>OZ</sub>   | Z State Leakage Current          | V <sub>O</sub> = 3.6V<br>V <sub>I</sub> = 3.6V               | 3.6V            |                                  | ± 1.5                  | 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          | Y         | 0.8V                           |                           | 13.5 |      |                                                 |      |                                                  |      | ns   |
|           |            |           | $1.2\text{V} \pm 0.1\text{V}$  | 1.9                       | 4.6  | 10.4 | 1.8                                             | 11.4 | 1.8                                              | 12.6 |      |
|           |            |           | $1.5\text{V} \pm 0.1\text{V}$  | 1.5                       | 3.3  | 6.5  | 1.4                                             | 7.4  | 1.4                                              | 8.2  |      |
|           |            |           | $1.8\text{V} \pm 0.15\text{V}$ | 1.2                       | 2.9  | 5.1  | 1.1                                             | 5.9  | 1.1                                              | 6.5  |      |
|           |            |           | $2.5\text{V} \pm 0.2\text{V}$  | 1.0                       | 2.4  | 4.4  | 0.9                                             | 4.6  | 0.9                                              | 4.9  |      |
|           |            |           | $3.3\text{V} \pm 0.3\text{V}$  | 0.9                       | 2.3  | 4.0  | 0.8                                             | 4.5  | 0.8                                              | 4.9  |      |

 $C_L = 10\text{pF}$  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          | Y         | 0.8V                           |                           | 16.3 |      |                                                 |      |                                                  |      | ns   |
|           |            |           | $1.2\text{V} \pm 0.1\text{V}$  | 2.3                       | 5.6  | 12.3 | 2.1                                             | 13.7 | 2.1                                              | 15.1 |      |
|           |            |           | $1.5\text{V} \pm 0.1\text{V}$  | 1.8                       | 4.1  | 7.6  | 1.7                                             | 8.8  | 1.7                                              | 9.7  |      |
|           |            |           | $1.8\text{V} \pm 0.15\text{V}$ | 1.6                       | 3.2  | 7.3  | 1.4                                             | 7.1  | 1.4                                              | 7.0  |      |
|           |            |           | $2.5\text{V} \pm 0.2\text{V}$  | 1.4                       | 2.9  | 6.1  | 1.2                                             | 6.4  | 1.2                                              | 5.9  |      |
|           |            |           | $3.3\text{V} \pm 0.3\text{V}$  | 1.3                       | 2.9  | 5.7  | 1.1                                             | 5.4  | 1.1                                              | 5.9  |      |

 $C_L = 15\text{pF}$  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          | Y         | 0.8V                           |                           | 19.0 |      |                                                 |      |                                                  |      | ns   |
|           |            |           | $1.2\text{V} \pm 0.1\text{V}$  | 2.6                       | 7.6  | 14.2 | 2.4                                             | 15.8 | 2.4                                              | 17.4 |      |
|           |            |           | $1.5\text{V} \pm 0.1\text{V}$  | 2.1                       | 6.5  | 12.1 | 1.9                                             | 12.7 | 1.9                                              | 12.9 |      |
|           |            |           | $1.8\text{V} \pm 0.15\text{V}$ | 1.9                       | 5.5  | 9.6  | 1.7                                             | 10.1 | 1.7                                              | 10.3 |      |
|           |            |           | $2.5\text{V} \pm 0.2\text{V}$  | 1.6                       | 4.6  | 8.1  | 1.5                                             | 9.1  | 1.5                                              | 9.3  |      |
|           |            |           | $3.3\text{V} \pm 0.3\text{V}$  | 1.6                       | 4.1  | 7.5  | 1.4                                             | 8.3  | 1.4                                              | 9.1  |      |

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

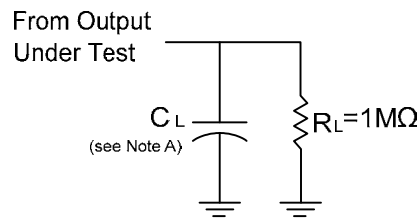
| Parameter | From Input | TO OUTPUT | $V_{CC}$                       | $T_A = +25^\circ\text{C}$ |     |      | $T_A = -40^\circ\text{C to } +85^\circ\text{C}$ |      | $T_A = -40^\circ\text{C to } +125^\circ\text{C}$ |      | Unit |
|-----------|------------|-----------|--------------------------------|---------------------------|-----|------|-------------------------------------------------|------|--------------------------------------------------|------|------|
|           |            |           |                                | Min                       | Typ | Max  | Min                                             | Max  | Min                                              | Max  |      |
| $t_{pd}$  | A          | Y         | 0.8V                           |                           | 27  |      |                                                 |      |                                                  |      | ns   |
|           |            |           | $1.2\text{V} \pm 0.1\text{V}$  | 3.6                       | 9.5 | 19.5 | 3.2                                             | 21.8 | 3.2                                              | 24   |      |
|           |            |           | $1.5\text{V} \pm 0.1\text{V}$  | 2.9                       | 8.5 | 16.1 | 2.6                                             | 13.6 | 2.6                                              | 15   |      |
|           |            |           | $1.8\text{V} \pm 0.15\text{V}$ | 2.6                       | 7.7 | 15.2 | 2.3                                             | 13.3 | 2.3                                              | 14.6 |      |
|           |            |           | $2.5\text{V} \pm 0.2\text{V}$  | 2.4                       | 7   | 13.1 | 2.1                                             | 13.3 | 2.1                                              | 13.5 |      |
|           |            |           | $3.3\text{V} \pm 0.3\text{V}$  | 2.3                       | 6.5 | 12.7 | 2.1                                             | 12.9 | 2.1                                              | 12.9 |      |

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

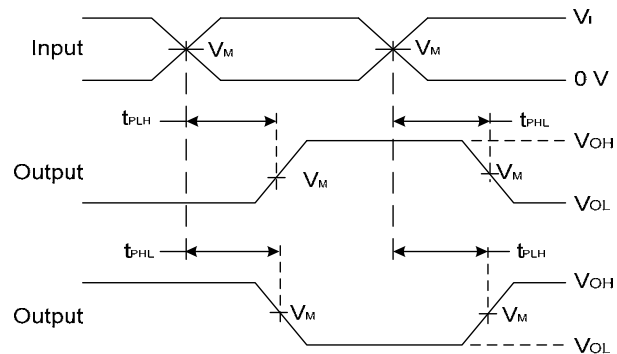
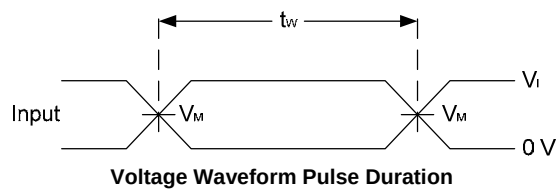
| Parameter       |                                        | Test Conditions                         |          | V <sub>CC</sub> | Typ | Unit |
|-----------------|----------------------------------------|-----------------------------------------|----------|-----------------|-----|------|
| C <sub>pd</sub> | Power Dissipation Capacitance          | f = 1MHz<br>No Load                     |          | 0.8V            | 6.5 | pF   |
|                 |                                        |                                         |          | 1.2V ± 0.1V     | 6.3 |      |
|                 |                                        |                                         |          | 1.5V ± 0.1V     | 6.3 |      |
|                 |                                        |                                         |          | 1.8V ± 0.15V    | 6.2 |      |
|                 |                                        |                                         |          | 2.5V ± 0.2V     | 6.2 |      |
|                 |                                        |                                         |          | 3.3V ± 0.3V     | 6.1 |      |
| 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-DFN0808-4                            |          |                 | 430 |      |
|                 |                                        | X2-DFN1010-6                            |          |                 | 445 |      |
|                 |                                        | X2-DFN1409-6                            |          |                 | 470 |      |
|                 |                                        | X2-DFN1410-6                            |          |                 | 460 |      |
| θ <sub>JC</sub> | Thermal Resistance Junction-to-Case    | SOT353                                  | (Note 6) |                 | 143 | °C/W |
|                 |                                        | X2-DFN0808-4                            |          |                 | 240 |      |
|                 |                                        | X2-DFN1010-6                            |          |                 | 250 |      |
|                 |                                        | X2-DFN1409-6                            |          |                 | 275 |      |
|                 |                                        | X2-DFN1410-6                            |          |                 | 265 |      |

Note: 6. Test condition for , SOT353, X2-DFN0808-4:, X2-DFN1010-6 X2-DFN1409-6 and X2-DFN1410-6: Device 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 |



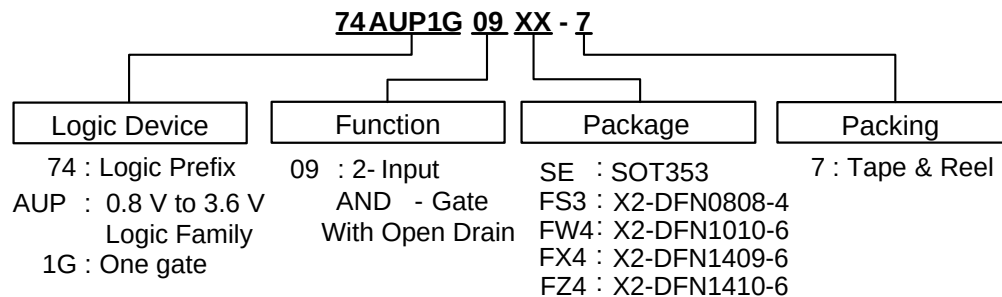
Voltage Waveform Propagation Delay Times  
Inverting and Non Inverting Outputs

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 ≤ 10MHz.
  - C. Inputs are measured separately one transition per measurement.
  - D.  $t_{PLH}$  and  $t_{PHL}$  are the same as  $t_{PD}$ .



## Ordering Information



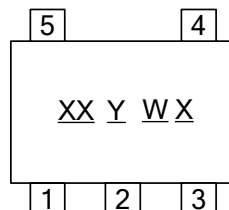
| Device           | Package Code | Packaging    | 7" Tape and Reel (Note 7) |                    |
|------------------|--------------|--------------|---------------------------|--------------------|
|                  |              |              | Quantity                  | Part Number Suffix |
| 74AUP1G09SE-7    | SE           | SOT353       | 3000/Tape & Reel          | -7                 |
| 74AUP1G09FS3-7** | FS3          | X2-DFN0808-4 | 5000/Tape & Reel          | -7                 |
| 74AUP1G09FW4-7   | FW4          | X2-DFN1010-6 | 5000/Tape & Reel          | -7                 |
| 74AUP1G09FX4-7** | FX4          | X2-DFN1409-6 | 5000/Tape & Reel          | -7                 |
| 74AUP1G09FZ4-7   | FZ4          | X2-DFN1410-6 | 5000/Tape & Reel          | -7                 |

Note: 7. The taping orientation is located on our website at <http://www.diodes.com/datasheets/ap02007.pdf>  
 \*\* Future Products – Contact your Diodes sales representative for availability.

## Marking Information

### (1) SOT353

(Top View)

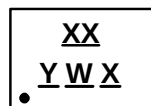


XX : Identification code  
 Y : Year 0~9  
 W : Week : A~Z : 1~26 week;  
 a~z : 27~52 week; z represents  
 52 and 53 week  
 X : A~Z : Internal code

| Part Number | Package | Identification Code |
|-------------|---------|---------------------|
| 74AUP1G09SE | SOT353  | XR                  |

### (2) X2-DFN0808-4, X2-DFN1010-6 X2-DFN1409-6 and X2-DFN1410-6

(Top View)



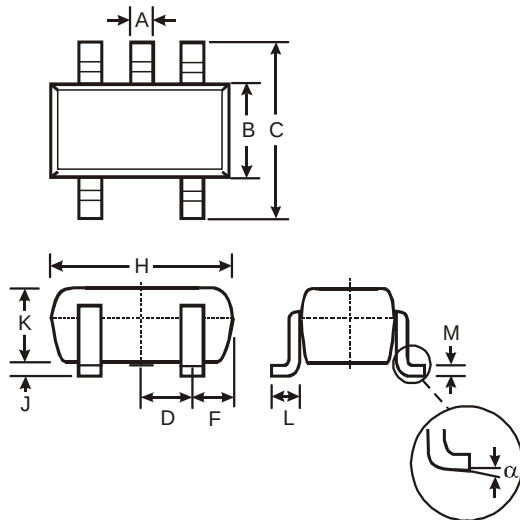
XX : Identification Code  
 Y : Year : 0~9  
 W : Week : A~Z : 1~26 week;  
 a~z : 27~52 week; z represents  
 52 and 53 week  
 X : A~Z : Internal code

| Part Number  | Package      | Identification Code |
|--------------|--------------|---------------------|
| 74AUP1G09FS3 | X2-DFN0808-4 | YU                  |
| 74AUP1G09FW4 | X2-DFN1010-6 | XR                  |
| 74AUP1G09FX4 | X2-DFN1409-6 | HG                  |
| 74AUP1G09FZ4 | X2-DFN1410-6 | XR                  |

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

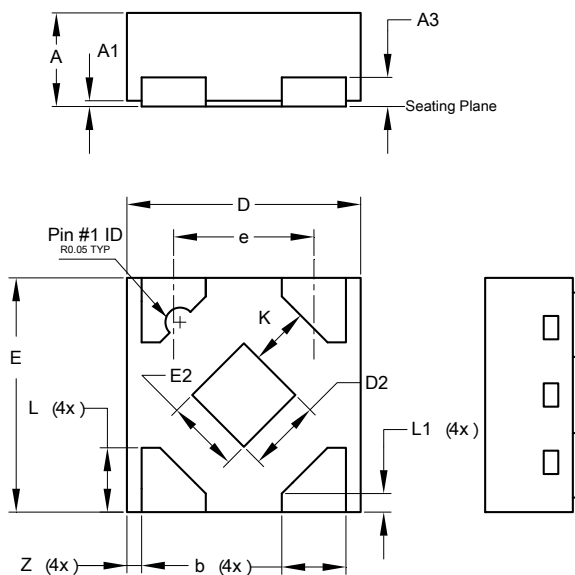
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.

**(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-DFN0808-4

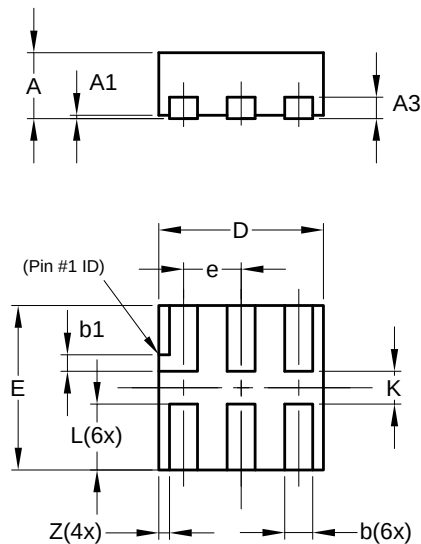


| X2-DFN0808-4         |      |      |      |
|----------------------|------|------|------|
| Dim                  | Min  | Max  | Typ  |
| A                    | 0.25 | 0.35 | 0.30 |
| A1                   | 0    | 0.04 | 0.02 |
| A3                   | -    | -    | 0.13 |
| b                    | 0.17 | 0.27 | 0.22 |
| D                    | 0.75 | 0.85 | 0.80 |
| D2                   | 0.15 | 0.35 | 0.25 |
| E                    | 0.75 | 0.85 | 0.80 |
| E2                   | 0.15 | 0.35 | 0.25 |
| e                    | -    | -    | 0.48 |
| K                    | 0.20 | -    | -    |
| L                    | 0.17 | 0.27 | 0.22 |
| L1                   | 0.02 | 0.12 | 0.07 |
| Z                    | -    | -    | 0.05 |
| All Dimensions in mm |      |      |      |

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

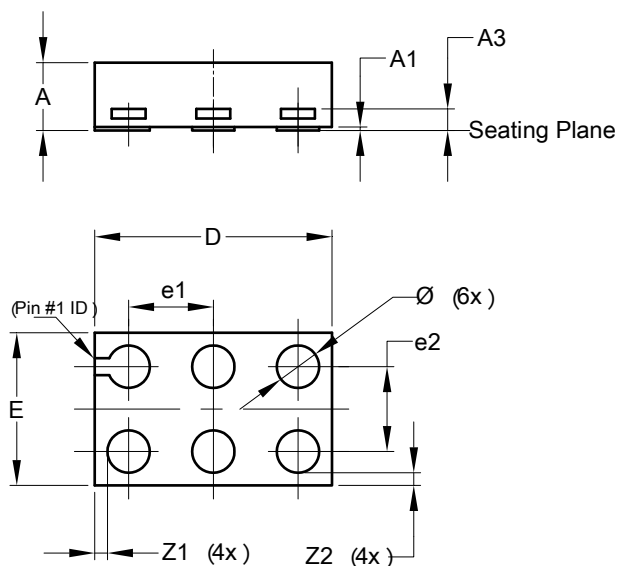
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.

## (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 |      |      |       |

## (4) X2-DFN1409-6

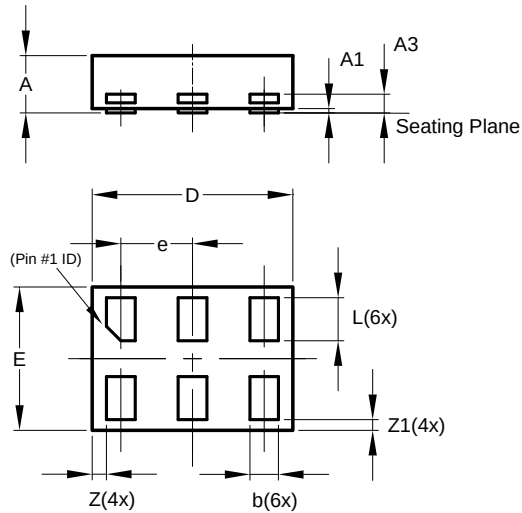


| X2-DFN1409-6         |      |      |       |
|----------------------|------|------|-------|
| Dim                  | Min  | Max  | Typ   |
| A                    | -    | 0.40 | 0.39  |
| A1                   | 0    | 0.05 | 0.02  |
| A3                   | -    | -    | 0.13  |
| Ø                    | 0.20 | 0.30 | 0.25  |
| D                    | 1.35 | 1.45 | 1.40  |
| E                    | 0.85 | 0.95 | 0.90  |
| e1                   | -    | -    | 0.50  |
| e2                   | -    | -    | 0.50  |
| Z1                   | -    | -    | 0.075 |
| Z2                   | -    | -    | 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.

### (5) X2-DFN1410-6

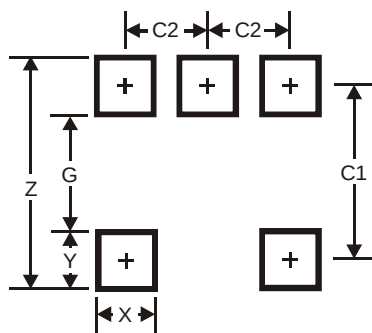


| X2-DFN1410-6         |       |       |       |
|----------------------|-------|-------|-------|
| Dim                  | Min   | Max   | Typ   |
| A                    | —     | 0.40  | 0.39  |
| A1                   | 0.00  | 0.05  | 0.02  |
| A3                   | —     | —     | 0.13  |
| b   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

## Suggested Pad Layout

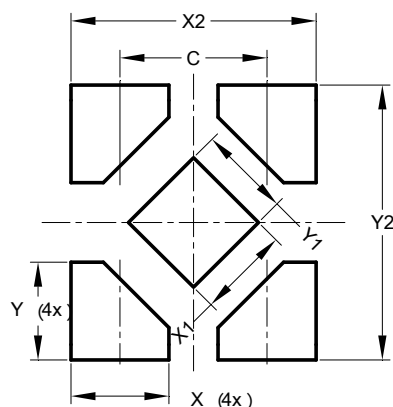
Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version

### (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-DFN0808-4

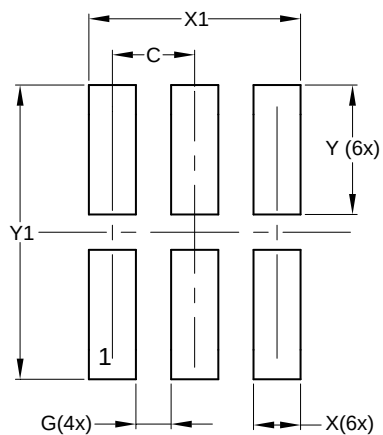


| Dimensions | Value (in mm) |
|------------|---------------|
| C          | 0.480         |
| X          | 0.320         |
| X1         | 0.300         |
| X2         | 0.800         |
| Y          | 0.320         |
| Y1         | 0.300         |
| Y2         | 0.900         |

## Suggested Pad Layout

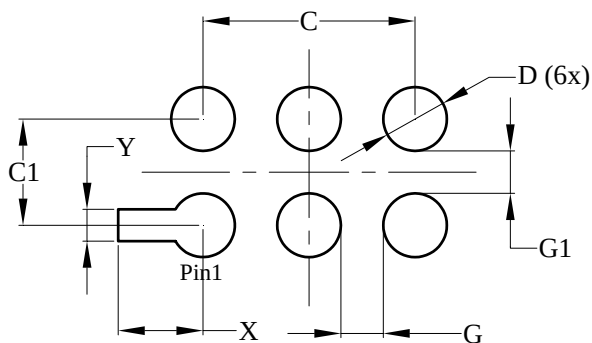
Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version

### (3) X2-DFN1010-6



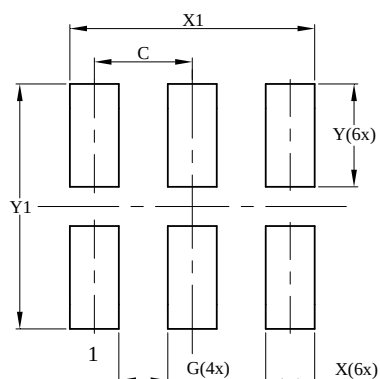
| Dimensions | Value<br>(in mm) |
|------------|------------------|
| C          | 0.350            |
| G          | 0.150            |
| X          | 0.200            |
| X1         | 0.900            |
| Y          | 0.550            |
| Y1         | 0.350            |

### (4) X2-DFN1409-6



| Dimensions | Value<br>(in mm) |
|------------|------------------|
| C          | 1.000            |
| C1         | 0.500            |
| D          | 0.300            |
| G          | 0.200            |
| G1         | 0.200            |
| X          | 0.400            |
| Y          | 0.150            |

### (5) X2-DFN1410-6



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

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