

## Description

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

The 74AUP1G04 is a single inverter gate with a standard push-pull output designed for operation over a power supply range of 0.8V to 3.6V. The device is fully specified for partial power down applications using I<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:

$$Y = \overline{A}$$

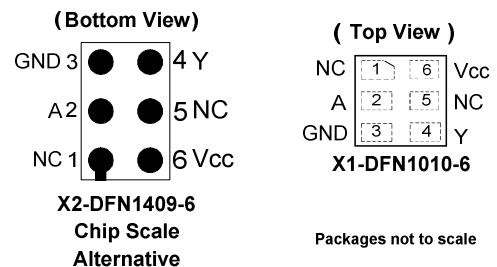
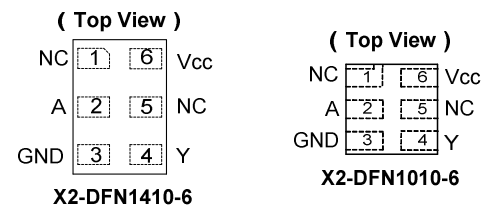
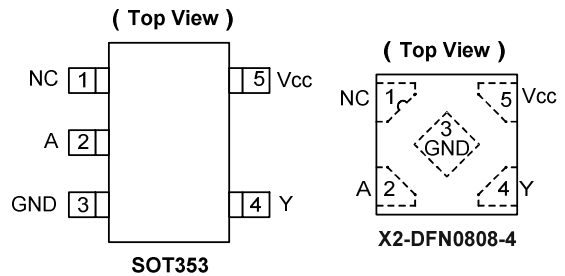
## Features

- Advanced Ultra Low Power (AUP) CMOS
- Supply Voltage Range from 0.8V to 3.6V
- ±4 mA Output Drive at 3.0V
- Low Static Power Consumption  
I<sub>CC</sub> < 0.9µA
- Low Dynamic Power Consumption  
C<sub>PD</sub> = 6.1pF (Typical at 3.6V)
- Schmitt Trigger Action at all inputs makes 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)  
Exceeds 1000-V Charged Device Model (C101)
- Latch-Up Exceeds 100mA per JESD 78, Class I
- 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/quality/lead\\_free.html](http://www.diodes.com/quality/lead_free.html) 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.

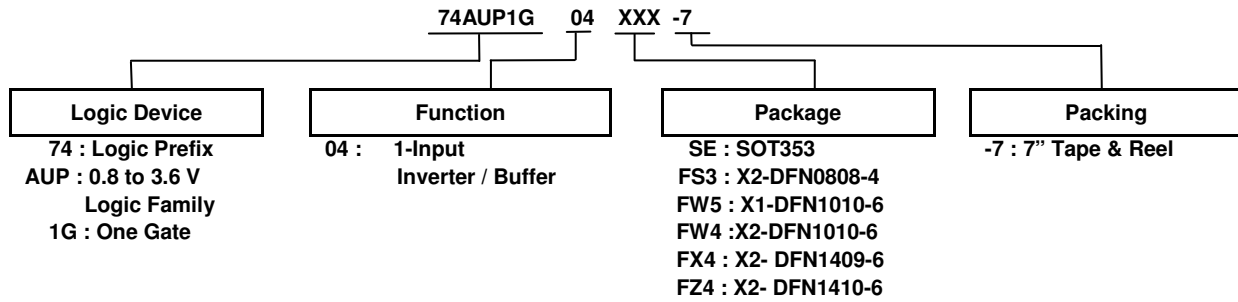
## Pin Assignments



## 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, SSDs, CD/DVD ROMs
  - TVs, DVDs, DVRs, Set-Top Boxes

## Ordering Information



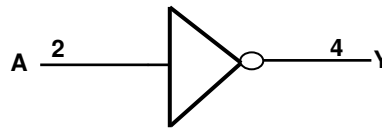
| Device         | Package Code | Package (Notes 4 & 5)                  | Package Size   | 7" Tape and Reel  |                    |
|----------------|--------------|--|--|-------------------|--------------------|
|                |              |  |  | Quantity          | Part Number Suffix |
| 74AUP1G04SE-7  | SE           | SOT353                                 | 2.0mm x 2.0mm x 1.1mm<br>0.65 mm lead pitch          | 3,000/Tape & Reel | -7                 |
| 74AUP1G04FS3-7 | FS3          | X2-DFN0808-4                           | 0.8mm x 0.8mm x 0.35mm<br>0.5 mm pad pitch (diamond) | 5,000/Tape & Reel | -7                 |
| 74AUP1G04FW5-7 | FW5          | X1-DFN1010-6                           | 1.0mm x 1.0mm x 0.5mm<br>0.35 mm pad pitch           | 5,000/Tape & Reel | -7                 |
| 74AUP1G04FW4-7 | FW4          | X2-DFN1010-6                           | 1.0mm x 1.0mm x 0.4mm<br>0.35 mm pad pitch           | 5,000/Tape & Reel | -7                 |
| 74AUP1G04FX4-7 | FX4          | X2-DFN1409-6<br>Chip Scale Alternative | 1.4mm x 0.9mm x 0.4mm<br>0.5 mm pad pitch            | 5,000/Tape & Reel | -7                 |
| 74AUP1G04FZ4-7 | FZ4          | X2-DFN1410-6                           | 1.4mm x 1.0mm x 0.4mm<br>0.5 mm pad pitch            | 5,000/Tape & Reel | -7                 |

Notes: 4. Pad layout as shown on Diodes Inc. suggested pad layout document AP02001, which can be found on our website at <http://www.diodes.com/datasheets/ap02001.pdf>.  
 5. The taping orientation is located on our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

## Pin Descriptions

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

## Logic Diagram



## Function Table

| Inputs   | Output   |
|----------|----------|
| <b>A</b> | <b>Y</b> |
| H        | L        |
| L        | H        |

### Absolute Maximum Ratings (Notes 6 & 7) (@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   |

- Notes:
- 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.
  - Forcing the maximum allowed voltage could cause a condition exceeding the maximum current or conversely forcing the maximum current could cause a condition exceeding the maximum voltage. The ratings of both current and voltage must be maintained within the controlled range.

### Recommended Operating Conditions (Note 8) (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Symbol          | Parameter                          | Min                            | Max             | Unit |     |      |
|-----------------|------------------------------------|--------------------------------|-----------------|------|-----|------|
| V <sub>CC</sub> | Operating Voltage                  | 0.8                            | 3.6             | V    |     |      |
| V <sub>I</sub>  | Input Voltage                      | 0                              | 3.6             | V    |     |      |
| V <sub>O</sub>  | Output Voltage                     | 0                              | V <sub>CC</sub> | V    |     |      |
| I <sub>OH</sub> | High-Level Output Current          | V <sub>CC</sub> = 0.8V         | —               | -20  | μA  |      |
|                 |                                    | V <sub>CC</sub> = 1.1V         | —               | -1.1 | mA  |      |
|                 |                                    | V <sub>CC</sub> = 1.4V         | —               | -1.7 |     |      |
|                 |                                    | V <sub>CC</sub> = 1.65V        | —               | -1.9 |     |      |
|                 |                                    | V <sub>CC</sub> = 2.3V         | —               | -3.1 |     |      |
|                 |                                    | V <sub>CC</sub> = 3.0V         | —               | -4   |     |      |
| I <sub>OL</sub> | Low-Level Output Current           | V <sub>CC</sub> = 0.8V         | —               | 20   | 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: 8. Unused inputs should be held at V<sub>CC</sub> or Ground.

**Electrical Characteristics**

| 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>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>   | 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                    | —                               | 0.6                    | 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><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> - 0.6                                | 3.3V            | —                      | 40                     | —                               | 50                     | μA   |

**Electrical Characteristics** (continued)

| 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   | —                                  | 0.25 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> = -20µA   | 0.8V to 3.6V    | V <sub>CC</sub> - 0.11             | —                      | V    |
|                        |                                  | I <sub>OH</sub> = -1.1mA  | 1.1V            | 0.6 x V <sub>CC</sub>              | —                      |      |
|                        |                                  | I <sub>OH</sub> = -1.7mA  | 1.4V            | 0.93                               | —                      |      |
|                        |                                  | I <sub>OH</sub> = -1.9mA  | 1.65V           | 1.17                               | —                      |      |
|                        |                                  | I <sub>OH</sub> = -2.3mA  | 2.3V            | 1.77                               | —                      |      |
|                        |                                  | I <sub>OH</sub> = -3.1mA  |                 | 1.67                               | —                      |      |
|                        |                                  | I <sub>OH</sub> = -2.7mA  | 3V              | 2.40                               | —                      |      |
| I <sub>OH</sub> = -4mA | 2.30                             | —   |                 |                                    |                        |      |
| V <sub>OL</sub>        | Low-Level Output Voltage         | I <sub>OL</sub> = 20µA  | 0.8V to 3.6V    | —                                  | 0.11                   | V    |
|                        |                                  | I <sub>OL</sub> = 1.1mA   | 1.1V            | —                                  | 0.33 x V <sub>CC</sub> |      |
|                        |                                  | I <sub>OL</sub> = 1.7mA   | 1.4V            | —                                  | 0.41                   |      |
|                        |                                  | I <sub>OL</sub> = 1.9mA   | 1.65V           | —                                  | 0.39                   |      |
|                        |                                  | I <sub>OL</sub> = 2.3mA   | 2.3V            | —                                  | 0.36                   |      |
|                        |                                  | I <sub>OL</sub> = 3.1mA   |                 | —                                  | 0.50                   |      |
|                        |                                  | I <sub>OL</sub> = 2.7mA   | 3V              | —                                  | 0.36                   |      |
|                        |                                  | I <sub>OL</sub> = 4mA   |                 | —                                  | 0.50                   |      |
| I <sub>I</sub>         | Input Current                    | 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                         | 0V              | —                                  | ± 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 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            | —                      | 16.0 | —    | —                               | —    | —                                | —    | ns   |
|                 |            |           | 1.2V ± 0.1V     | 2.4                    | 5.0  | 10.3 | 2.1                             | 14.1 | 2.1                              | 14.1 |      |
|                 |            |           | 1.5V ± 0.1V     | 1.8                    | 3.6  | 6.4  | 1.6                             | 7.4  | 1.6                              | 8.2  |      |
|                 |            |           | 1.8V ± 0.15V    | 1.5                    | 2.9  | 5.0  | 1.4                             | 5.9  | 1.4                              | 6.5  |      |
|                 |            |           | 2.5V ± 0.2V     | 1.2                    | 2.4  | 3.9  | 1.1                             | 4.5  | 1.1                              | 5.0  |      |
| 3.3V ± 0.3V     | 1.1        | 2.1       | 3.2             | 1.1                    | 3.9  | 1.1  | 4.3                             |      |                                  |      |      |

 $C_L = 10\text{pF}$ , 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            | —                      | 19.8 | —    | —                               | —    | —                                | —    | ns   |
|                 |            |           | 1.2V ± 0.1V     | 2.8                    | 5.9  | 12.2 | 2.6                             | 17.0 | 2.6                              | 17.0 |      |
|                 |            |           | 1.5V ± 0.1V     | 2.3                    | 4.2  | 7.5  | 2.1                             | 8.7  | 2.1                              | 9.6  |      |
|                 |            |           | 1.8V ± 0.15V    | 2.0                    | 3.5  | 5.9  | 1.8                             | 7.0  | 1.8                              | 7.7  |      |
|                 |            |           | 2.5V ± 0.2V     | 1.7                    | 2.9  | 4.6  | 1.5                             | 5.4  | 1.5                              | 6.0  |      |
|                 |            |           | 3.3V ± 0.3V     | 1.4                    | 2.7  | 3.8  | 1.4                             | 4.5  | 1.4                              | 5.0  |      |

 $C_L = 15\text{pF}$ , 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            | —                      | 23.3 | —    | —                               | —    | —                                | —    | ns   |
|                 |            |           | 1.2V ± 0.1V     | 3.2                    | 8.0  | 14.0 | 3.0                             | 26.0 | 3.0                              | 26.0 |      |
|                 |            |           | 1.5V ± 0.1V     | 2.6                    | 7.5  | 9.0  | 2.4                             | 10.0 | 2.4                              | 11.0 |      |
|                 |            |           | 1.8V ± 0.15V    | 2.3                    | 5.2  | 6.7  | 2.1                             | 8.0  | 2.1                              | 8.8  |      |
|                 |            |           | 2.5V ± 0.2V     | 2.1                    | 3.1  | 5.1  | 1.8                             | 6.1  | 1.8                              | 6.8  |      |
|                 |            |           | 3.3V ± 0.3V     | 1.8                    | 3.1  | 4.2  | 1.8                             | 5.0  | 1.8                              | 5.5  |      |

 $C_L = 30\text{pF}$ , See Figure 1

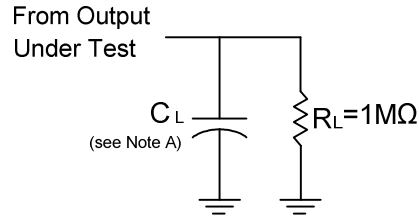
| Parameter       | From Input | To Output | V <sub>CC</sub> | T <sub>A</sub> = +25°C |      |      | T <sub>A</sub> = -40°C to +85°C |      | T <sub>A</sub> = -40°C to +125°C |      | Unit |
|-----------------|------------|-----------|-----------------|------------------------|------|------|---------------------------------|------|----------------------------------|------|------|
|                 |            |           |                 | Min                    | Typ  | Max  | Min                             | Max  | Min                              | Max  |      |
| t <sub>pd</sub> | A or B     | Y         | 0.8V            | —                      | 33.6 | —    | —                               | —    | —                                | —    | ns   |
|                 |            |           | 1.2V ± 0.1V     | 4.4                    | 13.0 | 18.0 | 4.0                             | 27.0 | 4.0                              | 27.0 |      |
|                 |            |           | 1.5V ± 0.1V     | 3.6                    | 6.3  | 12.0 | 3.2                             | 13.8 | 3.2                              | 14.2 |      |
|                 |            |           | 1.8V ± 0.15V    | 3.2                    | 5.3  | 9.0  | 2.9                             | 10.5 | 2.9                              | 11.6 |      |
|                 |            |           | 2.5V ± 0.2V     | 2.9                    | 4.5  | 6.5  | 2.6                             | 7.6  | 2.6                              | 8.4  |      |
|                 |            |           | 3.3V ± 0.3V     | 2.1                    | 4.2  | 5.4  | 2.1                             | 6.2  | 2.1                              | 6.9  |      |

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

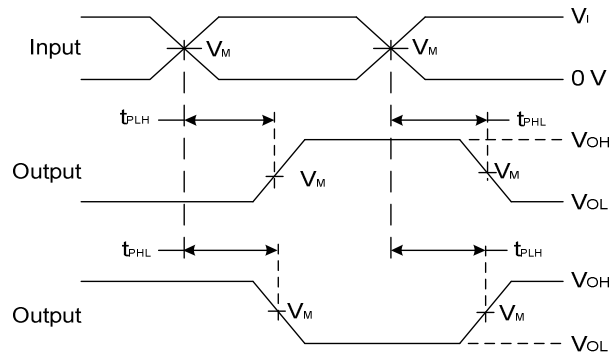
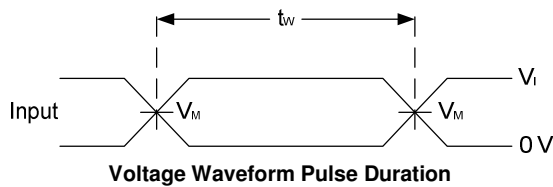
| Parameter       |  | Test Conditions                         |          | V <sub>CC</sub> | Typ | Unit |
|-----------------|--|---|----------|-----------------|-----|------|
| C <sub>pd</sub> | Power Dissipation Capacitance          | f = 1MHz<br>No Load                     |          | 0.8V            | 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 9) | —               | 371 | °C/W |
|                 |  | X2-DFN0808-4                            |          | —               | 430 |      |
|                 |  | X1-DFN1010-6                            |          | —               | 435 |      |
|                 |  | X2-DFN1010-6                            |          | —               | 445 |      |
|                 |  | X2-DFN1409-6                            |          | —               | 470 |      |
|                 |  | X2-DFN1410-6                            |          | —               | 460 |      |
| θ <sub>JC</sub> | Thermal Resistance Junction-to-Case    | SOT353                                  | (Note 9) | —               | 143 | °C/W |
|                 |  | X2-DFN0808-4                            |          | —               | 240 |      |
|                 |  | X1-DFN1010-6                            |          | —               | 250 |      |
|                 |  | X2-DFN1010-6                            |          | —               | 250 |      |
|                 |  | X2-DFN1409-6                            |          | —               | 275 |      |
|                 |  | X2-DFN1410-6                            |          | —               | 265 |      |

Note: 9. Test condition for each of the six package types: 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**

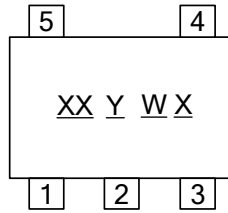
- Notes:
- A. Includes test lead and test apparatus capacitance.
  - B. All pulses are supplied at pulse repetition rate ≤ 10MHz.
  - C. Inputs are measured separately one transition per measurement.
  - D. t<sub>PLH</sub> and t<sub>PHL</sub> are the same as t<sub>PD</sub>.



**Marking Information**

(1) SOT353

(Top View)

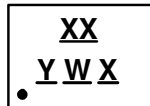


XX : Identification code  
Y : Year 0~9  
W : Week : A~Z : 1~26 week;  
 a~z : 27~52 week; z represents  
 52 and 53 week  
X : A~Z : Internal code

| Part Number | Package | Identification Code |
|-------------|---------|---------------------|
| 74AUP1G04SE | SOT353  | XK                  |

(2) X2-DFN0808-4, X1-DFN1010-6, X2-DFN1010-6, X2-DFN1409-6 and X2-DFN1410-6

(Top View)

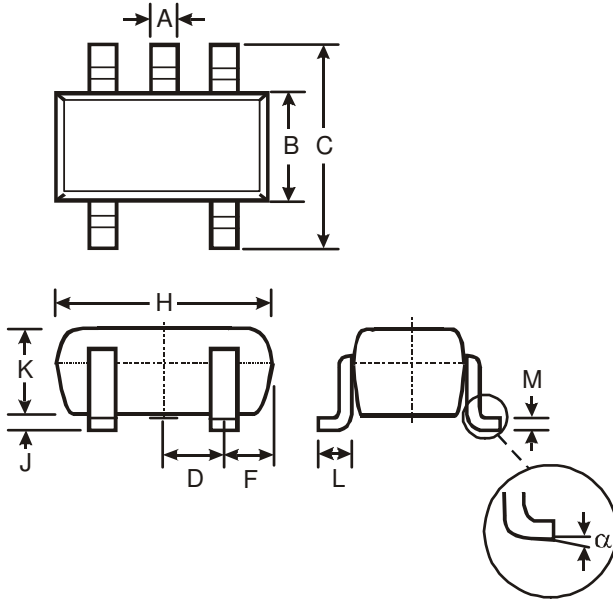


XX : Identification Code  
Y : Year : 0~9  
W : Week : A~Z : 1~26 week;  
 a~z : 27~52 week; z represents  
 52 and 53 week  
X : A~Z : Internal code

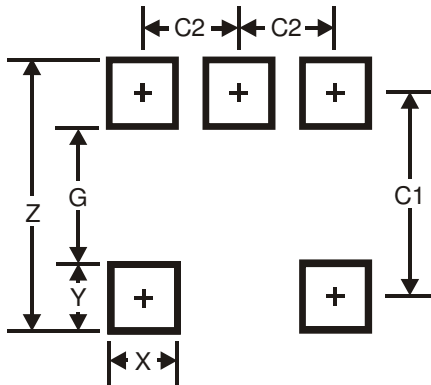
| Part Number  | Package      | Identification Code |
|--------------|--------------|---------------------|
| 74AUP1G04FS3 | X2-DFN0808-4 | YK                  |
| 74AUP1G04FW5 | X1-DFN1010-6 | Q4                  |
| 74AUP1G04FW4 | X2-DFN1010-6 | XK                  |
| 74AUP1G04FX4 | X2-DFN1409-6 | HC                  |
| 74AUP1G04FZ4 | X2-DFN1410-6 | XK                  |

**SOT353 Package Outline Dimensions and Suggested Pad Layout**

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



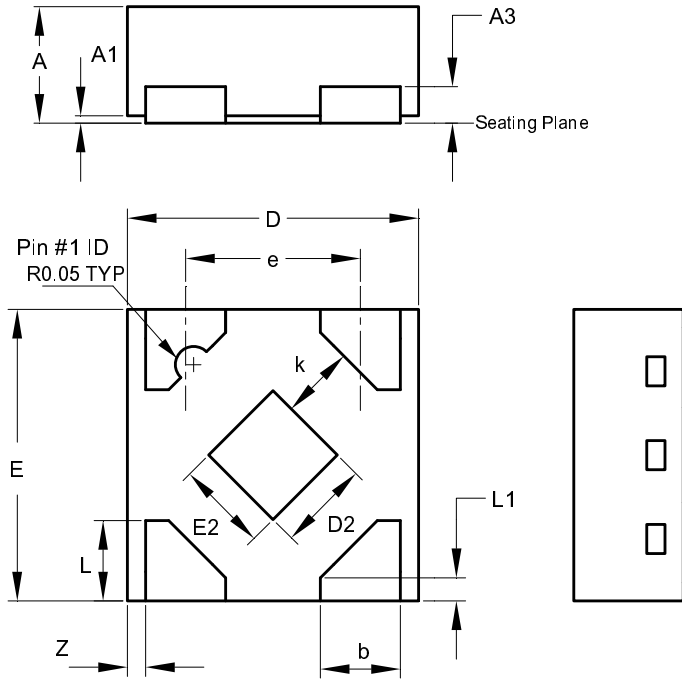
| SOT353               |          |      |       |
|----------------------|----------|------|-------|
| Dim                  | Min      | Max  | Typ   |
| A                    | 0.10     | 0.30 | 0.25  |
| B                    | 1.15     | 1.35 | 1.30  |
| C                    | 2.00     | 2.20 | 2.10  |
| 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 |          |      |       |



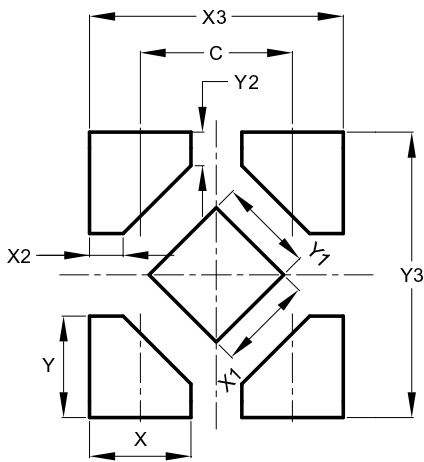
| Dimensions | Value (in mm) |
|------------|---------------|
| Z          | 2.5           |
| G          | 1.3           |
| X          | 0.42          |
| Y          | 0.6           |
| C1         | 1.9           |
| C2         | 0.65          |

**X2-DFN0808-4 Package Outline Dimensions and Suggested Pad Layout**

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



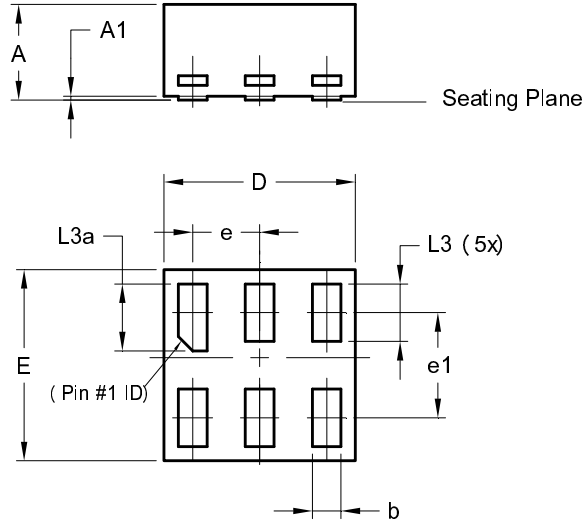
| X2-DFN0808-4         |      |      |      |
|----------------------|------|------|------|
| Dim                  | Min  | Max  | Typ  |
| A                    | 0.25 | 0.35 | 0.30 |
| A1                   | 0    | 0.04 | 0.02 |
| A3                   | -    | -    | 0.13 |
| b                    | 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 |      |      |      |



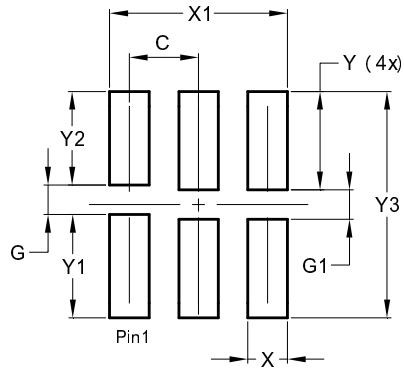
| Dimensions | Value |
|------------|-------|
| C          | 0.480 |
| X          | 0.320 |
| X1         | 0.300 |
| X2         | 0.106 |
| X3         | 0.800 |
| Y          | 0.320 |
| Y1         | 0.300 |
| Y2         | 0.106 |
| Y3         | 0.900 |

**X1-DFN1010-6 (Type B) Package Outline Dimensions and Suggested Pad Layout**

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



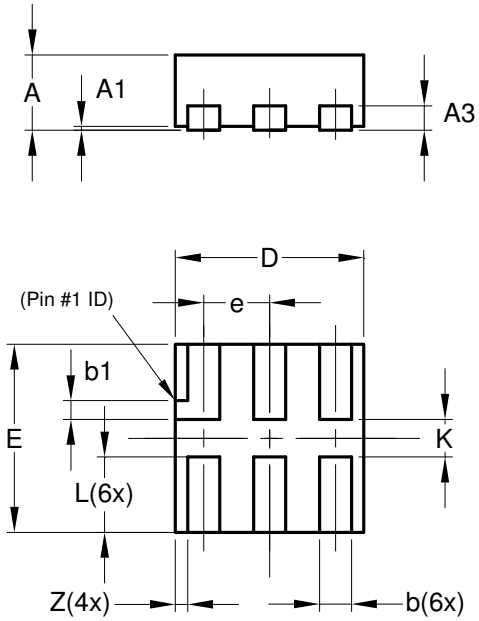
| X1-DFN1010-6<br>(Type B) |          |       |      |
|--------------------------|----------|-------|------|
| Dim                      | Min      | Max   | Typ  |
| A                        | -        | 0.50  | 0.39 |
| A1                       | -        | 0.04  | -    |
| b                        | 0.12     | 0.20  | 0.15 |
| D                        | 0.95     | 1.050 | 1.00 |
| E                        | 0.95     | 1.050 | 1.00 |
| e                        | 0.35 BSC |       |      |
| e1                       | 0.55 BSC |       |      |
| L3                       | 0.27     | 0.30  | 0.30 |
| L3a                      | 0.32     | 0.40  | 0.35 |
| All Dimensions in mm     |          |       |      |



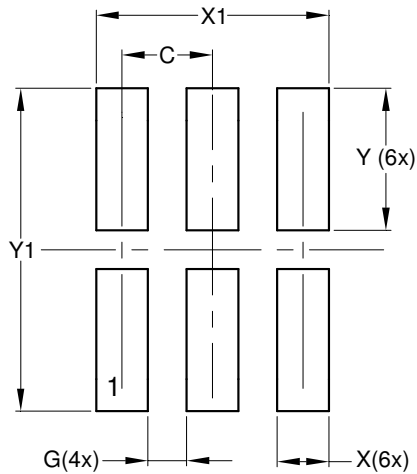
| Dimensions | Value (in mm) |
|------------|---------------|
| C          | 0.350         |
| G          | 0.150         |
| G1         | 0.150         |
| X          | 0.200         |
| X1         | 0.900         |
| Y          | 0.500         |
| Y1         | 0.525         |
| Y2         | 0.475         |
| Y3         | 1.150         |

**X2-DFN1010-6 Package Outline Dimensions and Suggested Pad Layout**

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



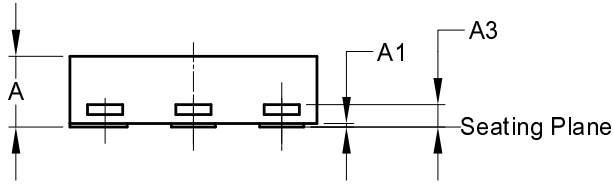
| X2-DFN1010-6         |      |      |       |
|----------------------|------|------|-------|
| Dim                  | Min  | Max  | Typ   |
| A                    | —    | 0.40 | 0.39  |
| A1                   | 0.00 | 0.05 | 0.02  |
| A3                   | —    | —    | 0.13  |
| b               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



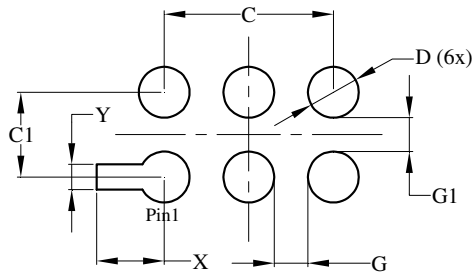
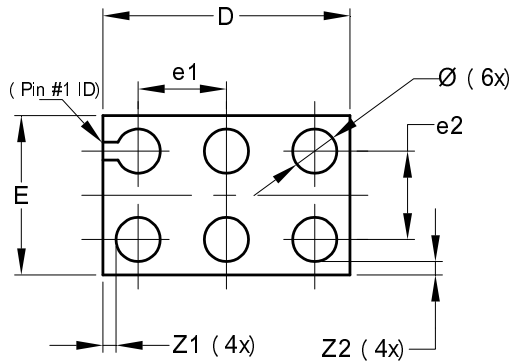
| Dimensions | Value (in mm) |
|------------|---------------|
| C          | 0.350         |
| G          | 0.150         |
| X          | 0.200         |
| X1         | 0.900         |
| Y          | 0.550         |
| Y1         | 1.250         |

**X2-DFN1409-6 Package Outline Dimensions and Suggested Pad Layout**

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



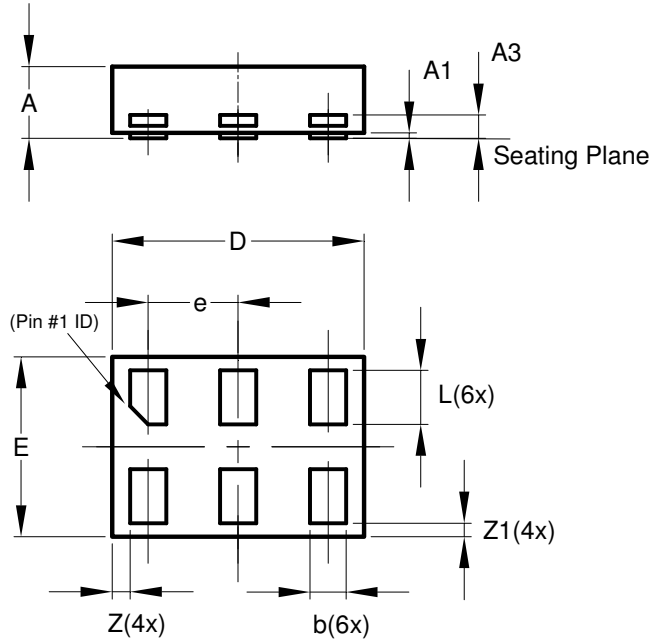
| X2-DFN1409-6         |      |      |       |
|----------------------|------|------|-------|
| Dim                  | Min  | Max  | Typ   |
| A                    | -    | 0.40 | 0.39  |
| A1                   | 0    | 0.05 | 0.02  |
| A3                   | -    | -    | 0.13  |
| Ø                    | 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 |      |      |       |



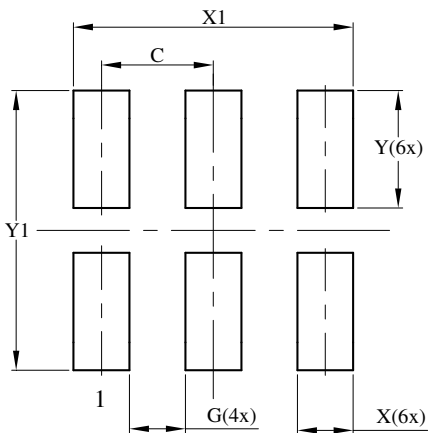
| Dimensions | Value (in mm) |
|------------|---------------|
| C          | 1.000         |
| C1         | 0.500         |
| D          | 0.300         |
| G          | 0.200         |
| G1         | 0.200         |
| X          | 0.400         |
| Y          | 0.150         |

**X2-DFN1410-6 Package Outline Dimensions and Suggested Pad Layout**

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



| 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 |       |       |       |



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

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