

## Description

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

The AUP1G14 is a single, one-input Schmitt-Trigger inverter gate with a standard push-pull output designed for operation over a power supply range of 0.8V to 3.6V. The device is fully specified for partial power down applications using I<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:

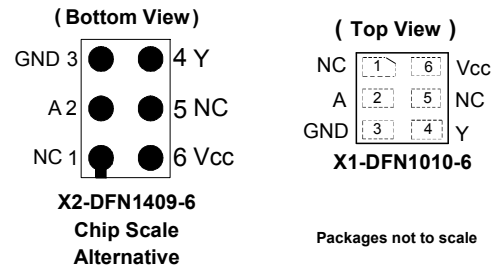
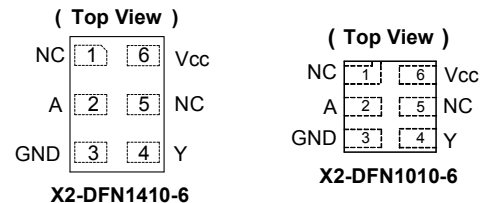
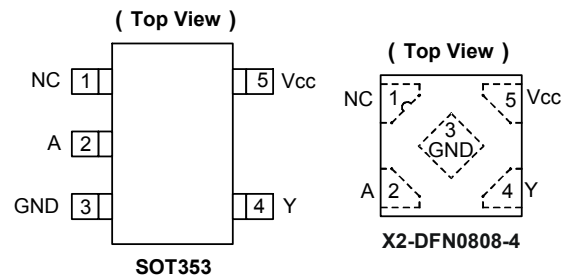
$$Y = \bar{A}$$

## 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> = 6.2pF (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.

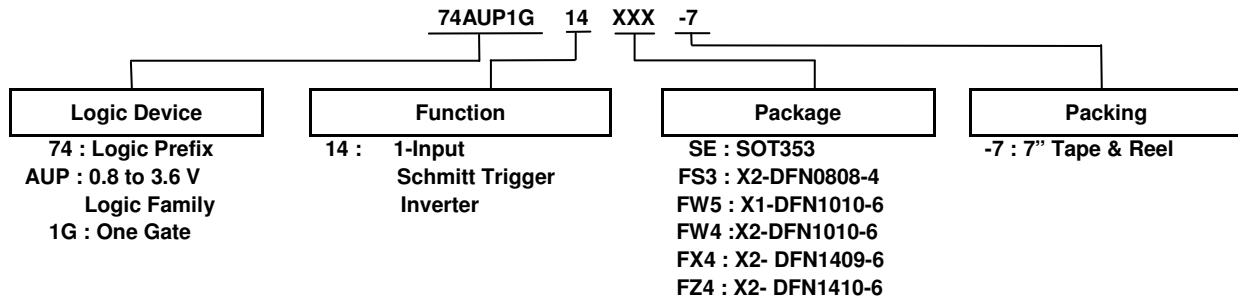
## Pin Assignments



## Applications

- Suited for Battery and Low Power Needs
- Wide array of products such as:
  - Tablets, E-readers
  - Cell Phones, Personal Navigation / GPS Systems
  - 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



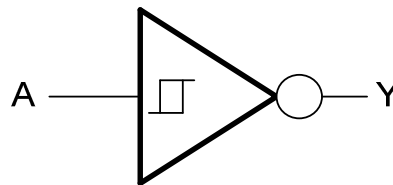
| Device         | Package Code | Package (Notes 4 & 5)                  | Package Size   | 7" Tape and Reel  |                    |
|----------------|--------------|--|--|-------------------|--------------------|
|                |              |  |  | Quantity          | Part Number Suffix |
| 74AUP1G14SE-7  | SE           | SOT353                                 | 2.0mm x 2.0mm x 1.1mm<br>0.65 mm lead pitch          | 3,000/Tape & Reel | -7                 |
| 74AUP1G14FS3-7 | FS3          | X2-DFN0808-4                           | 0.8mm x 0.8mm x 0.35mm<br>0.5 mm pad pitch (diamond) | 5,000/Tape & Reel | -7                 |
| 74AUP1G14FW5-7 | FW5          | X1-DFN1010-6                           | 1.0mm x 1.0mm x 0.5mm<br>0.35 mm pad pitch           | 5,000/Tape & Reel | -7                 |
| 74AUP1G14FW4-7 | FW4          | X2-DFN1010-6                           | 1.0mm x 1.0mm x 0.4mm<br>0.35 mm pad pitch           | 5,000/Tape & Reel | -7                 |
| 74AUP1G14FX4-7 | 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                 |
| 74AUP1G14FZ4-7 | 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 |
|--------|--------|
| A      | Y      |
| H      | L      |
| L      | H      |

**Absolute Maximum Ratings** (Notes 6 & 7) (@ $T_A = +25^\circ\text{C}$ , 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            | $^\circ\text{C}$ |

- 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) (@ $T_A = +25^\circ\text{C}$ , 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                |               |
| $T_A$    | Operating Free-Air Temperature | -40                     | 125      | $^\circ\text{C}$ |               |

- Note: 8. 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>T+</sub>   | Positive-Going Input Threshold Voltage          | —  | 0.8V            | 0.4                    | 0.65                  | 0.4                             | 0.65                  | V    |
|                   |   |  | 1.1V            | 0.53                   | 0.9                   | 0.53                            | 0.9                   |      |
|                   |   |  | 1.4V            | 0.74                   | 1.11                  | 0.74                            | 1.11                  |      |
|                   |   |  | 1.65V           | 0.91                   | 1.29                  | 0.91                            | 1.29                  |      |
|                   |   |  | 2.3V            | 1.37                   | 1.77                  | 1.37                            | 1.77                  |      |
|                   |   |  | 3.0V            | 1.61                   | 2.32                  | 1.61                            | 2.32                  |      |
| V <sub>T-</sub>   | Negative-Going Input Threshold Voltage          | —  | 0.8V            | 0.15                   | 0.4                   | 0.15                            | 0.4                   | V    |
|                   |   |  | 1.1V            | 0.26                   | 0.65                  | 0.26                            | 0.65                  |      |
|                   |   |  | 1.4V            | 0.39                   | 0.75                  | 0.39                            | 0.75                  |      |
|                   |   |  | 1.65V           | 0.47                   | 0.84                  | 0.47                            | 0.84                  |      |
|                   |   |  | 2.3V            | 0.69                   | 1.04                  | 0.69                            | 1.04                  |      |
|                   |   |  | 3.0V            | 0.88                   | 1.24                  | 0.88                            | 1.24                  |      |
| ΔV <sub>T</sub>   | Hysteresis (V <sub>T+</sub> - V <sub>T-</sub> ) | —  | 0.8V            | 0.07                   | 0.5                   | 0.07                            | 0.5                   | V    |
|                   |   |  | 1.1V            | 0.08                   | 0.46                  | 0.08                            | 0.46                  |      |
|                   |   |  | 1.4V            | 0.18                   | 0.56                  | 0.18                            | 0.56                  |      |
|                   |   |  | 1.65V           | 0.27                   | 0.66                  | 0.27                            | 0.66                  |      |
|                   |   |  | 2.3V            | 0.53                   | 0.92                  | 0.53                            | 0.92                  |      |
|                   |   |  | 3.0V            | 0.79                   | 1.31                  | 0.79                            | 1.31                  |      |
| V <sub>OH</sub>   | High-Level Output Voltage                       | I <sub>OH</sub> = -20μA                                      | 0.8V to 3.6V    | 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                   | —                     | 1.30                            | —                     |      |
|                   |   | I <sub>OH</sub> = -2.3mA                                     | 2.3V            | 2.05                   | —                     | 1.97                            | —                     |      |
|                   |   | I <sub>OH</sub> = -3.1mA                                     |                 | 1.9                    | —                     | 1.85                            | —                     |      |
|                   |   | I <sub>OH</sub> = -2.7mA                                     | 3V              | 2.72                   | —                     | 2.67                            | —                     |      |
|                   |   | I <sub>OH</sub> = -4mA                                       |                 | 2.6                    | —                     | 2.55                            | —                     |      |
| V <sub>OL</sub>   | 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> = 4 mA                                       |                 | —                      | 0.44                  | —                               | 0.45                  |      |
| I <sub>I</sub>    | Input Current                                   | V <sub>I</sub> = GND to 3.6V                                 | 0V to 3.6V      | —                      | ± 0.1                 | —                               | ± 0.5                 | μA   |
| I <sub>OFF</sub>  | Power Down Leakage Current                      | V <sub>I</sub> or V <sub>O</sub> = 0V to 3.6V                | 0               | —                      | ± 0.2                 | —                               | 0.6                   | μA   |
| ΔI <sub>OFF</sub> | Delta Power Down Leakage Current                | V <sub>I</sub> or V <sub>O</sub> = 0V to 3.6V                | 0V to 0.2V      | —                      | ± 0.2                 | —                               | 0.6                   | μA   |
| I <sub>CC</sub>   | Supply Current                                  | V <sub>I</sub> = GND or V <sub>CC</sub> , I <sub>O</sub> = 0 | 0.8V to 3.6V    | —                      | 0.5                   | —                               | 0.9                   | μA   |
| ΔI <sub>CC</sub>  | Additional Supply Current                       | Input at V <sub>CC</sub> - 0.6V                              | 3.3V            | —                      | 40                    | —                               | 50                    | μA   |

**Electrical Characteristics** (continued) (@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>T+</sub>   | Positive-Going Input Threshold Voltage          | —  | 0.8V            | 0.4                              | 0.65                   | V    |
|                   |   |  | 1.1V            | 0.53                             | 0.9                    |      |
|                   |   |  | 1.4V            | 0.74                             | 1.11                   |      |
|                   |   |  | 1.65V           | 0.91                             | 1.29                   |      |
|                   |   |  | 2.3V            | 1.37                             | 1.77                   |      |
|                   |   |  | 3.0V            | 1.61                             | 2.32                   |      |
| V <sub>T-</sub>   | Negative-Going Input Threshold Voltage          | —  | 0.8V            | 0.15                             | 0.4                    | V    |
|                   |   |  | 1.1V            | 0.26                             | 0.65                   |      |
|                   |   |  | 1.4V            | 0.39                             | 0.75                   |      |
|                   |   |  | 1.65V           | 0.47                             | 0.84                   |      |
|                   |   |  | 2.3V            | 0.69                             | 1.04                   |      |
|                   |   |  | 3.0V            | 0.88                             | 1.24                   |      |
| ΔV <sub>T</sub>   | Hysteresis (V <sub>T+</sub> - V <sub>T-</sub> ) | —  | 0.8V            | 0.07                             | 0.5                    | V    |
|                   |   |  | 1.1V            | 0.08                             | 0.46                   |      |
|                   |   |  | 1.4V            | 0.18                             | 0.56                   |      |
|                   |   |  | 1.65V           | 0.27                             | 0.66                   |      |
|                   |   |  | 2.3V            | 0.53                             | 0.92                   |      |
|                   |   |  | 3.0V            | 0.79                             | 1.31                   |      |
| V <sub>OH</sub>   | High-Level Output Voltage                       | I <sub>OH</sub> = -20μA                                      | 0.8V to 3.6V    | V <sub>CC</sub> - 0.11           | —                      | V    |
|                   |   | I <sub>OH</sub> = -1.1mA                                     | 1.1V            | 0.6 x V <sub>CC</sub>            | —                      |      |
|                   |   | I <sub>OH</sub> = -1.7mA                                     | 1.4V            | 0.93                             | —                      |      |
|                   |   | I <sub>OH</sub> = -1.9mA                                     | 1.65V           | 1.17                             | —                      |      |
|                   |   | I <sub>OH</sub> = -2.3mA                                     | 2.3V            | 1.77                             | —                      |      |
|                   |   | I <sub>OH</sub> = -3.1mA                                     |                 | 1.67                             | —                      |      |
|                   |   | I <sub>OH</sub> = -2.7mA                                     | 3V              | 2.40                             | —                      |      |
|                   |   | I <sub>OH</sub> = -4mA                                       |                 | 2.30                             | —                      |      |
| V <sub>OL</sub>   | 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                                   | V <sub>I</sub> = GND to 3.6V                                 | 0V to 3.6V      | —                                | ± 0.75                 | μA   |
| I <sub>OFF</sub>  | Power Down Leakage Current                      | V <sub>I</sub> or V <sub>O</sub> = 0V to 3.6V                | 0               | —                                | ± 3.5                  | μA   |
| ΔI <sub>OFF</sub> | Delta Power Down Leakage Current                | V <sub>I</sub> or V <sub>O</sub> = 0V to 3.6V                | 0V to 0.2V      | —                                | ± 2.5                  | μA   |
| I <sub>CC</sub>   | Supply Current                                  | V <sub>I</sub> = GND or V <sub>CC</sub> , I <sub>O</sub> = 0 | 0.8V to 3.6V    | —                                | 3.0                    | μA   |
| ΔI <sub>CC</sub>  | Additional Supply Current                       | Input at V <sub>CC</sub> - 0.6V                              | 3.3V            | —                                | 75                     | μA   |

## Switching Characteristics

 $C_L=5\text{pF}$ , See Figure 1

| Parameter       | From Input | To Output | V <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            | —                       | 19.9 | —    | —                                 | —    | —                                  | —    | ns   |
|                 |            |           | 1.2V ± 0.1V     | 2.0                     | 8.5  | 12.0 | 2.0                               | 13.1 | 2.0                                | 13.1 |      |
|                 |            |           | 1.5V ± 0.1V     | 1.5                     | 4.3  | 6.6  | 1.5                               | 7.1  | 1.5                                | 7.4  |      |
|                 |            |           | 1.8V ± 0.15V    | 1.2                     | 3.7  | 5.4  | 1.2                               | 6.0  | 1.2                                | 6.2  |      |
|                 |            |           | 2.5V ± 0.2V     | 1.0                     | 3.0  | 4.1  | 1.0                               | 4.5  | 1.0                                | 4.7  |      |
|                 |            |           | 3.3V ± 0.3V     | 0.8                     | 2.8  | 3.6  | 0.8                               | 3.9  | 0.8                                | 4.0  |      |

 $C_L=10\text{pF}$ , See Figure 1

| Parameter       | From Input | To Output | V <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            | —                       | 23.4 | —    | —                                 | —    | —                                  | —    | ns   |
|                 |            |           | 1.2V ± 0.1V     | 2.5                     | 8.7  | 13.7 | 2.5                               | 13.8 | 2.5                                | 13.9 |      |
|                 |            |           | 1.5V ± 0.1V     | 2.0                     | 5.0  | 7.7  | 2.0                               | 8.2  | 2.0                                | 8.6  |      |
|                 |            |           | 1.8V ± 0.15V    | 1.7                     | 4.2  | 6.2  | 1.7                               | 6.7  | 1.7                                | 7.1  |      |
|                 |            |           | 2.5V ± 0.2V     | 1.4                     | 3.6  | 4.8  | 1.4                               | 5.2  | 1.4                                | 5.5  |      |
|                 |            |           | 3.3V ± 0.3V     | 1.2                     | 3.3  | 4.3  | 1.2                               | 4.5  | 1.2                                | 4.7  |      |

 $C_L=15\text{pF}$ , See Figure 1

| Parameter       | From Input | To Output | V <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            | —                       | 26.9 | —    | —                                 | —   | —                                  | —   | ns   |
|                 |            |           | 1.2V ± 0.1V     | 2.9                     | 9.2  | 15.3 | 2.9                               | 17  | 2.9                                | 17  |      |
|                 |            |           | 1.5V ± 0.1V     | 2.3                     | 5.5  | 8.6  | 2.3                               | 9.4 | 2.3                                | 9.8 |      |
|                 |            |           | 1.8V ± 0.15V    | 2.1                     | 4.7  | 7    | 2.1                               | 7.7 | 2.1                                | 8.1 |      |
|                 |            |           | 2.5V ± 0.2V     | 1.7                     | 4    | 5.5  | 1.7                               | 5.9 | 1.7                                | 6.2 |      |
|                 |            |           | 3.3V ± 0.3V     | 1.5                     | 3.8  | 4.8  | 1.5                               | 5.2 | 1.5                                | 5.4 |      |

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

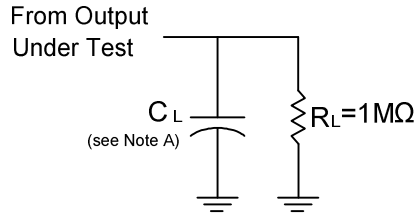
| Parameter       | From Input | To Output | V <sub>cc</sub> | T <sub>A</sub> = +25 °C |      |      | T <sub>A</sub> = -40 °C to +85 °C |      | T <sub>A</sub> = -40 °C to +125 °C |      | Unit |
|-----------------|------------|-----------|-----------------|-------------------------|------|------|-----------------------------------|------|------------------------------------|------|------|
|                 |            |           |                 | Min                     | Typ  | Max  | Min                               | Max  | Min                                | Max  |      |
| t <sub>pd</sub> | A or B     | Y         | 0.8V            | —                       | 37.3 | —    | —                                 | —    | —                                  | —    | ns   |
|                 |            |           | 1.2V ± 0.1V     | 3.9                     | 11.2 | 20.7 | 3.9                               | 22.5 | 3.9                                | 22.5 |      |
|                 |            |           | 1.5V ± 0.1V     | 3.2                     | 7.1  | 11.2 | 3.2                               | 12.3 | 3.2                                | 12.9 |      |
|                 |            |           | 1.8V ± 0.15V    | 2.9                     | 6.0  | 9.1  | 2.9                               | 10.0 | 2.9                                | 10.6 |      |
|                 |            |           | 2.5V ± 0.2V     | 2.5                     | 5.2  | 6.9  | 2.5                               | 7.5  | 2.5                                | 7.9  |      |
|                 |            |           | 3.3V ± 0.3V     | 2.3                     | 4.8  | 6.1  | 2.3                               | 7.1  | 2.3                                | 7.4  |      |

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

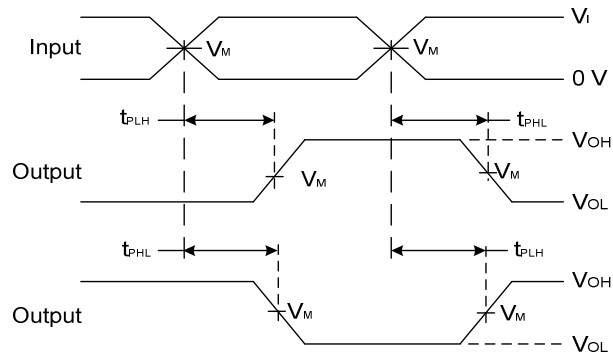
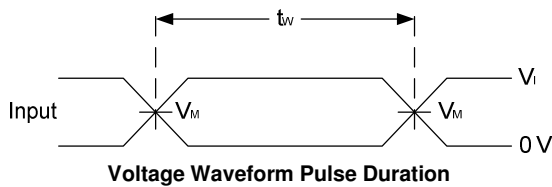
| Parameter       |   | Test Conditions                         |          | V <sub>CC</sub> | Typ | Unit |
|-----------------|---|---|----------|-----------------|-----|------|
| C <sub>pd</sub> | Power Dissipation Capacitance             | f = 1MHz<br>No Load                     |          | 0.8V            | 6.5 | pF   |
|                 |   |   |          | 1.2V ± 0.1V     | 6.3 |      |
|                 |   |   |          | 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<br>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<br>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**

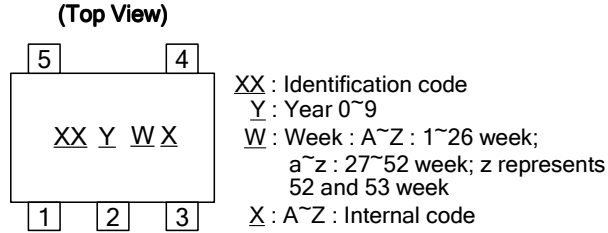
**Figure 1 Load Circuit and Voltage Waveforms**

- 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>.



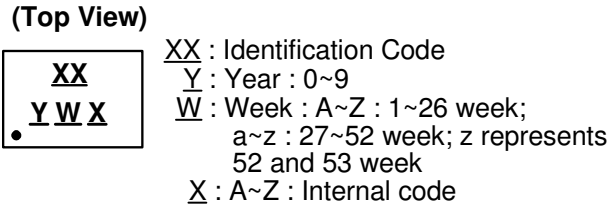
**Marking Information**

(1) SOT353



| Part Number   | Package | Identification Code |
|---------------|---------|---------------------|
| 74AUP1G14SE-7 | SOT353  | XS                  |

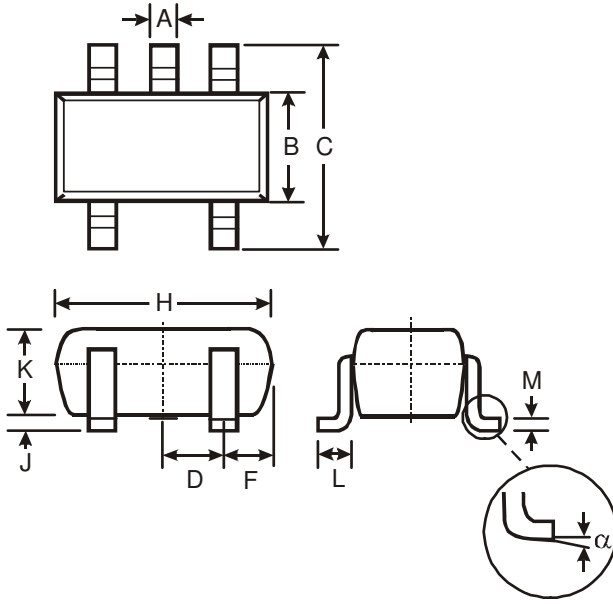
(2) X2-DFN0808-4, X1-DFN1010-6, X2-DFN1010-6 X2-DFN1409-6 and X2-DFN1410-6



| Part Number    | Package      | Identification Code |
|----------------|--------------|---------------------|
| 74AUP1G14FS3-7 | X2-DFN0808-4 | YS                  |
| 74AUP1G14FW5-7 | X1-DFN1010-6 | Q9                  |
| 74AUP1G14FW4-7 | X2-DFN1010-6 | XS                  |
| 74AUP1G14FX4-7 | X2-DFN1409-6 | HH                  |
| 74AUP1G14FZ4-7 | X2-DFN1410-6 | XS                  |

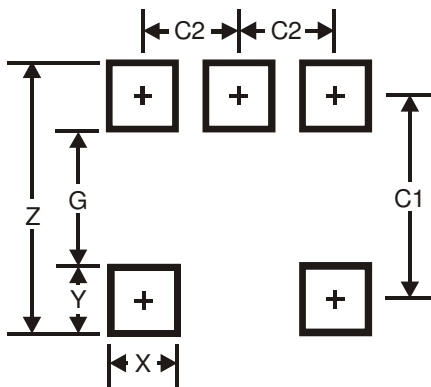
**SOT353 Package Outline Dimensions and Suggested Pad Layout**

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°   | -     |

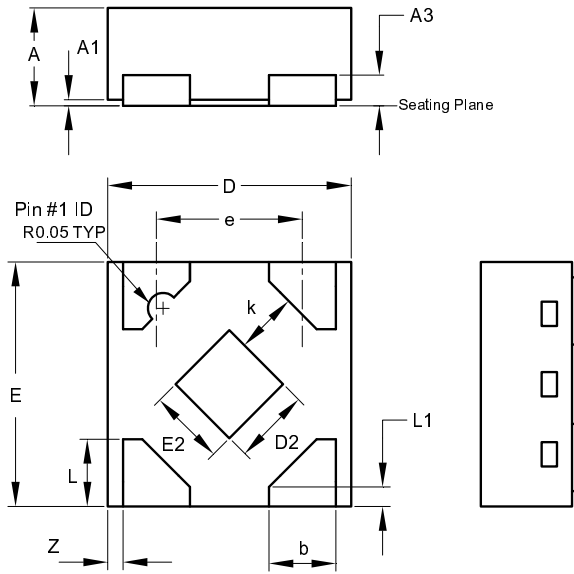
All Dimensions in mm



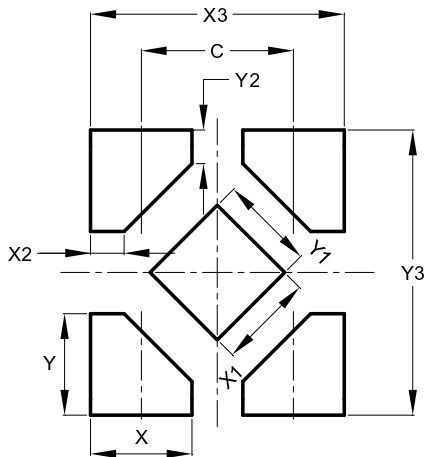
| Dimensions | Value (in mm) |
|------------|---------------|
| Z          | 2.5           |
| G          | 1.3           |
| X          | 0.42          |
| Y          | 0.6           |
| C1         | 1.9           |
| C2         | 0.65          |

**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.



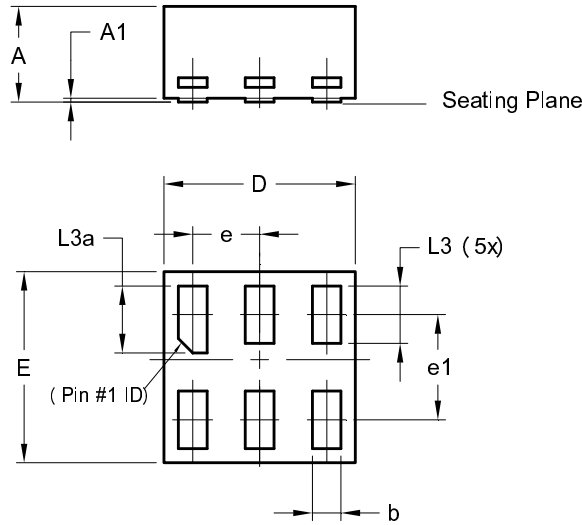
| X2-DFN0808-4         |      |      |      |
|----------------------|------|------|------|
| Dim                  | Min  | Max  | Typ  |
| A                    | 0.25 | 0.35 | 0.30 |
| A1                   | 0    | 0.04 | 0.02 |
| A3                   | -    | -    | 0.13 |
| b                    |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



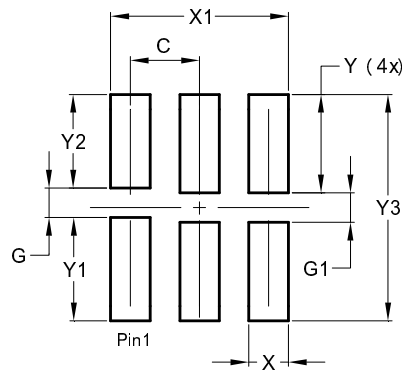
| Dimensions | Value |
|------------|-------|
| C          | 0.480 |
| X          | 0.320 |
| X1         | 0.300 |
| X2         | 0.106 |
| X3         | 0.800 |
| Y          | 0.320 |
| Y1         | 0.300 |
| Y2         | 0.106 |
| Y3         | 0.900 |

**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.



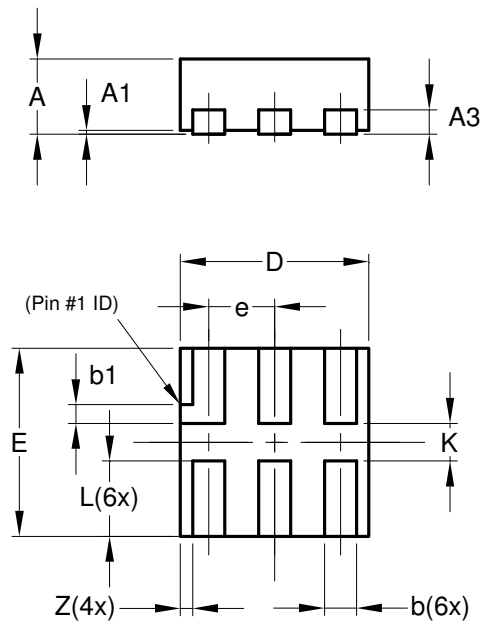
| X1-DFN1010-6<br>(Type B) |          |       |      |
|--------------------------|----------|-------|------|
| Dim                      | Min      | Max   | Typ  |
| A                        | -        | 0.50  | 0.39 |
| A1                       | -        | 0.04  | -    |
| b                        | 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     |          |       |      |



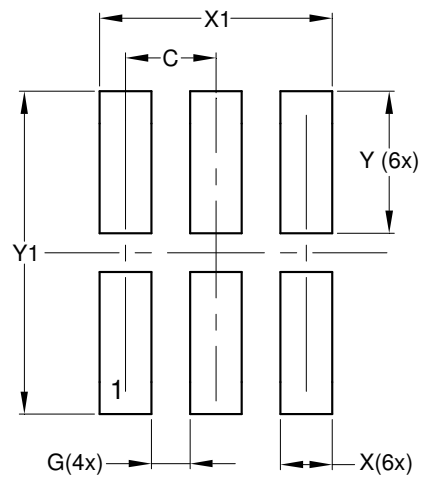
| Dimensions | Value (in mm) |
|------------|---------------|
| C          | 0.350         |
| G          | 0.150         |
| G1         | 0.150         |
| X          | 0.200         |
| X1         | 0.900         |
| Y          | 0.500         |
| Y1         | 0.525         |
| Y2         | 0.475 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



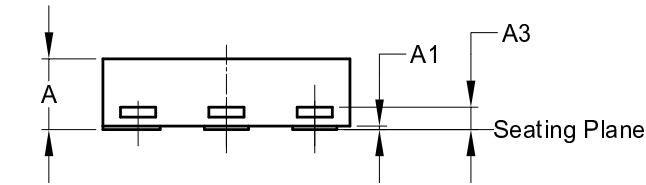
| X2-DFN1010-6         |      |      |       |
|----------------------|------|------|-------|
| Dim                  | Min  | Max  | Typ   |
| A                    | —    | 0.40 | 0.39  |
| A1                   | 0.00 | 0.05 | 0.02  |
| A3                   | —    | —    | 0.13  |
| b               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



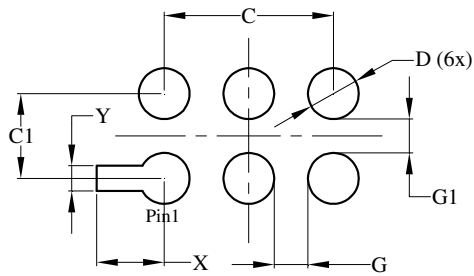
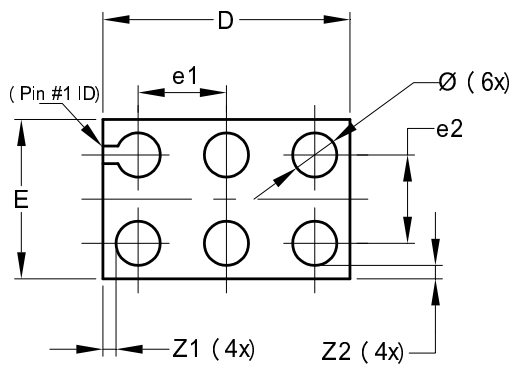
| Dimensions | Value (in mm) |
|------------|---------------|
| C          | 0.350         |
| G          | 0.150         |
| X          | 0.200         |
| X1         | 0.900         |
| Y          | 0.550         |
| Y1         | 1.250         |

**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.



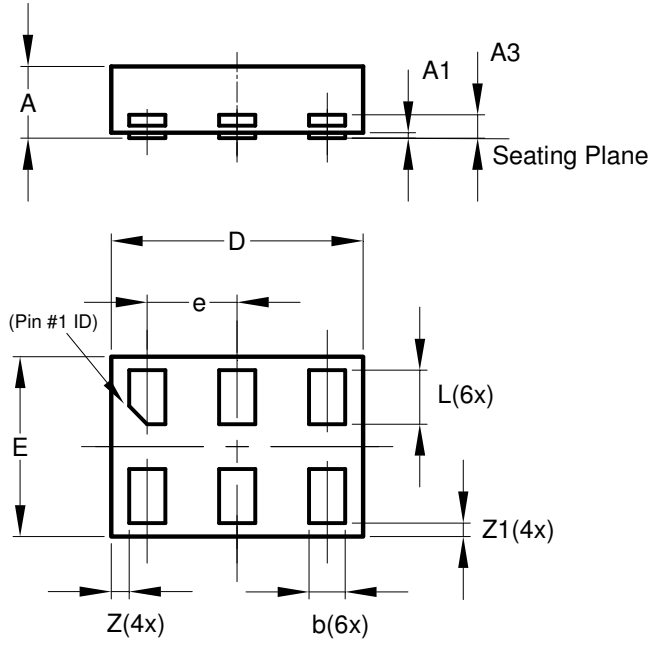
| X2-DFN1409-6         |      |      |       |
|----------------------|------|------|-------|
| Dim                  | Min  | Max  | Typ   |
| A                    | -    | 0.40 | 0.39  |
| A1                   | 0    | 0.05 | 0.02  |
| A3                   | -    | -    | 0.13  |
| Ø               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



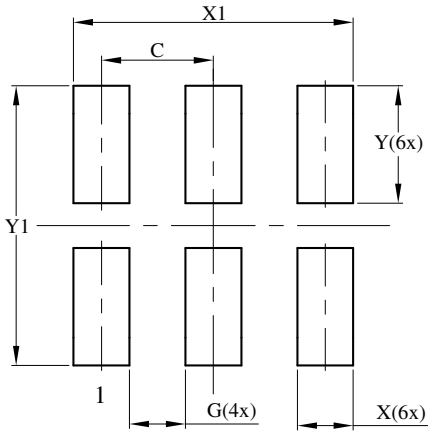
| Dimensions | Value (in mm) |
|------------|---------------|
| C          | 1.000         |
| C1         | 0.500         |
| D          | 0.300         |
| G          | 0.200         |
| G1         | 0.200         |
| X          | 0.400         |
| Y          | 0.150         |

**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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