



**THE DATASHEET OF  
74AUP1G57FW4-7**



## Description

The 74AUP1G57 is a single, 3-input positive configurable multiple function gate with a standard push-pull output. The output state is determined by eight patterns of 3-bit input. The user can choose the logic functions AND, OR, NAND, NOR, XNOR, inverter or non-inverting buffer. All inputs can be connected to ground or Vcc as required.

The device is designed for operation with a power supply range of 0.8V to 3.6V.

The inputs are tolerant to 3.6V allowing this device to be used in a mixed voltage environment.

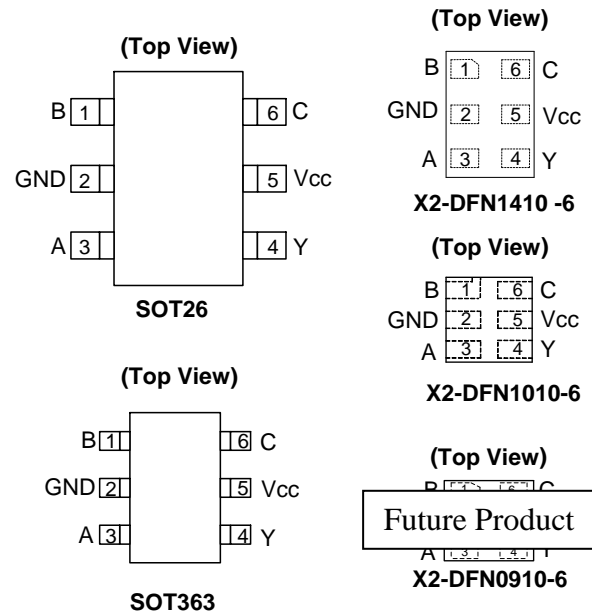
The device is fully specified for partial power down applications using IOFF. The IOFF circuitry disables the output preventing damaging current backflow when the device is powered down. The user is reminded that the device can simulate several types of logic gates but may respond differently due to the Schmitt action at the inputs.

## Features

- Advanced Ultra Low-Power (AUP) CMOS
- Supply Voltage Range from 0.8V to 3.6V
- $\pm 4\text{mA}$  Output Drive at 3.0V
- Low Static Power Consumption
- $I_C < 0.9\mu\text{A}$
- Low Dynamic Power Consumption
- $C_{PD} = 4.8\text{pF}$  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 950mV at  $V_{CC} = 3.0\text{V}$ .
- IOFF Supports Partial-Power-Down Mode Operation
- ESD Protection per JESD 22
  - Exceeds 200-V Machine Model (A115)
  - Exceeds 2000-V Human Body Model (A114)
  - Exceeds 1000-V Charged Device Model (C101)
- Latch-Up Exceeds 100mA per JESD 78, Class I
- Standard SOT26 and SOT363 Packages
- Leadless Packages per JESD30E
  - DFN1410 denoted as X2-DFN1410-6
  - DFN1010 denoted as X2-DFN1010-6
  - DFN0910 denoted as X2-DFN0910-6
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
  2. See [http://www.diodes.com/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.

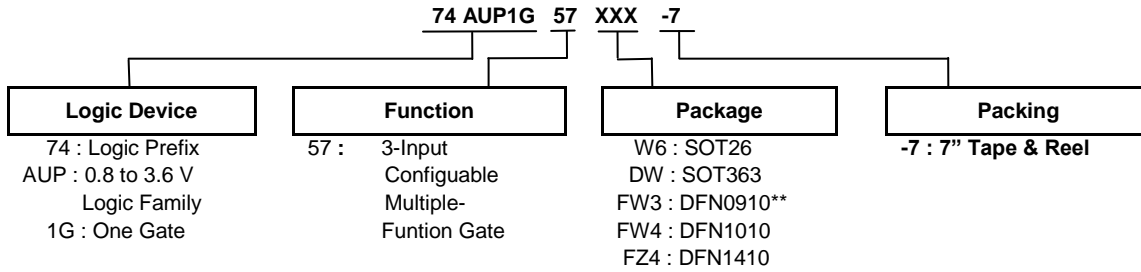
## Pin Assignments



## Applications

- Suited for Battery and Low-Power Needs
- Voltage Level Shifting
- General Purpose Logic
- Power Down Signal Isolation
- Wide array of products such as:
  - PCs, Networking, Notebooks, Netbooks, PDAs
  - Tablet Computers, E-readers
  - Computer Peripherals, Hard Drives, CD/DVD ROMs
  - TVs, DVDs, DVRs, Set-Top Boxes
  - Cell Phones, Personal Navigation / GPS
  - MP3 players, Cameras, Video Recorders

## Ordering Information



| Device           | Package Code | Package (Notes 4 & 5) | Package Size                                | 7" Tape and Reel  |                    |
|------------------|--------------|-----------------------|---|-------------------|--------------------|
|                  |              |                       |   | Quantity          | Part Number Suffix |
| 74AUP1G57W6-7    | W6           | SOT26                 | 3.0mm x 2.8mm x 1.2mm<br>0.95 mm lead pitch | 3,000/Tape & Reel | -7                 |
| 74AUP1G57DW-7    | DW           | SOT363                | 2.0mm x 2.0mm x 1.1mm<br>0.65 mm lead pitch | 3,000/Tape & Reel | -7                 |
| 74AUP1G57FW3-7** | FW3          | X2-DFN0910-6          | 0.9mm x 1.0mm x 0.35mm<br>0.3 mm lead pitch | 5,000/Tape & Reel | -7                 |
| 74AUP1G57FW4-7   | FW4          | X2-DFN1010-6          | 1.0mm x 1.0mm x 0.4mm<br>0.35 mm lead pitch | 5,000/Tape & Reel | -7                 |
| 74AUP1G57FZ4-7   | FZ4          | X2-DFN1410-6          | 1.4mm x 1.0mm x 0.4mm<br>0.5 mm lead 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>.  
\*\* The X2-DFN0910-6 is a future product.

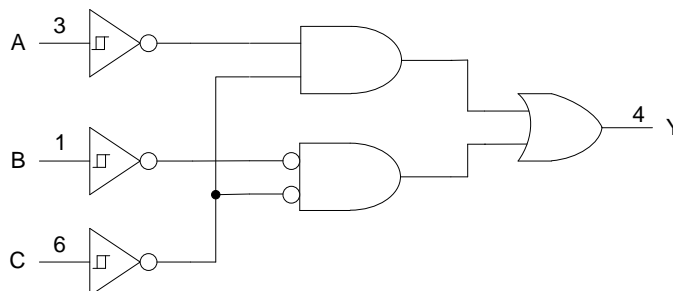
## Pin Descriptions

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

## Function Table

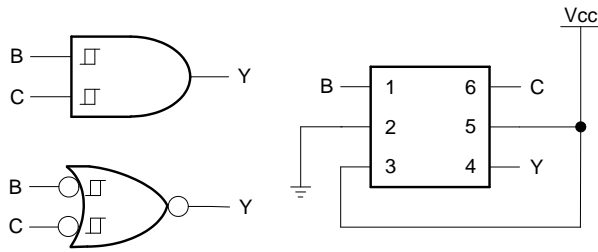
| Inputs |   |   | Output |
|--------|---|---|--------|
| C      | B | A | Y      |
| L      | L | L | H      |
| L      | L | H | L      |
| L      | H | L | H      |
| L      | H | H | L      |
| H      | L | L | L      |
| H      | L | H | L      |
| H      | H | L | H      |
| H      | H | H | H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

## Logic Diagram

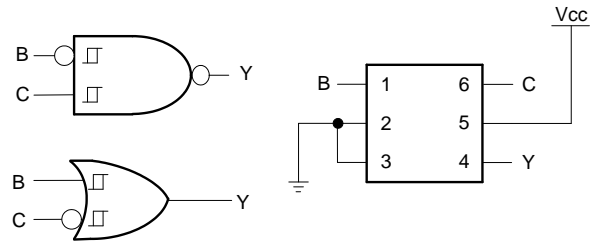


**Logic Configurations**

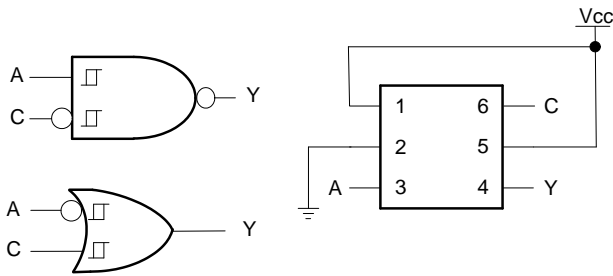
NEW PRODUCT



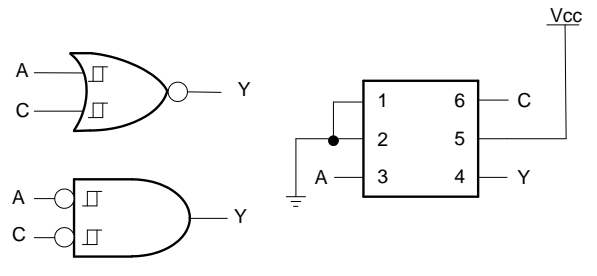
Configuration 1  
2-Input AND Gate  
2-Input NOR Gate with Both Inputs Inverted



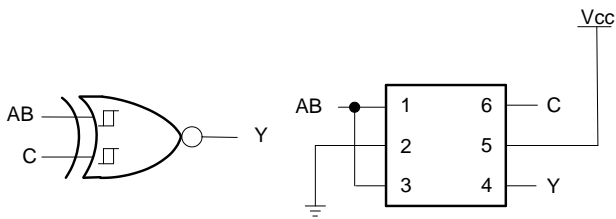
Configuration 2  
2-Input NAND Gate with B Input Inverted  
2-Input OR Gate with C input Inverted



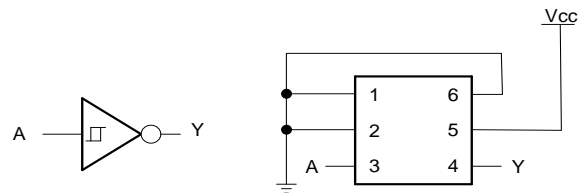
Configuration 3  
2-Input NAND Gate with C Input Inverted  
2-Input OR Gate with A Input Inverted



Configuration 4  
2-Input NOR Gate  
2-Input AND Gate with Both Inputs Inverted



Configuration 5  
2-Input XNOR Gate



Configuration 6  
Inverter

| Function Selection Table              |               |
|---------------------------------------|---------------|
| Logic Function                        | Configuration |
| 2-Input AND                           | 1             |
| 2-Input AND with both inputs inverted | 4             |
| 2-Input NAND with inverted input      | 2, 3          |
| 2-Input OR with inverted input        | 2, 3          |
| 2-Input NOR                           | 4             |
| 2-Input NOR with both inputs inverted | 1             |
| 2-Input XNOR                          | 5             |
| 1-Input INVERTER                      | 6             |

**Absolute Maximum Ratings** (Notes 6 & 7)

| Symbol           | Description  | Rating                       | Unit |
|------------------|--|------------------------------|------|
| ESD HBM          | Human Body Model ESD Protection                                    | 2                            | kV   |
| ESD CDM          | Charged Device Model ESD Protection                                | 1                            | kV   |
| ESD MM           | Machine Model ESD Protection                                       | 200                          | V    |
| 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)

| 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                 | Active Mode              | 0   | V <sub>CC</sub> | V    |
|                 |                                | Power Down Mode          | 0   | 3.6             | V    |
| I <sub>OH</sub> | High-Level Output Current      | V <sub>CC</sub> = 0.8 V  | -   | -20             | μA   |
|                 |                                | V <sub>CC</sub> = 1.1 V  | -   | -1.1            | mA   |
|                 |                                | V <sub>CC</sub> = 1.4 V  | -   | -1.7            |      |
|                 |                                | V <sub>CC</sub> = 1.65 V | -   | -1.9            |      |
|                 |                                | V <sub>CC</sub> = 2.3 V  | -   | -3.1            |      |
|                 |                                | V <sub>CC</sub> = 3.0 V  | -   | -4              |      |
| I <sub>OL</sub> | Low-Level Output Current       | V <sub>CC</sub> = 0.8 V  | -   | 20              | uA   |
|                 |                                | V <sub>CC</sub> = 1.1 V  | -   | 1.1             | mA   |
|                 |                                | V <sub>CC</sub> = 1.4 V  | -   | 1.7             |      |
|                 |                                | V <sub>CC</sub> = 1.65 V | -   | 1.9             |      |
|                 |                                | V <sub>CC</sub> = 2.3 V  | -   | 3.1             |      |
|                 |                                | V <sub>CC</sub> = 3.0 V  | -   | 4               |      |
| 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   | Vcc          | T <sub>A</sub> = +25°C |                       | T <sub>A</sub> = -40 to +85°C |                       | Unit |
|-------------------|---|---|--------------|------------------------|-----------------------|-------------------------------|-----------------------|------|
|                   |   |   |              | Min                    | Max                   | Min                           | Max                   |      |
| V <sub>T+</sub>   | Positive-Going Input Threshold Voltage          | -   | 0.8V         | 0.3                    | 0.65                  | 0.3                           | 0.7                   | 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                  |      |
| V <sub>T-</sub>   | Negative-Going Input Threshold Voltage          | -   | 0.8V         | 0.1                    | 0.6                   | 0.1                           | 0.6                   | 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                  |      |
| 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                  |      |
| 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 Input 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   | 1.65 V       | -                      | 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 3.6 V                                     | 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> =<br>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> =<br>0V to 3.6V                                  | 0V to 0.2 V  | -                      | ± 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                       | One input at V <sub>CC</sub> -<br>0.6 V Other inputs<br>at V <sub>CC</sub> or GND | 3.3V         | -                      | 40                    | -                             | 50                    | μA   |

**Electrical Characteristics** (continued)

| Symbol            | Parameter                                       | Test Conditions   | Vcc          | T <sub>A</sub> = -40 to +125°C |                        | Unit |
|-------------------|---|---|--------------|--------------------------------|------------------------|------|
|                   |   |   |              | Min                            | Max                    |      |
| V <sub>T+</sub>   | Positive-Going Input Threshold Voltage          | -   | 0.8V         | 0.3                            | 0.7                    | V    |
|                   |   | -   | 1.1V         | 0.53                           | 0.92                   |      |
|                   |   | -   | 1.4V         | 0.74                           | 1.13                   |      |
|                   |   | -   | 1.65V        | 0.91                           | 1.31                   |      |
|                   |   | -   | 2.3V         | 1.37                           | 1.8                    |      |
|                   |   | -   | 3.0V         | 1.88                           | 2.32                   |      |
| V <sub>T-</sub>   | Negative-Going Input Threshold Voltage          | -   | 0.8V         | 0.1                            | 0.6                    | 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 Input 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   | 1.65 V       | -                              | 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 3.6 V                                     | 0V to 3.6V   | -                              | ± 0.75                 | μA   |
| I <sub>OFF</sub>  | Power Down Leakage Current                      | V <sub>I</sub> or V <sub>O</sub> =<br>0V to 3.6V                                  | 0            | -                              | ± 1.0                  | μA   |
| ΔI <sub>OFF</sub> | Delta Power Down Leakage Current                | V <sub>I</sub> or V <sub>O</sub> =<br>0V to 3.6V                                  | 0V to 0.2 V  | -                              | ± 2.5                  | 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 | -                              | 1.4                    | μA   |
| ΔI <sub>CC</sub>  | Additional Supply Current                       | One input at V <sub>CC</sub> -<br>0.6 V Other inputs<br>at V <sub>CC</sub> or GND | 3.3V         | -                              | 75                     | μA   |

### Package Characteristics

| Symbol        | Parameter                              | Package      | Test Conditions | Min | Typ. | Max | Unit                 |
|---------------|--|--------------|-----------------|-----|------|-----|----------------------|
| $\theta_{JA}$ | Thermal Resistance Junction-to-Ambient | SOT26        | (Note 9)        | -   | 166  | -   | $^{\circ}\text{C/W}$ |
|               |  | SOT363       |                 | -   | 371  | -   |                      |
|               |  | X2-DFN0910-6 |                 | -   | 450  | -   |                      |
|               |  | X2-DFN1010-6 |                 | -   | 445  | -   |                      |
|               |  | X2-DFN1410-6 |                 | -   | 430  | -   |                      |
| $\theta_{JC}$ | Thermal Resistance Junction-to-Case    | SOT26        | (Note 9)        | -   | 46   | -   | $^{\circ}\text{C/W}$ |
|               |  | SOT363       |                 | -   | 143  | -   |                      |
|               |  | X2-DFN0910-6 |                 | -   | 255  | -   |                      |
|               |  | X2-DFN1010-6 |                 | -   | 250  | -   |                      |
|               |  | X2-DFN1410-6 |                 | -   | 190  | -   |                      |

Note: 9. Test condition for each of the 8 package types: Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.

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

| Parameter |                               | Test Conditions       | Vcc              | TYP | Unit |
|-----------|-------------------------------|-----------------------|------------------|-----|------|
| $C_{pd}$  | Power Dissipation Capacitance | f = 1MHz<br>No Load   | 0.8 V            | 4   | pF   |
|           |                               |                       | 1.2V $\pm$ 0.1V  | 4   |      |
|           |                               |                       | 1.5V $\pm$ 0.1V  | 4   |      |
|           |                               |                       | 1.8V $\pm$ 0.15V | 4   |      |
|           |                               |                       | 2.5V $\pm$ 0.2V  | 4.4 |      |
|           |                               |                       | 3.3 $\pm$ 0.3V   | 4.8 |      |
| $C_i$     | Input Capacitance             | $V_i = V_{CC}$ or GND | 0 V or 3.3V      | 1.1 | pF   |
| $C_o$     | Output Capacitance            | $V_0 = V_{CC}$ or GND | 0 V              | 2.0 | pF   |

### Switching Characteristics

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

| Parameter | From Input          | TO OUTPUT | Vcc                | $T_A = +25^{\circ}\text{C}$ |     |      | $T_A = -40^{\circ}\text{C to } +85^{\circ}\text{C}$ |      | $T_A = -40^{\circ}\text{C to } +125^{\circ}\text{C}$ |      | Unit |
|-----------|---------------------|-----------|--------------------|-----------------------------|-----|------|---|------|--|------|------|
|           |                     |           |                    | Min                         | TYP | Max  | Min   | Max  | Min  | Max  |      |
| $t_{pd}$  | A,<br>B,<br>or<br>C | Y         | 0.8 V              | -                           | 28  | -    | -   | -    | -  | -    | ns   |
|           |                     |           | 1.2 V $\pm$ 0.1 V  | 2.6                         | 7.4 | 14.4 | 2.1   | 14.8 | 2.1  | 15.1 |      |
|           |                     |           | 1.5 V $\pm$ 0.1 V  | 1.9                         | 4.6 | 7.6  | 1.4   | 8.2  | 1.4  | 8.6  |      |
|           |                     |           | 1.8 V $\pm$ 0.15 V | 1.4                         | 3.9 | 6.2  | 0.9   | 6.8  | 0.9  | 7.2  |      |
|           |                     |           | 2.5 V $\pm$ 0.2 V  | 1.1                         | 3.1 | 4.5  | 0.6   | 5.1  | 0.6  | 5.3  |      |
|           |                     |           | 3.3 V $\pm$ 0.3 V  | 1                           | 2.8 | 3.9  | 0.5   | 4.1  | 0.5  | 4.3  |      |

**Switching Characteristics** (continued)

 $C_L=10\text{pF}$ , 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,<br>B,<br>or<br>C | Y         | 0.8 V           | -                      | 32  | -    | -                               | -   | -                                | -    | ns   |
|                 |                     |           | 1.2 V ± 0.1 V   | 2.6                    | 8.3 | 16.4 | 2.1                             | 17  | 2.1                              | 17.3 |      |
|                 |                     |           | 1.5 V ± 0.1 V   | 1.9                    | 5.2 | 8.7  | 1.4                             | 9.4 | 1.4                              | 9.8  |      |
|                 |                     |           | 1.8 V ± 0.15 V  | 1.4                    | 4.5 | 7    | 0.9                             | 7.8 | 0.9                              | 8.2  |      |
|                 |                     |           | 2.5 V ± 0.2 V   | 1.1                    | 3.7 | 5.2  | 0.6                             | 5.9 | 0.6                              | 6.2  |      |
|                 |                     |           | 3.3 V ± 0.3 V   | 1                      | 3.4 | 4.6  | 0.5                             | 4.9 | 0.5                              | 5.1  |      |

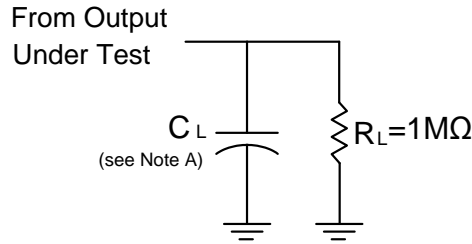
 $C_L=15\text{pF}$ , See Figure 1

| 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,<br>B,<br>or<br>C | Y         | 0.8 V           | -                      | 38  | -    | -                               | -    | -                                | -    | ns   |
|                 |                     |           | 1.2 V ± 0.1 V   | 3.4                    | 9.1 | 17.9 | 3.1                             | 19.8 | 3.1                              | 20   |      |
|                 |                     |           | 1.5 V ± 0.1 V   | 2.8                    | 5.7 | 9.6  | 2.3                             | 10.4 | 2.3                              | 10.9 |      |
|                 |                     |           | 1.8 V ± 0.15 V  | 2.1                    | 4.9 | 7.8  | 1.6                             | 8.7  | 1.6                              | 9.2  |      |
|                 |                     |           | 2.5 V ± 0.2 V   | 1.7                    | 4.1 | 5.8  | 1.2                             | 6.5  | 1.2                              | 6.9  |      |
|                 |                     |           | 3.3 V ± 0.3 V   | 1.5                    | 3.8 | 5.1  | 1                               | 5.5  | 1                                | 5.7  |      |

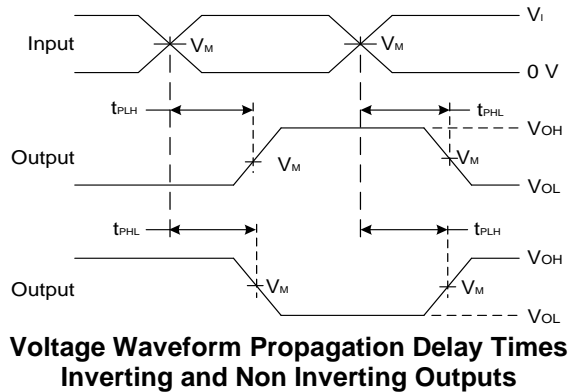
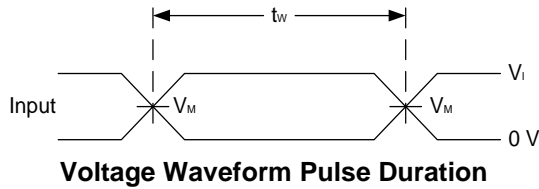
 $C_L=30\text{pF}$ , See Figure 1

| 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,<br>B,<br>or<br>C | Y         | 0.8 V           | -                      | 46   | -    | -                               | -    | -                                | -    | ns   |
|                 |                     |           | 1.2 V ± 0.1 V   | 4.6                    | 11.9 | 23.8 | 3.9                             | 24.9 | 3.9                              | 25.4 |      |
|                 |                     |           | 1.5 V ± 0.1 V   | 3.6                    | 7.4  | 12.2 | 3.4                             | 13.3 | 3.4                              | 14.1 |      |
|                 |                     |           | 1.8 V ± 0.15 V  | 3.1                    | 6.2  | 9.9  | 2.6                             | 11.1 | 2.6                              | 11.8 |      |
|                 |                     |           | 2.5 V ± 0.2 V   | 2.6                    | 5.2  | 7.4  | 2.1                             | 8.3  | 2.1                              | 8.8  |      |
|                 |                     |           | 3.3 V ± 0.3 V   | 2.3                    | 4.9  | 6.6  | 1.8                             | 7    | 1                                | 7.4  |      |

**Parameter Measurement Information**



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

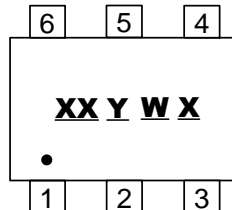


**Figure 1. Load Circuit and Voltage Waveforms**

- Notes:
- A. Includes test lead and test apparatus capacitance.
  - B. All pulses are supplied at pulse repetition rate  $\leq 10$  MHz.
  - C. Inputs are measured separately one transition per measurement.
  - D.  $t_{PLH}$  and  $t_{PHL}$  are the same as  $t_{PD}$ .

**Marking Information**

(1) SOT26, SOT363

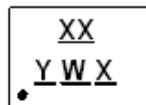


XX : Identification code  
Y : Year 0~9  
W : Week : A~Z : 1~26 week;  
a~z : 27~52 week; z represents  
52 and 53 week  
X : A~Z : Internal Code

| Part Number | Package | Identification Code |
|-------------|---------|---------------------|
| 74AUP1G57W6 | SOT26   | AP                  |
| 74AUP1G57DW | SOT363  | BV                  |

(2) X2-DFN0910-6, X2-DFN1010-6, X2-DFN1410-6

(Top View)

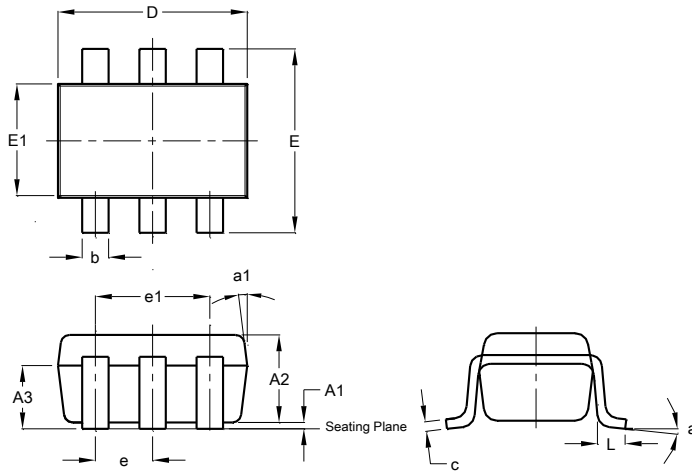


XX : Identification Code  
Y : Year : 0~9  
W : Week : A~Z : 1~26 week;  
a~z : 27~52 week; z represents  
52 and 53 week  
X : A~Z : Internal code

| Part Number  | Package      | Identification Code |
|--------------|--------------|---------------------|
| 74AUP1G57FW3 | X2-DFN0910-6 | AP                  |
| 74AUP1G57FW4 | X2-DFN1010-6 | BV                  |
| 74AUP1G57FZ4 | X2-DFN1410-6 | NG                  |

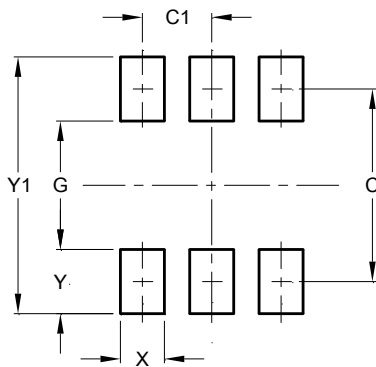
**SOT26 Package Outline Dimensions and Suggested Pad Layout**

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



| SOT26 |       |      |      |
|-------|-------|------|------|
| Dim   | Min   | Max  | Typ  |
| A1    | 0.013 | 0.10 | 0.05 |
| A2    | 1.00  | 1.30 | 1.10 |
| A3    | 0.70  | 0.80 | 0.75 |
| b     | 0.35  | 0.50 | 0.38 |
| c     | 0.10  | 0.20 | 0.15 |
| D     | 2.90  | 3.10 | 3.00 |
| e     | -     | -    | 0.95 |
| e1    | -     | -    | 1.90 |
| E     | 2.70  | 3.00 | 2.80 |
| E1    | 1.50  | 1.70 | 1.60 |
| L     | 0.35  | 0.55 | 0.40 |
| a     | -     | -    | 8°   |
| a1    | -     | -    | 7°   |

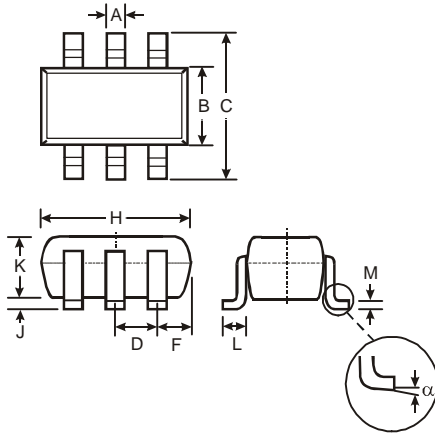
All Dimensions in mm



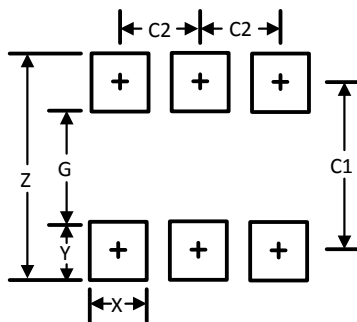
| Dimensions | Value (in mm) |
|------------|---------------|
| C          | 2.40          |
| C1         | 0.95          |
| G          | 1.60          |
| X          | 0.55          |
| Y          | 0.80          |
| Y1         | 3.20          |

**SOT363 Package Outline Dimensions and Suggested Pad Layout**

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



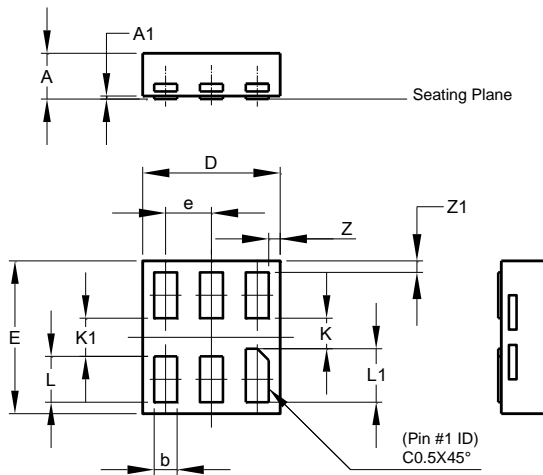
| SOT363               |          |      |       |
|----------------------|----------|------|-------|
| Dim                  | Min      | Max  | Typ   |
| A                    | 0.10     | 0.30 | 0.25  |
| B                    | 1.15     | 1.35 | 1.30  |
| C                    | 2.00     | 2.20 | 2.10  |
| 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 |          |      |       |



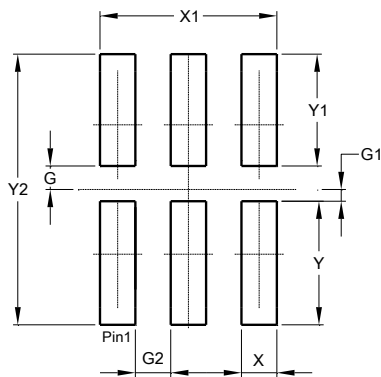
| Dimensions | Value (in mm) |
|------------|---------------|
| Z          | 2.5           |
| G          | 1.3           |
| X          | 0.42          |
| Y          | 0.6           |
| C1         | 1.9           |
| C2         | 0.65          |

**X2-DFN0910-6 Package Outline Dimensions and Suggested Pad Layout**

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



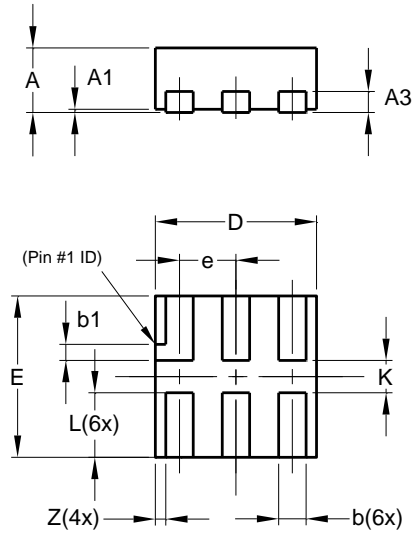
| X2-DFN0910-6         |      |      |       |
|----------------------|------|------|-------|
| Dim                  | Min  | Max  | Typ   |
| A                    | -    | 0.35 | 0.30  |
| A1                   | 0    | 0.03 | 0.02  |
| b                    | 0.10 | 0.20 | 0.15  |
| D                    | 0.85 | 0.95 | 0.90  |
| E                    | 0.95 | 1.05 | 1.00  |
| e                    | -    | -    | 0.30  |
| K                    | 0.20 | -    | -     |
| K1                   | 0.25 | -    | -     |
| L                    | 0.25 | 0.35 | 0.30  |
| L1                   | 0.30 | 0.40 | 0.35  |
| Z                    | -    | -    | 0.075 |
| Z1                   | -    | -    | 0.075 |
| All Dimensions in mm |      |      |       |



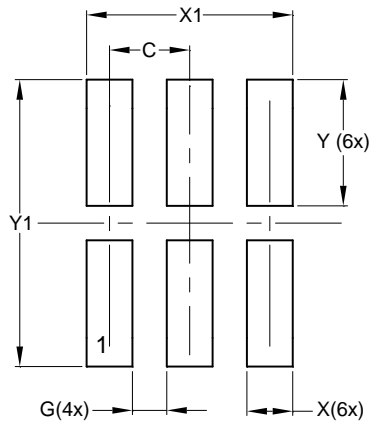
| Dimensions | Value (in mm) |
|------------|---------------|
| G          | 0.100         |
| G1         | 0.050         |
| G2         | 0.150         |
| X          | 0.150         |
| X1         | 0.750         |
| Y          | 0.525         |
| Y1         | 0.475         |
| Y2         | 1.150         |

**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.



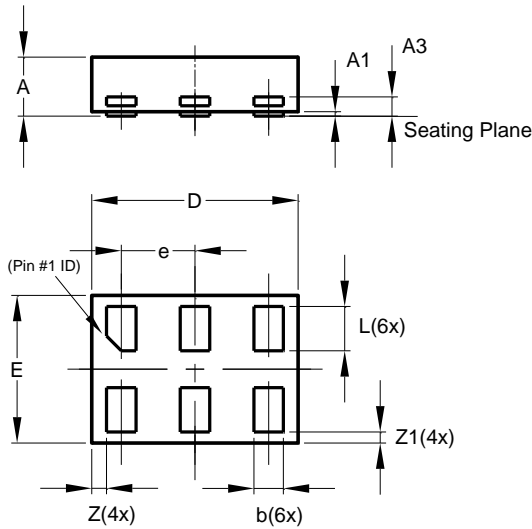
| X2-DFN1010-6         |      |      |       |
|----------------------|------|------|-------|
| Dim                  | Min  | Max  | Typ   |
| A                    | —    | 0.40 | 0.39  |
| A1                   | 0.00 | 0.05 | 0.02  |
| A3                   | —    | —    | 0.13  |
| b               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



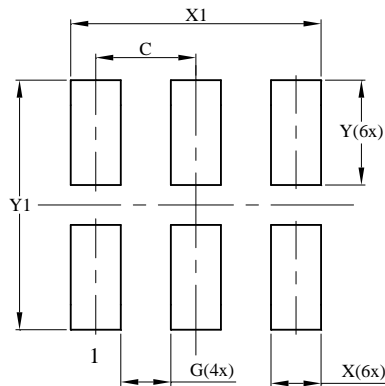
| Dimensions | Value (in mm) |
|------------|---------------|
| C          | 0.350         |
| G          | 0.150         |
| X          | 0.200         |
| X1         | 0.900         |
| Y          | 0.550         |
| Y1         | 1.250         |

**X2-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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