

## Description

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

The 74AUP1G125 is a single non-inverting buffer/bus driver designed for operation over a power supply range of 0.8V to 3.6V. The device has a 3-state output that enters a high impedance state when a HIGH-level is applied to the output enable ( $\overline{OE}$ ) pin. The device is fully specified for partial power down applications using  $I_{OFF}$ . The  $I_{OFF}$  circuitry disables the output preventing damaging current backflow when the device is powered down.

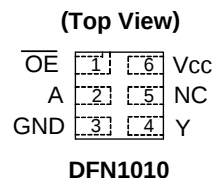
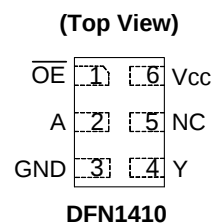
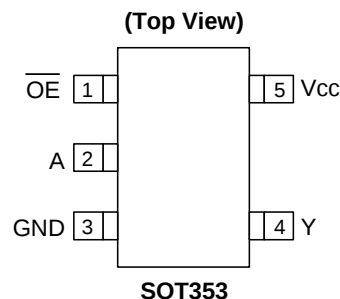
## Features

- 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
  - $I_{CC} < 0.9\mu\text{A}$
- Low Dynamic Power Consumption
  - $C_{PD} = 6.3\text{pF}$  (Typical at 3.6V)
- Schmitt Trigger Action at All Inputs Make the Circuit Tolerant for Slower Input Rise and Fall Time. The hysteresis is typically 250mV at  $V_{CC} = 3.0\text{V}$
- $I_{OFF}$  Supports Partial-Power-Down Mode Operation
- ESD Protection Exceeds JESD 22
  - 2000-V Human Body Model (A114-A)
  - Exceeds 1000-V Charged Device Model (C101C)
- Latch-Up Exceeds 100mA per JESD 78, Class II
- Range of Package Options SOT353, DFN1410, and DFN1010
- Leadless packages per JESD30E
  - DFN1010 denoted as X2-DFN1010-6
  - DFN1014 denoted as X2-DFN1014-6
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

Notes:

1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
2. See <http://www.diodes.com> for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.

## Pin Assignments



## Applications

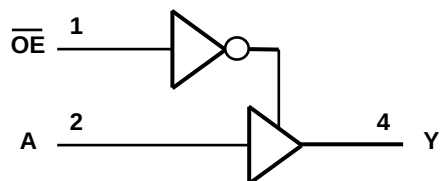
- Suited for battery and low power needs
- Wide array of products such as:
  - Tablets, E-readers
  - Cell Phones, Personal Navigation / GPS
  - MP3 players, Cameras, Video Recorders
  - PCs ultrabooks, notebooks, netbooks,
  - Computer peripherals, hard drives, CD/DVD ROM
  - TV, DVD, DVR, set top box

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

## Pin Descriptions

| Pin Name               | Function       |
|------------------------|----------------|
| $\overline{\text{OE}}$ | Output Enable  |
| A                      | Data Input     |
| GND                    | Ground         |
| Y                      | Data Output    |
| V <sub>CC</sub>        | Supply Voltage |

## Logic Diagram



## Function Table

| Inputs                 |   | Output |
|------------------------|---|--------|
| $\overline{\text{OE}}$ | A | Y      |
| L                      | H | H      |
| L                      | L | L      |
| H                      | X | Z      |

## Absolute Maximum Ratings (Note 4) (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Symbol           | Parameter                                                          | Rating                       | Unit |
|------------------|--------------------------------------------------------------------|------------------------------|------|
| ESD HBM          | Human Body Model ESD Protection                                    | 2                            | KV   |
| ESD CDM          | Charged Device Model ESD Protection                                | 1                            | KV   |
| V <sub>CC</sub>  | Supply Voltage Range                                               | -0.5 to +4.6                 | V    |
| V <sub>I</sub>   | Input Voltage Range                                                | -0.5 to +4.6                 | V    |
| V <sub>O</sub>   | Voltage applied to output in high or low state                     | -0.5 to V <sub>CC</sub> +0.5 | V    |
| I <sub>IK</sub>  | Input Clamp Current V <sub>I</sub> < 0                             | 50                           | mA   |
| I <sub>OK</sub>  | Output Clamp Current (V <sub>O</sub> < 0)                          | 50                           | mA   |
| I <sub>O</sub>   | Continuous Output Current (V <sub>O</sub> = 0 to V <sub>CC</sub> ) | ±20                          | mA   |
| I <sub>CC</sub>  | Continuous Current Through V <sub>CC</sub>                         | 50                           | mA   |
| I <sub>GND</sub> | Continuous Current Through GND                                     | -50                          | mA   |
| T <sub>J</sub>   | Operating Junction Temperature                                     | -40 to +150                  | °C   |
| T <sub>STG</sub> | Storage Temperature                                                | -65 to +150                  | °C   |

Note: 4. Stresses beyond the absolute maximum may result in immediate failure or reduced reliability. These are stress values and device operation should be within recommend values.

## Recommended Operating Conditions (Note 5) (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Symbol          | Parameter                          | Min                            | Max             | Unit |
|-----------------|------------------------------------|--------------------------------|-----------------|------|
| V <sub>CC</sub> | Operating Voltage                  | 0.8                            | 3.6             | V    |
| V <sub>I</sub>  | Input Voltage                      | 0                              | 3.6             | V    |
| V <sub>O</sub>  | Output Voltage                     | 0                              | V <sub>CC</sub> | V    |
| I <sub>OH</sub> | High-Level Output Current          | V <sub>CC</sub> = 0.8V         | -20             | μA   |
|                 |                                    | V <sub>CC</sub> = 1.1V         | -1.1            | mA   |
|                 |                                    | V <sub>CC</sub> = 1.4V         | -1.7            |      |
|                 |                                    | V <sub>CC</sub> = 1.65V        | -1.9            |      |
|                 |                                    | V <sub>CC</sub> = 2.3V         | -3.1            |      |
|                 |                                    | V <sub>CC</sub> = 3.0V         | -4              |      |
| I <sub>OL</sub> | Low-Level Output Current           | V <sub>CC</sub> = 0.8V         | 20              | μA   |
|                 |                                    | V <sub>CC</sub> = 1.1V         | 1.1             | mA   |
|                 |                                    | V <sub>CC</sub> = 1.4V         | 1.7             |      |
|                 |                                    | V <sub>CC</sub> = 1.65V        | 1.9             |      |
|                 |                                    | V <sub>CC</sub> = 2.3V         | 3.1             |      |
|                 |                                    | V <sub>CC</sub> = 3.0V         | 4               |      |
| Δt/ΔV           | Input Transition Rise or Fall Rate | V <sub>CC</sub> = 0.8V to 3.6V | 200             | ns/V |
| T <sub>A</sub>  | Operating Free-Air Temperature     | -40                            | +125            | °C   |

Note: 5. Unused inputs should be held at V<sub>CC</sub> or Ground.

# Electrical Characteristics (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Symbol            | Parameter                        | Test Conditions                                                                                | V <sub>CC</sub> | T <sub>A</sub> = +25°C |                        | T <sub>A</sub> = -40°C to +85°C |                        | Unit |
|-------------------|----------------------------------|------------------------------------------------------------------------------------------------|-----------------|------------------------|------------------------|---------------------------------|------------------------|------|
|                   |                                  |                                                                                                |                 | Min                    | Max                    | Min                             | Max                    |      |
| V <sub>IH</sub>   | High-Level Input Voltage         |                                                                                                | 0.8V to 1.65V   | 0.80 X V <sub>CC</sub> |                        | 0.80 X V <sub>CC</sub>          |                        | V    |
|                   |                                  |                                                                                                | 1.65V to 1.95V  | 0.65 X V <sub>CC</sub> |                        | 0.65 X V <sub>CC</sub>          |                        |      |
|                   |                                  |                                                                                                | 2.3V to 2.7V    | 1.6                    |                        | 1.6                             |                        |      |
|                   |                                  |                                                                                                | 3.0V to 3.6V    | 2.0                    |                        | 2.0                             |                        |      |
| V <sub>IL</sub>   | Low-Level Input Voltage          |                                                                                                | 0.8V to 1.65V   |                        | 0.30 X V <sub>CC</sub> |                                 | 0.30 X V <sub>CC</sub> | V    |
|                   |                                  |                                                                                                | 1.65V to 1.95V  |                        | 0.35 X V <sub>CC</sub> |                                 | 0.35 X V <sub>CC</sub> |      |
|                   |                                  |                                                                                                | 2.3V to 2.7V    |                        | 0.7                    |                                 | 0.7                    |      |
|                   |                                  |                                                                                                | 3.0V to 3.6V    |                        | 0.9                    |                                 | 0.9                    |      |
| V <sub>OH</sub>   | High-Level Output Voltage        | I <sub>OH</sub> = -20μA                                                                        | 0.8V to 3.6V    | V <sub>CC</sub> - 0.1  |                        | V <sub>CC</sub> - 0.1           |                        | V    |
|                   |                                  | I <sub>OH</sub> = -1.1mA                                                                       | 1.1V            | 0.75 X V <sub>CC</sub> |                        | 0.7 X V <sub>CC</sub>           |                        |      |
|                   |                                  | I <sub>OH</sub> = -1.7mA                                                                       | 1.4V            | 1.11                   |                        | 1.03                            |                        |      |
|                   |                                  | I <sub>OH</sub> = -1.9mA                                                                       | 1.65V           | 1.32                   |                        | 1.3                             |                        |      |
|                   |                                  | I <sub>OH</sub> = -2.3mA                                                                       | 2.3V            | 2.05                   |                        | 1.97                            |                        |      |
|                   |                                  | I <sub>OH</sub> = -3.1mA                                                                       |                 | 1.9                    |                        | 1.85                            |                        |      |
|                   |                                  | I <sub>OH</sub> = -2.7mA                                                                       | 3V              | 2.72                   |                        | 2.67                            |                        |      |
|                   |                                  | I <sub>OH</sub> = -4mA                                                                         |                 | 2.6                    |                        | 2.55                            |                        |      |
| V <sub>OL</sub>   | High-Level Input Voltage         | I <sub>OL</sub> = 20μA                                                                         | 0.8V to 3.6V    |                        | 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> = 3.1 mA                                                                       |                 |                        | 0.44                   |                                 | 0.45                   |      |
|                   |                                  | I <sub>OL</sub> = 2.7 mA                                                                       | 3V              |                        | 0.31                   |                                 | 0.33                   |      |
|                   |                                  | I <sub>OL</sub> = 4 mA                                                                         |                 |                        | 0.44                   |                                 | 0.45                   |      |
| I <sub>I</sub>    | Input Current                    | A or B Input<br>V <sub>I</sub> = GND to 3.6V                                                   | 0 to 3.6V       |                        | ±0.1                   |                                 | ±0.5                   | μA   |
| I <sub>OFF</sub>  | Power Down Leakage Current       | V <sub>I</sub> or V <sub>O</sub> = 0V to 3.6V                                                  | 0               |                        | ±0.2                   |                                 | ±0.5                   | μA   |
| I <sub>OZ</sub>   | Z State Leakage Current          | V <sub>O</sub> = 3.6V<br>V <sub>I</sub> = 3.6V                                                 | 3.6V            |                        | ±0.2                   |                                 | ±0.5                   | μA   |
| ΔI <sub>OFF</sub> | Delta Power Down Leakage Current | V <sub>I</sub> or V <sub>O</sub> = 0V to 3.6V                                                  | 0 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        | Data input at V <sub>CC</sub> -0.6V<br>OE= GND I <sub>O</sub> =0 A                             | 3.3V            |                        | 40                     |                                 | 50                     | μA   |
|                   |                                  | OE input at V <sub>CC</sub> -0.6V<br>Data Input = GND or V <sub>CC</sub> , I <sub>O</sub> =0 A | 3.3V            |                        | 110                    |                                 | 120                    | μA   |
|                   |                                  | OE input at V <sub>CC</sub><br>Data Input = GND to 3.6V<br>I <sub>O</sub> = 0A                 | 0.8V to 3.6V    |                        | 1                      |                                 | 1                      | μA   |

# Electrical Characteristics (cont.) (@T<sub>A</sub> = +25°C, unless otherwise specified.)

| Symbol            | Parameter                        | Test Conditions                                                                                 | V <sub>CC</sub> | T <sub>A</sub> = -40°C to +125°C |                        | Unit |
|-------------------|----------------------------------|-------------------------------------------------------------------------------------------------|-----------------|----------------------------------|------------------------|------|
|                   |                                  |                                                                                                 |                 | Min                              | Max                    |      |
| V <sub>IH</sub>   | High-Level Input Voltage         |                                                                                                 | 0.8V to 1.65V   | 0.80 X V <sub>CC</sub>           |                        | V    |
|                   |                                  |                                                                                                 | 1.65V to 1.95V  | 0.70 X V <sub>CC</sub>           |                        |      |
|                   |                                  |                                                                                                 | 2.3V to 2.7V    | 1.6                              |                        |      |
|                   |                                  |                                                                                                 | 3.0V to 3.6V    | 2.0                              |                        |      |
| V <sub>IL</sub>   | Low-Level Input Voltage          |                                                                                                 | 0.8V to 1.65V   |                                  | 0.25X V <sub>CC</sub>  | V    |
|                   |                                  |                                                                                                 | 1.65V to 1.95V  |                                  | 0.35 X V <sub>CC</sub> |      |
|                   |                                  |                                                                                                 | 2.3V to 2.7V    |                                  | 0.7                    |      |
|                   |                                  |                                                                                                 | 3.0V to 3.6V    |                                  | 0.9                    |      |
| V <sub>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>   | High-Level Input Voltage         | I <sub>OL</sub> = 20μA                                                                          | 0.8V to 3.6V    |                                  | 0.11                   | V    |
|                   |                                  | I <sub>OL</sub> = 1.1mA                                                                         | 1.1V            |                                  | 0.3 X V <sub>CC</sub>  |      |
|                   |                                  | I <sub>OL</sub> = 1.7mA                                                                         | 1.4V            |                                  | 0.41                   |      |
|                   |                                  | I <sub>OL</sub> = 1.9mA                                                                         | 1.65V           |                                  | 0.39                   |      |
|                   |                                  | I <sub>OL</sub> = 2.3mA                                                                         | 2.3V            |                                  | 0.36                   |      |
|                   |                                  | I <sub>OL</sub> = 3.1mA                                                                         |                 |                                  | 0.50                   |      |
|                   |                                  | I <sub>OL</sub> = 2.7mA                                                                         | 3V              |                                  | 0.36                   |      |
|                   |                                  | I <sub>OL</sub> = 4mA                                                                           |                 |                                  | 0.50                   |      |
| I <sub>I</sub>    | Input Current                    | A or B Input<br>V <sub>I</sub> = GND to 3.6V                                                    | 0 to 3.6V       |                                  | ±0.75                  | μA   |
| I <sub>OFF</sub>  | Power Down Leakage Current       | V <sub>I</sub> or V <sub>O</sub> = 0V to 3.6V                                                   | 0               |                                  | ±3.5                   | μA   |
| I <sub>OZ</sub>   | Z State Leakage Current          | V <sub>O</sub> = 3.6V<br>V <sub>I</sub> = 3.6V                                                  | 3.6V            |                                  | ±1.5                   | μA   |
| ΔI <sub>OFF</sub> | Delta Power Down Leakage Current | V <sub>I</sub> or V <sub>O</sub> = 0 to 3.6V                                                    | 0 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        | Data input at V <sub>CC</sub> -0.6V<br>OE = GND I <sub>O</sub> = 0A                             | 3.3V            |                                  | 75                     | μA   |
|                   |                                  | OE input at V <sub>CC</sub> -0.6V<br>Data Input = GND or V <sub>CC</sub><br>I <sub>O</sub> = 0A | 3.3V            |                                  | 180                    | μA   |
|                   |                                  | OE input at V <sub>CC</sub><br>Data Input = GND to 3.6V<br>I <sub>O</sub> = 0 A                 | 0.8V to 3.6V    |                                  | 1                      | μA   |

## Switching Characteristics

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

| Parameter | From Input             | TO OUTPUT | $V_{CC}$                       | $T_A = +25^\circ\text{C}$ |      |      | $T_A = -40^\circ\text{C to } +85^\circ\text{C}$ |      | $T_A = -40^\circ\text{C to } +125^\circ\text{C}$ |      | Unit |
|-----------|------------------------|-----------|--------------------------------|---------------------------|------|------|-------------------------------------------------|------|--------------------------------------------------|------|------|
|           |                        |           |                                | Min                       | Typ  | Max  | Min                                             | Max  | Min                                              | Max  |      |
| $t_{pd}$  | A                      | Y         | 0.8V                           |                           | 20.6 |      |                                                 |      |                                                  |      | ns   |
|           |                        |           | $1.2\text{V} \pm 0.1\text{V}$  | 2.8                       | 5.5  | 10.5 | 2.5                                             | 11.7 | 2.5                                              | 12.9 |      |
|           |                        |           | $1.5\text{V} \pm 0.1\text{V}$  | 2.0                       | 3.9  | 6.1  | 1.9                                             | 7.3  | 1.9                                              | 8.1  |      |
|           |                        |           | $1.8\text{V} \pm 0.15\text{V}$ | 1.9                       | 3.2  | 4.8  | 1.7                                             | 6.1  | 1.7                                              | 6.7  |      |
|           |                        |           | $2.5\text{V} \pm 0.2\text{V}$  | 1.6                       | 2.6  | 3.6  | 1.4                                             | 4.3  | 1.4                                              | 4.9  |      |
|           |                        |           | $3.3\text{V} \pm 0.3\text{V}$  | 1.2                       | 2.4  | 3.1  | 1.2                                             | 3.9  | 1.2                                              | 4.4  |      |
| $t_{en}$  | $\overline{\text{OE}}$ | Y         | 0.8V                           |                           | 69.9 |      |                                                 |      |                                                  |      | ns   |
|           |                        |           | $1.2\text{V} \pm 0.1\text{V}$  | 3.1                       | 6.1  | 11.8 | 2.9                                             | 13.9 | 2.9                                              | 15.4 |      |
|           |                        |           | $1.5\text{V} \pm 0.1\text{V}$  | 2.3                       | 4.2  | 6.6  | 2.2                                             | 7.7  | 2.2                                              | 8.3  |      |
|           |                        |           | $1.8\text{V} \pm 0.15\text{V}$ | 2.0                       | 3.4  | 5.1  | 1.9                                             | 6.2  | 1.9                                              | 6.8  |      |
|           |                        |           | $2.5\text{V} \pm 0.2\text{V}$  | 1.8                       | 2.6  | 3.7  | 1.7                                             | 4.5  | 1.7                                              | 5.0  |      |
|           |                        |           | $3.3\text{V} \pm 0.3\text{V}$  | 1.7                       | 2.4  | 3.1  | 1.7                                             | 3.5  | 1.7                                              | 3.9  |      |
| $t_{dis}$ | $\overline{\text{OE}}$ | Y         | 0.8V                           |                           | 14.3 |      |                                                 |      |                                                  |      | ns   |
|           |                        |           | $1.2\text{V} \pm 0.1\text{V}$  | 2.7                       | 4.3  | 6.5  | 2.7                                             | 7.3  | 2.7                                              | 8.2  |      |
|           |                        |           | $1.5\text{V} \pm 0.1\text{V}$  | 2.1                       | 3.2  | 5.1  | 2.1                                             | 5.7  | 2.1                                              | 5.7  |      |
|           |                        |           | $1.8\text{V} \pm 0.15\text{V}$ | 2.0                       | 3.0  | 4.9  | 2.0                                             | 5.4  | 2.0                                              | 5.7  |      |
|           |                        |           | $2.5\text{V} \pm 0.2\text{V}$  | 1.4                       | 2.7  | 3.9  | 1.4                                             | 4.0  | 1.4                                              | 4.1  |      |
|           |                        |           | $3.3\text{V} \pm 0.3\text{V}$  | 1.3                       | 2.5  | 3.2  | 1.3                                             | 3.4  | 1.3                                              | 3.9  |      |

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

| Parameter | From Input             | TO OUTPUT | $V_{CC}$                       | $T_A = +25^\circ\text{C}$ |      |      | $T_A = -40^\circ\text{C to } +85^\circ\text{C}$ |      | $T_A = -40^\circ\text{C to } +125^\circ\text{C}$ |      | Unit |
|-----------|------------------------|-----------|--------------------------------|---------------------------|------|------|-------------------------------------------------|------|--------------------------------------------------|------|------|
|           |                        |           |                                | Min                       | Typ  | Max  | Min                                             | Max  | Min                                              | Max  |      |
| $t_{pd}$  | A                      | Y         | 0.8V                           |                           | 24.0 |      |                                                 |      |                                                  |      | ns   |
|           |                        |           | $1.2\text{V} \pm 0.1\text{V}$  | 3.2                       | 6.4  | 12.3 | 3.0                                             | 13.8 | 3.0                                              | 15.2 |      |
|           |                        |           | $1.5\text{V} \pm 0.1\text{V}$  | 2.1                       | 4.5  | 7.3  | 1.9                                             | 8.5  | 1.9                                              | 9.4  |      |
|           |                        |           | $1.8\text{V} \pm 0.15\text{V}$ | 1.9                       | 3.8  | 5.5  | 1.7                                             | 6.8  | 1.7                                              | 7.6  |      |
|           |                        |           | $2.5\text{V} \pm 0.2\text{V}$  | 1.7                       | 3.2  | 4.2  | 1.6                                             | 5.3  | 1.6                                              | 5.9  |      |
|           |                        |           | $3.3\text{V} \pm 0.3\text{V}$  | 1.4                       | 3.0  | 3.8  | 1.4                                             | 4.6  | 1.4                                              | 5.2  |      |
| $t_{en}$  | $\overline{\text{OE}}$ | Y         | 0.8V                           |                           | 73.7 |      |                                                 |      |                                                  |      | ns   |
|           |                        |           | $1.2\text{V} \pm 0.1\text{V}$  | 3.6                       | 6.9  | 13.5 | 3.4                                             | 15.8 | 3.4                                              | 17.5 |      |
|           |                        |           | $1.5\text{V} \pm 0.1\text{V}$  | 2.3                       | 4.8  | 7.7  | 2.2                                             | 8.6  | 2.2                                              | 9.4  |      |
|           |                        |           | $1.8\text{V} \pm 0.15\text{V}$ | 2.0                       | 3.9  | 5.8  | 1.9                                             | 6.8  | 1.9                                              | 7.4  |      |
|           |                        |           | $2.5\text{V} \pm 0.2\text{V}$  | 1.8                       | 3.2  | 4.3  | 1.7                                             | 5.3  | 1.7                                              | 5.9  |      |
|           |                        |           | $3.3\text{V} \pm 0.3\text{V}$  | 1.7                       | 3.0  | 3.9  | 1.7                                             | 4.3  | 1.7                                              | 4.8  |      |
| $t_{dis}$ | $\overline{\text{OE}}$ | Y         | 0.8V                           |                           | 32.7 |      |                                                 |      |                                                  |      | ns   |
|           |                        |           | $1.2\text{V} \pm 0.1\text{V}$  | 3.4                       | 5.4  | 7.9  | 3.4                                             | 8.8  | 3.4                                              | 9.9  |      |
|           |                        |           | $1.5\text{V} \pm 0.1\text{V}$  | 2.2                       | 4.1  | 5.5  | 2.2                                             | 6.2  | 2.2                                              | 7.1  |      |
|           |                        |           | $1.8\text{V} \pm 0.15\text{V}$ | 2.2                       | 4.2  | 5.6  | 1.9                                             | 6.3  | 1.9                                              | 7.1  |      |
|           |                        |           | $2.5\text{V} \pm 0.2\text{V}$  | 1.7                       | 3.0  | 5.2  | 1.7                                             | 5.5  | 1.7                                              | 6.1  |      |
|           |                        |           | $3.3\text{V} \pm 0.3\text{V}$  | 1.9                       | 3.8  | 4.8  | 1.7                                             | 5.0  | 1.7                                              | 5.6  |      |

# Switching Characteristics (cont.)

C<sub>L</sub>=15pF 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          | Y         | 0.8V            |                        | 27.4 |      |                                 |      |                                  |      | ns   |
|                  |            |           | 1.2V ± 0.1V     | 3.6                    | 7.2  | 14.1 | 3.3                             | 15.8 | 3.3                              | 17.5 |      |
|                  |            |           | 1.5V ± 0.1V     | 3.0                    | 5.1  | 8.1  | 2.5                             | 9.8  | 2.5                              | 10.9 |      |
|                  |            |           | 1.8V ± 0.15V    | 2.2                    | 4.3  | 6.3  | 2.0                             | 7.9  | 2.0                              | 8.8  |      |
|                  |            |           | 2.5V ± 0.2V     | 2.0                    | 3.7  | 4.9  | 1.8                             | 6.0  | 1.8                              | 6.7  |      |
|                  |            |           | 3.3V ± 0.3V     | 1.5                    | 3.5  | 4.4  | 1.5                             | 5.4  | 1.5                              | 6.1  |      |
| t <sub>en</sub>  | OE         | Y         | 0.8V            |                        | 77.5 |      |                                 |      |                                  |      | ns   |
|                  |            |           | 1.2V ± 0.1V     | 4.0                    | 7.7  | 15.2 | 3.7                             | 17.6 | 3.7                              | 19.6 |      |
|                  |            |           | 1.5V ± 0.1V     | 3.0                    | 5.3  | 8.4  | 2.5                             | 9.8  | 2.5                              | 10.7 |      |
|                  |            |           | 1.8V ± 0.15V    | 2.3                    | 4.4  | 6.5  | 2.1                             | 7.7  | 2.1                              | 8.5  |      |
|                  |            |           | 2.5V ± 0.2V     | 2.1                    | 3.6  | 5.0  | 2.0                             | 6.1  | 2.0                              | 6.8  |      |
|                  |            |           | 3.3V ± 0.3V     | 2.0                    | 3.5  | 4.5  | 1.9                             | 4.9  | 1.9                              | 5.5  |      |
| t <sub>dis</sub> | OE         | Y         | 0.8V            |                        | 60.8 |      |                                 |      |                                  |      | ns   |
|                  |            |           | 1.2V ± 0.1V     | 3.8                    | 6.5  | 12.3 | 3.7                             | 13.3 | 3.7                              | 13.3 |      |
|                  |            |           | 1.5V ± 0.1V     | 2.8                    | 5.8  | 10.1 | 2.5                             | 10.5 | 2.5                              | 10.5 |      |
|                  |            |           | 1.8V ± 0.15V    | 2.2                    | 5.3  | 9.0  | 2.1                             | 9.4  | 2.1                              | 9.9  |      |
|                  |            |           | 2.5V ± 0.2V     | 2.1                    | 5.1  | 7.9  | 2.0                             | 8.1  | 2.0                              | 8.4  |      |
|                  |            |           | 3.3V ± 0.3V     | 1.9                    | 5.0  | 7.0  | 1.9                             | 7.5  | 1.9                              | 7.5  |      |

C<sub>L</sub>=30pF see Figure 1

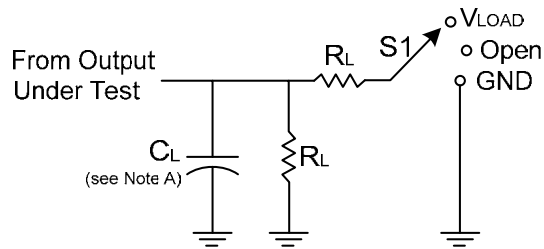
| Parameter        | From Input | TO OUTPUT | V <sub>CC</sub> | T <sub>A</sub> = +25°C |      |      | T <sub>A</sub> = -40°C to +85°C |      | T <sub>A</sub> = -40°C to +125°C |      | Unit |
|------------------|------------|-----------|-----------------|------------------------|------|------|---------------------------------|------|----------------------------------|------|------|
|                  |            |           |                 | Min                    | Typ  | Max  | Min                             | Max  | Min                              | Max  |      |
| t <sub>pd</sub>  | A          | Y         | 0.8V            |                        | 37.4 |      |                                 |      |                                  |      | ns   |
|                  |            |           | 1.2V ± 0.1V     | 4.8                    | 9.5  | 19.0 | 4.4                             | 21.6 | 4.4                              | 24.0 |      |
|                  |            |           | 1.5V ± 0.1V     | 4.0                    | 6.7  | 10.8 | 3.0                             | 13.0 | 3.0                              | 14.5 |      |
|                  |            |           | 1.8V ± 0.15V    | 2.4                    | 5.6  | 8.4  | 2.4                             | 10.3 | 2.4                              | 11.5 |      |
|                  |            |           | 2.5V ± 0.2V     | 2.1                    | 4.8  | 6.3  | 2.1                             | 7.8  | 2.1                              | 8.7  |      |
|                  |            |           | 3.3V ± 0.3V     | 2.0                    | 4.6  | 5.8  | 2.0                             | 7.5  | 2.0                              | 8.3  |      |
| t <sub>en</sub>  | OE         | Y         | 0.8V            |                        | 88.9 |      |                                 |      |                                  |      | ns   |
|                  |            |           | 1.2V ± 0.1V     | 5.2                    | 9.9  | 19.8 | 4.8                             | 22.8 | 4.8                              | 25.3 |      |
|                  |            |           | 1.5V ± 0.1V     | 4.0                    | 6.8  | 10.8 | 3.1                             | 12.6 | 3.1                              | 14.1 |      |
|                  |            |           | 1.8V ± 0.15V    | 3.0                    | 5.6  | 8.5  | 2.8                             | 10.2 | 2.8                              | 11.3 |      |
|                  |            |           | 2.5V ± 0.2V     | 2.2                    | 4.8  | 6.5  | 2.2                             | 8.1  | 2.2                              | 8.8  |      |
|                  |            |           | 3.3V ± 0.3V     | 2.1                    | 4.6  | 6.0  | 2.1                             | 7.5  | 2.1                              | 7.7  |      |
| t <sub>dis</sub> | OE         | Y         | 0.8V            |                        | 49.9 |      |                                 |      |                                  |      | ns   |
|                  |            |           | 1.2V ± 0.1V     | 6.0                    | 9.9  | 13.3 | 4.8                             | 16.5 | 4.8                              | 16.5 |      |
|                  |            |           | 1.5V ± 0.1V     | 2.8                    | 9.0  | 12.0 | 3.1                             | 13.2 | 3.1                              | 14.2 |      |
|                  |            |           | 1.8V ± 0.15V    | 2.6                    | 8.8  | 11.1 | 2.8                             | 12.4 | 2.8                              | 13.8 |      |
|                  |            |           | 2.5V ± 0.2V     | 2.6                    | 8.7  | 10.9 | 2.6                             | 11.6 | 2.6                              | 13.5 |      |
|                  |            |           | 3.3V ± 0.3V     | 2.5                    | 8.6  | 10.5 | 2.5                             | 10.8 | 2.5                              | 13.1 |      |

## 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            | 6.9 | pF   |
|                 |                                        |                                         |          | 1.2V ± 0.1V     | 6.7 |      |
|                 |                                        |                                         |          | 1.5V ± 0.1V     | 6.6 |      |
|                 |                                        |                                         |          | 1.8V ± 0.15V    | 6.5 |      |
|                 |                                        |                                         |          | 2.5V ± 0.2V     | 6.4 |      |
|                 |                                        |                                         |          | 3.3V ± 0.3V     | 6.3 |      |
| C <sub>i</sub>  | Input Capacitance                      | V <sub>i</sub> = V <sub>CC</sub> or GND |          | 0 or 3.3V       | 1.5 | pF   |
| θ <sub>JA</sub> | Thermal Resistance Junction-to-Ambient | SOT353                                  | (Note 6) |                 | 371 | °C/W |
|                 |                                        | X2-DFN1410-6                            |          |                 | 430 |      |
|                 |                                        | X2-DFN1010-6                            |          |                 | 445 |      |
| θ <sub>JC</sub> | Thermal Resistance Junction-to-Case    | SOT353                                  | (Note 6) |                 | 143 | °C/W |
|                 |                                        | X2-DFN1410-6                            |          |                 | 190 |      |
|                 |                                        | X2-DFN1010-6                            |          |                 | 250 |      |

Note: 6. Test condition for SOT353, DFN1410, and DFN1010 devices mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.

## Parameter Measurement Information



| TEST              | S1         | $R_L$       |
|-------------------|------------|-------------|
| $t_{PLH}/t_{PHL}$ | Open       | 1M $\Omega$ |
| $t_{PLZ}/t_{PZL}$ | $V_{LOAD}$ | 5K $\Omega$ |
| $t_{PHZ}/t_{PZH}$ | GND        | 5K $\Omega$ |

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

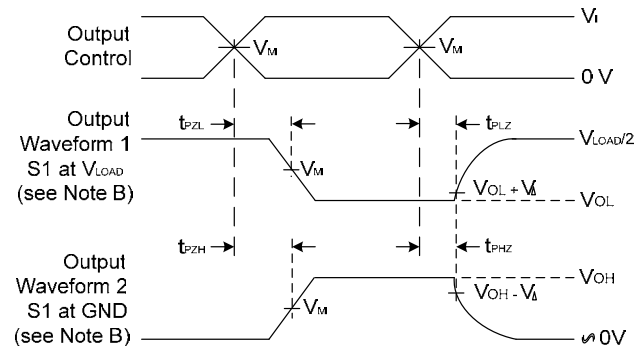
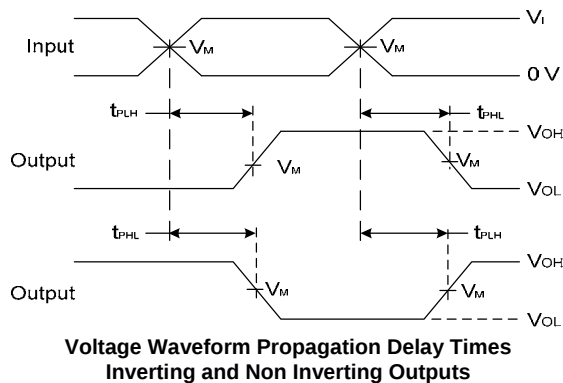
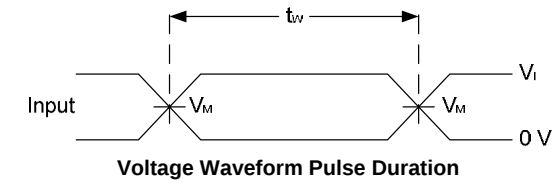
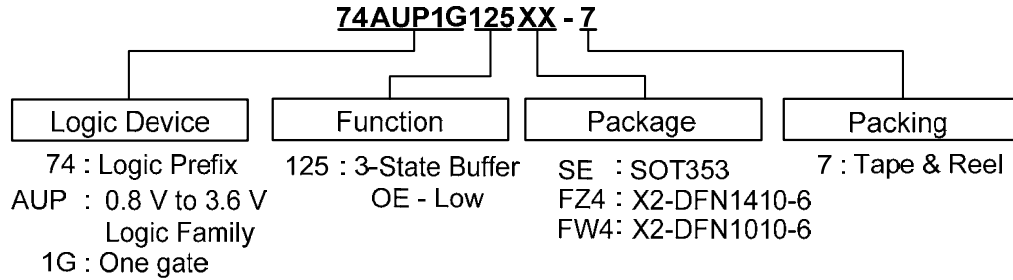


Figure 1. Load Circuit and Voltage Waveforms

- 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.  $t_{PLZ}$  and  $t_{PHZ}$  are the same as  $t_{dis}$ .
  - E.  $t_{PZL}$  and  $t_{PZH}$  are the same as  $t_{EN}$ .
  - F.  $t_{PLH}$  and  $t_{PHL}$  are the same as  $t_{PD}$ .

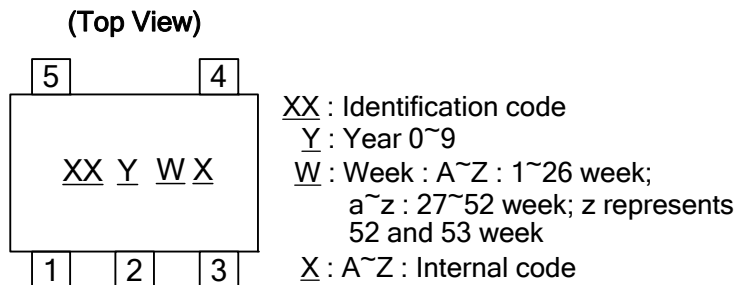
## Ordering Information



| Part Number     | Package Code | Packaging    | 7" Tape and Reel |                    |
|-----------------|--------------|--------------|------------------|--------------------|
|                 |              |              | Quantity         | Part Number Suffix |
| 74AUP1G125SE-7  | SE           | SOT353       | 3000/Tape & Reel | -7                 |
| 74AUP1G125FZ4-7 | FZ4          | X2-DFN1410-6 | 5000/Tape & Reel | -7                 |
| 74AUP1G125FW4-7 | FW4          | X2-DFN1010-6 | 5000/Tape & Reel | -7                 |

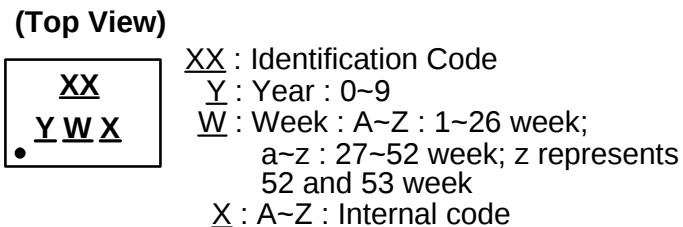
## Marking Information

### (1) SOT353



| Part Number  | Package | Identification Code |
|--------------|---------|---------------------|
| 74AUP1G125SE | SOT353  | XY                  |

### (2) X2-DFN1410-6 and X2-DFN1010-6

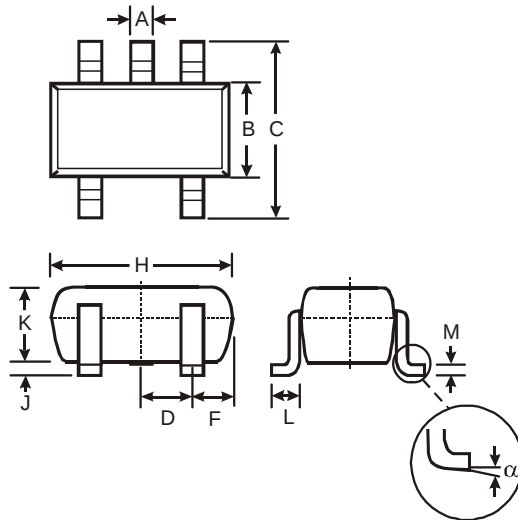


| Part Number   | Package      | Identification Code |
|---------------|--------------|---------------------|
| 74AUP1G125FZ4 | X2-DFN1410-6 | XY                  |
| 74AUP1G125FW4 | X2-DFN1010-6 | XY                  |

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

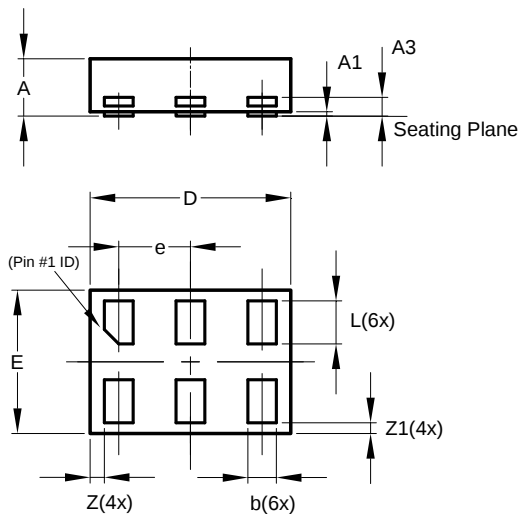
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.

### (1) SOT353



| SOT353               |          |      |       |
|----------------------|----------|------|-------|
| Dim                  | Min      | Max  | Typ   |
| A                    | 0.10     | 0.30 | 0.25  |
| B                    | 1.15     | 1.35 | 1.30  |
| C                    | 2.00     | 2.20 | 2.10  |
| D                    | 0.65 Typ |      |       |
| F                    | 0.40     | 0.45 | 0.425 |
| H                    | 1.80     | 2.20 | 2.15  |
| J                    | 0        | 0.10 | 0.05  |
| K                    | 0.90     | 1.00 | 1.00  |
| L                    | 0.25     | 0.40 | 0.30  |
| M                    | 0.10     | 0.22 | 0.11  |
| $\alpha$             | 0°       | 8°   | -     |
| All Dimensions in mm |          |      |       |

### (2) X2-DFN1410-6

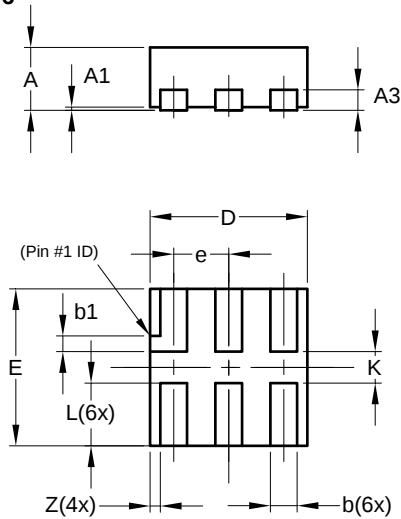


| X2-DFN1410-6         |       |       |       |
|----------------------|-------|-------|-------|
| Dim                  | Min   | Max   | Typ   |
| A                    | —     | 0.40  | 0.39  |
| A1                   | 0.00  | 0.05  | 0.02  |
| A3                   | —     | —     | 0.13  |
| b                    | 0.15  | 0.25  | 0.20  |
| D                    | 1.35  | 1.45  | 1.40  |
| E                    | 0.95  | 1.05  | 1.00  |
| e                    | —     | —     | 0.50  |
| L                    | 0.25  | 0.35  | 0.30  |
| Z                    | —     | —     | 0.10  |
| Z1                   | 0.045 | 0.105 | 0.075 |
| All Dimensions in mm |       |       |       |

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

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

### (3) X2-DFN1010-6

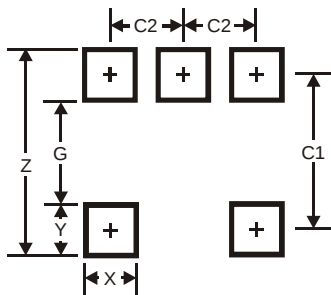


| X2-DFN1010-6         |      |      |       |
|----------------------|------|------|-------|
| Dim                  | Min  | Max  | Typ   |
| A                    | —    | 0.40 | 0.39  |
| A1                   | 0.00 | 0.05 | 0.02  |
| A3                   | —    | —    | 0.13  |
| b                    | 0.14 | 0.20 | 0.17  |
| b1                   | 0.05 | 0.15 | 0.10  |
| D                    | 0.95 | 1.05 | 1.00  |
| E                    | 0.95 | 1.05 | 1.00  |
| e                    | —    | —    | 0.35  |
| L                    | 0.35 | 0.45 | 0.40  |
| K                    | 0.15 | —    | —     |
| Z                    | —    | —    | 0.065 |
| All Dimensions in mm |      |      |       |

## Suggested Pad Layout

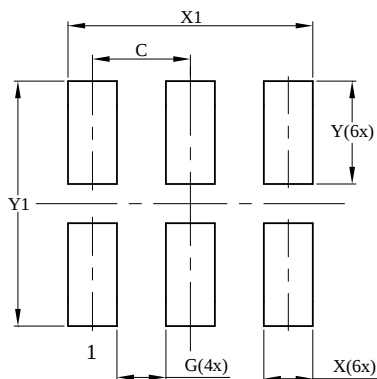
Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version

### (1) SOT353



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

### (2) X2-DFN1410-6

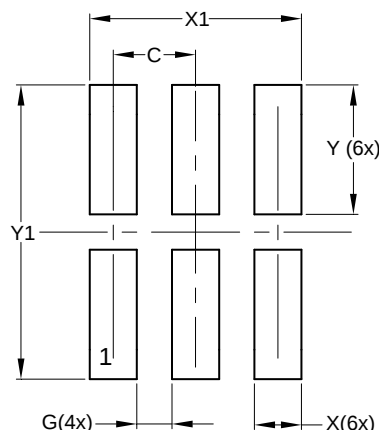


| Dimensions | Value (in mm) |
|------------|---------------|
| C          | 0.500         |
| G          | 0.250         |
| X          | 0.250         |
| X1         | 1.250         |
| Y          | 0.525         |
| Y1         | 1.250         |

## Suggested Pad Layout (cont.)

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

### (3) X2-DFN1010-6



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

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Вы можете разместить у нас заказ для любого Вашего проекта, будь то серийное производство или разработка единичного прибора.

В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

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