

## Description

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

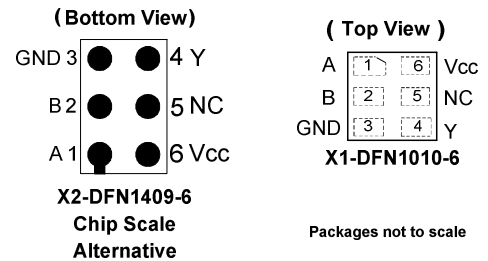
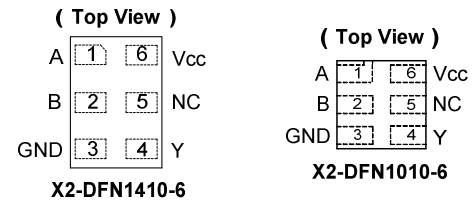
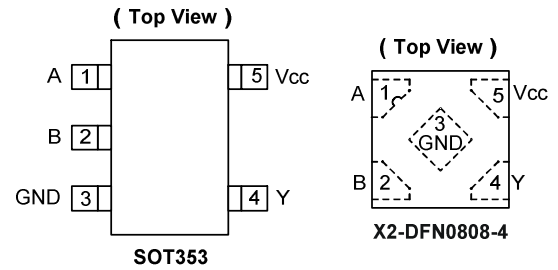
The 74AUP1G08 is a single, two-input, positive AND gate with a standard push-pull output designed for operation over a power supply range of 0.8V to 3.6V. The device is fully specified for partial power down applications using I<sub>OFF</sub>. The I<sub>OFF</sub> circuitry disables the output preventing damaging current backflow when the device is powered down. The gate performs the positive Boolean function:

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

## Features

- Advanced Ultra Low Power (AUP) CMOS
- Supply Voltage Range from 0.8V to 3.6V
- ±4mA Output Drive at 3.0V
- Low Static Power Consumption  
I<sub>CC</sub> < 0.9µA
- Low Dynamic Power Consumption  
C<sub>PD</sub> = 6.3 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<sub>CC</sub> = 3.0V.
- I<sub>OFF</sub> Supports Partial-Power-Down Mode Operation
- ESD Protection Exceeds JESD 22  
2000-V Human Body Model (A114)  
Exceeds 1000-V Charged Device Model (C101)
- Latch-Up Exceeds 100mA per JESD 78, Class I
- Leadless packages named per JESD30E
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- Halogen and Antimony Free. "Green" Device (Note 3)**

## Pin Assignments

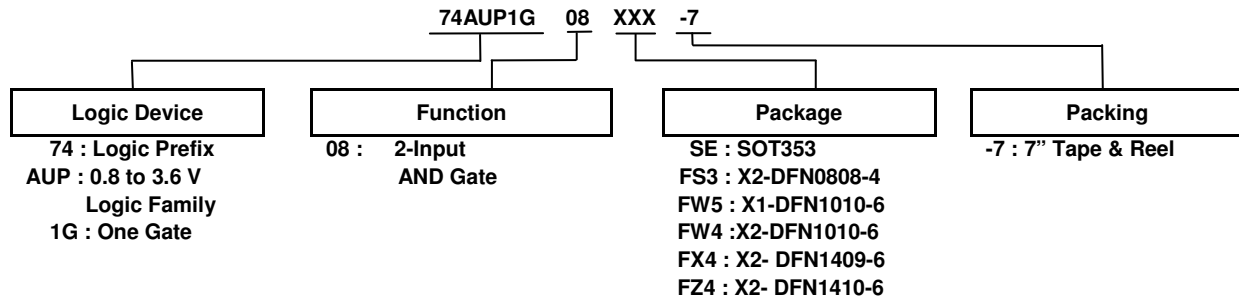


## Applications

- Suited for battery and low power needs
- Wide array of products such as:
  - Tablets, E-readers
  - Cell Phones, Personal Navigation / GPS
  - MP3 Players, Cameras, Video Recorders
  - PCs, Ultrabooks, Notebooks, Netbooks
  - Computer Peripherals, Hard Drives, SSDs, CD/DVD ROMs
  - TVs, DVDs, DVRs, Set-Top Boxes

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.

## Ordering Information



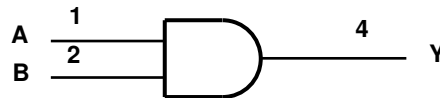
| Device         | Package Code | Package (Notes 4 & 5)                  | Package Size   | 7" Tape and Reel  |                    |
|----------------|--------------|--|--|-------------------|--------------------|
|                |              |  |  | Quantity          | Part Number Suffix |
| 74AUP1G08SE-7  | SE           | SOT353                                 | 2.0mm x 2.0mm x 1.1mm<br>0.65 mm lead pitch          | 3,000/Tape & Reel | -7                 |
| 74AUP1G08FS3-7 | FS3          | X2-DFN0808-4                           | 0.8mm x 0.8mm x 0.35mm<br>0.5 mm pad pitch (diamond) | 5,000/Tape & Reel | -7                 |
| 74AUP1G08FW5-7 | FW5          | X1-DFN1010-6                           | 1.0mm x 1.0mm x 0.5mm<br>0.35 mm pad pitch           | 5,000/Tape & Reel | -7                 |
| 74AUP1G08FW4-7 | FW4          | X2-DFN1010-6                           | 1.0mm x 1.0mm x 0.4mm<br>0.35 mm pad pitch           | 5,000/Tape & Reel | -7                 |
| 74AUP1G08FX4-7 | FX4          | X2-DFN1409-6<br>Chip scale alternative | 1.4mm x 0.9mm x 0.4mm<br>0.5 mm pad pitch            | 5,000/Tape & Reel | -7                 |
| 74AUP1G08FZ4-7 | FZ4          | X2-DFN1410-6                           | 1.4mm x 1.0mm x 0.4mm<br>0.5 mm pad pitch            | 5,000/Tape & Reel | -7                 |

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

### Pin Descriptions

| Pin Name | Function       |
|----------|----------------|
| A        | Data Input     |
| B        | Data Input     |
| GND      | Ground         |
| Y        | Data Output    |
| Vcc      | Supply Voltage |

### Logic Diagram



### Function Table

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

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

| Symbol    | Parameter   | Rating                 | Unit             |
|-----------|---|------------------------|------------------|
| ESD HBM   | Human Body Model ESD Protection                     | 2                      | kV               |
| ESD CDM   | Charged Device Model ESD Protection                 | 1                      | kV               |
| $V_{CC}$  | Supply Voltage Range                                | -0.5 to +4.6           | V                |
| $V_I$     | Input Voltage Range                                 | -0.5 to +4.6           | V                |
| $V_O$     | Voltage applied to output in High or Low State      | -0.5 to $V_{CC} + 0.5$ | V                |
| $I_{IK}$  | Input Clamp Current $V_I < 0$                       | 50                     | mA               |
| $I_{OK}$  | Output Clamp Current ( $V_O < 0$ )                  | 50                     | mA               |
| $I_O$     | Continuous Output Current ( $V_O = 0$ to $V_{CC}$ ) | $\pm 20$               | mA               |
| $I_{CC}$  | Continuous Current Through $V_{CC}$                 | 50                     | mA               |
| $I_{GND}$ | Continuous Current Through GND                      | -50                    | mA               |
| $T_J$     | Operating Junction Temperature                      | -40 to +150            | $^\circ\text{C}$ |
| $T_{STG}$ | Storage Temperature                                 | -65 to +150            | $^\circ\text{C}$ |

- Notes:
- Stresses beyond the absolute maximum may result in immediate failure or reduced reliability. These are stress values and device operation should be within recommend values.
  - Forcing the maximum allowed voltage could cause a condition exceeding the maximum current or conversely forcing the maximum current could cause a condition exceeding the maximum voltage. The ratings of both current and voltage must be maintained within the controlled range.

**Recommended Operating Conditions** (Note 8) (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

| Symbol              | Parameter                          |   | Min | Max      | Unit             |
|---------------------|------------------------------------|---|-----|----------|------------------|
| $V_{CC}$            | Operating Voltage                  |   | 0.8 | 3.6      | V                |
| $V_I$               | Input Voltage                      |   | 0   | 3.6      | V                |
| $V_O$               | Output Voltage                     |   | 0   | $V_{CC}$ | V                |
| $I_{OH}$            | High-Level Output Current          | $V_{CC} = 0.8\text{V}$                  | —   | -20      | $\mu\text{A}$    |
|                     |                                    | $V_{CC} = 1.1\text{V}$                  | —   | -1.1     | mA               |
|                     |                                    | $V_{CC} = 1.4\text{V}$                  | —   | -1.7     |                  |
|                     |                                    | $V_{CC} = 1.65\text{V}$                 | —   | -1.9     |                  |
|                     |                                    | $V_{CC} = 2.3\text{V}$                  | —   | -3.1     |                  |
|                     |                                    | $V_{CC} = 3.0\text{V}$                  | —   | -4       |                  |
| $I_{OL}$            | Low-Level Output Current           | $V_{CC} = 0.8\text{V}$                  | —   | 20       | $\mu\text{A}$    |
|                     |                                    | $V_{CC} = 1.1\text{V}$                  | —   | 1.1      | mA               |
|                     |                                    | $V_{CC} = 1.4\text{V}$                  | —   | 1.7      |                  |
|                     |                                    | $V_{CC} = 1.65\text{V}$                 | —   | 1.9      |                  |
|                     |                                    | $V_{CC} = 2.3\text{V}$                  | —   | 3.1      |                  |
|                     |                                    | $V_{CC} = 3.0\text{V}$                  | —   | 4        |                  |
| $\Delta t/\Delta V$ | Input Transition Rise or Fall Rate | $V_{CC} = 0.8\text{V}$ to $3.6\text{V}$ | —   | 200      | ns/V             |
| $T_A$               | Operating Free-Air Temperature     |   | -40 | +125     | $^\circ\text{C}$ |

- Note: 8. Unused inputs should be held at  $V_{CC}$  or Ground.

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

| Symbol           | Parameter                        | Test Conditions  | $V_{CC}$       | $T_A = +25^\circ\text{C}$ |                      | $T_A = -40^\circ\text{C to } +85^\circ\text{C}$ |                      | Unit          |
|------------------|----------------------------------|--|----------------|---------------------------|----------------------|---|----------------------|---------------|
|                  |                                  |  |                | Min                       | Max                  | Min   | Max                  |               |
| $V_{IH}$         | High-Level Input Voltage         | —  | 0.8V to 1.65V  | $0.80 \times V_{CC}$      | —                    | $0.80 \times V_{CC}$                            | —                    | V             |
|                  |                                  | —  | 1.65V to 1.95V | $0.65 \times V_{CC}$      | —                    | $0.65 \times V_{CC}$                            | —                    |               |
|                  |                                  | —  | 2.3V to 2.7V   | 1.6                       | —                    | 1.6   | —                    |               |
|                  |                                  | —  | 3.0V to 3.6V   | 2.0                       | —                    | 2.0   | —                    |               |
| $V_{IL}$         | Low-Level Input Voltage          | —  | 0.8V to 1.65V  | —                         | $0.30 \times V_{CC}$ | —   | $0.30 \times V_{CC}$ | V             |
|                  |                                  | —  | 1.65V to 1.95V | —                         | $0.35 \times V_{CC}$ | —   | $0.35 \times V_{CC}$ |               |
|                  |                                  | —  | 2.3V to 2.7V   | —                         | 0.7                  | —   | 0.7                  |               |
|                  |                                  | —  | 3.0V to 3.6V   | —                         | 0.9                  | —   | 0.9                  |               |
| $V_{OH}$         | High-Level Output Voltage        | $I_{OH} = -20\mu\text{A}$  | 0.8V to 3.6V   | $V_{CC} - 0.1$            | —                    | $V_{CC} - 0.1$                                  | —                    | V             |
|                  |                                  | $I_{OH} = -1.1\text{mA}$   | 1.1V           | $0.75 \times V_{CC}$      | —                    | $0.7 \times V_{CC}$                             | —                    |               |
|                  |                                  | $I_{OH} = -1.7\text{mA}$   | 1.4V           | 1.11                      | —                    | 1.03  | —                    |               |
|                  |                                  | $I_{OH} = -1.9\text{mA}$   | 1.65V          | 1.32                      | —                    | 1.3   | —                    |               |
|                  |                                  | $I_{OH} = -2.3\text{mA}$   | 2.3V           | 2.05                      | —                    | 1.97  | —                    |               |
|                  |                                  | $I_{OH} = -3.1\text{mA}$   |                | 1.9                       | —                    | 1.85  | —                    |               |
|                  |                                  | $I_{OH} = -2.7\text{mA}$   | 3V             | 2.72                      | —                    | 2.67  | —                    |               |
|                  |                                  | $I_{OH} = -4\text{mA}$   |                | 2.6                       | —                    | 2.55  | —                    |               |
| $V_{OL}$         | Low-Level Output Voltage         | $I_{OL} = 20\mu\text{A}$   | 0.8V to 3.6V   | —                         | 0.1                  | —   | 0.1                  | V             |
|                  |                                  | $I_{OL} = 1.1\text{mA}$  | 1.1V           | —                         | $0.3 \times V_{CC}$  | —   | $0.3 \times V_{CC}$  |               |
|                  |                                  | $I_{OL} = 1.7\text{mA}$  | 1.4V           | —                         | 0.31                 | —   | 0.37                 |               |
|                  |                                  | $I_{OL} = 1.9\text{mA}$  | 1.65V          | —                         | 0.31                 | —   | 0.35                 |               |
|                  |                                  | $I_{OL} = 2.3\text{mA}$  | 2.3V           | —                         | 0.31                 | —   | 0.33                 |               |
|                  |                                  | $I_{OL} = 3.1\text{mA}$  |                | —                         | 0.44                 | —   | 0.45                 |               |
|                  |                                  | $I_{OL} = 2.7\text{mA}$  | 3V             | —                         | 0.31                 | —   | 0.33                 |               |
|                  |                                  | $I_{OL} = 4\text{mA}$  |                | —                         | 0.44                 | —   | 0.45                 |               |
| $I_I$            | Input Current                    | A or B Input<br>$V_I = \text{GND to } 3.6\text{V}$                     | 0V to 3.6V     | —                         | $\pm 0.1$            | —   | $\pm 0.5$            | $\mu\text{A}$ |
| $I_{OFF}$        | Power Down Leakage Current       | $V_I$ or $V_O = 0\text{V to } 3.6\text{V}$                             | 0              | —                         | 0.2                  | —   | 0.6                  | $\mu\text{A}$ |
| $\Delta I_{OFF}$ | Delta Power Down Leakage Current | $V_I$ or $V_O = 0\text{V to } 3.6\text{V}$                             | 0V to 0.2V     | —                         | 0.2                  | —   | 0.6                  | $\mu\text{A}$ |
| $I_{CC}$         | Supply Current                   | $V_I = \text{GND or } V_{CC}, I_O = 0$                                 | 0.8V to 3.6V   | —                         | 0.5                  | —   | 0.9                  | $\mu\text{A}$ |
| $\Delta I_{CC}$  | Additional Supply Current        | One input at $V_{CC} - 0.6\text{V}$<br>Other inputs at $V_{CC}$ or GND | 3.3V           | —                         | 40                   | —   | 50                   | $\mu\text{A}$ |

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

| Symbol           | Parameter                        | Test Conditions  | $V_{CC}$       | $T_A = -40^\circ\text{C to } +125^\circ\text{C}$ |                      | Unit          |
|------------------|----------------------------------|--|----------------|--|----------------------|---------------|
|                  |                                  |  |                | Min  | Max                  |               |
| $V_{IH}$         | High-Level Input Voltage         | —  | 0.8V to 1.65V  | $0.80 \times V_{CC}$                             | —                    | V             |
|                  |                                  | —  | 1.65V to 1.95V | $0.70 \times V_{CC}$                             | —                    |               |
|                  |                                  | —  | 2.3V to 2.7V   | 1.6  | —                    |               |
|                  |                                  | —  | 3.0V to 3.6V   | 2.0  | —                    |               |
| $V_{IL}$         | Low-Level input voltage          | —  | 0.8V to 1.65 V | —  | $0.25 \times V_{CC}$ | V             |
|                  |                                  | —  | 1.65V to 1.95V | —  | $0.30 \times V_{CC}$ |               |
|                  |                                  | —  | 2.3V to 2.7V   | —  | 0.7                  |               |
|                  |                                  | —  | 3.0V to 3.6V   | —  | 0.9                  |               |
| $V_{OH}$         | High-Level Output Voltage        | $I_{OH} = -20 \mu\text{A}$   | 0.8V to 3.6V   | $V_{CC} - 0.11$                                  | —                    | V             |
|                  |                                  | $I_{OH} = -1.1 \text{ mA}$   | 1.1V           | $0.6 \times V_{CC}$                              | —                    |               |
|                  |                                  | $I_{OH} = -1.7 \text{ mA}$   | 1.4V           | 0.93   | —                    |               |
|                  |                                  | $I_{OH} = -1.9 \text{ mA}$   | 1.65V          | 1.17   | —                    |               |
|                  |                                  | $I_{OH} = -2.3 \text{ mA}$   | 2.3V           | 1.77   | —                    |               |
|                  |                                  | $I_{OH} = -3.1 \text{ mA}$   |                | 1.67   | —                    |               |
|                  |                                  | $I_{OH} = -2.7 \text{ mA}$   | 3V             | 2.40   | —                    |               |
|                  |                                  | $I_{OH} = -4 \text{ mA}$   |                | 2.30   | —                    |               |
| $V_{OL}$         | Low-Level Output Voltage         | $I_{OL} = 20 \mu\text{A}$  | 0.8 V to 3.6V  | —  | 0.11                 | V             |
|                  |                                  | $I_{OL} = 1.1 \text{ mA}$  | 1.1V           | —  | $0.33 \times V_{CC}$ |               |
|                  |                                  | $I_{OL} = 1.7 \text{ mA}$  | 1.4V           | —  | 0.41                 |               |
|                  |                                  | $I_{OL} = 1.9 \text{ mA}$  | 1.65V          | —  | 0.39                 |               |
|                  |                                  | $I_{OL} = 2.3 \text{ mA}$  | 2.3V           | —  | 0.36                 |               |
|                  |                                  | $I_{OL} = 3.1 \text{ mA}$  |                | —  | 0.50                 |               |
|                  |                                  | $I_{OL} = 2.7 \text{ mA}$  | 3V             | —  | 0.36                 |               |
|                  |                                  | $I_{OL} = 4 \text{ mA}$  |                | —  | 0.50                 |               |
| $I_I$            | Input Current                    | A or B Input<br>$V_I = \text{GND to } 3.6\text{V}$                 | 0V to 3.6V     | —  | $\pm 0.75$           | $\mu\text{A}$ |
| $I_{OFF}$        | Power Down Leakage Current       | $V_I$ or $V_O = 0\text{V to } 3.6\text{V}$                         | 0              | —  | $\pm 3.5$            | $\mu\text{A}$ |
| $\Delta I_{OFF}$ | Delta Power Down Leakage Current | $V_I$ or $V_O = 0\text{V to } 3.6\text{V}$                         | 0V to 0.2V     | —  | $\pm 2.5$            | $\mu\text{A}$ |
| $I_{CC}$         | Supply Current                   | $V_I = \text{GND or } V_{CC}, I_O = 0$                             | 0.8V to 3.6V   | —  | 3.0                  | $\mu\text{A}$ |
| $\Delta I_{CC}$  | Additional Supply Current        | Input at $V_{CC} - 0.6\text{V}$<br>Other inputs at $V_{CC}$ or GND | 3.3V           | —  | 75                   | $\mu\text{A}$ |

## Switching Characteristics

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

| Parameter       | From Input | To Output | V <sub>CC</sub> | T <sub>A</sub> = +25 °C |      |      | T <sub>A</sub> = -40 °C to +85 °C |      | T <sub>A</sub> = -40 °C to +125 °C |      | Unit |
|-----------------|------------|-----------|-----------------|-------------------------|------|------|-----------------------------------|------|------------------------------------|------|------|
|                 |            |           |                 | Min                     | Typ  | Max  | Min                               | Max  | Min                                | Max  |      |
| t <sub>pd</sub> | A or B     | Y         | 0.8V            | —                       | 17.0 | —    | —                                 | —    | —                                  | —    | ns   |
|                 |            |           | 1.2V ± 0.1V     | 2.4                     | 5.1  | 10.8 | 2.1                               | 11.7 | 2.1                                | 12.9 |      |
|                 |            |           | 1.5V ± 0.1V     | 1.6                     | 3.7  | 6.5  | 1.5                               | 7.5  | 1.5                                | 8.3  |      |
|                 |            |           | 1.8V ± 0.15V    | 1.3                     | 3.0  | 5.2  | 1.3                               | 6.1  | 1.3                                | 6.7  |      |
|                 |            |           | 2.5V ± 0.2V     | 1.1                     | 2.4  | 4.0  | 1.0                               | 4.8  | 1.0                                | 5.3  |      |
|                 |            |           | 3.3V ± 0.3V     | 1.0                     | 2.2  | 3.5  | 0.9                               | 4.3  | 0.9                                | 4.8  |      |

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

| Parameter       | From Input | To Output | V <sub>CC</sub> | T <sub>A</sub> = +25 °C |      |      | T <sub>A</sub> = -40 °C to +85 °C |      | T <sub>A</sub> = -40 °C to +125 °C |      | Unit |
|-----------------|------------|-----------|-----------------|-------------------------|------|------|-----------------------------------|------|------------------------------------|------|------|
|                 |            |           |                 | Min                     | Typ  | Max  | Min                               | Max  | Min                                | Max  |      |
| t <sub>pd</sub> | A or B     | Y         | 0.8V            | —                       | 20.6 | —    | —                                 | —    | —                                  | —    | ns   |
|                 |            |           | 1.2V ± 0.1V     | 2.4                     | 6.0  | 12.5 | 2.2                               | 13.6 | 2.2                                | 15.0 |      |
|                 |            |           | 1.5V ± 0.1V     | 2.0                     | 4.3  | 7.6  | 1.8                               | 8.9  | 1.8                                | 9.8  |      |
|                 |            |           | 1.8V ± 0.15V    | 1.7                     | 3.6  | 6.1  | 1.6                               | 7.2  | 1.6                                | 7.9  |      |
|                 |            |           | 2.5V ± 0.2V     | 1.4                     | 2.9  | 4.7  | 1.3                               | 5.7  | 1.3                                | 6.3  |      |
|                 |            |           | 3.3V ± 0.3V     | 1.3                     | 2.7  | 4.2  | 1.2                               | 4.7  | 1.2                                | 5.2  |      |

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

| Parameter       | From Input | To Output | V <sub>CC</sub> | T <sub>A</sub> = +25 °C |      |      | T <sub>A</sub> = -40 °C to +85 °C |      | T <sub>A</sub> = -40 °C to +125 °C |      | Unit |
|-----------------|------------|-----------|-----------------|-------------------------|------|------|-----------------------------------|------|------------------------------------|------|------|
|                 |            |           |                 | Min                     | Typ  | Max  | Min                               | Max  | Min                                | Max  |      |
| t <sub>pd</sub> | A or B     | Y         | 0.8V            | —                       | 24.1 | —    | —                                 | —    | —                                  | —    | ns   |
|                 |            |           | 1.2V ± 0.1V     | 3.4                     | 6.8  | 14.2 | 3.1                               | 15.7 | 3.1                                | 17.3 |      |
|                 |            |           | 1.5V ± 0.1V     | 2.3                     | 4.9  | 8.6  | 2.1                               | 10.1 | 2.1                                | 11.2 |      |
|                 |            |           | 1.8V ± 0.15V    | 1.9                     | 4.0  | 6.9  | 1.8                               | 8.2  | 1.8                                | 9.0  |      |
|                 |            |           | 2.5V ± 0.2V     | 1.7                     | 3.4  | 5.5  | 1.6                               | 6.5  | 1.6                                | 7.2  |      |
|                 |            |           | 3.3V ± 0.3V     | 1.5                     | 3.1  | 4.8  | 1.5                               | 5.9  | 1.5                                | 6.5  |      |

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

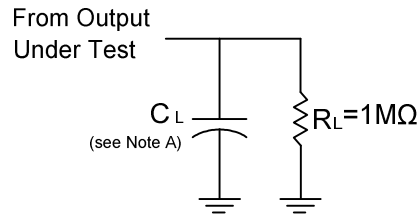
| Parameter       | From Input | To Output | V <sub>CC</sub> | T <sub>A</sub> = +25 °C |      |      | T <sub>A</sub> = -40 °C to +85 °C |      | T <sub>A</sub> = -40 °C to +125 °C |      | Unit |
|-----------------|------------|-----------|-----------------|-------------------------|------|------|-----------------------------------|------|------------------------------------|------|------|
|                 |            |           |                 | Min                     | TYP  | Max  | Min                               | Max  | Min                                | Max  |      |
| t <sub>pd</sub> | A or B     | Y         | 0.8V            | —                       | 34.4 | —    | —                                 | —    | —                                  | —    | ns   |
|                 |            |           | 1.2V ± 0.1V     | 4.0                     | 9.1  | 19.4 | 4.0                               | 21.8 | 4.0                                | 24.0 |      |
|                 |            |           | 1.5V ± 0.1V     | 3.2                     | 6.4  | 11.5 | 2.9                               | 13.6 | 2.9                                | 15.0 |      |
|                 |            |           | 1.8V ± 0.15V    | 2.6                     | 5.3  | 9.1  | 2.4                               | 10.9 | 2.4                                | 12.1 |      |
|                 |            |           | 2.5V ± 0.2V     | 2.3                     | 4.5  | 7.2  | 2.2                               | 8.6  | 2.2                                | 9.5  |      |
|                 |            |           | 3.3V ± 0.3V     | 2.1                     | 4.2  | 6.2  | 2.1                               | 7.5  | 2.1                                | 8.3  |      |

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

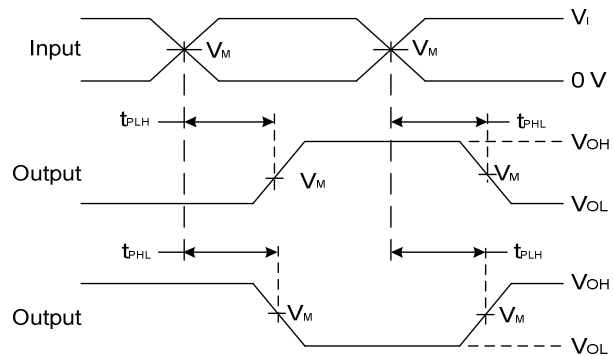
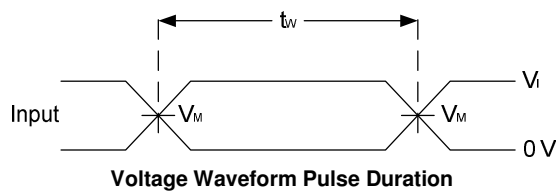
| Parameter       |   | Test Conditions                         |          | V <sub>CC</sub> | Typ | Unit |
|-----------------|---|---|----------|-----------------|-----|------|
| C <sub>pd</sub> | Power Dissipation Capacitance             | f = 1MHz<br>No Load                     |          | 0.8V            | 6.7 | pF   |
|                 |   |   |          | 1.2V ± 0.1V     | 6.6 |      |
|                 |   |   |          | 1.5V ± 0.1V     | 6.5 |      |
|                 |   |   |          | 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 |          | 0V or 3.3V      | 1.5 | pF   |
| θ <sub>JA</sub> | Thermal Resistance<br>Junction-to-Ambient | SOT353                                  | (Note 9) | —               | 371 | °C/W |
|                 |   | X2-DFN0808-4                            |          | —               | 430 |      |
|                 |   | X1-DFN1010-6                            |          | —               | 435 |      |
|                 |   | X2-DFN1010-6                            |          | —               | 445 |      |
|                 |   | X2-DFN1409-6                            |          | —               | 470 |      |
|                 |   | X2-DFN1410-6                            |          | —               | 460 |      |
| θ <sub>JC</sub> | Thermal Resistance<br>Junction-to-Case    | SOT353                                  | (Note 9) | —               | 143 | °C/W |
|                 |   | X2-DFN0808-4                            |          | —               | 240 |      |
|                 |   | X1-DFN1010-6                            |          | —               | 250 |      |
|                 |   | X2-DFN1010-6                            |          | —               | 250 |      |
|                 |   | X2-DFN1409-6                            |          | —               | 275 |      |
|                 |   | X2-DFN1410-6                            |          | —               | 265 |      |

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

**Parameter Measurement Information**



| V <sub>CC</sub> | Inputs          |                                | V <sub>M</sub>     | C <sub>L</sub>  |
|-----------------|-----------------|--------------------------------|--------------------|-----------------|
|                 | V <sub>I</sub>  | t <sub>r</sub> /t <sub>f</sub> |                    |                 |
| 0.8V            | V <sub>CC</sub> | ≤3ns                           | V <sub>CC</sub> /2 | 5, 10, 15, 30pF |
| 1.2V±0.1V       | V <sub>CC</sub> | ≤3ns                           | V <sub>CC</sub> /2 | 5, 10, 15, 30pF |
| 1.5V±0.1V       | V <sub>CC</sub> | ≤3ns                           | V <sub>CC</sub> /2 | 5, 10, 15, 30pF |
| 1.8V ±0.15V     | V <sub>CC</sub> | ≤3ns                           | V <sub>CC</sub> /2 | 5, 10, 15, 30pF |
| 2.5V±0.2V       | V <sub>CC</sub> | ≤3ns                           | V <sub>CC</sub> /2 | 5, 10, 15, 30pF |
| 3.3V±0.3V       | V <sub>CC</sub> | ≤3ns                           | V <sub>CC</sub> /2 | 5, 10, 15, 30pF |



**Voltage Waveform Propagation Delay Times  
Inverting and Non Inverting Outputs**

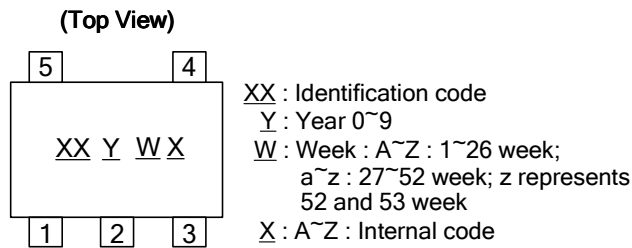
**Figure 1 Load Circuit and Voltage Waveforms**

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



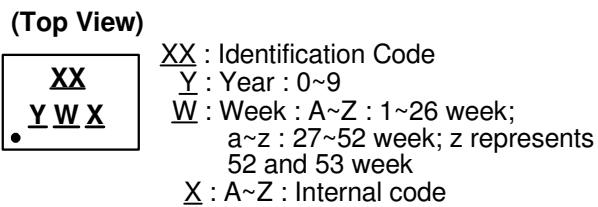
**Marking Information**

(1) SOT353



| Part Number | Package | Identification Code |
|-------------|---------|---------------------|
| 74AUP1G08SE | SOT353  | XP                  |

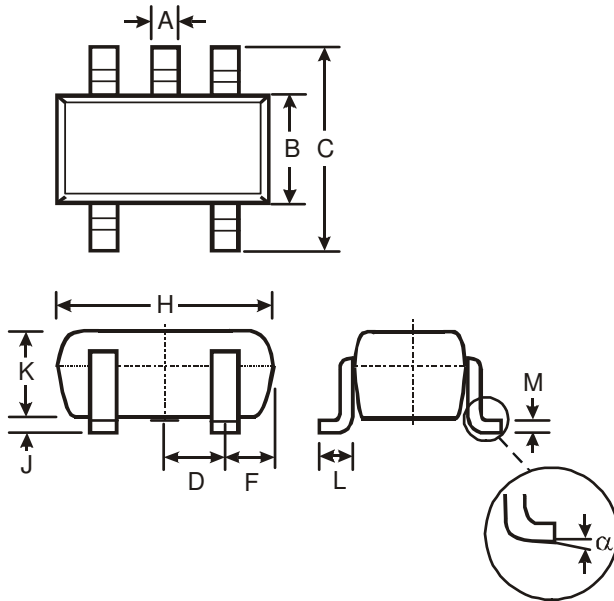
(2) X2-DFN0808-4, X1-DFN1010-6, X2-DFN1010-6, X2-DFN1409-6 and X2-DFN1410-6



| Part Number  | Package      | Identification Code |
|--------------|--------------|---------------------|
| 74AUP1G08FS3 | X2-DFN0808-4 | YR                  |
| 74AUP1G08FW5 | X1-DFN1010-6 | Q7                  |
| 74AUP1G08FW4 | X2-DFN1010-6 | XP                  |
| 74AUP1G08FX4 | X2-DFN1409-6 | HF                  |
| 74AUP1G08FZ4 | X2-DFN1410-6 | XP                  |

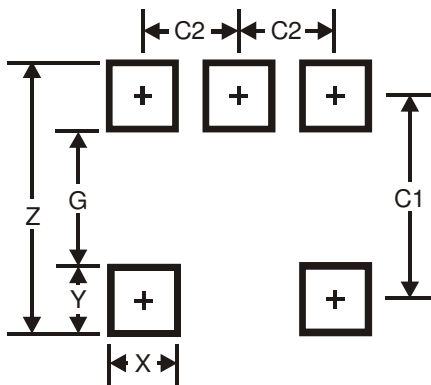
**SOT353 Package Outline Dimensions and Suggested Pad Layout**

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



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

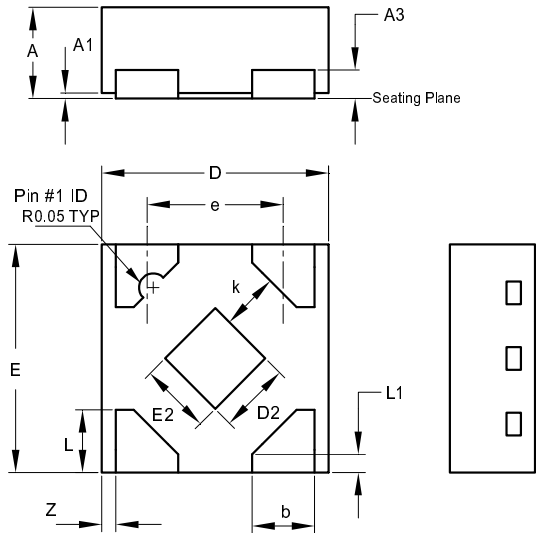
All Dimensions in mm



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

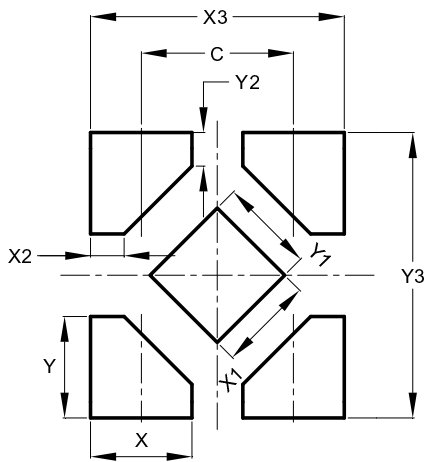
**X2-DFN0808-4 Package Outline Dimensions and Suggested Pad Layout**

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



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

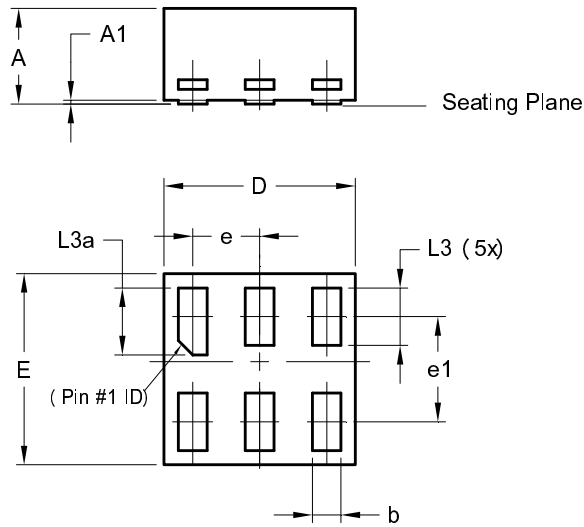
All Dimensions in mm



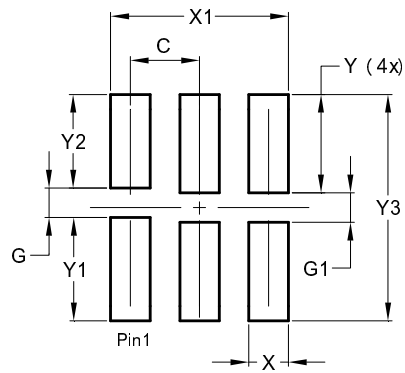
| Dimensions | Value |
|------------|-------|
| C          | 0.480 |
| X          | 0.320 |
| X1         | 0.300 |
| X2         | 0.106 |
| X3         | 0.800 |
| Y          | 0.320 |
| Y1         | 0.300 |
| Y2         | 0.106 |
| Y3         | 0.900 |

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

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



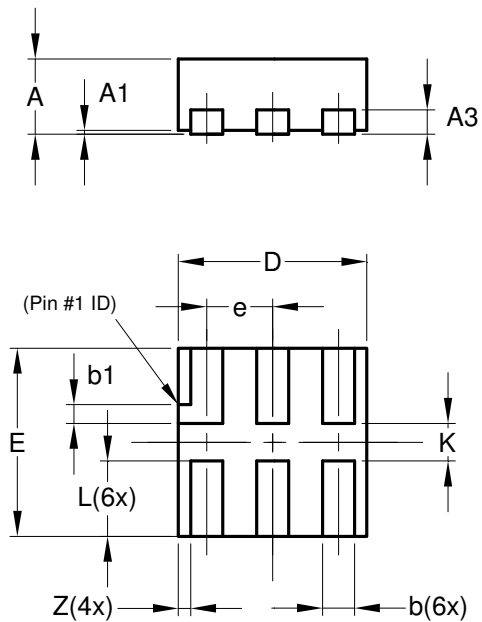
| X1-DFN1010-6<br>(Type B) |          |       |      |
|--------------------------|----------|-------|------|
| Dim                      | Min      | Max   | Typ  |
| A                        | -        | 0.50  | 0.39 |
| A1                       | -        | 0.04  | -    |
| b                      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



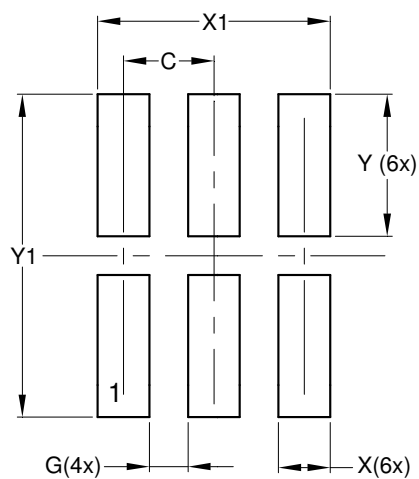
| Dimensions | Value (in mm) |
|------------|---------------|
| C          | 0.350         |
| G          | 0.150         |
| G1         | 0.150         |
| X          | 0.200         |
| X1         | 0.900         |
| Y          | 0.500         |
| Y1         | 0.525         |
| Y2         | 0.475 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

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

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



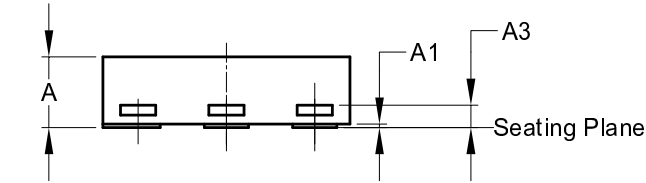
| X2-DFN1010-6         |      |      |       |
|----------------------|------|------|-------|
| Dim                  | Min  | Max  | Typ   |
| A                    | —    | 0.40 | 0.39  |
| A1                   | 0.00 | 0.05 | 0.02  |
| A3                   | —    | —    | 0.13  |
| b               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



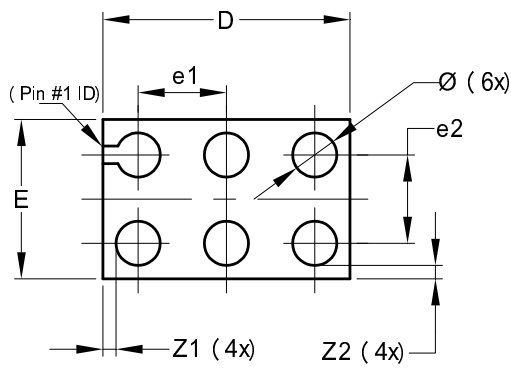
| Dimensions | Value (in mm) |
|------------|---------------|
| C          | 0.350         |
| G          | 0.150         |
| X          | 0.200         |
| X1         | 0.900         |
| Y          | 0.550         |
| Y1         | 1.250         |

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

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



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



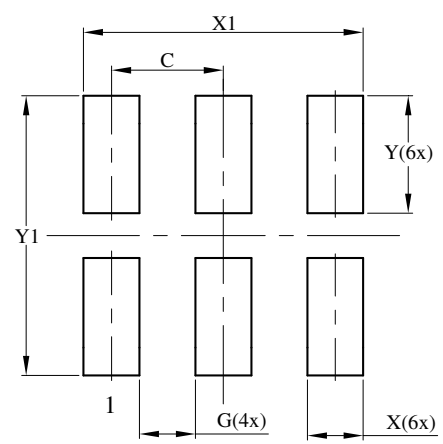
| Dimensions | Value (in mm) |
|------------|---------------|
| C          | 1.000         |
| C1         | 0.500         |
| D          | 0.300         |
| G          | 0.200         |
| G1         | 0.200         |
| X          | 0.400         |
| Y          | 0.150         |

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

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



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



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

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