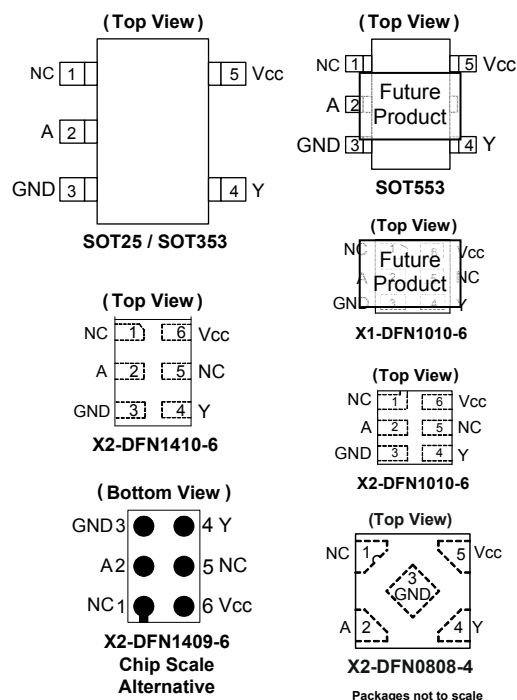


**SINGLE SCHMITT-TRIGGER INVERTER**
**Description**

The 74LVC1G14 is a single 1-input Schmitt-trigger inverter with a standard push-pull output. The device is designed for operation with a power supply range of 1.65V to 5.5V. The inputs are tolerant to 5.5V allowing this device to be used in a mixed voltage environment. 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. The gate performs the positive Boolean function:

$$Y = \overline{A}$$

**Pin Assignments**

**Features**

- Wide Supply Voltage Range from 1.65V to 5.5V
- $\pm 24\text{mA}$  Output Drive at 3.3V
- CMOS low power consumption
- IOFF Supports Partial-Power-Down Mode Operation
- Inputs accept up to 5.5V
- ESD Protection Exceeds JESD 22
  - 200-V Machine Model (A115)
  - 2000-V Human Body Model (A114)
- Latch-Up Exceeds 100mA per JESD 78, Class I
- Range of Package Options
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

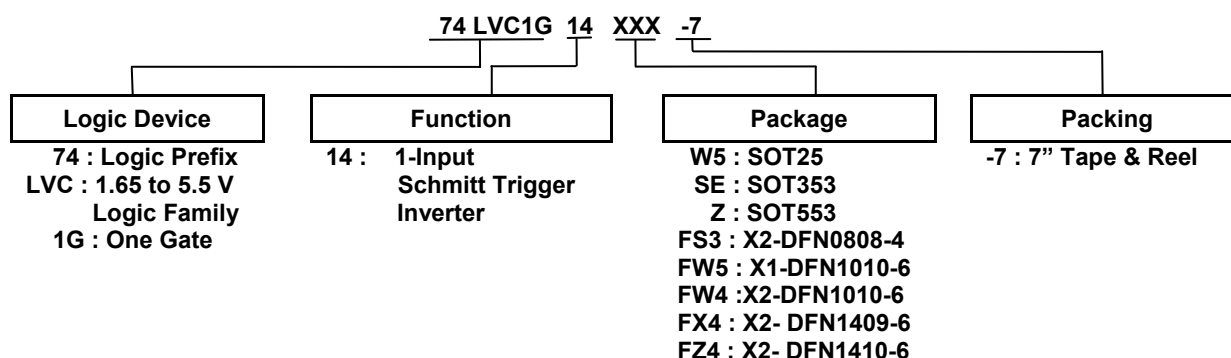
**Applications**

- Voltage Level Shifting
- General Purpose Logic
- Power Down Signal Isolation
- Wide array of products such as:
  - PCs, networking, notebooks, netbooks, PDAs
  - Computer peripherals, hard drives, CD/DVD ROM
  - TV, DVD, DVR, set top box
  - Cell Phones, Personal Navigation / GPS
  - MP3 players, Cameras, Video Recorders

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 < 1000 ppm antimony compounds.

## Ordering Information



| Device                             | Package Code | Package (Notes 4,5)                      | Package Size                                         | 7" Tape and Reel |                    |
|------------------------------------|--------------|------------------------------------------|------------------------------------------------------|------------------|--------------------|
|                                    |              |                                          |                                                      | Quantity         | Part Number Suffix |
| 74LVC1G14W5-7                      | W5           | SOT25                                    | 3.0mm X 2.8mm X 1.2mm<br>0.95mm lead pitch           | 3000/Tape & Reel | -7                 |
| 74LVC1G14SE-7                      | SE           | SOT353                                   | 2.0mm X 2.0mm X 1.1mm<br>0.65mm lead pitch           | 3000/Tape & Reel | -7                 |
| 74LVC1G14Z-7<br>Future Product     | Z            | SOT553<br>Future Product                 | 1.6mm X 1.6 mm X 0.62mm<br>0.5mm lead pitch          | 4000/Tape & Reel | -7                 |
| 74LVC1G14FS3-7                     | FS3          | X2-DFN0808-4                             | 0.9mm X 0.9 mm X 0.35mm<br>0.5mm pad pitch (diamond) | 5000/Tape & Reel | -7                 |
| 74LVC1G14FW5-7<br>(Future Product) | FW5          | X1-DFN1010-6<br>(Future Product)         | 1.0mm X 1.0mm X 0.5mm<br>0.35mm pad pitch            | 5000/Tape & Reel | -7                 |
| 74LVC1G14FW4-7                     | FW4          | X2-DFN1010-6                             | 1.0mm X 1.0mm X 0.4mm<br>0.35mm pad pitch            | 5000/Tape & Reel | -7                 |
| 74LVC1G14FX4-7                     | FX4          | X2-DFN1409-6<br>(Chip scale alternative) | 1.4mm X 0.9mm X 0.4mm<br>0.5mm pad pitch             | 5000/Tape & Reel | -7                 |
| 74LVC1G14FZ4-7                     | FZ4          | X2-DFN1410-6                             | 1.4mm X 1.0mm X 0.4mm<br>0.5mm pad pitch             | 5000/Tape & Reel | -7                 |

Notes:

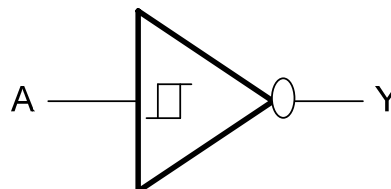
4. Pad layout as shown on Diodes Inc. suggested pad layout document AP02001, which can be found on our website at <http://www.diodes.com/datasheets/ap02001.pdf>.

5. The taping orientation is located on our website at <http://www.diodes.com/datasheets/ap02007.pdf>

## Pin Descriptions

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

## Logic Diagram



## Function Table

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

## Absolute Maximum Ratings (Notes 6, 7)

| Symbol                             | Description                                                           | Rating                       | Unit |
|------------------------------------|-----------------------------------------------------------------------|------------------------------|------|
| ESD HBM                            | Human Body Model ESD Protection                                       | 2                            | kV   |
| ESD MM                             | Machine Model ESD Protection                                          | 200                          | V    |
| V <sub>CC</sub>                    | Supply Voltage Range                                                  | -0.5 to 6.5                  | V    |
| V <sub>I</sub>                     | Input Voltage Range                                                   | -0.5 to 6.5                  | V    |
| V <sub>O</sub>                     | Voltage Applied to Output in High Impedance or I <sub>OFF</sub> State | -0.5 to 6.5                  | 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                                                  | -50                          | mA   |
| I <sub>O</sub>                     | Continuous Output Current                                             | ±50                          | mA   |
| I <sub>CC</sub> , I <sub>GND</sub> | Continuous Current Through V <sub>CC</sub> or GND                     | ±100                         | mA   |
| T <sub>J</sub>                     | Operating Junction Temperature                                        | -40 to 150                   | °C   |
| T <sub>STG</sub>                   | Storage Temperature                                                   | -65 to 150                   | °C   |

Notes: 6. 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.  
7. Forcing the maximum allowed voltage could cause a condition exceeding the maximum current or conversely forcing the maximum current could cause a condition exceeding the maximum voltage. The ratings of both current and voltage must be maintained within the controlled range..

## Recommended Operating Conditions (Note 8)

| Symbol          | Parameter                      |                         | Min  | Max             | Unit |
|-----------------|--------------------------------|-------------------------|------|-----------------|------|
| V <sub>CC</sub> | Operating Voltage              | Operating               | 1.65 | 5.5             | V    |
|                 |                                | Data retention only     | 1.5  | —               | V    |
| V <sub>I</sub>  | Input Voltage                  |                         | 0    | 5.5             | 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> = 1.65V | —    | -4              | mA   |
|                 |                                | V <sub>CC</sub> = 2.3V  | —    | -8              |      |
|                 |                                | V <sub>CC</sub> = 2.7V  | —    | -12             |      |
|                 |                                | V <sub>CC</sub> = 3V    | —    | -16             |      |
|                 |                                |                         | —    | -24             |      |
|                 |                                | V <sub>CC</sub> = 4.5V  | —    | -32             |      |
| I <sub>OL</sub> | Low-Level Output Current       | V <sub>CC</sub> = 1.65V | —    | 4               | mA   |
|                 |                                | V <sub>CC</sub> = 2.3V  | —    | 8               |      |
|                 |                                | V <sub>CC</sub> = 2.7V  | —    | 12              |      |
|                 |                                | V <sub>CC</sub> = 3V    | —    | 16              |      |
|                 |                                |                         | —    | 24              |      |
|                 |                                | V <sub>CC</sub> = 4.5V  | —    | 32              |      |
| T <sub>A</sub>  | Operating Free-Air Temperature | —                       | -40  | +125            | °C   |

Notes: 8. Unused inputs should be held at V<sub>CC</sub> or Ground.

**Electrical Characteristics**
 $T_A = -40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$  (All typical values are at  $V_{CC} = 3.3\text{V}$ ,  $T_A = +25^{\circ}\text{C}$ )

| Symbol          | Parameter                               | Test Conditions                         | $V_{CC}$      | Min            | Typ. | Max      | Unit          |
|-----------------|-----------------------------------------|-----------------------------------------|---------------|----------------|------|----------|---------------|
| $V_{T+}$        | Positive-Going Input Threshold Voltage  | —                                       | 1.65V         | 0.70           | —    | 1.20     | —             |
|                 |                                         | —                                       | 2.3V          | 1.11           | —    | 1.60     | —             |
|                 |                                         | —                                       | 3V            | 1.50           | —    | 2.00     | —             |
|                 |                                         | —                                       | 4.5V          | 2.16           | —    | 2.74     | —             |
|                 |                                         | —                                       | 5.5V          | 2.61           | —    | 3.33     | —             |
| $V_{T-}$        | Negative- Going Input Threshold Voltage | —                                       | 1.65V         | 0.30           | —    | 0.72     | —             |
|                 |                                         | —                                       | 2.3V          | 0.58           | —    | 1.00     | —             |
|                 |                                         | —                                       | 3V            | 0.80           | —    | 1.30     | —             |
|                 |                                         | —                                       | 4.5V          | 1.21           | —    | 1.95     | —             |
|                 |                                         | —                                       | 5.5V          | 1.45           | —    | 2.35     | —             |
| $\Delta V_T$    | Hysteresis ( $V_{T+} - V_{T-}$ )        | —                                       | 1.65V         | 0.30           | —    | 0.62     | —             |
|                 |                                         | —                                       | 2.3V          | 0.40           | —    | 0.80     | —             |
|                 |                                         | —                                       | 3V            | 0.35           | —    | 1.00     | —             |
|                 |                                         | —                                       | 4.5V          | 0.55           | —    | 1.10     | —             |
|                 |                                         | —                                       | 5.5V          | 0.60           | —    | 1.20     | —             |
| $V_{OH}$        | High Level Output Voltage               | $I_{OH} = -100\mu\text{A}$              | 1.65V to 5.5V | $V_{CC} - 0.1$ | —    | —        | V             |
|                 |                                         | $I_{OH} = -4\text{mA}$                  | 1.65V         | 1.2            | —    | —        |               |
|                 |                                         | $I_{OH} = -8\text{mA}$                  | 2.3V          | 1.9            | —    | —        |               |
|                 |                                         | $I_{OH} = -12\text{mA}$                 | 2.7V          | 2.2            | —    | —        |               |
|                 |                                         | $I_{OH} = -16\text{mA}$                 | 3V            | 2.4            | —    | —        |               |
|                 |                                         | $I_{OH} = -24\text{mA}$                 |               | 2.3            | —    | —        |               |
|                 |                                         | $I_{OH} = -32\text{mA}$                 | 4.5V          | 3.8            | —    | —        |               |
| $V_{OL}$        | Low-Level Output Voltage                | $I_{OL} = 100\mu\text{A}$               | 1.65V to 5.5V | —              | —    | 0.1      | V             |
|                 |                                         | $I_{OL} = 4\text{mA}$                   | 1.65V         | —              | —    | 0.45     |               |
|                 |                                         | $I_{OL} = 8\text{mA}$                   | 2.3V          | —              | —    | 0.3      |               |
|                 |                                         | $I_{OL} = 12\text{mA}$                  | 2.7V          | —              | —    | 0.4      |               |
|                 |                                         | $I_{OL} = 16\text{mA}$                  | 3V            | —              | —    | 0.4      |               |
|                 |                                         | $I_{OL} = 24\text{mA}$                  |               | —              | —    | 0.55     |               |
|                 |                                         | $I_{OL} = 32\text{mA}$                  | 4.5           | —              | —    | 0.55     |               |
| $I_I$           | Input Current                           | $V_I = 5.5\text{V}$ or GND              | 0 to 5.5V     | —              | —    | $\pm 5$  | $\mu\text{A}$ |
| $I_{OFF}$       | Power Down Leakage Current              | $V_I$ or $V_O = 5.5\text{V}$            | 0             | —              | —    | $\pm 10$ | $\mu\text{A}$ |
| $I_{CC}$        | Supply Current                          | $V_I = 5.5\text{V}$ of GND<br>$I_O = 0$ | 1.65V to 5.5V | —              | —    | 10       | $\mu\text{A}$ |
| $\Delta I_{CC}$ | Additional Supply Current               | Input at $V_{CC} - 0.6\text{V}$         | 3V to 5.5V    | —              | —    | 500      | $\mu\text{A}$ |

**Electrical Characteristics**  $T_A = -40^\circ\text{C}$  to  $+125^\circ\text{C}$  (All typical values are at  $V_{CC} = 3.3\text{V}$ ,  $T_A = +25^\circ\text{C}$ )

| Symbol          | Parameter                               | Test Conditions                         | $V_{CC}$      | Min            | Typ. | Max       | Unit          |
|-----------------|-----------------------------------------|-----------------------------------------|---------------|----------------|------|-----------|---------------|
| $V_{T+}$        | Positive- Going Input Threshold Voltage | —                                       | 1.65V         | 0.70           | —    | 1.20      | —             |
|                 |                                         | —                                       | 2.3V          | 1.11           | —    | 1.60      | —             |
|                 |                                         | —                                       | 3V            | 1.50           | —    | 2.00      | —             |
|                 |                                         | —                                       | 4.5V          | 2.16           | —    | 2.74      | —             |
|                 |                                         | —                                       | 5.5V          | 2.61           | —    | 3.33      | —             |
| $V_{T-}$        | Negative- Going Input Threshold Voltage | —                                       | 1.65V         | 0.30           | —    | 0.75      | —             |
|                 |                                         | —                                       | 2.3V          | 0.58           | —    | 1.03      | —             |
|                 |                                         | —                                       | 3V            | 0.80           | —    | 1.33      | —             |
|                 |                                         | —                                       | 4.5V          | 1.21           | —    | 1.95      | —             |
|                 |                                         | —                                       | 5.5V          | 1.45           | —    | 2.35      | —             |
| $\Delta V_T$    | Hysteresis ( $V_{T+} - V_{T-}$ )        | —                                       | 1.65V         | 0.30           | —    | 0.62      | —             |
|                 |                                         | —                                       | 2.3V          | 0.37           | —    | 0.80      | —             |
|                 |                                         | —                                       | 3V            | 0.32           | —    | 1.00      | —             |
|                 |                                         | —                                       | 4.5V          | 0.50           | —    | 1.20      | —             |
|                 |                                         | —                                       | 5.5V          | 0.55           | —    | 1.40      | —             |
| $V_{OH}$        | High Level Output Voltage               | $I_{OH} = -100\mu\text{A}$              | 1.65V to 5.5V | $V_{CC} - 0.1$ | —    | —         | V             |
|                 |                                         | $I_{OH} = -4\text{mA}$                  | 1.65V         | 0.95           | —    | —         |               |
|                 |                                         | $I_{OH} = -8\text{mA}$                  | 2.3V          | 1.7            | —    | —         |               |
|                 |                                         | $I_{OH} = -12\text{mA}$                 | 2.7V          | 1.9            | —    | —         |               |
|                 |                                         | $I_{OH} = -16\text{mA}$                 | 3V            | 1.9            | —    | —         |               |
|                 |                                         | $I_{OH} = -24\text{mA}$                 |               | 2.0            | —    | —         |               |
|                 |                                         | $I_{OH} = -32\text{mA}$                 | 4.5V          | 3.4            | —    | —         |               |
| $V_{OL}$        | Low-Level Output Voltage                | $I_{OL} = 100\mu\text{A}$               | 1.65V to 5.5V | —              | —    | 0.1       | V             |
|                 |                                         | $I_{OL} = 4\text{mA}$                   | 1.65V         | —              | —    | 0.7       |               |
|                 |                                         | $I_{OL} = 8\text{mA}$                   | 2.3V          | —              | —    | 0.45      |               |
|                 |                                         | $I_{OL} = 12\text{mA}$                  | 2.7V          | —              | —    | 0.6       |               |
|                 |                                         | $I_{OL} = 16\text{mA}$                  | 3V            | —              | —    | 0.6       |               |
|                 |                                         | $I_{OL} = 24\text{mA}$                  |               | —              | —    | 0.8       |               |
|                 |                                         | $I_{OL} = 32\text{mA}$                  | 4.5V          | —              | —    | 0.8       |               |
| $I_I$           | Input Current                           | $V_I = 5.5\text{V}$ or GND              | 0 to 5.5V     | —              | —    | $\pm 100$ | $\mu\text{A}$ |
| $I_{OFF}$       | Power Down Leakage Current              | $V_I$ or $V_O = 5.5\text{V}$            | 0             | —              | —    | $\pm 200$ | $\mu\text{A}$ |
| $I_{CC}$        | Supply Current                          | $V_I = 5.5\text{V}$ of GND<br>$I_O = 0$ | 1.65V to 5.5V | —              | —    | 200       | $\mu\text{A}$ |
| $\Delta I_{CC}$ | Additional Supply Current               | Input at $V_{CC} - 0.6\text{V}$         | 3V to 5.5V    | —              | —    | 5000      | $\mu\text{A}$ |

**Package Characteristics** (All typical values are at  $V_{CC} = 3.3V$ ,  $T_A = +25^\circ C$ )

| Symbol        | Parameter                                 | Test Conditions | $V_{CC}$ | Min | Typ. | Max | Unit         |
|---------------|-------------------------------------------|-----------------|----------|-----|------|-----|--------------|
| $\theta_{JA}$ | Thermal Resistance<br>Junction-to-Ambient | SOT25           | (Note 9) | —   | 204  | —   | $^\circ C/W$ |
|               |                                           | SOT353          |          | —   | 371  | —   |              |
|               |                                           | SOT553          |          | —   | 231  | —   |              |
|               |                                           | X2-DFN0808-4    |          | —   | 400  | —   |              |
|               |                                           | X1-DFN1010-6    |          | —   | 435  | —   |              |
|               |                                           | X2-DFN1010-6    |          | —   | 445  | —   |              |
|               |                                           | X2-DFN1409-6    |          | —   | 470  | —   |              |
|               |                                           | X2-DFN1410-6    |          | —   | 460  | —   |              |
| $\theta_{JC}$ | Thermal Resistance<br>Junction-to-Case    | SOT25           | (Note 9) | —   | 52   | —   | $^\circ C/W$ |
|               |                                           | SOT353          |          | —   | 143  | —   |              |
|               |                                           | SOT553          |          | —   | 105  | —   |              |
|               |                                           | X2-DFN0808-4    |          | —   | 225  | —   |              |
|               |                                           | X1-DFN1010-6    |          | —   | 250  | —   |              |
|               |                                           | X2-DFN1010-6    |          | —   | 250  | —   |              |
|               |                                           | X2-DFN1409-6    |          | —   | 275  | —   |              |
|               |                                           | X2-DFN1410-6    |          | —   | 265  | —   |              |

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

**Switching Characteristics**

$T_A = -40^\circ C$  to  $+85^\circ C$ ,  $C_L = 15pF$  as noted (see Figure 1)

| Parameter | From<br>Input | To<br>Output | $V_{CC} = 1.8V$<br>$\pm 0.15V$ |     | $V_{CC} = 2.5V$<br>$\pm 0.2V$ |     | $V_{CC} = 3.3V$<br>$\pm 0.3V$ |     | $V_{CC} = 5V$<br>$\pm 0.5V$ |     | Unit |
|-----------|---------------|--------------|--------------------------------|-----|-------------------------------|-----|-------------------------------|-----|-----------------------------|-----|------|
|           |               |              | Min                            | Max | Min                           | Max | Min                           | Max | Min                         | Max |      |
| $t_{pd}$  | A             | Y            | 1.0                            | 9.9 | 0.7                           | 5.5 | 0.7                           | 4.6 | 0.7                         | 4.4 | ns   |

$T_A = -40^\circ C$  to  $+85^\circ C$ ,  $C_L = 30$  or  $50pF$  as noted (see Figure 2)

| Parameter | From<br>Input | To<br>Output | $V_{CC} = 1.8V$<br>$\pm 0.15V$ |     | $V_{CC} = 2.5V$<br>$\pm 0.2V$ |     | $V_{CC} = 3.3V$<br>$\pm 0.3V$ |     | $V_{CC} = 5V$<br>$\pm 0.5V$ |     | Unit |
|-----------|---------------|--------------|--------------------------------|-----|-------------------------------|-----|-------------------------------|-----|-----------------------------|-----|------|
|           |               |              | Min                            | Max | Min                           | Max | Min                           | Max | Min                         | Max |      |
| $t_{pd}$  | A             | Y            | 1.0                            | 11  | 0.7                           | 6.5 | 0.7                           | 5.5 | 0.7                         | 5   | ns   |

$T_A = -40^\circ C$  to  $+125^\circ C$ ,  $C_L = 15pF$  as noted (see Figure 1)

| Parameter | From<br>Input | To<br>Output | $V_{CC} = 1.8V$<br>$\pm 0.15V$ |      | $V_{CC} = 2.5V$<br>$\pm 0.2V$ |     | $V_{CC} = 3.3V$<br>$\pm 0.3V$ |     | $V_{CC} = 5V$<br>$\pm 0.5V$ |     | Unit |
|-----------|---------------|--------------|--------------------------------|------|-------------------------------|-----|-------------------------------|-----|-----------------------------|-----|------|
|           |               |              | Min                            | Max  | Min                           | Max | Min                           | Max | Min                         | Max |      |
| $t_{pd}$  | A             | Y            | 1.0                            | 12.5 | 0.7                           | 7.5 | 0.7                           | 6.5 | 0.7                         | 5.5 | ns   |

$T_A = -40^\circ C$  to  $+125^\circ C$ ,  $C_L = 30$  or  $50pF$  as noted (see Figure 2)

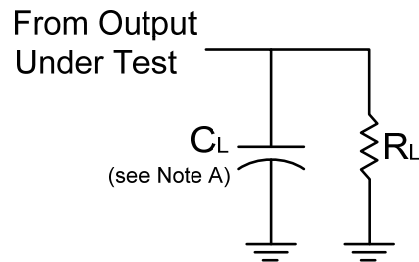
| Parameter | From<br>Input | To<br>Output | $V_{CC} = 1.8V$<br>$\pm 0.15V$ |      | $V_{CC} = 2.5V$<br>$\pm 0.2V$ |     | $V_{CC} = 3.3V$<br>$\pm 0.3V$ |     | $V_{CC} = 5V$<br>$\pm 0.5V$ |     | Unit |
|-----------|---------------|--------------|--------------------------------|------|-------------------------------|-----|-------------------------------|-----|-----------------------------|-----|------|
|           |               |              | Min                            | Max  | Min                           | Max | Min                           | Max | Min                         | Max |      |
| $t_{pd}$  | A             | Y            | 1.0                            | 14.0 | 0.7                           | 8.5 | 0.7                           | 7.0 | 0.7                         | 6.5 | ns   |

## Operating Characteristics

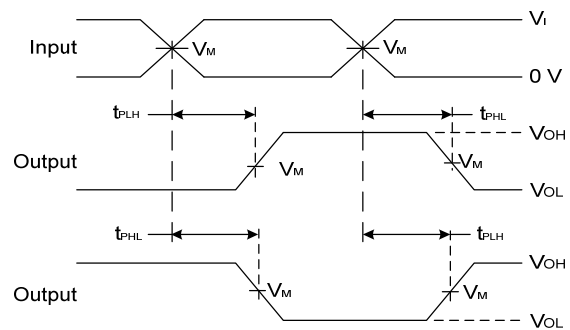
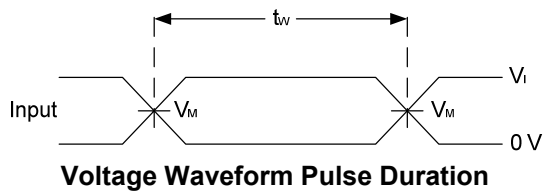
$T_A = +25^\circ\text{C}$

| Parameter |                               | Test Conditions     | $V_{CC} = 1.8\text{V}$ | $V_{CC} = 2.5\text{V}$ | $V_{CC} = 3.3\text{V}$ | $V_{CC} = 5\text{V}$ | Unit |
|-----------|-------------------------------|---------------------|------------------------|------------------------|------------------------|----------------------|------|
|           |                               |                     | Typ.                   | Typ.                   | Typ.                   | Typ.                 |      |
| $C_{pd}$  | Power Dissipation Capacitance | $f = 10\text{ MHz}$ | 20                     | 21                     | 22                     | 25                   | pF   |

## Parameter Measurement Information



| $V_{CC}$                       | Inputs   |                     | $V_M$      | $C_L$ | $R_L$       |
|--------------------------------|----------|---------------------|------------|-------|-------------|
|                                | $V_I$    | $t_r/t_f$           |            |       |             |
| $1.8\text{V} \pm 0.15\text{V}$ | $V_{CC}$ | $\leq 2\text{ns}$   | $V_{CC}/2$ | 15pF  | 1M $\Omega$ |
| $2.5\text{V} \pm 0.2\text{V}$  | $V_{CC}$ | $\leq 2\text{ns}$   | $V_{CC}/2$ | 15pF  | 1M $\Omega$ |
| $3.3\text{V} \pm 0.3\text{V}$  | 3V       | $\leq 2.5\text{ns}$ | 1.5V       | 15pF  | 1M $\Omega$ |
| $5\text{V} \pm 0.5\text{V}$    | $V_{CC}$ | $\leq 2.5\text{ns}$ | $V_{CC}/2$ | 15pF  | 1M $\Omega$ |

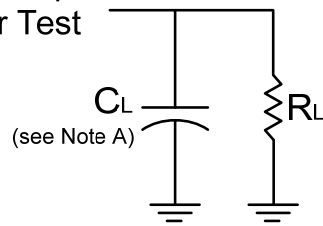


**Figure 1. Load Circuit and Voltage Waveforms**

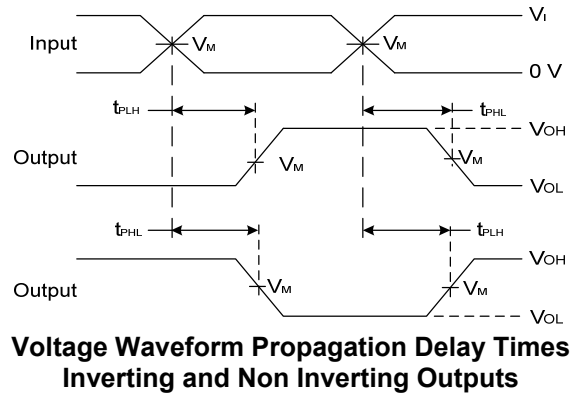
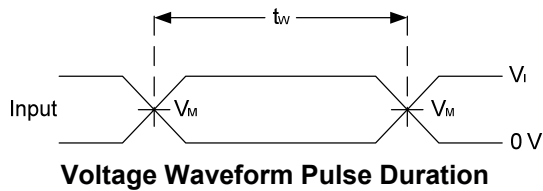
- Notes:
- A. Includes test lead and test apparatus capacitance.
  - B. All pulses are supplied at pulse repetition rate  $\leq 10\text{MHz}$ .
  - C. Inputs are measured separately one transition per measurement.
  - D.  $t_{PLH}$  and  $t_{PHL}$  are the same as  $t_{PD}$ .

## Parameter Measurement Information (Cont.)

From Output  
Under Test



| $V_{CC}$         | Inputs   |              | $V_M$      | $C_L$ | $R_L$        |
|------------------|----------|--------------|------------|-------|--------------|
|                  | $V_I$    | $t_r/t_f$    |            |       |              |
| $1.8V \pm 0.15V$ | $V_{CC}$ | $\leq 2ns$   | $V_{CC}/2$ | 30pF  | 1k $\Omega$  |
| $2.5V \pm 0.2V$  | $V_{CC}$ | $\leq 2ns$   | $V_{CC}/2$ | 30pF  | 500 $\Omega$ |
| $3.3V \pm 0.3V$  | 3V       | $\leq 2.5ns$ | 1.5V       | 50pF  | 500 $\Omega$ |
| $5V \pm 0.5V$    | $V_{CC}$ | $\leq 2.5ns$ | $V_{CC}/2$ | 50pF  | 500 $\Omega$ |

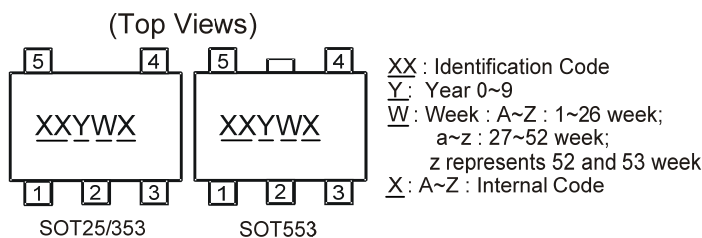


**Figure 2. Load Circuit and Voltage Waveforms**

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

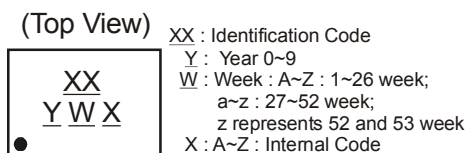
## Marking Information

### (1) SOT25, SOT353 and SOT553



| Part Number   | Package | Identification Code |
|---------------|---------|---------------------|
| 74LVC1G14W5-7 | SOT25   | UP                  |
| 74LVC1G14SE-7 | SOT353  | UP                  |
| 74LVC1G14Z-7  | SOT553  | UP                  |

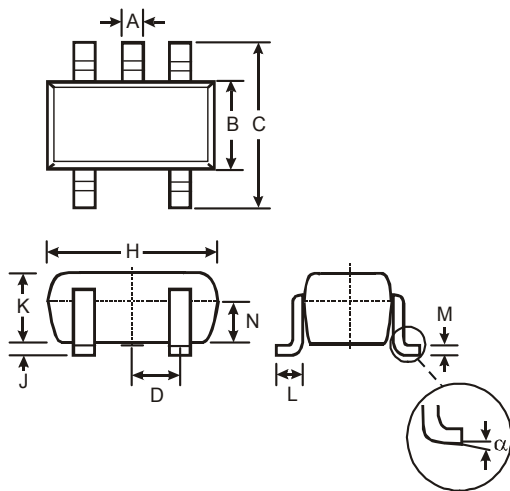
### (2) DFN packages



| Part Number    | Package      | Identification Code |
|----------------|--------------|---------------------|
| 74LVC1G14FS3-7 | X2-DFN0808-4 | WP                  |
| 74LVC1G14FW5-7 | X1-DFN1010-6 | V8                  |
| 74LVC1G14FW4-7 | X2-DFN1010-6 | UP                  |
| 74LVC1G14FX4-7 | X2-DFN1409-6 | MG                  |
| 74LVC1G14FZ4-7 | X2-DFN1410-6 | UP                  |

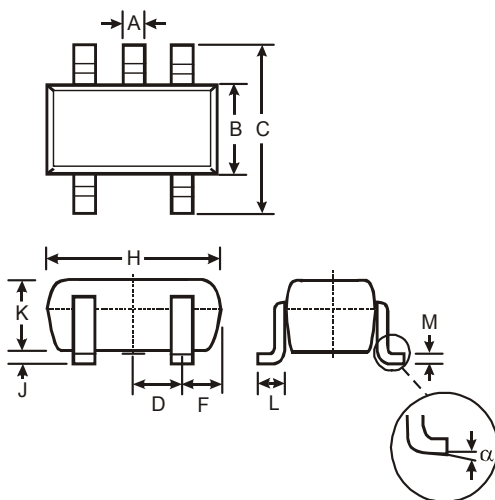
## Package Outline Dimensions (All Dimensions in mm)

### (1) Package Type: SOT25



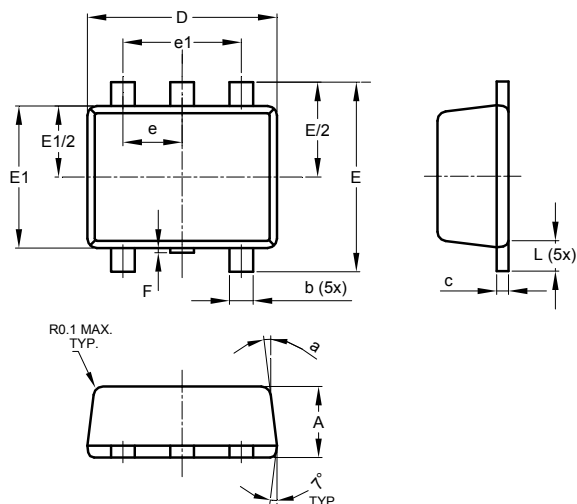
| SOT25                |       |      |      |
|----------------------|-------|------|------|
| Dim                  | Min   | Max  | Typ  |
| A                    | 0.35  | 0.50 | 0.38 |
| B                    | 1.50  | 1.70 | 1.60 |
| C                    | 2.70  | 3.00 | 2.80 |
| D                    | —     | —    | 0.95 |
| H                    | 2.90  | 3.10 | 3.00 |
| J                    | 0.013 | 0.10 | 0.05 |
| K                    | 1.00  | 1.30 | 1.10 |
| L                    | 0.35  | 0.55 | 0.40 |
| M                    | 0.10  | 0.20 | 0.15 |
| N                    | 0.70  | 0.80 | 0.75 |
| $\alpha$             | 0°    | 8°   | —    |
| All Dimensions in mm |       |      |      |

### (2) Package Type: SOT353



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

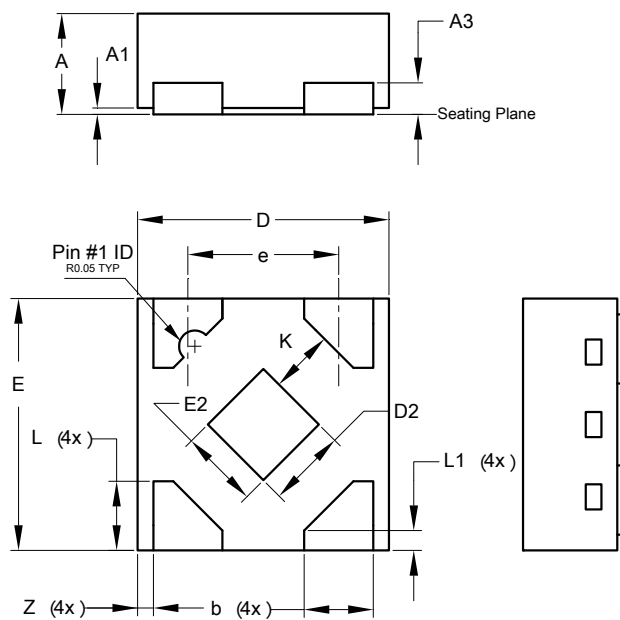
### (3) Package Type: SOT553



| SOT553               |          |      |      |
|----------------------|----------|------|------|
| Dim                  | Min      | Max  | Typ  |
| A                    | 0.55     | 0.62 | 0.60 |
| b                    | 0.15     | 0.30 | 0.20 |
| c                    | 0.10     | 0.18 | 0.15 |
| D                    | 1.50     | 1.70 | 1.60 |
| E                    | 1.55     | 1.70 | 1.60 |
| E1                   | 1.10     | 1.25 | 1.20 |
| e                    | 0.50 BSC |      |      |
| e1                   | 1.00 BSC |      |      |
| F                    | 0.00     | 0.10 | —    |
| L                    | 0.10     | 0.30 | 0.20 |
| a                    | 6°       | 8°   | 7°   |
| All Dimensions in mm |          |      |      |

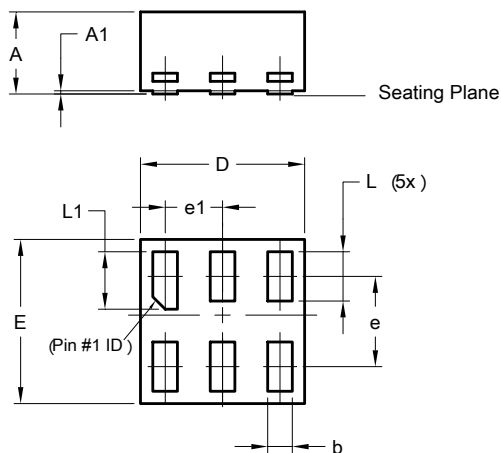
## Package Outline Dimensions (cont.)

### (4) Package Type X2-DFN0808-4



| 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 |      |      |      |

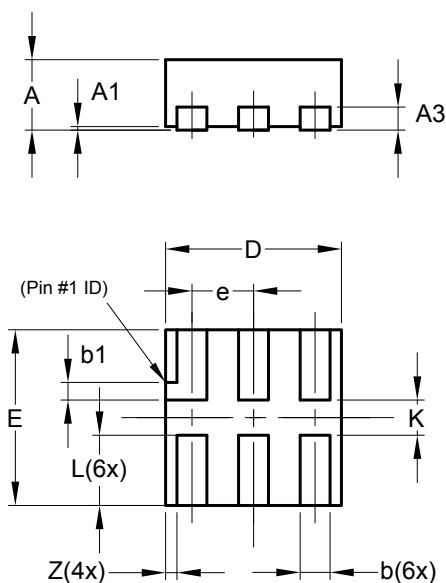
### (5) Package Type: X1-DFN1010-6



| X1-DFN1010-6         |          |       |      |
|----------------------|----------|-------|------|
| 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                    | 0.55 BSC |       |      |
| e1                   | 0.35 BSC |       |      |
| L                    | 0.27     | 0.35  | 0.30 |
| L1                   | 0.32     | 0.40  | 0.35 |
| All Dimensions in mm |          |       |      |

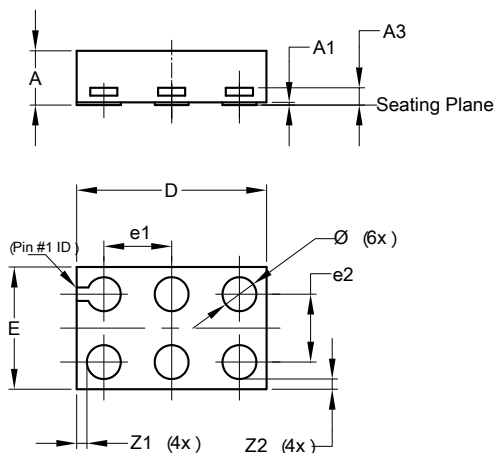
## Package Outline Dimensions (cont.)

### (6) Package Type X2-DFN1010-6



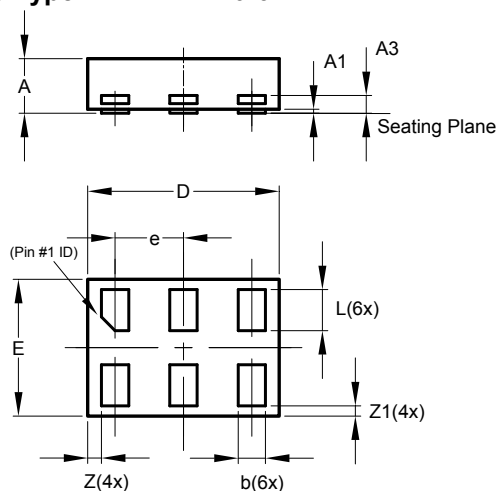
| X2-DFN1010-6         |      |      |       |
|----------------------|------|------|-------|
| Dim                  | Min  | Max  | Typ   |
| A                    | —    | 0.40 | 0.39  |
| A1                   | 0.00 | 0.05 | 0.02  |
| A3                   | —    | —    | 0.13  |
| b               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

### (7) Package Type: X2-DFN1409-6 6 CHIP SCALE ALTERNATIVE



| 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 |      |      |       |

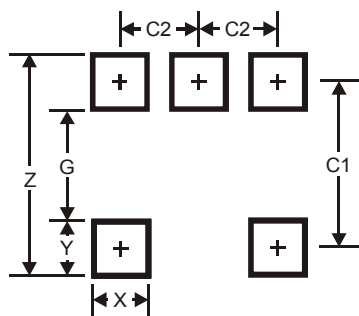
### (8) Package Type: X2-DFN1410-6



| 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 |       |       |       |

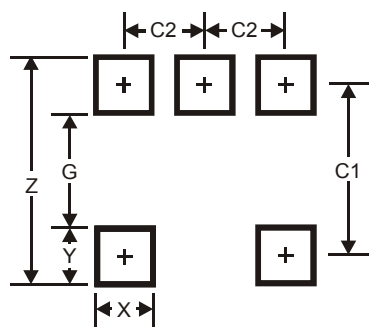
## Suggested Pad Layout

### (1) Package Type: SOT25



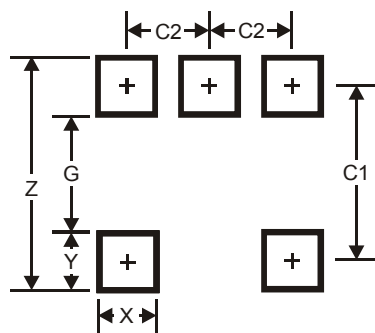
| Dimensions | Value (in mm) |
|------------|---------------|
| Z          | 3.20          |
| G          | 1.60          |
| X          | 0.55          |
| Y          | 0.80          |
| C1         | 2.40          |
| C2         | 0.95          |

### (2) Package Type: SOT353



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

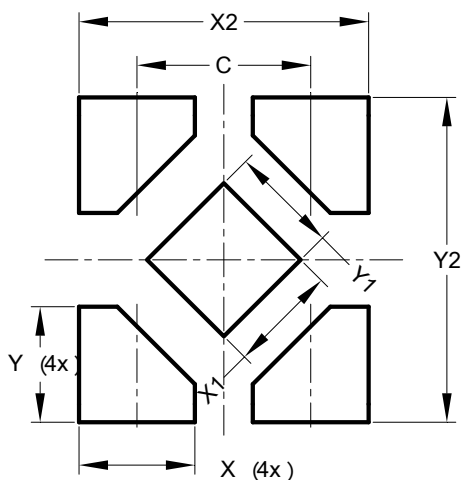
### (3) Package Type: SOT553



| Dimensions | Value (in mm) |
|------------|---------------|
| Z          | 2.2           |
| G          | 1.2           |
| X          | 0.375         |
| Y          | 0.5           |
| C1         | 1.7           |
| C2         | 0.5           |

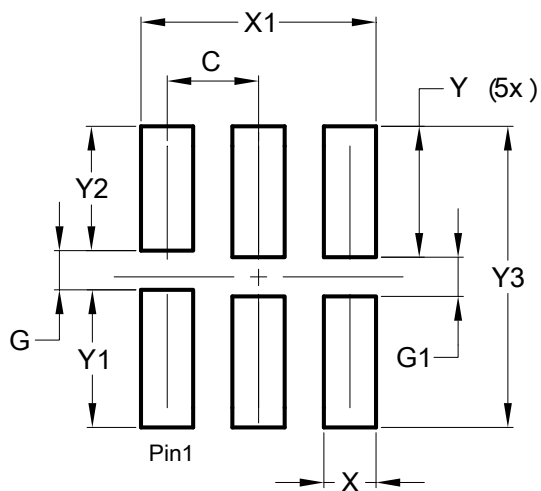
## Suggested Pad Layout (cont.)

### (4) Package Type X2-DFN0808-4

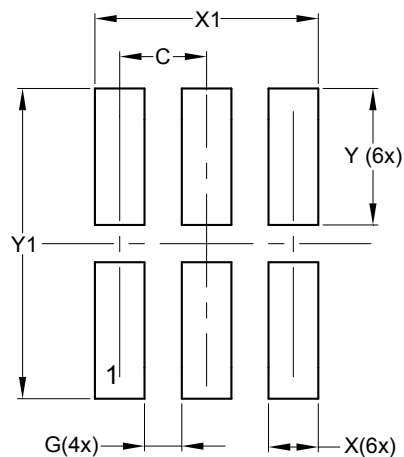


| Dimensions | Value (in mm) |
|------------|---------------|
| C          | 0.480         |
| X          | 0.320         |
| X1         | 0.300         |
| X2         | 0.800         |
| Y          | 0.320         |
| Y1         | 0.300         |
| Y2         | 0.900         |

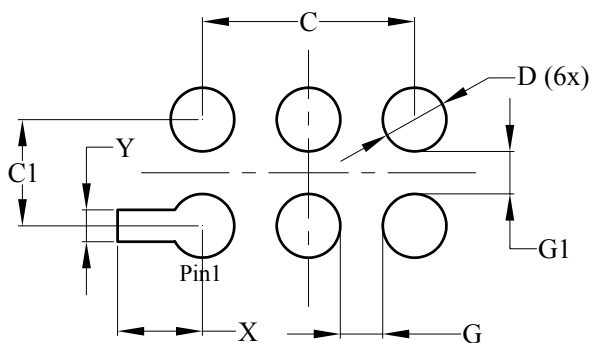
### (5) Package Type X1-DFN1010-6



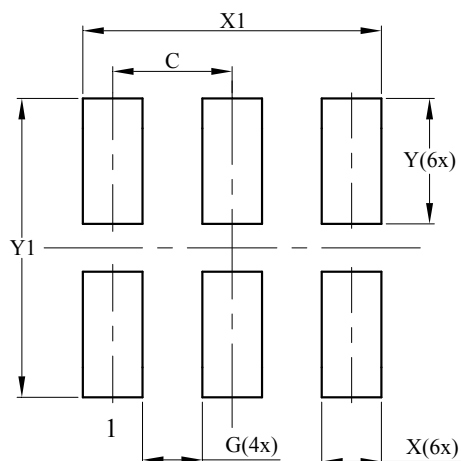
| Dimensions | Value (in mm) |
|------------|---------------|
| C          | 0.350         |
| G          | 0.150         |
| G1         | 0.150         |
| X          | 0.200         |
| X1         | 0.900         |
| Y          | 0.500         |
| Y1         | 0.525         |
| Y2         | 0.475 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

**Suggested Pad Layout (cont.)**
**(6) (Package Type X2-DFN1010-6)**


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

**(7) Package Type: X2-DFN1409-6**


| 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         |

**(8) Package Type: 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         |

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