

Description

The 74LVC2G34 is a dual buffer gate with standard push-pull outputs. 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:

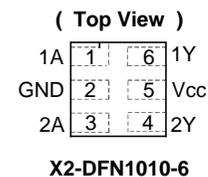
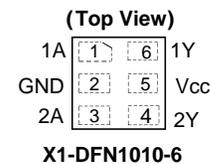
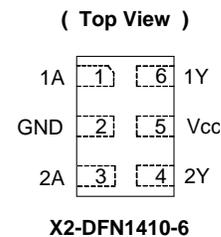
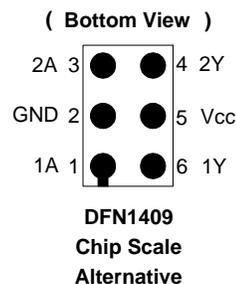
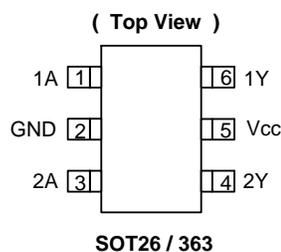
$$Y = A$$

Features

- Wide Supply Voltage Range from 1.65V to 5.5V
- ±24mA Output Drive at 3.0V
- CMOS Low Power Consumption
- I_{OFF} Supports Partial-Power-Down Mode Operation
- Inputs Accept up to 5.5V
- ESD Protection Tested per JESD 22
 - Exceeds 200-V Machine Model (A115)
 - Exceeds 2000-V Human Body Model (A114)
 - Exceeds 1000-V Charged Device Model (C101)
- Latch-Up Exceeds 100mA per JESD 78, Class I
- DFN1409 Package Designed as a Direct Replacement for Chip Scale Packaging
- Range of Package Options SOT26, SOT363, X1-DFN1010-6, X2-DFN1010-6, X2-DFN1409-6, and X2-DFN1410-6
- Leadless Packages Named per JESD30E
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

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

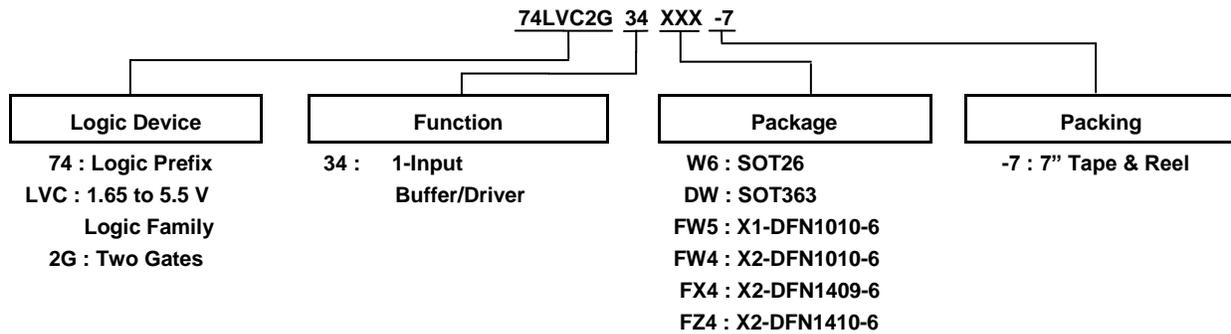
Pin Assignments



Applications

- Voltage Level Shifting
- General Purpose Logic
- Power Down Signal Isolation
- Wide Array of Products Such as:
 - PCs, Networking, Notebooks, Netbooks, Tablets
 - Computer Peripherals, Hard Drives, SSD, CD/DVD ROM
 - TV, DVD, DVR, Set Top Box
 - Cell Phones, Personal Navigation / GPS
 - MP3 Players, Cameras, Video Recorders

Ordering Information



| Device | Package Code | Package (Note 4) | Package Size | 7" Tape and Reel (Note 5) | |
|----------------|--------------|--|--|---------------------------|--------------------|
| | | | | Quantity | Part Number Suffix |
| 74LVC2G34W6-7 | W6 | SOT26 | 2.8mm X 2.2mm X 1.1mm 0.95mm lead pitch | 3000/Tape & Reel | -7 |
| 74LVC2G34DW-7 | DW | SOT363 | 2.0mm X 2.0mm X 1.1mm 0.65mm lead pitch | 3000/Tape & Reel | -7 |
| 74LVC2G34FW5-7 | FW5 | X1-DFN1010-6 | 1.0mm X 1.0mm X 0.5mm 0.35mm pad pitch | 5000/Tape & Reel | -7 |
| 74LVC2G34FW4-7 | FW4 | X2-DFN1010-6 | 1.0mm X 1.0mm X 0.4mm 0.35mm pad pitch | 5000/Tape & Reel | -7 |
| 74LVC2G34FX4-7 | FX4 | X2-DFN1409-6 Chip Scale Alternative | 1.4mm X 0.9mm X 0.4mm 0.5mm pad pitch | 5000/Tape & Reel | -7 |
| 74LVC2G34FZ4-7 | FZ4 | X2-DFN1410-6 | 1.4mm X 1.0mm X 0.4mm 0.5mm pad pitch | 5000/Tape & Reel | -7 |

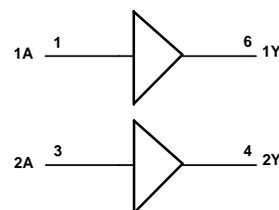
Notes: 4. Pad layout as shown on Diodes Inc. suggested pad layout document AP02001, which can be found on our website at <http://www.diodes.com/datasheets/ap02001.pdf>.

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

Pin Descriptions

| Pin Number | Pin Name | Function |
|------------|-----------------|----------------|
| 1 | 1A | Data Input |
| 2 | GND | Ground |
| 3 | 2A | Data Input |
| 4 | 2Y | Data Output |
| 5 | V _{CC} | Supply Voltage |
| 6 | 1Y | Data Output |

Logic Diagram



Function Table

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

Absolute Maximum Ratings (Notes 6, 7) (@T_A = +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 |
| ESD MM | Machine Model ESD Protection | 200 | V |
| V _{CC} | Supply Voltage Range | -0.5 to +6.5 | V |
| V _I | Input Voltage Range | -0.5 to +6.5 | V |
| V _O | Voltage Applied to Output in High Impedance or I _{OFF} State | -0.5 to +6.5 | V |
| V _O | Voltage Applied to Output in High or Low State | -0.3 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 | -50 | mA |
| — | Continuous Current through V _{DD} or GND | ±100 | mA |
| T _J | Operating Junction Temperature | -40 to +150 | °C |
| T _{STG} | Storage Temperature | -65 to +150 | °C |

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

Recommended Operating Conditions (Note 8) (@T_A = +25°C, unless otherwise specified.)

| Symbol | Parameter | Min | Max | Unit | |
|-----------------|---------------------------|----------------------------------|------------------------|------------------------|----|
| V _{CC} | Operating Voltage | Operating | 1.65 | 5.5 | V |
| | | Data Retention Only | 1.5 | — | V |
| V _{IH} | High-Level Input Voltage | V _{CC} = 1.65V to 1.95V | 0.65 X V _{CC} | — | V |
| | | V _{CC} = 2.3V to 2.7V | 1.7 | — | |
| | | V _{CC} = 3V to 3.6V | 2 | — | |
| | | V _{CC} = 4.5V to 5.5V | 0.7 X V _{CC} | — | |
| V _{IL} | Low-Level Input Voltage | V _{CC} = 1.65V to 1.95V | — | 0.35 X V _{CC} | V |
| | | V _{CC} = 2.3V to 2.7V | — | 0.7 | |
| | | V _{CC} = 3V to 3.6V | — | 0.8 | |
| | | V _{CC} = 4.5V to 5.5V | — | 0.3 X V _{CC} | |
| V _I | Input Voltage | 0 | 5.5 | V | |
| V _O | Output Voltage | 0 | V _{CC} | V | |
| I _{OH} | High-Level Output Current | V _{CC} = 1.65V | — | -4 | mA |
| | | V _{CC} = 2.3V | — | -8 | |
| | | V _{CC} = 3V | — | -16 | |
| | | V _{CC} = 4.5V | — | -24 | |
| | | | | -32 | |

Recommended Operating Conditions (Note 8) (@T_A = +25°C, unless otherwise specified.)

| Symbol | Parameter | Min | Max | Unit | |
|-----------------|------------------------------------|---|-----|------|------|
| I _{OL} | Low-Level Output Current | V _{CC} = 1.65V | — | 4 | mA |
| | | V _{CC} = 2.3V | — | 8 | |
| | | V _{CC} = 3V | — | 16 | |
| | | | — | 24 | |
| | | V _{CC} = 4.5V | — | 32 | |
| Δt/ΔV | Input Transition Rise or Fall Rate | V _{CC} = 1.8V ± 0.15V, 2.5V ± 0.2V | — | 20 | ns/V |
| | | V _{CC} = 3.3V ± 0.3V | — | 10 | |
| | | V _{CC} = 5V ± 0.5V | — | 5 | |
| T _A | Operating Free-air Temperature | — | -40 | +125 | °C |

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

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

| Symbol | Parameter | Test Conditions | V _{CC} | +40°C to +85°C | | -40°C to +125°C | | Unit | |
|------------------|----------------------------|--|-----------------|-----------------------|------|-----------------------|------|------|------|
| | | | | Min | Max | Min | Max | | |
| V _{OH} | High-Level Output Voltage | I _{OH} = -100μA | 1.65V to 5.5V | V _{CC} - 0.1 | — | V _{CC} - 0.1 | — | V | |
| | | I _{OH} = -4mA | 1.65V | 1.2 | — | 0.95 | — | | |
| | | I _{OH} = -8mA | 2.3V | 1.9 | — | 1.7 | — | | |
| | | I _{OH} = -16mA | 3V | 2.4 | — | 1.9 | — | | |
| | | | | 2.3 | — | 2.0 | — | | |
| | | I _{OH} = -32mA | 4.5V | 3.8 | — | 3.4 | — | | |
| V _{OL} | Low-Level Output Voltage | I _{OL} = 100μA | 1.65V to 5.5V | — | 0.1 | — | 0.1 | V | |
| | | I _{OL} = 4mA | 1.65V | — | 0.45 | — | 0.70 | | |
| | | I _{OL} = 8mA | 2.3V | — | 0.3 | — | 0.45 | | |
| | | I _{OL} = 16mA | 3V | — | — | 0.4 | — | | 0.60 |
| | | | | — | — | 0.55 | — | | 0.80 |
| | | I _{OL} = 24mA | 4.5V | — | 0.55 | — | 0.80 | | |
| I _I | Input Current | V _I = 5.5V or GND | 0 to 5.5V | — | ±5 | — | ±20 | μA | |
| I _{OFF} | Power Down Leakage Current | V _I or V _O = 5.5V | 0 | — | ±10 | — | ±20 | μA | |
| I _{CC} | Supply Current | V _I = 5.5V or GND, I _O = 0 | 1.65V to 5.5V | — | 10 | — | 40 | μA | |
| ΔI _{CC} | Additional Supply Current | Input at V _{CC} - 0.6V | 3V to 5.5V | — | 500 | — | 5000 | μA | |

Package Characteristics (@ $T_A = +25^\circ\text{C}$, $V_{CC} = 3.3\text{V}$, unless otherwise specified.)

| Symbol | Parameter | Package | Conditions | Min | Typ | Max | Unit |
|---------------|--|-------------------------|---|-----|-----|-----|--------------------|
| C_I | Input Capacitance | Typical of All Packages | $V_{CC} = 3.3\text{V}$ $V_I = V_{CC}$ or GND | — | 3.5 | — | pF |
| θ_{JA} | Thermal Resistance Junction-to-Ambient | SOT26 | (Note 9) | — | 204 | — | $^\circ\text{C/W}$ |
| | | SOT363 | | — | 371 | — | |
| | | X2-DFN1410-6 | | — | 430 | — | |
| | | X2-DFN1409-6 | | — | 450 | — | |
| | | X1-DFN1010-6 | | — | 495 | — | |
| | | X2-DFN1010-6 | | — | 510 | — | |
| θ_{JC} | Thermal Resistance Junction-to-Case | SOT26 | (Note 9) | — | 52 | — | $^\circ\text{C/W}$ |
| | | SOT363 | | — | 143 | — | |
| | | X2-DFN1410-6 | | — | 190 | — | |
| | | X2-DFN1409-6 | | — | 225 | — | |
| | | X1-DFN1010-6 | | — | 245 | — | |
| | | X2-DFN1010-6 | | — | 250 | — | |

Note: 9. Test condition for all packages: Device mounted on FR-4 substrate PC board, 2oz copper with minimum recommended pad layout.

Switching Characteristics

$T_A = -40^\circ\text{C}$ to $+85^\circ\text{C}$, $C_L = 30$ or 50pF (see Figure 1)

| Parameter | From (Input) | To (Output) | $V_{CC} = 1.8\text{V} \pm 0.15\text{V}$ | | $V_{CC} = 2.5\text{V} \pm 0.2\text{V}$ | | $V_{CC} = 3.3\text{V} \pm 0.3\text{V}$ | | $V_{CC} = 5\text{V} \pm 0.5\text{V}$ | | Unit |
|-----------|--------------|-------------|---|-----|--|-----|--|-----|--------------------------------------|-----|------|
| | | | Min | Max | Min | Max | Min | Max | Min | Max | |
| t_{PD} | A | Y | 0.5 | 8.6 | 0.5 | 4.4 | 0.5 | 4.1 | 0.5 | 3.2 | ns |

$T_A = -40^\circ\text{C}$ to $+125^\circ\text{C}$, $C_L = 30$ or 50pF (see Figure 1)

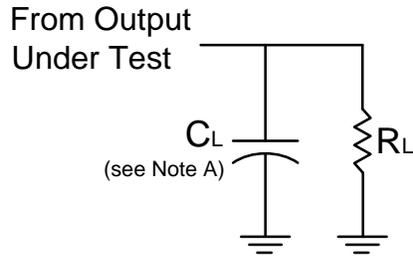
| Parameter | From (Input) | To (Output) | $V_{CC} = 1.8\text{V} \pm 0.15\text{V}$ | | $V_{CC} = 2.5\text{V} \pm 0.2\text{V}$ | | $V_{CC} = 3.3\text{V} \pm 0.3\text{V}$ | | $V_{CC} = 5\text{V} \pm 0.5\text{V}$ | | Unit |
|-----------|--------------|-------------|---|------|--|-----|--|-----|--------------------------------------|-----|------|
| | | | Min | Max | Min | Max | Min | Max | Min | Max | |
| t_{PD} | A | Y | 0.5 | 10.8 | 0.5 | 5.5 | 0.5 | 5.1 | 0.5 | 4.0 | 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 $f = 10\text{MHz}$ | 17 | 19 | 20 | 21 | pF |

Parameter Measurement Information



| V _{CC} | Inputs | | V _M | C _L | R _L |
|-----------------|-----------------|--------------------------------|--------------------|----------------|----------------|
| | V _I | t _r /t _f | | | |
| 1.8V±0.15V | V _{CC} | ≤2ns | V _{CC} /2 | 30pF | 1kΩ |
| 2.5V±0.2V | V _{CC} | ≤2ns | V _{CC} /2 | 30pF | 500Ω |
| 3.3V±0.3V | 3V | ≤2.5ns | 1.5V | 50pF | 500Ω |
| 5V±0.5V | V _{CC} | ≤2.5ns | V _{CC} /2 | 50pF | 500Ω |

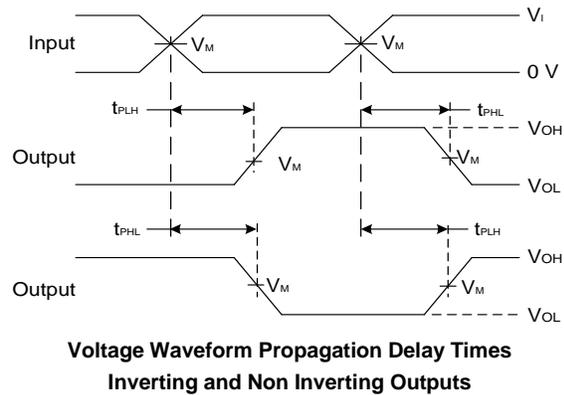
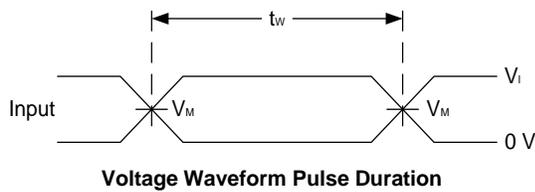


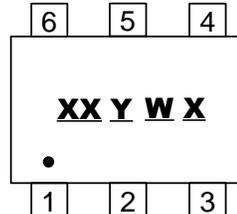
Figure 1. Load Circuit and Voltage Waveforms

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

Marking Information

(1) SOT26, SOT363

(Top View)

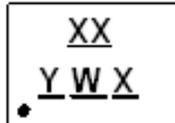


XX : Identification Code
Y : Year 0~9
W : Week : A~Z : 1~26 Week;
a~z : 27~52 Week; z Represents
52 and 53 Week
X : A~Z : Internal Code

| Part Number | Package | Identification Code |
|---------------|---------|---------------------|
| 74LVC2G34W6-7 | SOT26 | Z7 |
| 74LVC2G34DW-7 | SOT363 | Z7 |

(2) X1-DFN1010-6, X2-DFN1010-6, X2-DFN1409-6, X2-DFN1410-6

(Top View)

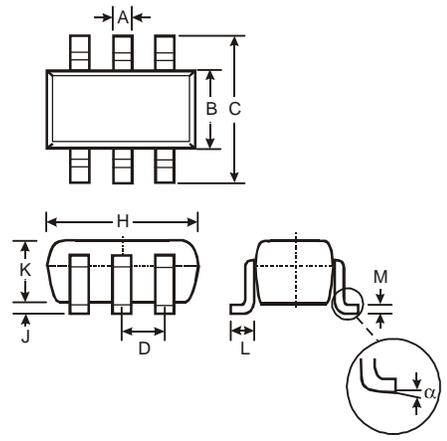


XX : Identification Code
Y : Year 0~9
W : Week : A~Z : 1~26 Week;
a~z : 27~52 Week; z Represents
52 and 53 Week
X : A~Z : Internal Code

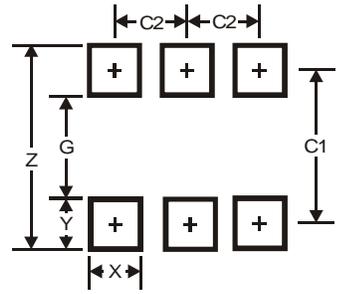
| Part Number | Package | Identification Code |
|----------------|--------------|---------------------|
| 74LVC2G34FW4-7 | X2-DFN1010-6 | Z7 |
| 74LVC2G34FW5-7 | X1-DFN1010-6 | W7 |
| 74LVC2G34FX4-7 | X2-DFN1409-6 | X7 |
| 74LVC2G34FZ4-7 | X2-DFN1410-6 | Z7 |

SOT26 Package Outline Dimensions and Suggested Pad Layout

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



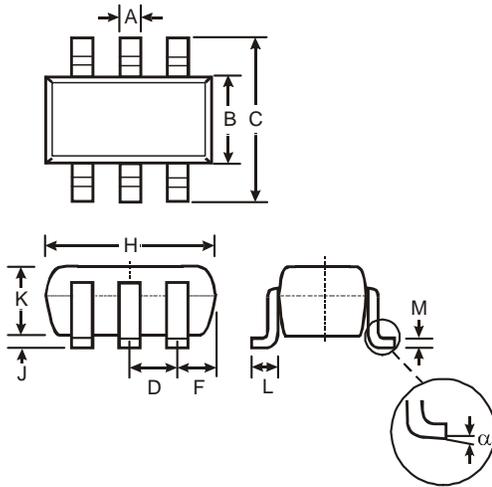
| SOT26 | | | |
|----------------------|-------|------|------|
| Dim | Min | Max | Typ |
| A | 0.35 | 0.50 | 0.38 |
| B | 1.50 | 1.70 | 1.60 |
| C | 2.70 | 3.00 | 2.80 |
| D | — | — | 0.95 |
| H | 2.90 | 3.10 | 3.00 |
| J | 0.013 | 0.10 | 0.05 |
| K | 1.00 | 1.30 | 1.10 |
| L | 0.35 | 0.55 | 0.40 |
| M | 0.10 | 0.20 | 0.15 |
| α | 0° | 8° | — |
| All Dimensions in mm | | | |



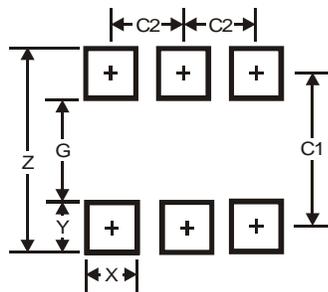
| Dimensions | Value (in mm) |
|------------|---------------|
| Z | 3.20 |
| G | 1.60 |
| X | 0.55 |
| Y | 0.80 |
| C1 | 2.40 |
| C2 | 0.95 |

SOT363 Package Outline Dimensions and Suggested Pad Layout

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



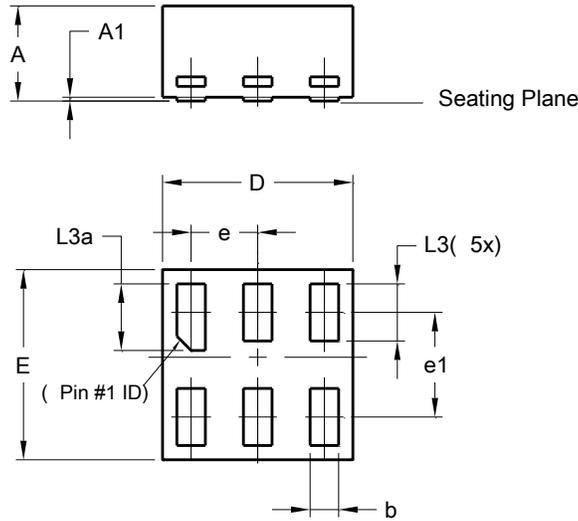
| SOT363 | | | |
|-----------------------------|----------|------|-------|
| Dim | Min | Max | Typ |
| A | 0.10 | 0.30 | 0.25 |
| B | 1.15 | 1.35 | 1.30 |
| C | 2.00 | 2.20 | 2.10 |
| D | 0.65 Typ | | |
| F | 0.40 | 0.45 | 0.425 |
| H | 1.80 | 2.20 | 2.15 |
| J | 0 | 0.10 | 0.05 |
| K | 0.90 | 1.00 | 1.00 |
| L | 0.25 | 0.40 | 0.30 |
| M | 0.10 | 0.22 | 0.11 |
| α | 0° | 8° | - |
| All Dimensions in mm | | | |



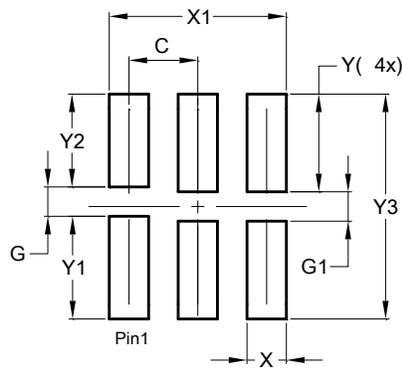
| Dimensions | Value (in mm) |
|------------|---------------|
| Z | 2.5 |
| G | 1.3 |
| X | 0.42 |
| Y | 0.6 |
| C1 | 1.9 |
| C2 | 0.65 |

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.



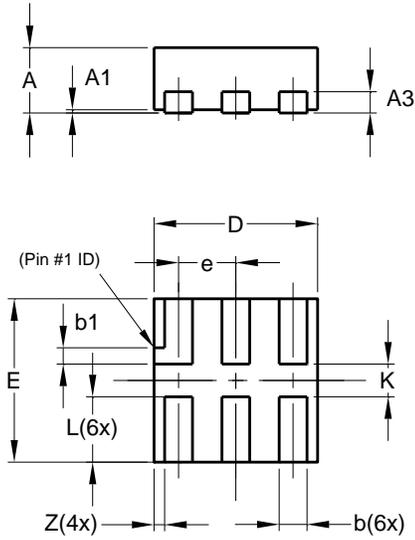
| X1-DFN1010-6 (Type B) | | | |
|-----------------------|----------|-------|------|
| Dim | Min | Max | Typ |
| A | - | 0.50 | 0.39 |
| A1 | - | 0.04 | - |
| b | 0.12 | 0.20 | 0.15 |
| D | 0.95 | 1.050 | 1.00 |
| E | 0.95 | 1.050 | 1.00 |
| e | 0.35 BSC | | |
| e1 | 0.55 BSC | | |
| L3 | 0.27 | 0.30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



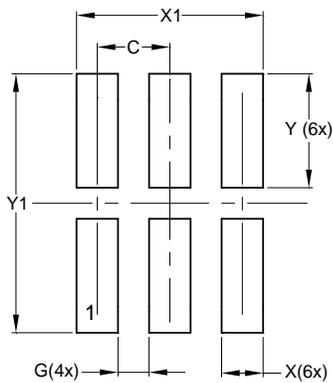
| Dimensions | Value (in mm) |
|------------|---------------|
| C | 0.350 |
| G | 0.150 |
| G1 | 0.150 |
| X | 0.200 |
| X1 | 0.900 |
| Y | 0.500 |
| Y1 | 0.525 |
| Y2 | 0.475 |
| Y3 | 1.150 |

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

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



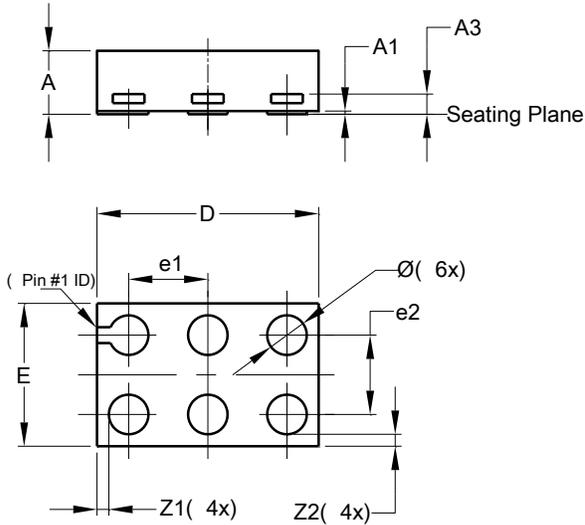
| X2-DFN1010-6 | | | |
|----------------------|------|------|-------|
| Dim | Min | Max | Typ |
| A | — | 0.40 | 0.39 |
| A1 | 0.00 | 0.05 | 0.02 |
| A3 | — | — | 0.13 |
| b | 0.14 | 0.20 | 0.17 |
| b1 | 0.05 | 0.15 | 0.10 |
| D | 0.95 | 1.05 | 1.00 |
| E | 0.95 | 1.05 | 1.00 |
| e | — | — | 0.35 |
|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



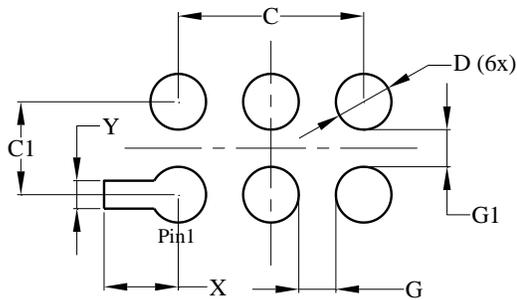
| Dimensions | Value (in mm) |
|------------|---------------|
| C | 0.350 |
| G | 0.150 |
| X | 0.200 |
| X1 | 0.900 |
| Y | 0.550 |
| Y1 | 1.250 |

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.



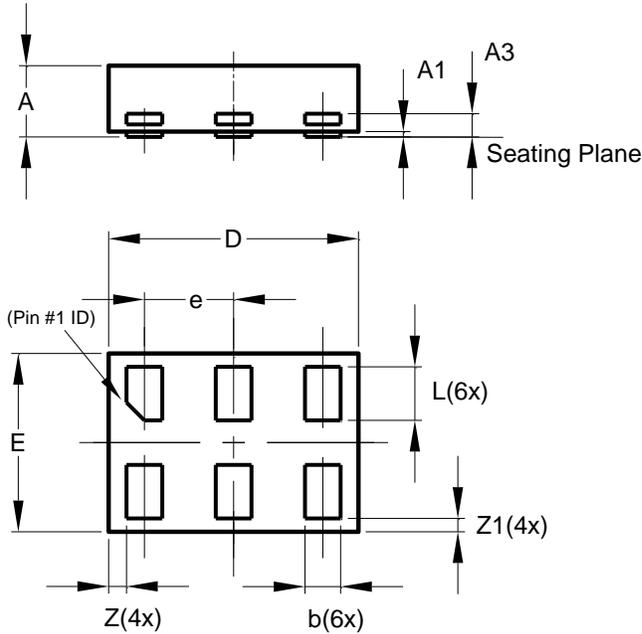
| X2-DFN1409-6 | | | |
|----------------------|------|------|-------|
| Dim | Min | Max | Typ |
| A | — | 0.40 | 0.39 |
| A1 | 0 | 0.05 | 0.02 |
| A3 | — | — | 0.13 |
| Ø | 0.20 | 0.30 | 0.25 |
| D | 1.35 | 1.45 | 1.40 |
| E | 0.85 | 0.95 | 0.90 |
| e1 | — | — | 0.50 |
| e2 | — | — | 0.50 |
| Z1 | —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



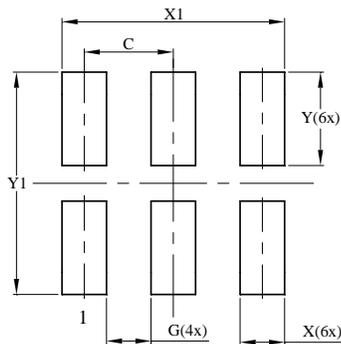
| Dimensions | Value (in mm) |
|------------|---------------|
| C | 1.000 |
| C1 | 0.500 |
| D | 0.300 |
| G | 0.200 |
| G1 | 0.200 |
| X | 0.400 |
| Y | 0.150 |

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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