

Description

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

The 74AUP1G04 is a single inverter 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_{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:

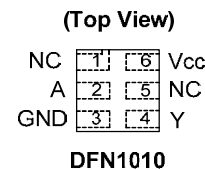
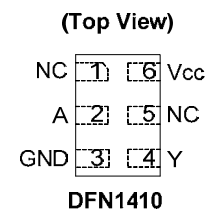
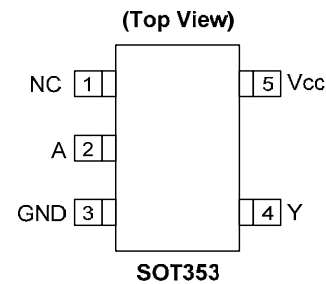
$$Y = \overline{A}$$

Features

- Advanced Ultra Low Power (AUP) CMOS
- Supply Voltage Range from 0.8V to 3.6V
- ± 4 mA Output Drive at 3.0V
- Low Static power consumption
 - I_{CC} < 0.9µA
- Low Dynamic Power Consumption
 - C_{PD} = 6.1pF (Typical at 3.6V)
- Schmitt Trigger Action at All Inputs Make the Circuit Tolerant for Slower Input Rise and Fall Time. The hysteresis is typically 250mV at V_{CC} = 3.0V
- I_{OFF} Supports Partial-Power-Down Mode Operation
- ESD Protection Exceeds JESD 22
 - 2000-V Human Body Model (A114-A)
 - Exceeds 1000-V Charged Device Model (C101C)
- Latch-Up Exceeds 100mA per JESD 78, Class II
- Range of Package Options SOT353, DFN1410, and DFN1010
- Leadless packages per JESD30E
 - DFN1010 denoted as X2-DFN1010-6
 - DFN1014 denoted as X2-DFN1014-6
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

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

Pin Assignments



Applications

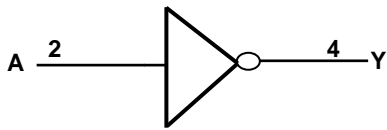
- Suited for battery and low power needs
- Wide array of products such as:
 - Tablets, E-readers
 - Cell Phones, Personal Navigation / GPS
 - MP3 players, Cameras, Video Recorders
 - PCs ultrabooks, notebooks, netbooks,
 - Computer peripherals, hard drives, CD/DVD ROM
 - TV, DVD, DVR, set top box

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

Pin Descriptions

| Pin Name | Function |
|-----------------|----------------|
| NC | No Connection |
| A | Data Input |
| GND | Ground |
| Y | Data Output |
| V _{CC} | Supply Voltage |

Logic Diagram



Function Table

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

Absolute Maximum Ratings (Note 4) (@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 |
| 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}) | ±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 | °C |
| T _{STG} | Storage Temperature | -65 to +150 | °C |

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

Recommended Operating Conditions (Note 5) (@T_A = +25°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 V | -20 | μA |
| | | V _{CC} = 1.1 V | -1.1 | |
| | | V _{CC} = 1.4 V | -1.7 | |
| | | V _{CC} = 1.65 V | -1.9 | |
| | | V _{CC} = 2.3 V | -3.1 | |
| | | V _{CC} = 3.0 V | -4 | |
| I _{OL} | Low-level output current | V _{CC} = 0.8 V | 20 | uA |
| | | V _{CC} = 1.1 V | 1.1 | |
| | | V _{CC} = 1.4 V | 1.7 | |
| | | V _{CC} = 1.65 V | 1.9 | |
| | | V _{CC} = 2.3 V | 3.1 | |
| | | V _{CC} = 3.0 V | 4 | |
| Δt/ΔV | Input transition rise or fall rate | V _{CC} = 0.8 V to 3.6 V | 200 | ns/V |
| T _A | Operating free-air temperature | -40 | +125 | °C |

Note: 5. Unused inputs should be held at V_{CC} or Ground.

Electrical Characteristics

| Symbol | Parameter | Test Conditions | V _{CC} | T _A = +25°C | | T _A = -40°C to +85°C | | Unit |
|-------------------|----------------------------------|---|-----------------|------------------------|------------------------|---------------------------------|------------------------|------|
| | | | | Min | Max | Min | Max | |
| V _{IH} | High-Level Input Voltage | | 0.8V to 1.65V | 0.80 X V _{CC} | | 0.80 X V _{CC} | | V |
| | | | 1.65V to 1.95V | 0.65 X V _{CC} | | 0.65 X 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 X V _{CC} | | 0.30 X V _{CC} | V |
| | | | 1.65V to 1.95V | | 0.35 X V _{CC} | | 0.35 X 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} = -20μA | 0.8V to 3.6V | V _{CC} - 0.1 | | V _{CC} - 0.1 | | V |
| | | I _{OH} = -1.1mA | 1.1V | 0.75 X V _{CC} | | 0.7 X V _{CC} | | |
| | | I _{OH} = -1.7mA | 1.4V | 1.11 | | 1.03 | | |
| | | I _{OH} = -1.9mA | 1.65V | 1.32 | | 1.3 | | |
| | | I _{OH} = -2.3mA | 2.3V | 2.05 | | 1.97 | | |
| | | I _{OH} = -3.1mA | | 1.9 | | 1.85 | | |
| | | I _{OH} = -2.7mA | 3V | 2.72 | | 2.67 | | |
| | | I _{OH} = -4mA | | 2.6 | | 2.55 | | |
| V _{OL} | High-Level Input Voltage | I _{OL} = 20μA | 0.8V to 3.6V | | 0.1 | | 0.1 | V |
| | | I _{OL} = 1.1mA | 1.1V | | 0.3 X V _{CC} | | 0.3 X V _{CC} | |
| | | I _{OL} = 1.7mA | 1.4V | | 0.31 | | 0.37 | |
| | | I _{OL} = 1.9mA | 1.65V | | 0.31 | | 0.35 | |
| | | I _{OL} = 2.3mA | 2.3V | | 0.31 | | 0.33 | |
| | | I _{OL} = 3.1mA | | | 0.44 | | 0.45 | |
| | | I _{OL} = 2.7mA | 3V | | 0.31 | | 0.33 | |
| | | I _{OL} = 4mA | | | 0.44 | | 0.45 | |
| I _I | Input Current | A or B Input V _I = GND to 3.6V | 0V to 3.6V | | ± 0.1 | | ± 0.5 | μA |
| I _{OFF} | Power Down Leakage Current | V _I or V _O = 0V to 3.6V | 0 | | 0.2 | | 0.6 | μA |
| ΔI _{OFF} | Delta Power Down Leakage Current | V _I or V _O = 0V to 3.6V | 0V to 0.2V | | 0.2 | | 0.6 | μA |
| I _{CC} | Supply Current | V _I = GND or V _{CC} I _O = 0 | 0.8V to 3.6V | | 0.5 | | 0.9 | μA |
| ΔI _{CC} | Additional Supply Current | Input at V _{CC} -0.6 | 3.3V | | 40 | | 50 | μA |

Electrical Characteristics (cont.)

| Symbol | Parameter | Test Conditions | V _{CC} | T _A = -40°C to +125°C | | Unit |
|-------------------|----------------------------------|---|-----------------|----------------------------------|------------------------|------|
| | | | | Min | Max | |
| V _{IH} | High-level Input Voltage | | 0.8V to 1.65V | 0.80 X V _{CC} | | V |
| | | | 1.65V to 1.95V | 0.70 X 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 1.65V | | 0.25 X V _{CC} | V |
| | | | 1.65V to 1.95V | | 0.30 X V _{CC} | |
| | | | 2.3V to 2.7V | | 0.7 | |
| | | | 3.0V to 3.6V | | 0.9 | |
| V _{OH} | High Level Output Voltage | I _{OH} = -20μA | 0.8V to 3.6V | V _{CC} - 0.11 | | V |
| | | I _{OH} = -1.1mA | 1.1V | 0.6 X V _{CC} | | |
| | | I _{OH} = -1.7mA | 1.4V | 0.93 | | |
| | | I _{OH} = -1.9mA | 1.65V | 1.17 | | |
| | | I _{OH} = -2.3mA | 2.3V | 1.77 | | |
| | | I _{OH} = -3.1mA | | 1.67 | | |
| | | I _{OH} = -2.7mA | 3V | 2.40 | | |
| | | I _{OH} = -4mA | | 2.30 | | |
| V _{OL} | High-level Input Voltage | I _{OL} = 20μA | 0.8V to 3.6V | | 0.11 | V |
| | | I _{OL} = 1.1mA | 1.1V | | 0.33 X V _{CC} | |
| | | I _{OL} = 1.7mA | 1.4V | | 0.41 | |
| | | I _{OL} = 1.9mA | 1.65V | | 0.39 | |
| | | I _{OL} = 2.3mA | 2.3V | | 0.36 | |
| | | I _{OL} = 3.1mA | | | 0.50 | |
| | | I _{OL} = 2.7mA | 3V | | 0.36 | |
| | | I _{OL} = 4mA | | | 0.50 | |
| I _I | Input Current | A or B Input V _I = GND to 3.6V | 0V to 3.6V | | ± 0.75 | μA |
| I _{OFF} | Power Down Leakage Current | V _I or V _O = 0V to 3.6V | 0V | | ± 3.5 | μA |
| ΔI _{OFF} | Delta Power Down Leakage Current | V _I or V _O = 0V to 3.6V | 0V to 0.2V | | ± 2.5 | μA |
| I _{CC} | Supply Current | V _I = GND or V _{CC} , I _O = 0 | 0.8V to 3.6V | | 3.0 | μA |
| ΔI _{CC} | Additional Supply Current | Input at V _{CC} -0.6V Other inputs at V _{CC} or GND | 3.3V | | 75 | μA |

Switching Characteristics

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

| Parameter | From Input | TO OUTPUT | V _{CC} | T _A = +25°C | | | T _A = -40°C to +85°C | | T _A = -40°C to +125°C | | Unit |
|-----------------|------------|-----------|-----------------|------------------------|------|------|---------------------------------|------|----------------------------------|------|------|
| | | | | Min | Typ | Max | Min | Max | Min | Max | |
| t _{pd} | A or B | Y | 0.8V | | 16.0 | | | | | | ns |
| | | | 1.2V ± 0.1V | 2.4 | 5.0 | 10.3 | 2.1 | 14.1 | 2.1 | 14.1 | |
| | | | 1.5V ± 0.1V | 1.8 | 3.6 | 6.4 | 1.6 | 7.4 | 1.6 | 8.2 | |
| | | | 1.8V ± 0.15V | 1.5 | 2.9 | 5.0 | 1.4 | 5.9 | 1.4 | 6.5 | |
| | | | 2.5V ± 0.2V | 1.2 | 2.4 | 3.9 | 1.1 | 4.5 | 1.1 | 5.0 | |
| | | | 3.3V ± 0.3V | 1.1 | 2.1 | 3.2 | 1.1 | 3.9 | 1.1 | 4.3 | |

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

| Parameter | From Input | TO OUTPUT | V _{CC} | T _A = +25°C | | | T _A = -40°C to +85°C | | T _A = -40°C to +125°C | | Unit |
|-----------------|------------|-----------|-----------------|------------------------|------|------|---------------------------------|------|----------------------------------|------|------|
| | | | | Min | Typ | Max | Min | Max | Min | Max | |
| t _{pd} | A or B | Y | 0.8V | | 19.8 | | | | | | ns |
| | | | 1.2V ± 0.1V | 2.8 | 5.9 | 12.2 | 2.6 | 17.0 | 2.6 | 17.0 | |
| | | | 1.5V ± 0.1V | 2.3 | 4.2 | 7.5 | 2.1 | 8.7 | 2.1 | 9.6 | |
| | | | 1.8V ± 0.15V | 2.0 | 3.5 | 5.9 | 1.8 | 7.0 | 1.8 | 7.7 | |
| | | | 2.5V ± 0.2V | 1.7 | 2.9 | 4.6 | 1.5 | 5.4 | 1.5 | 6.0 | |
| | | | 3.3V ± 0.3V | 1.4 | 2.7 | 3.8 | 1.4 | 4.5 | 1.4 | 5.0 | |

$C_L = 15\text{pF}$ see Figure 1

| Parameter | From Input | TO OUTPUT | V _{CC} | T _A = +25°C | | | T _A = -40°C to +85°C | | T _A = -40°C to +125°C | | Unit |
|-----------------|------------|-----------|-----------------|------------------------|------|------|---------------------------------|------|----------------------------------|------|------|
| | | | | Min | Typ | Max | Min | Max | Min | Max | |
| t _{pd} | A or B | Y | 0.8V | | 23.3 | | | | | | ns |
| | | | 1.2V ± 0.1V | 3.2 | 8.0 | 14.0 | 3.0 | 26.0 | 3.0 | 26.0 | |
| | | | 1.5V ± 0.1V | 2.6 | 7.5 | 9.0 | 2.4 | 10.0 | 2.4 | 11.0 | |
| | | | 1.8V ± 0.15V | 2.3 | 5.2 | 6.7 | 2.1 | 8.0 | 2.1 | 8.8 | |
| | | | 2.5V ± 0.2V | 2.1 | 3.1 | 5.1 | 1.8 | 6.1 | 1.8 | 6.8 | |
| | | | 3.3V ± 0.3V | 1.8 | 3.1 | 4.2 | 1.8 | 5.0 | 1.8 | 5.5 | |

$C_L = 30\text{pF}$ see Figure 1

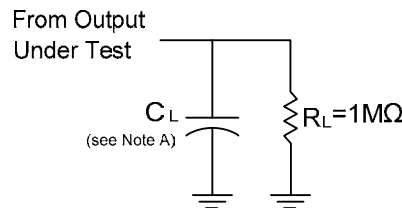
| Parameter | From Input | TO OUTPUT | V _{CC} | T _A = +25°C | | | T _A = -40°C to +85°C | | T _A = -40°C to +125°C | | Unit |
|-----------------|------------|-----------|-----------------|------------------------|------|------|---------------------------------|------|----------------------------------|------|------|
| | | | | Min | Typ | Max | Min | Max | Min | Max | |
| t _{pd} | A or B | Y | 0.8V | | 33.6 | | | | | | ns |
| | | | 1.2V ± 0.1V | 4.4 | 13.0 | 18.0 | 4.0 | 27.0 | 4.0 | 27.0 | |
| | | | 1.5V ± 0.1V | 3.6 | 6.3 | 12.0 | 3.2 | 13.8 | 3.2 | 14.2 | |
| | | | 1.8V ± 0.15V | 3.2 | 5.3 | 9.0 | 2.9 | 10.5 | 2.9 | 11.6 | |
| | | | 2.5V ± 0.2V | 2.9 | 4.5 | 6.5 | 2.6 | 7.6 | 2.6 | 8.4 | |
| | | | 3.3V ± 0.3V | 2.1 | 4.2 | 5.4 | 2.1 | 6.2 | 2.1 | 6.9 | |

Operating and Package Characteristics (@T_A = +25°C, unless otherwise specified.)

| Parameter | | Test Conditions | | V _{CC} | Typ | Unit |
|-----------------|--|---|----------|-----------------|-----|------|
| C _{pd} | Power Dissipation Capacitance | f = 1MHz No Load | | 0.8V | 6.5 | pF |
| | | | | 1.2V ± 0.1V | 6.3 | |
| | | | | 1.5V ± 0.1V | 6.3 | |
| | | | | 1.8V ± 0.15V | 6.2 | |
| | | | | 2.5V ± 0.2V | 6.2 | |
| | | | | 3.3V ± 0.3V | 6.1 | |
| C _i | Input Capacitance | V _i = V _{CC} or GND | | 0V or 3.3V | 1.5 | pF |
| θ _{JA} | Thermal Resistance Junction-to-Ambient | SOT353 | (Note 6) | | 371 | °C/W |
| | | X2-DFN1410-6 | | 430 | | |
| | | X2-DFN1010-6 | | 445 | | |
| θ _{JC} | Thermal Resistance Junction-to-Case | SOT353 | (Note 6) | | 143 | °C/W |
| | | X2-DFN1410-6 | | 190 | | |
| | | X2-DFN1010-6 | | 250 | | |

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

Parameter Measurement Information



| V _{CC} | Inputs | | V _M | C _L |
|-----------------|-----------------|--------------------------------|--------------------|-----------------|
| | V _i | t _r /t _f | | |
| 0.8V | V _{CC} | ≤3ns | V _{CC} /2 | 5, 10, 15, 30pF |
| 1.2V±0.1V | V _{CC} | ≤3ns | V _{CC} /2 | 5, 10, 15, 30pF |
| 1.5V±0.1V | V _{CC} | ≤3ns | V _{CC} /2 | 5, 10, 15, 30pF |
| 1.8V±0.15V | V _{CC} | ≤3ns | V _{CC} /2 | 5, 10, 15, 30pF |
| 2.5V±0.2V | V _{CC} | ≤3ns | V _{CC} /2 | 5, 10, 15, 30pF |
| 3.3V±0.3V | V _{CC} | ≤3ns | V _{CC} /2 | 5, 10, 15, 30pF |

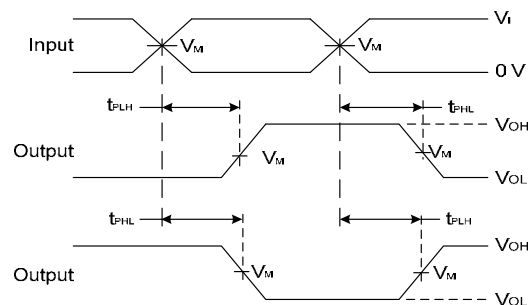
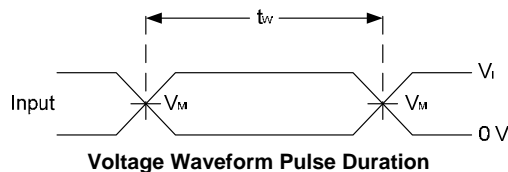
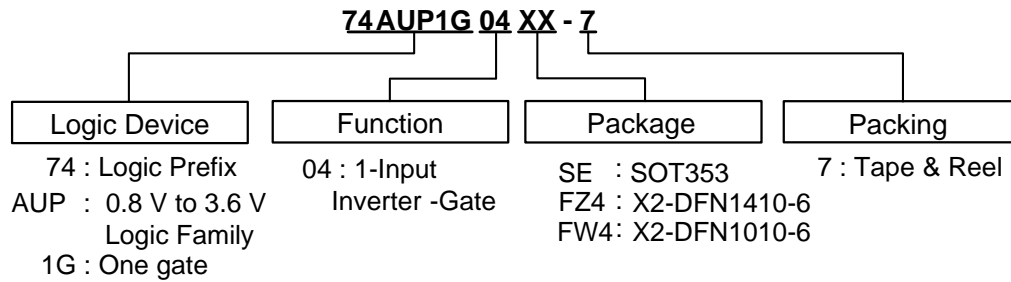


Figure 1. Load Circuit and Voltage Waveforms

- 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}.

Ordering Information

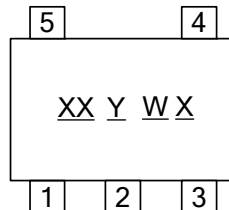


| Part Number | Package Code | Packaging | 7" Tape and Reel | |
|----------------|--------------|--------------|------------------|--------------------|
| | | | Quantity | Part Number Suffix |
| 74AUP1G04SE-7 | SE | SOT353 | 3000/Tape & Reel | -7 |
| 74AUP1G04FZ4-7 | FZ4 | X2-DFN1410-6 | 5000/Tape & Reel | -7 |
| 74AUP1G04FW4-7 | FW4 | X2-DFN1010-6 | 5000/Tape & Reel | -7 |

Marking Information

(1) SOT353

(Top View)

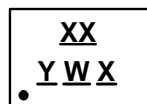


XX : Identification code
Y : Year 0~9
W : Week : A~Z : 1~26 week;
a~z : 27~52 week; z represents
52 and 53 week
X : A~Z : Internal code

| Part Number | Package | Identification Code |
|-------------|---------|---------------------|
| 74AUP1G04SE | SOT353 | XK |

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

(Top View)



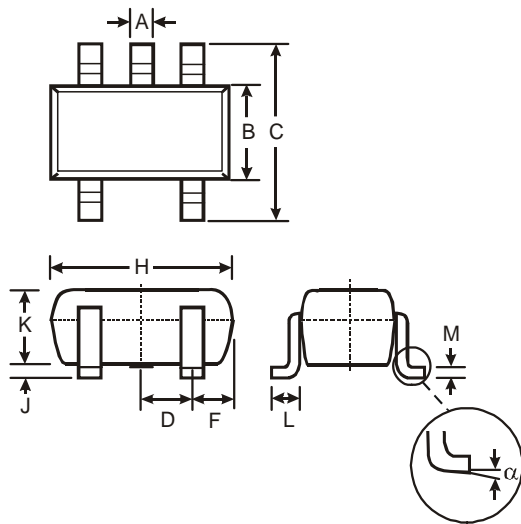
XX : Identification Code
Y : Year : 0~9
W : Week : A~Z : 1~26 week;
a~z : 27~52 week; z represents
52 and 53 week
X : A~Z : Internal code

| Part Number | Package | Identification Code |
|--------------|--------------|---------------------|
| 74AUP1G04FZ4 | X2-DFN1410-6 | XK |
| 74AUP1G04FW4 | X2-DFN1010-6 | XK |

Package Outline Dimensions (All dimensions in mm.)

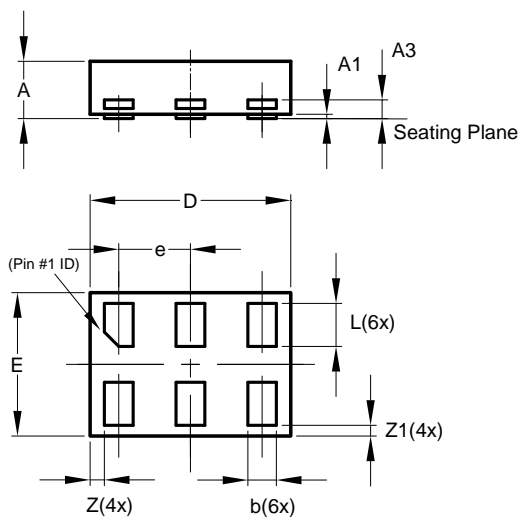
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.

(1) SOT353



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

(2) X2-DFN1410-6

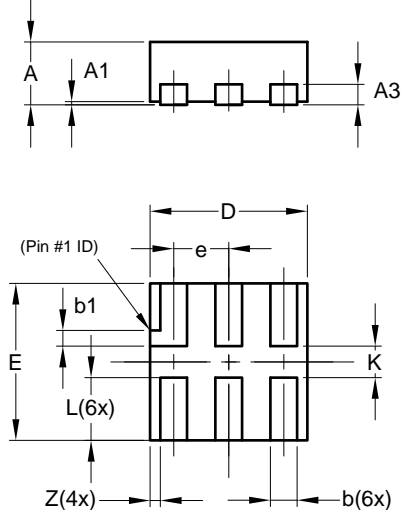


| X2-DFN1410-6 | | | |
|----------------------|-------|-------|-------|
| Dim | Min | Max | Typ |
| A | — | 0.40 | 0.39 |
| A1 | 0.00 | 0.05 | 0.02 |
| A3 | — | — | 0.13 |
| b | 0.15 | 0.25 | 0.20 |
| D | 1.35 | 1.45 | 1.40 |
| E | 0.95 | 1.05 | 1.00 |
| e | — | — | 0.50 |
| L | 0.25 | 0.35 | 0.30 |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

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

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

(3) X2-DFN1010-6

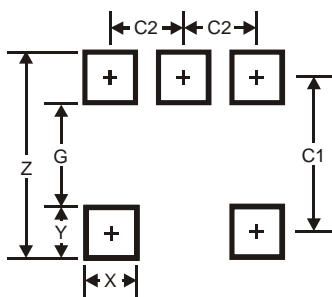


| X2-DFN1010-6 | | | |
|----------------------|------|------|-------|
| Dim | Min | Max | Typ |
| A | — | 0.40 | 0.39 |
| A1 | 0.00 | 0.05 | 0.02 |
| A3 | — | — | 0.13 |
| b | 0.14 | 0.20 | 0.17 |
| b1 | 0.05 | 0.15 | 0.10 |
| D | 0.95 | 1.05 | 1.00 |
| E | 0.95 | 1.05 | 1.00 |
| e | — | — | 0.35 |
|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

Suggested Pad Layout

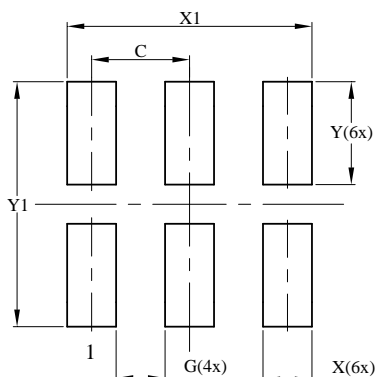
Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version

(1) SOT353



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

(2) X2-DFN1410-6

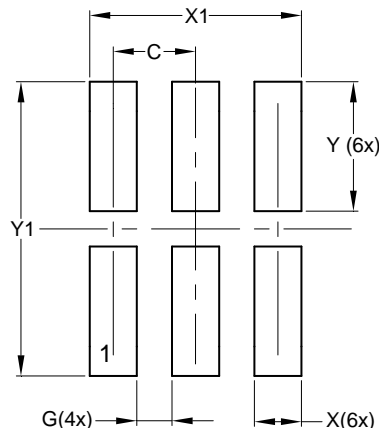


| Dimensions | Value (in mm) |
|------------|---------------|
| C | 0.500 |
| G | 0.250 |
| X | 0.250 |
| X1 | 1.250 |
| Y | 0.525 |
| Y1 | 1.250 |

Suggested Pad Layout (cont.)

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

(3) X2-DFN1010-6



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

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