

SINGLE-BIT DUAL POWER SUPPLY TRANSLATING BUFFER WITH 3 STATE OUTPUTS
Description

The 74AUP1T34 is a single-bit, dual-supply, noninverting buffer translator suitable for transmitting a single logic bit across different voltage domains. It is a unidirectional translator from A to Y. The input pin A has input switching thresholds related to V_{CCA} , operating from 0.9V to 3.6V. The output pin Y has a HIGH level output voltage that tracks V_{CCB} , also operating from 0.9V to 3.6V. This arrangement allows for universal low-voltage translation between any voltages from 0.9V to 3.6V.

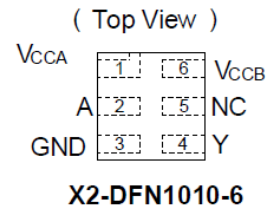
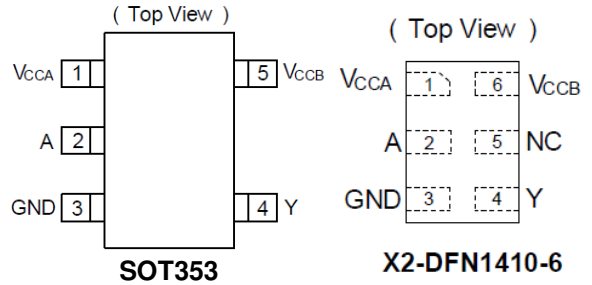
The three-state feature occurs when the V_{CCA} power-supply voltages are zero. This is also an I_{OFF} feature and allows the output to remain in a high-impedance state, preventing damaging backflow currents and providing power-down electrical isolation of up to 3.6V. If the V_{CCB} is at ground, the input circuits at pin A are disabled and no input current flows regardless of any applied voltage between 0V and 3.6V.

The 74AUP1T34 is available in the SOT353, X2-DFN1410-6, and X2-DFN1010-6 packages, and is specified for operation from -40°C to $+125^{\circ}\text{C}$ among all supply voltages. The wide temperature ranges and high ESD tolerance facilitate their use in harsh applications.

Features

- Wide Supply Voltage Range:
 - $V_{CC(A)}$: from 0.9V to 3.6V
 - $V_{CC(B)}$: from 0.9V to 3.6V
- $\pm 6\text{mA}$ Output Drive at 3V
- Low-Static Power Consumption; $I_{CC} = 5\mu\text{A}$ (Maximum)
- High Noise Immunity (100mV Hysteresis Typical)
- I_{OFF} Supports Partial Power-Down Mode Operation
- I_{OFF} Controlled by V_{CCB} Being at 0V
- Input Isolation when V_{CCA} is Ground; No Input Current Even when Floating
- ESD Protection Exceeds JESD 22
 - Exceeds 5000V Human Body Model (A114)
 - Exceeds 1000V Charged Device Model (C101)
- Latch-Up Exceeds 100mA per JESD 78, class II
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **An automotive-compliant part is available under separate datasheet ([74AUP1T34Q](#))**

Notes: 1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
 2. See <https://www.diodes.com/quality/lead-free/> 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

- Voltage level translation:
 - Well suited to join logic types operating at different voltages
- Power-down signal isolation:
 - When $V_{CCA} = \text{GND}$ output is three-state
 - When $V_{CCB} = \text{GND}$ input is disabled and may be left floating
- Wide array of products such as:
 - Cell phones, tablets, e-readers
 - PCs, notebooks, netbooks, ultrabooks
 - Networking, routers, gateways
 - Personal electronics
 - Telecommunications
 - Industrial devices

Pin Descriptions

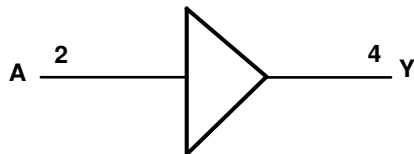
| Pin Name | Pin SOT353 | Pin X2-DFN1410-6 | Pin X2-DFN1010-6 | Function |
|------------------|------------|------------------|------------------|--|
| V _{CCA} | 1 | 1 | 1 | Supply for pin A |
| A | 2 | 2 | 2 | Data Input (threshold based on V _{CCA}) |
| GND | 3 | 3 | 3 | Ground |
| Y | 4 | 4 | 4 | Data Output (V _{OH} based on V _{CCB}) |
| NC | — | 5 | 5 | NC (can be connected to any potential) |
| V _{CCB} | 5 | 6 | 6 | Supply for pin Y |

Function Table

| Supply Voltage | | Input | Output |
|------------------|------------------|-------------------|--------|
| V _{CCA} | V _{CCB} | A | Y |
| 0.9V to 3.6V | 0.9V to 3.6V | L | L |
| 0.9V to 3.6V | 0.9V to 3.6V | H | H |
| 0V | 0.9V to 3.6V | X | Z |
| 0V to 3.6V | 0V | Isolated (Note 4) | Z |

Note: 4. Floating input pin is allowed for this case

Logic Diagram



Absolute Maximum Ratings (@T_A = +25°C, unless otherwise specified.) (Note 5)

| Symbol | Parameter | Rating | Unit |
|-------------------------------------|---|--------------|------|
| ESD HBM | Human Body Model ESD Protection | 5 | kV |
| ESD CDM | Charged Device Model ESD Protection | 1 | kV |
| V _{CCA} , V _{CCB} | Supply Voltage Range | -0.3 to +4.0 | V |
| V _I | Input Voltage Range | -0.5 to +4.6 | V |
| V _O | Voltage Applied to Output in High-Impedance or I _{OFF} State | -0.5 to +4.6 | V |
| V _O | Voltage Applied to Output in High or Low State | -0.5 to +4.6 | V |
| I _{IK} | Input Clamp Current V _I < 0 | -50 | mA |
| I _{OK} | Output Clamp Current | -50 | mA |
| I _O | Continuous Output Current | ±50 | mA |
| — | Continuous Current Through V _{CCA} or GND | ±100 | mA |
| T _J | Operating Junction Temperature | -40 to +150 | °C |
| T _{STG} | Storage Temperature | -65 to +150 | °C |

Note: 5. Stresses beyond the absolute maximum can result in immediate failure or reduced reliability. These are stress values and device operation should be within recommend values.

Recommended Operating Condition (@T_A = +25°C, unless otherwise specified.) (Note 6)

| Symbol | Parameter | V _{CCA} | V _{CCB} | Min | Max | Units |
|------------------|--------------------------------|-------------------------|------------------|-------------------------|-------------------------|-------|
| V _{CCA} | Operating Voltage | — | — | 0.9 | 3.6 | V |
| V _{CCB} | Operating Voltage | — | — | 0.9 | 3.6 | V |
| V _{IH} | High-Level Input Voltage | 0.9V to 1.95V | 0.9V to 3.6V | 0.65 x V _{CCA} | — | V |
| | | 2.3V to 2.7V | 0.9V to 3.6V | 1.6 | — | |
| | | 3V to 3.6V | 0.9V to 3.6V | 2 | — | |
| V _{IL} | Low-Level Input Voltage | 0.9V | 0.9V to 3.6V | — | 0.3 x V _{CCA} | V |
| | | 1V to 1.95V | 0.9V to 3.6V | — | 0.35 x V _{CCA} | |
| | | 0.35 x V _{CCA} | 0.9V to 3.6V | — | 0.7 | |
| | | 3V to 3.6V | 0.9V to 3.6V | — | 0.8 | |
| T _A | Operating Free-Air Temperature | | | -40 | +125 | °C |

Note: 6. Test condition for each of the three package types: Device mounted on JEDEC standard PCB per JESD51, with minimum recommended pad layout.

Electrical Characteristics (@T_A = -40°C to +125°C, unless otherwise specified.)

| Symbol | Parameter | Test Conditions | V _{CCA} | V _{CCB} | T _A = -40°C to +125°C | | Unit | |
|-------------------------------------|---------------------------|--|------------------------------|------------------|----------------------------------|------------------------|------|----|
| | | | | | Min | Max | | |
| V _{OH} | High-Level Output Voltage | I _{OH} = -100µA | 0.9V to 3.6V | 0.9V to 3.6V | V _{CCB} - 0.2 | — | V | |
| | | I _{OH} = -0.25mA | 0.9V to 1V | 0.9V to 1V | 0.75 x V _{CCB} | — | | |
| | | I _{OH} = -1.5mA | 1.2V | 1.2V | 1 | — | | |
| | | I _{OH} = -2mA | 1.65V | 1.65V | 1.32 | — | | |
| | | I _{OH} = -3mA | 2.3V | 2.3V | 1.9 | — | | |
| | | I _{OH} = -6mA | 3V | 3V | 2.72 | — | | |
| V _{OL} | Low-Level Output Voltage | I _{OL} = 100µA | 0.9V to 3.6V | 0.9V to 3.6V | — | 0.1 | V | |
| | | I _{OL} = 0.25mA | 0.9V to 1V | 0.9V to 1V | — | 0.1 | | |
| | | I _{OL} = 1.5mA | 1.2V | 1.2V | — | 0.3 x V _{CCB} | | |
| | | I _{OL} = 2mA | 1.65V | 1.65V | — | 0.31 | | |
| | | I _{OL} = 3mA | 2.3V | 2.3V | — | 0.31 | | |
| | | I _{OL} = 6mA | 3V | 3V | — | 0.31 | | |
| I _I | Input Current | V _I = V _{CCA} or GND | 0.9V to 3.6V | 0.9V to 3.6V | — | ±1 | µA | |
| I _{OFF} | Off-State Current | A pin | 0V | 0 to 3.6V | — | ±5 | µA | |
| | | Y pin | 0 to 3.6V | 0V | — | ±5 | | |
| I _{CCA} | Supply Current | V _I = V _{CCA} or GND I _O = 0mA | 0.9V to 3.6V | 0.9V to 3.6V | — | 5 | µA | |
| | | | 0.9V to 3.6V | V _{CCA} | — | 2 | | |
| | | | 0V | 0V to 3.6V | — | 1 | | |
| | | | 0.9V to 3.6V | 0V | — | 1 | | |
| I _{CCB} | Supply Current | V _I = V _{CCA} or GND I _O = 0mA | 0.9V to 3.6V | 0.9V to 3.6V | — | 5 | µA | |
| | | | 0.9V to 3.6V | V _{CCA} | — | 2 | | |
| | | | 0V | 0V to 3.6V | — | 1 | | |
| | | | 0.9V to 3.6V | 0V | — | 1 | | |
| I _{CCA} + I _{CCB} | Supply Current | V _I = V _{CCA} or GND I _O = 0mA | 1.2V to 3.6V | 1.2V to 3.6V | — | 20 | µA | |
| C _I | Input Capacitance | A pin | V _I = 3.3V or GND | 3.3V | 3.3V | — | 4 | pF |
| C _O | Output Capacitance | Y pin | V _O = 3.3V or GND | 0V | 3.3V | — | 7 | pF |

Package Characteristics

| Symbol | Parameter | Package | Test Conditions | Min | Typ | Max | Unit |
|-----------------|--|--------------|-----------------|-----|-----|-----|------|
| θ _{JA} | Thermal Resistance Junction-to-Ambient | SOT353 | Note 7 | — | 318 | — | °C/W |
| | | X2-DFN1410-6 | | — | 210 | — | |
| | | X2-DFN1010-6 | | — | 180 | — | |
| θ _{JC} | Thermal Resistance Junction-to-Case | SOT353 | Note 7 | — | 156 | — | °C/W |
| | | X2-DFN1410-6 | | — | 54 | — | |
| | | X2-DFN1010-6 | | — | 34 | — | |

Note: 7. Test condition for each of the three package types: Device mounted on JEDEC standard PCB per JESD51, with minimum recommended pad layout.

Switching Characteristics

| Parameter | Test Conditions | V _{CCA} | V _{CCB} | Min | Typ | Max | Units |
|--|-----------------------|------------------|------------------|-----|-------|-------|-------|
| t _{PLH} /t _{PHL} Propagation Delay Time Low-to-High Output / High-to-Low Output | C _L = 5pF | 0.9V | 0.9V | — | 25 | — | ns |
| | | | 1.2V | — | 18 | — | |
| | | | 1.65V | — | 16.2 | — | |
| | | | 2.3V | — | 16.3 | — | |
| | | | 3V | — | 16.8 | — | |
| | C _L = 5pF | 1.2V | 0.9V | — | — | 42.5 | |
| | | | 1.2V | — | — | 24.9 | |
| | | | 1.65V | — | — | 23.2 | |
| | | | 2.3V | — | — | 22.6 | |
| | | | 3V | — | — | 22.5 | |
| | C _L = 5pF | 1.65V | 0.9V | — | — | 40 | |
| | | | 1.2V | — | — | 10.7 | |
| | | | 1.65V | — | — | 8.84 | |
| | | | 2.3V | — | — | 8.08 | |
| | | | 3V | — | — | 7.88 | |
| | C _L = 5pF | 2.3V | 0.9V | — | — | 41.3 | |
| | | | 1.2V | — | — | 8.02 | |
| | | | 1.65V | — | — | 5.73 | |
| | | | 2.3V | — | — | 4.92 | |
| | | | 3V | — | — | 4.2 | |
| C _L = 5pF | 3V | 0.9V | — | — | 42.5 | | |
| | | 1.2V | — | — | 7.61 | | |
| | | 1.65V | — | — | 5.5 | | |
| | | 2.3V | — | — | 4.65 | | |
| | | 3V | — | — | 4.39 | | |
| t _{PLH} /t _{PHL} Propagation Delay Time Low-to-High Output / High-to-Low Output | C _L = 10pF | 0.9V | 0.9V | — | 28.9 | — | |
| | | | 1.2V | — | 19.8 | — | |
| | | | 1.65V | — | 17.9 | — | |
| | | | 2.3V | — | 18 | — | |
| | | | 3V | — | 18.5 | — | |
| | C _L = 10pF | 1.2V | 0.9V | — | — | 43.22 | |
| | | | 1.2V | — | — | 12.33 | |
| | | | 1.65V | — | — | 9.57 | |
| | | | 2.3V | — | — | 8.81 | |
| | | | 3V | — | — | 8.61 | |
| | C _L = 10pF | 1.65V | 0.9V | — | — | 40.44 | |
| | | | 1.2V | — | — | 9.21 | |
| | | | 1.65V | — | — | 6.57 | |
| | | | 2.3V | — | — | 5.5 | |
| | | | 3V | — | — | 4.73 | |
| | C _L = 10pF | 2.3V | 0.9V | — | — | 41.56 | |
| | | | 1.2V | — | — | 8.3 | |
| | | | 1.65V | — | — | 5.54 | |
| | | | 2.3V | — | — | 4.42 | |
| | | | 3V | — | — | 4.01 | |
| C _L = 10pF | 3V | 0.9V | — | — | 42.81 | | |
| | | 1.2V | — | — | 7.87 | | |
| | | 1.65V | — | — | 4.55 | | |
| | | 2.3V | — | — | 3.8 | | |
| | | 3V | — | — | 3.36 | | |

Switching Characteristics (continued)

| Parameter | Test Conditions | V _{CCA} | V _{CCB} | Min | Typ | Max | Units |
|--|-----------------------|------------------|------------------|-----|-------|-------|-------|
| t _{PLH} /t _{PHL} Propagation Delay Time Low-to-High Output / High-to-Low Output | C _L = 15pF | 0.9V | 0.9V | — | 30.6 | — | ns |
| | | | 1.2V | — | 21.6 | — | |
| | | | 1.65V | — | 19.6 | — | |
| | | | 2.3V | — | 19.7 | — | |
| | | | 3V | — | 20.3 | — | |
| | C _L = 15pF | 1.2V | 0.9V | — | — | 43.87 | |
| | | | 1.2V | — | — | 12.9 | |
| | | | 1.65V | — | — | 10.3 | |
| | | | 2.3V | — | — | 9.54 | |
| | | | 3V | — | — | 9.34 | |
| | C _L = 15pF | 1.65V | 0.9V | — | — | 40.78 | |
| | | | 1.2V | — | — | 9.59 | |
| | | | 1.65V | — | — | 6.95 | |
| | | | 2.3V | — | — | 5.87 | |
| | | | 3V | — | — | 5.07 | |
| | C _L = 15pF | 2.3V | 0.9V | — | — | 41.79 | |
| | | | 1.2V | — | — | 8.55 | |
| | | | 1.65V | — | — | 5.8 | |
| | | | 2.3V | — | — | 4.68 | |
| | | | 3V | — | — | 4.27 | |
| C _L = 15pF | 3V | 0.9V | — | — | 43.09 | | |
| | | 1.2V | — | — | 8.16 | | |
| | | 1.65V | — | — | 4.84 | | |
| | | 2.3V | — | — | 4.09 | | |
| | | 3V | — | — | 3.65 | | |
| t _{PLH} /t _{PHL} Propagation Delay Time Low-to-High Output / High-to-Low Output | C _L = 30pF | 0.9V | 0.9V | — | 32.1 | — | |
| | | | 1.2V | — | 21.3 | — | |
| | | | 1.65V | — | 18.7 | — | |
| | | | 2.3V | — | 18 | — | |
| | | | 3V | — | 18.3 | — | |
| | C _L = 30pF | 1.2V | 0.9V | — | — | 45.65 | |
| | | | 1.2V | — | — | 14.76 | |
| | | | 1.65V | — | — | 12.37 | |
| | | | 2.3V | — | — | 11.61 | |
| | | | 3V | — | — | 11.41 | |
| | C _L = 30pF | 1.65V | 0.9V | — | — | 41.72 | |
| | | | 1.2V | — | — | 10.65 | |
| | | | 1.65V | — | — | 8.01 | |
| | | | 2.3V | — | — | 6.94 | |
| | | | 3V | — | — | 5.99 | |
| | C _L = 30pF | 2.3V | 0.9V | — | — | 42.44 | |
| | | | 1.2V | — | — | 9.26 | |
| | | | 1.65V | — | — | 6.51 | |
| | | | 2.3V | — | — | 6.39 | |
| | | | 3V | — | — | 5.97 | |
| C _L = 30pF | 3V | 0.9V | — | — | 43.69 | | |
| | | 1.2V | — | — | 8.8 | | |
| | | 1.65V | — | — | 6.48 | | |
| | | 2.3V | — | — | 5.72 | | |
| | | 3V | — | — | 5.28 | | |

Parameter Measurement Information (Notes B, C)

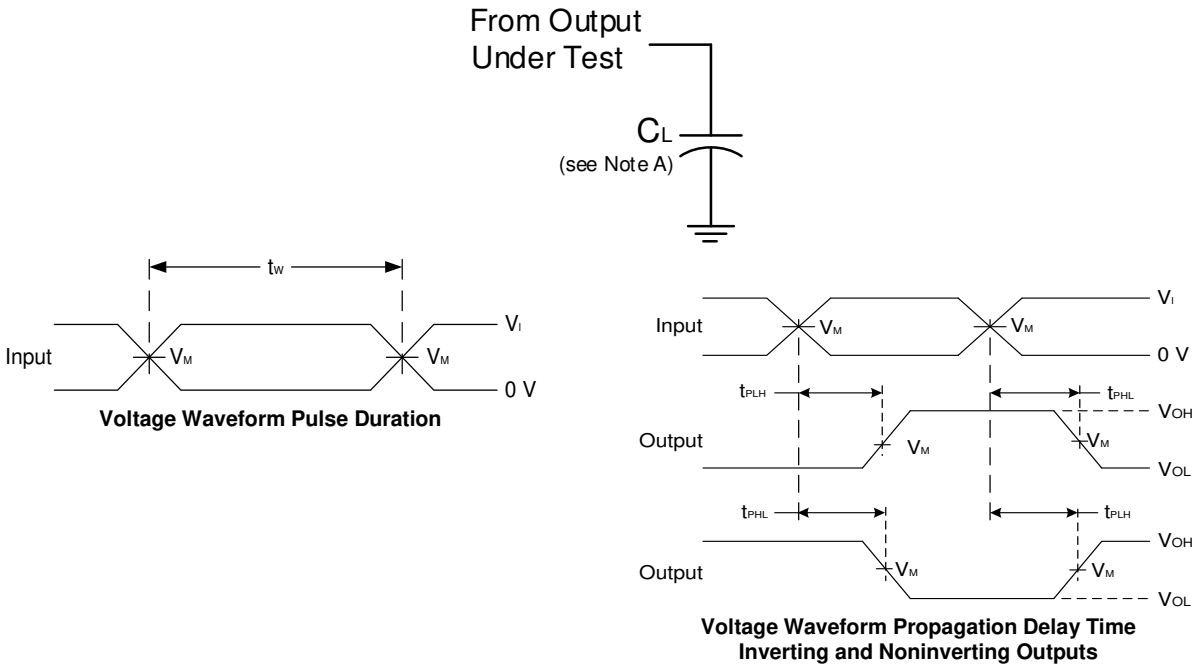
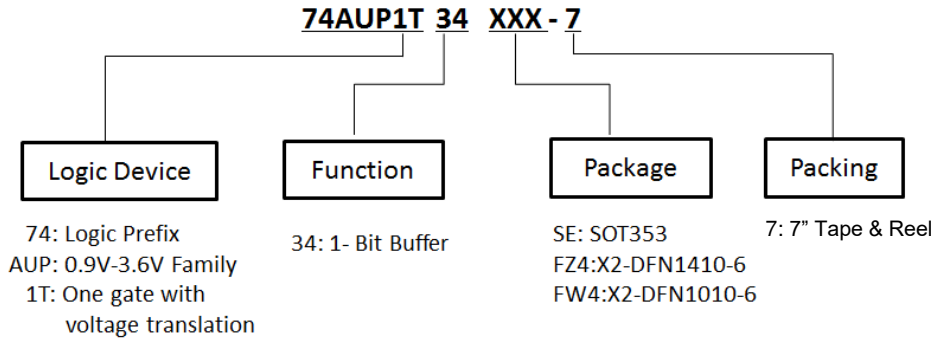


Figure 1. Load Circuit and Voltage Waveforms

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

Ordering Information (Note 8)



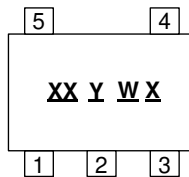
| Part Number | Package Code | Package | Packing | | Part Number Suffix |
|----------------|--------------|--------------|---------|----------------|--------------------|
| | | | Qty. | Carrier | |
| 74AUP1T34SE-7 | SE | SOT353 | 3000 | 7" Tape & Reel | -7 |
| 74AUP1T34FZ4-7 | FZ4 | X2-DFN1410-6 | 5000 | 7" Tape & Reel | -7 |
| 74AUP1T34FW4-7 | FW4 | X2-DFN1010-6 | 5000 | 7" Tape & Reel | -7 |

Note: 8. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information

(1) SOT353

(Top View)

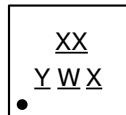


XX : Identification Code
 Y : Year 0 to 9
 W : Week : A to Z : 1 to 26 week;
 a to z : 27 to 52 week; z represents 52 and 53 week
 X : Internal Code

| Part Number | Package | Identification Code |
|---------------|---------|---------------------|
| 74AUP1T34SE-7 | SOT353 | 4S |

(2) DFN Packages

(Top View)



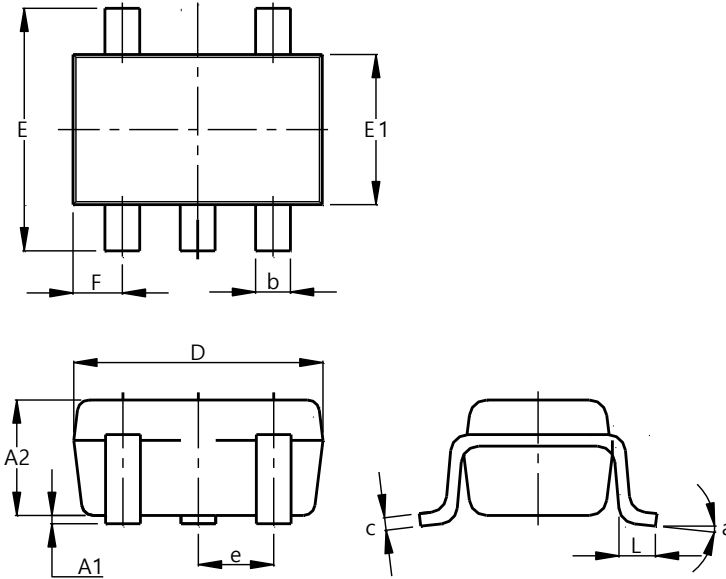
XX : Identification Code
 Y : Year : 0~9
 W : Week : A~Z : 1~26 week;
 a~z : 27~52 week; z represents 52 and 53 week
 X : Internal Code

| Part Number | Package | Identification Code |
|----------------|--------------|---------------------|
| 74AUP1T34FZ4-7 | X2-DFN1410-6 | 4S |
| 74AUP1T34FW4-7 | X2-DFN1010-6 | 4U |

Package Outline Dimensions

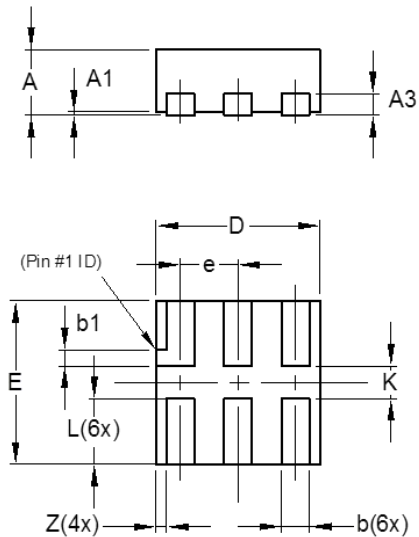
Please see <http://www.diodes.com/package-outlines.html> for the latest version.

(1) Package Type: SOT353



| SOT353 | | | |
|-----------------------------|-----------|------|-------|
| Dim | Min | Max | Typ |
| A1 | 0.00 | 0.10 | 0.05 |
| A2 | 0.90 | 1.00 | 0.95 |
| b | 0.10 | 0.30 | 0.25 |
| c | 0.10 | 0.22 | 0.11 |
| D | 1.80 | 2.20 | 2.15 |
| E | 2.00 | 2.20 | 2.10 |
| E1 | 1.15 | 1.35 | 1.30 |
| e | 0.650 BSC | | |
| F | 0.40 | 0.45 | 0.425 |
| L | 0.25 | 0.40 | 0.30 |
| a | 0° | 8° | -- |
| All Dimensions in mm | | | |

(2) Package Type: X2-DFN1010-6

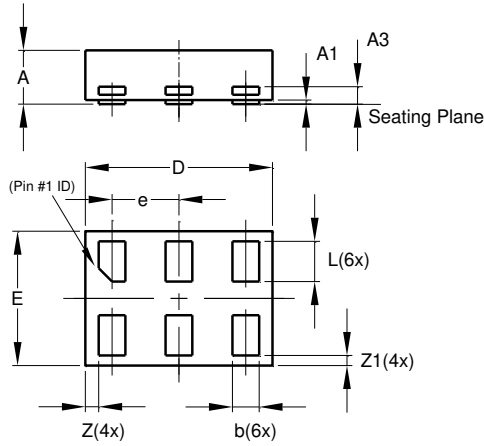


| X2-DFN1010-6 | | | |
|-----------------------------|------|------|-------|
| Dim | Min | Max | Typ |
| A | — | 0.40 | 0.39 |
| A1 | 0.00 | 0.05 | 0.02 |
| A3 | — | — | 0.13 |
| b | 0.14 | 0.20 | 0.17 |
| b1 | 0.05 | 0.15 | 0.10 |
| D | 0.95 | 1.05 | 1.00 |
| E | 0.95 | 1.05 | 1.00 |
| e | — | — | 0.35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

Package Outline Dimensions (continued)

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

(3) Package Type: X2-DFN1410-6

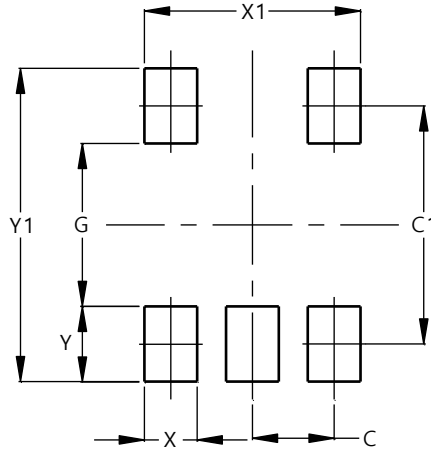


| X2-DFN1410-6 | | | |
|----------------------|-------|-------|-------|
| Dim | Min | Max | Typ |
| A | — | 0.40 | 0.39 |
| A1 | 0.00 | 0.05 | 0.02 |
| A3 | — | — | 0.13 |
| b | 0.15 | 0.25 | 0.20 |
| D | 1.35 | 1.45 | 1.40 |
| E | 0.95 | 1.05 | 1.00 |
| e | — | — | 0.50 |
| L | 0.25 | 0.35 | 0.30 |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

Suggested Pad Layout

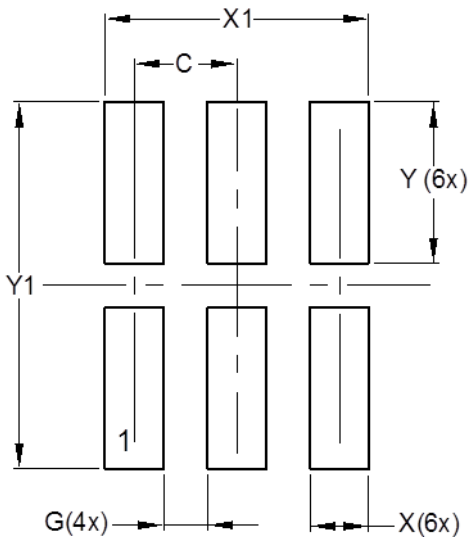
Please see <http://www.diodes.com/package-outlines.html> for the latest version.

(1) Package Type: SOT353



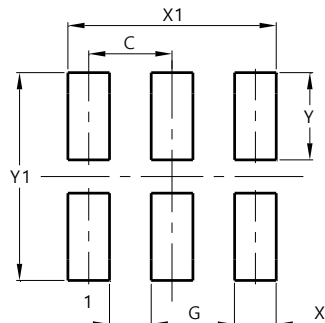
| Dimensions | Value (in mm) |
|------------|---------------|
| C | 0.650 |
| C1 | 1.900 |
| G | 1.300 |
| X | 0.420 |
| X1 | 1.720 |
| Y | 0.600 |
| Y1 | 2.500 |

(2) 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 |

(3) 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 |

Mechanical Data

SOT353

- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 **(e3)**
- Weight: 0.006 grams (Approximate)

X2-DFN1010-6

- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - NiPdAu Nickel Palladium Gold, Solderable per MIL-STD-202, Method 208 **(e4)**
- Weight 0.0012 grams (Approximate)

X2-DFN1410-6

- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - NiPdAu Nickel Palladium Gold, Solderable per MIL-STD-202, Method 208 **(e4)**
- Weight: 0.002 grams (Approximate)

IMPORTANT NOTICE

1. DIODES INCORPORATED (Diodes) AND ITS SUBSIDIARIES MAKE NO WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, WITH REGARDS TO ANY INFORMATION CONTAINED IN THIS DOCUMENT, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION).
2. The Information contained herein is for informational purpose only and is provided only to illustrate the operation of Diodes' products described herein and application examples. Diodes does not assume any liability arising out of the application or use of this document or any product described herein. This document is intended for skilled and technically trained engineering customers and users who design with Diodes' products. Diodes' products may be used to facilitate safety-related applications; however, in all instances customers and users are responsible for (a) selecting the appropriate Diodes products for their applications, (b) evaluating the suitability of Diodes' products for their intended applications, (c) ensuring their applications, which incorporate Diodes' products, comply the applicable legal and regulatory requirements as well as safety and functional-safety related standards, and (d) ensuring they design with appropriate safeguards (including testing, validation, quality control techniques, redundancy, malfunction prevention, and appropriate treatment for aging degradation) to minimize the risks associated with their applications.
3. Diodes assumes no liability for any application-related information, support, assistance or feedback that may be provided by Diodes from time to time. Any customer or user of this document or products described herein will assume all risks and liabilities associated with such use, and will hold Diodes and all companies whose products are represented herein or on Diodes' websites, harmless against all damages and liabilities.
4. Products described herein may be covered by one or more United States, international or foreign patents and pending patent applications. Product names and markings noted herein may also be covered by one or more United States, international or foreign trademarks and trademark applications. Diodes does not convey any license under any of its intellectual property rights or the rights of any third parties (including third parties whose products and services may be described in this document or on Diodes' website) under this document.
5. Diodes' products are provided subject to Diodes' Standard Terms and Conditions of Sale (<https://www.diodes.com/about/company/terms-and-conditions/terms-and-conditions-of-sales/>) or other applicable terms. This document does not alter or expand the applicable warranties provided by Diodes. Diodes does not warrant or accept any liability whatsoever in respect of any products purchased through unauthorized sales channel.
6. Diodes' products and technology may not be used for or incorporated into any products or systems whose manufacture, use or sale is prohibited under any applicable laws and regulations. Should customers or users use Diodes' products in contravention of any applicable laws or regulations, or for any unintended or unauthorized application, customers and users will (a) be solely responsible for any damages, losses or penalties arising in connection therewith or as a result thereof, and (b) indemnify and hold Diodes and its representatives and agents harmless against any and all claims, damages, expenses, and attorney fees arising out of, directly or indirectly, any claim relating to any noncompliance with the applicable laws and regulations, as well as any unintended or unauthorized application.
7. While efforts have been made to ensure the information contained in this document is accurate, complete and current, it may contain technical inaccuracies, omissions and typographical errors. Diodes does not warrant that information contained in this document is error-free and Diodes is under no obligation to update or otherwise correct this information. Notwithstanding the foregoing, Diodes reserves the right to make modifications, enhancements, improvements, corrections or other changes without further notice to this document and any product described herein. This document is written in English but may be translated into multiple languages for reference. Only the English version of this document is the final and determinative format released by Diodes.
8. Any unauthorized copying, modification, distribution, transmission, display or other use of this document (or any portion hereof) is prohibited. Diodes assumes no responsibility for any losses incurred by the customers or users or any third parties arising from any such unauthorized use.
9. This Notice may be periodically updated with the most recent version available at <https://www.diodes.com/about/company/terms-and-conditions/important-notice>

The Diodes logo is a registered trademark of Diodes Incorporated in the United States and other countries.
All other trademarks are the property of their respective owners.
© 2023 Diodes Incorporated. All Rights Reserved.

www.diodes.com