

Single Bit Uni-Directional Translator

FXLP34

Description

The FXLP34 is a single translator with two separate supply voltages: V_{CC1} for input translation voltages and V_{CC} for output translation voltages. The FXLP34 is part of onsemi's Ultra Low Power (ULP) series of products. This device operates with VCC values from 1.0 V to 3.6 V, and is intended for use in portable applications that require ultra low power consumption.

The internal circuit is composed of a minimum of buffer stages, to enable ultra low dynamic power.

The FXLP34 is uniquely designed for optimized power and speed, and is fabricated with an advanced CMOS technology to achieve high-speed operation while maintaining low CMOS power dissipation.

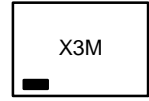
Features

- 1.0 V to 3.6 V V_{CC} Supply Voltage
- Converts Any Voltage (1.0 V to 3.6 V) to (1.0 V to 3.6 V)
- 4.6V Tolerant Inputs and Outputs
- t_{PD} :
 - ◆ 4 ns Typical for 3.0 V to 3.6 V V_{CC}
- Power-Off High Impedance Inputs and Outputs
- Static Drive (I_{OH}/I_{OL}):
 - ◆ ± 2.6 mA at 3.00 V V_{CC}
- Uses Proprietary Quiet Series Noise / EMI Reduction Circuitry
- Ultra-Small MicroPak™ Leadless Packages
- Ultra-Low Dynamic Power
- These are Pb-Free Devices

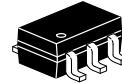
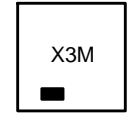


SIP6 1.45X1.0
CASE 127EB

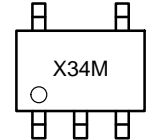
MARKING DIAGRAM



UDFN6
1.0X1.0, 0.35P
CASE 517DP



SC-88A (SC-70
5 Lead), 1.25x2
CASE 419AC-01



X3, X34 = Device Code
 M = Assembly Operation Month

ORDERING INFORMATION

See detailed ordering and shipping information on page 9 of this data sheet.

FXLP34

PIN CONFIGURATION

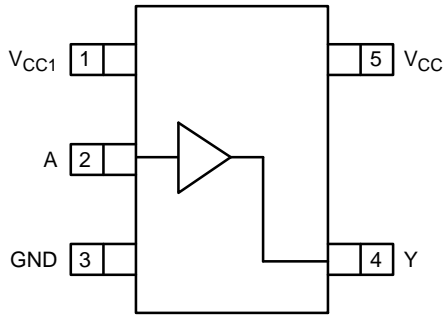


Figure 1. SC70 (Top View)

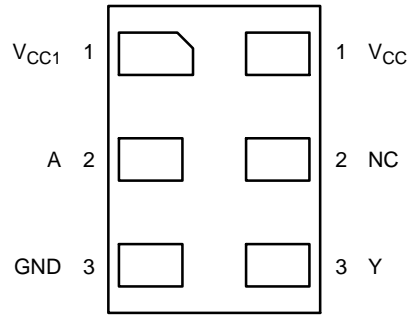


Figure 2. MicroPak (Top Through View)

PIN DEFINITIONS

| Pin # SC70 | Pin # MicroPak | Name | Description |
|------------|----------------|------|----------------------------|
| 1 | 1 | Vcc1 | Input Translation Voltage |
| 2 | 2 | A | Input |
| 3 | 3 | GND | Ground |
| 4 | 4 | Y | Output |
| | 5 | NC | No Connect |
| 5 | 6 | Vcc | Output Translation Voltage |

TRUTH TABLE

| Input | Outputs |
|-------|---------|
| A | Y |
| L | L |
| H | H |

H = Logic Level HIGH
L = Logic Level Low

FXLP34

ABSOLUTE MAXIMUM RATINGS

| Symbol | Parameter | | Min | Max | Unit |
|-------------------------------------|---|------------------------------------|------|-------------------------|------|
| V _{CC} , V _{CC1} | Supply Voltage | | -0.5 | +4.6 | V |
| V _{IN} | DC Input Voltage | | -0.5 | +4.6 | V |
| V _{OUT} | DC Output Voltage | HIGH or LOW State (Note 1) | -0.5 | V _{CC} + 0.5 V | V |
| | | V _{CC} = 0 V | -0.5 | +4.6 | |
| I _{IK} | DC Input Diode Current | V _{IN} < 0 | - | -50 | mA |
| I _{OK} | DC Output Diode Current | V _{OUT} < 0 V | - | -50 | mA |
| | | V _{OUT} > V _{CC} | - | +50 | |
| I _{OH} /I _{OL} | DC Output Source/Sink Current | | - | ±50 | mA |
| I _{CC} or I _{GND} | DC V _{CC} or Ground Current per Supply Pin | | - | ±100 | mA |
| T _{STG} | Storage Temperature Range | | -65 | 150 | °C |
| P _D | Power Dissipation at +85°C | SC70-6 | - | 180 | mW |
| | | MicroPak™-6 | - | 130 | |
| | | MicroPak2™-6 | - | 120 | |
| ESD | Human Body Model, JEDEC:JESD22-A114 | | - | 4000 | V |
| | Charge Device Model, JEDEC:JESD22-C101 | | - | 2000 | |

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. I_O Absolute Maximum Rating must be observed.

RECOMMENDED OPERATING CONDITIONS

| Symbol | Parameter | Conditions | Min | Max | Unit |
|------------------------------------|--|----------------------------------|-----|-----------------|------|
| V _{CC} , V _{CC1} | Supply Voltage | | 1.0 | 3.6 | V |
| V _{IN} | Input Voltage | | 0 | 3.6 | V |
| V _{OUT} | Output Voltage | HIGH or LOW State | 0 | V _{CC} | V |
| | | V _{CC} = 0 V | 0 | 3.6 | |
| I _{OH} /I _{OL} | Output Current in I _{OH} /I _{OL} | V _{CC} = 3.0 to 3.6 V | - | ±2.6 | mA |
| | | V _{CC} = 2.3 to 2.7 V | - | ±2.1 | |
| | | V _{CC} = 1.65 to 1.95 V | - | ±1.5 | |
| | | V _{CC} = 1.40 to 1.60 V | - | ±1.0 | |
| | | V _{CC} = 1.10 to 1.30 V | - | ±0.5 | |
| | | V _{CC} = 1.0 V | - | ±20 | μA |
| T _A | Operating Temperature, Free Air | | -40 | +85 | °C |
| θ _{JA} | Thermal Resistance | SC70-6 | - | 425 | °C/W |
| | | MicroPak-6 | - | 500 | |
| | | MicroPak2-6 | - | 560 | |

Functional operation above the stresses listed in the Recommended Operating Ranges is not implied. Extended exposure to stresses beyond the Recommended Operating Ranges limits may affect device reliability.

2. Unused inputs must be held HIGH or LOW. They may not float.

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ELECTRICAL CHARACTERISTICS

| Symbol | Parameter | Condition | V _{CC} (V) | V _{CC1} (V) | T _A = +25°C | | T _A = -40 to 85°C | | Unit |
|------------------|--------------------------------------|--|--------------------------------|--------------------------------|-------------------------|-------------------------|------------------------------|-------------------------|------|
| | | | | | Min | Max | Min | Max | |
| V _{IH} | HIGH Level Input (V _{CC1}) | | 1.0 to 3.6 | 1.0 | 0.65 x V _{CC1} | - | 0.65 x V _{CC1} | - | V |
| | | | | 1.10 ≤ V _{CC1} ≤ 1.30 | 0.65 x V _{CC1} | - | 0.65 x V _{CC1} | - | |
| | | | | 1.40 ≤ V _{CC1} ≤ 1.60 | 0.65 x V _{CC1} | - | 0.65 x V _{CC1} | - | |
| | | | | 1.65 ≤ V _{CC1} ≤ 1.95 | 0.65 x V _{CC1} | - | 0.65 x V _{CC1} | - | |
| | | | | 2.30 ≤ V _{CC1} ≤ 2.70 | 1.6 | - | 1.6 | - | |
| | | | | 3.00 ≤ V _{CC1} ≤ 3.60 | 2.1 | - | 2.1 | - | |
| V _{IL} | LOW Level Input (V _{CC1}) | | 1.0 to 3.6 | 1.0 | - | 0.35 x V _{CC1} | - | 0.35 x V _{CC1} | V |
| | | | | 1.10 ≤ V _{CC1} ≤ 1.30 | - | 0.35 x V _{CC1} | - | 0.35 x V _{CC1} | |
| | | | | 1.40 ≤ V _{CC1} ≤ 1.60 | - | 0.35 x V _{CC1} | - | 0.35 x V _{CC1} | |
| | | | | 1.65 ≤ V _{CC1} ≤ 1.95 | - | 0.35 x V _{CC1} | - | 0.35 x V _{CC1} | |
| | | | | 2.30 ≤ V _{CC1} ≤ 2.70 | - | 0.7 | - | 0.7 | |
| | | | | 3.00 ≤ V _{CC1} ≤ 3.60 | - | 0.9 | - | 0.9 | |
| V _{OH} | HIGH Level Output (V _{CC}) | I _{OH} = -20 μA | 1.0 | 1.0 to 3.6 | V _{CC} - 0.1 | - | V _{CC} - 0.1 | - | V |
| | | | 1.10 ≤ V _{CC1} ≤ 1.30 | | V _{CC} - 0.1 | - | V _{CC} - 0.1 | - | |
| | | | 1.40 ≤ V _{CC1} ≤ 1.60 | | V _{CC} - 0.1 | - | V _{CC} - 0.1 | - | |
| | | | 1.65 ≤ V _{CC1} ≤ 1.95 | | V _{CC} - 0.1 | - | V _{CC} - 0.1 | - | |
| | | | 2.30 ≤ V _{CC1} ≤ 2.70 | | V _{CC} - 0.1 | - | V _{CC} - 0.1 | - | |
| | | | 3.00 ≤ V _{CC1} ≤ 3.60 | | V _{CC} - 0.1 | - | V _{CC} - 0.1 | - | |
| | | I _{OH} = -0.5 mA | 1.10 ≤ V _{CC1} ≤ 1.30 | 1.0 to 3.6 | 0.75 x V _{CC} | - | 0.70 x V _{CC} | - | |
| | | I _{OH} = -1.0 mA | 1.40 ≤ V _{CC1} ≤ 1.60 | | 1.07 | - | 0.99 | - | |
| | | I _{OH} = -1.5 mA | 1.65 ≤ V _{CC1} ≤ 1.95 | | 1.24 | - | 1.22 | - | |
| | | I _{OH} = -2.1 mA | 2.30 ≤ V _{CC1} ≤ 2.70 | | 1.95 | - | 1.87 | - | |
| | | I _{OH} = -2.6 mA | 3.00 ≤ V _{CC1} ≤ 3.60 | | 2.61 | - | 2.55 | - | |
| | | | | | | | | | |
| V _{OL} | LOW Level Output (V _{CC}) | I _{OL} = 20 μA | 1.0 | 1.0 to 3.6 | - | 0.1 | - | 0.1 | V |
| | | | 1.10 ≤ V _{CC1} ≤ 1.30 | | - | 0.1 | - | 0.1 | |
| | | | 1.40 ≤ V _{CC1} ≤ 1.60 | | - | 0.1 | - | 0.1 | |
| | | | 1.65 ≤ V _{CC1} ≤ 1.95 | | - | 0.1 | - | 0.1 | |
| | | | 2.30 ≤ V _{CC1} ≤ 2.70 | | - | 0.1 | - | 0.1 | |
| | | I _{OL} = 0.5 mA | 1.10 ≤ V _{CC1} ≤ 1.30 | 1.0 to 3.6 | - | 0.30 x V _{CC} | - | 0.30 x V _{CC} | |
| | | I _{OL} = 1.0 mA | 1.40 ≤ V _{CC1} ≤ 1.60 | | - | 0.31 | - | 0.37 | |
| | | I _{OL} = 1.5 mA | 1.65 ≤ V _{CC1} ≤ 1.95 | | - | 0.31 | - | 0.35 | |
| | | I _{OL} = 2.1 mA | 2.30 ≤ V _{CC1} ≤ 2.70 | | - | 0.31 | - | 0.33 | |
| | | I _{OL} = 2.6 mA | 3.00 ≤ V _{CC1} ≤ 3.60 | | - | 0.31 | - | 0.33 | |
| I _{IN} | Input Leakage Current | 0 ≤ V _{IN} ≤ 3.60 | | 1.0 to 3.6 | - | ±0.1 | - | ±1.0 | μA |
| I _{OFF} | Power Off Leakage Current | 0 ≤ (V _{IN} , V _O) ≤ 3.60 | 0 | 0 | - | 1.0 | - | 5.0 | μA |
| I _{CC} | Quiescent Supply Current | V _{IN} = V _{CC} or GND | 1.0 to 3.6 | 1.0 to 3.6 | - | 0.9 | - | 5.0 | μA |

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

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AC ELECTRICAL CHARACTERISTICS

| Symbol | Parameter | Condition | V _{CC} (V) | T _A = +25°C | | | T _A = -40 to 85°C | | Unit | Figure |
|--|--|--|---------------------|------------------------|------|------|------------------------------|------|------|-----------------------|
| | | | | Min | Typ | Max | Min | Max | | |
| t _{PHL} , t _{PLH} | Propagation Delay Output Translation V _{CC} (V) = 1.0 | C _L = 10 pF, R _L = 1 MΩ | 1.0 | – | 26.0 | – | – | – | ns | Figure 3, Figure 4 |
| | | | 1.10 to 1.30 | 15.0 | 25.0 | 38.1 | 12.0 | 43.3 | | |
| | | | 1.40 to 1.60 | 14.0 | 24.0 | 36.7 | 11.0 | 42.0 | | |
| | | | 1.65 to 1.95 | 13.0 | 23.0 | 36.0 | 10.0 | 41.4 | | |
| | | | 2.30 to 2.70 | 12.0 | 22.0 | 35.5 | 9.0 | 40.9 | | |
| | | | 3.00 to 3.60 | 11.0 | 21.0 | 35.5 | 8.0 | 40.6 | | |
| t _{PHL} , t _{PLH} | Propagation Delay Output Translation V _{CC} (V) = 1.2 | C _L = 10 pF, R _L = 1 MΩ | 1.0 | – | 18.0 | – | – | – | ns | Figure 3, Figure 4 |
| | | | 1.10 to 1.30 | 8.0 | 15.0 | 23.2 | 6.0 | 41.0 | | |
| | | | 1.40 to 1.60 | 7.5 | 14.0 | 21.7 | 5.5 | 39.1 | | |
| | | | 1.65 to 1.95 | 7.0 | 13.0 | 20.9 | 5.0 | 32.3 | | |
| | | | 2.30 to 2.70 | 6.5 | 12.0 | 20.4 | 4.5 | 29.6 | | |
| | | | 3.00 to 3.60 | 6.0 | 12.0 | 20.2 | 4.0 | 29.4 | | |
| t _{PHL} , t _{PLH} | Propagation Delay Output Translation V _{CC} (V) = 1.5 | C _L = 10 pF, R _L = 1 MΩ | 1.0 | – | 14.0 | – | – | – | ns | Figure 3, Figure 4 |
| | | | 1.10 to 1.30 | 5.0 | 11.0 | 16.3 | 4.0 | 20.6 | | |
| | | | 1.40 to 1.60 | 4.8 | 10.0 | 14.8 | 3.5 | 19.3 | | |
| | | | 1.65 to 1.95 | 4.5 | 9.0 | 14.1 | 3.0 | 18.7 | | |
| | | | 2.30 to 2.70 | 4.0 | 8.0 | 13.5 | 2.5 | 18.0 | | |
| | | | 3.00 to 3.60 | 3.5 | 8.0 | 13.3 | 2.0 | 17.8 | | |
| t _{PHL} , t _{PLH} | Propagation Delay Output Translation V _{CC} (V) = 1.8 | C _L = 10 pF, R _L = 1 MΩ | 1.0 | – | 13.0 | – | – | – | ns | Figure 3, Figure 4 |
| | | | 1.10 to 1.30 | 4.0 | 9.0 | 13.5 | 3.0 | 17.5 | | |
| | | | 1.40 to 1.60 | 3.5 | 8.0 | 12.0 | 2.5 | 16.3 | | |
| | | | 1.65 to 1.95 | 3.0 | 7.0 | 11.3 | 2.0 | 15.6 | | |
| | | | 2.30 to 2.70 | 2.5 | 6.0 | 10.7 | 1.5 | 15.0 | | |
| | | | 3.00 to 3.60 | 2.5 | 6.0 | 10.5 | 1.0 | 14.7 | | |
| t _{PHL} , t _{PLH} | Propagation Delay Output Translation V _{CC} (V) = 2.5 | C _L = 10 pF, R _L = 1 MΩ | 1.0 | – | 12.0 | – | – | – | ns | Figure 3, Figure 4 |
| | | | 1.10 to 1.30 | 3.0 | 7.0 | 10.9 | 2.5 | 14.3 | | |
| | | | 1.40 to 1.60 | 2.5 | 6.0 | 9.4 | 2.0 | 13.1 | | |
| | | | 1.65 to 1.95 | 2.0 | 5.0 | 8.6 | 1.5 | 11.4 | | |
| | | | 2.30 to 2.70 | 1.5 | 4.0 | 8.0 | 1.0 | 10.8 | | |
| | | | 3.00 to 3.60 | 1.5 | 4.0 | 7.8 | 1.0 | 10.5 | | |
| t _{PHL} , t _{PLH} | Propagation Delay Output Translation V _{CC} (V) = 3.3 | C _L = 10 pF, R _L = 1 MΩ | 1.0 | – | 11.0 | – | – | – | ns | Figure 3, Figure 4 |
| | | | 1.10 to 1.30 | 3.0 | 6.0 | 10.1 | 2.0 | 13.8 | | |
| | | | 1.40 to 1.60 | 2.5 | 5.0 | 8.2 | 1.5 | 10.5 | | |
| | | | 1.65 to 1.95 | 2.0 | 4.0 | 7.4 | 1.0 | 9.9 | | |
| | | | 2.30 to 2.70 | 1.0 | 3.0 | 6.8 | 1.0 | 9.2 | | |
| | | | 3.00 to 3.60 | 1.0 | 3.0 | 6.6 | 1.0 | 9.0 | | |

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AC ELECTRICAL CHARACTERISTICS (continued)

| Symbol | Parameter | Condition | V _{CC} (V) | T _A = +25°C | | | T _A = -40 to 85°C | | Unit | Figure |
|--|--|--|---------------------|------------------------|------|------|------------------------------|------|------|-----------------------|
| | | | | Min | Typ | Max | Min | Max | | |
| t _{PHL} , t _{PLH} | Propagation Delay Output Translation V _{CC} (V) = 1.0 | C _L = 15 pF, R _L = 1 MΩ | 1.0 | – | 28.0 | – | – | – | ns | Figure 3, Figure 4 |
| | | | 1.10 to 1.30 | 16.0 | 27.0 | 43.0 | 12.0 | 44.8 | | |
| | | | 1.40 to 1.60 | 15.0 | 26.0 | 41.6 | 11.0 | 43.6 | | |
| | | | 1.65 to 1.95 | 14.0 | 25.0 | 40.9 | 10.0 | 47.9 | | |
| | | | 2.30 to 2.70 | 13.0 | 24.0 | 40.5 | 9.0 | 47.5 | | |
| | | | 3.00 to 3.60 | 12.0 | 23.0 | 40.4 | 8.0 | 41.4 | | |
| t _{PHL} , t _{PLH} | Propagation Delay Output Translation V _{CC} (V) = 1.2 | C _L = 15 pF, R _L = 1 MΩ | 1.0 | – | 19.0 | – | – | – | ns | Figure 3, Figure 4 |
| | | | 1.10 to 1.30 | 9.0 | 16.0 | 24.6 | 8.0 | 43.1 | | |
| | | | 1.40 to 1.60 | 8.5 | 15.0 | 23.1 | 7.5 | 42.2 | | |
| | | | 1.65 to 1.95 | 8.0 | 14.0 | 22.4 | 7.0 | 31.4 | | |
| | | | 2.30 to 2.70 | 7.5 | 13.0 | 21.8 | 6.5 | 30.7 | | |
| | | | 3.00 to 3.60 | 7.0 | 13.0 | 21.6 | 6.0 | 30.5 | | |
| t _{PHL} , t _{PLH} | Propagation Delay Output Translation V _{CC} (V) = 1.5 | C _L = 15 pF, R _L = 1 MΩ | 1.0 | – | 15.0 | – | – | – | ns | Figure 3, Figure 4 |
| | | | 1.10 to 1.30 | 6.0 | 12.0 | 17.2 | 5.5 | 21.5 | | |
| | | | 1.40 to 1.60 | 5.8 | 11.0 | 15.7 | 5.0 | 20.3 | | |
| | | | 1.65 to 1.95 | 5.5 | 10.0 | 14.9 | 4.5 | 19.6 | | |
| | | | 2.30 to 2.70 | 5.0 | 9.0 | 14.3 | 4.0 | 18.9 | | |
| | | | 3.00 to 3.60 | 4.5 | .0 | 14.2 | 3.5 | 18.7 | | |
| t _{PHL} , t _{PLH} | Propagation Delay Output Translation V _{CC} (V) = 1.8 | C _L = 15 pF, R _L = 1 MΩ | 1.0 | – | 14.0 | – | – | – | ns | Figure 3, Figure 4 |
| | | | 1.10 to 1.30 | 5.0 | 8.0 | 14.2 | 5.5 | 18.2 | | |
| | | | 1.40 to 1.60 | 4.5 | 7.0 | 12.7 | 4.0 | 17.0 | | |
| | | | 1.65 to 1.95 | 4.0 | 6.0 | 11.9 | 3.5 | 16.3 | | |
| | | | 2.30 to 2.70 | 3.5 | 5.0 | 11.3 | 3.0 | 15.7 | | |
| | | | 3.00 to 3.60 | 3.5 | 5.0 | 11.2 | 2.5 | 14.4 | | |
| t _{PHL} , t _{PLH} | Propagation Delay Output Translation V _{CC} (V) = 2.5 | C _L = 15 pF, R _L = 1 MΩ | 1.0 | – | 12.0 | – | – | – | ns | Figure 3, Figure 4 |
| | | | 1.10 to 1.30 | 4.0 | 7.0 | 11.3 | 3.5 | 14.9 | | |
| | | | 1.40 to 1.60 | 3.5 | 6.0 | 9.8 | 3.0 | 13.6 | | |
| | | | 1.65 to 1.95 | 3.0 | 5.0 | 9.1 | 2.5 | 12.0 | | |
| | | | 2.30 to 2.70 | 2.5 | 4.0 | 8.5 | 2.0 | 11.3 | | |
| | | | 3.00 to 3.60 | 2.5 | 4.0 | 8.3 | 2.0 | 11.1 | | |
| t _{PHL} , t _{PLH} | Propagation Delay Output Translation V _{CC} (V) = 3.3 | C _L = 15 pF, R _L = 1 MΩ | 1.0 | – | 11.0 | – | – | – | ns | Figure 3, Figure 4 |
| | | | 1.10 to 1.30 | 3.0 | 6.0 | 10.5 | 2.0 | 14.2 | | |
| | | | 1.40 to 1.60 | 2.5 | 5.0 | 8.6 | 1.5 | 11.0 | | |
| | | | 1.65 to 1.95 | 2.0 | 4.0 | 7.8 | 1.0 | 10.3 | | |
| | | | 2.30 to 2.70 | 1.5 | 3.0 | 7.2 | 1.0 | 9.7 | | |
| | | | 3.00 to 3.60 | 1.5 | 3.0 | 7.0 | 1.0 | 9.4 | | |

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AC ELECTRICAL CHARACTERISTICS (continued)

| Symbol | Parameter | Condition | V _{CC} (V) | T _A = +25°C | | | T _A = -40 to 85°C | | Unit | Figure |
|--|--|--|---------------------|------------------------|------|------|------------------------------|------|------|-----------------------|
| | | | | Min | Typ | Max | Min | Max | | |
| t _{PHL} , t _{PLH} | Propagation Delay Output Translation V _{CC} (V) = 1.0 | C _L = 30 pF, R _L = 1 MΩ | 1.0 | – | 34.0 | – | – | – | ns | Figure 3, Figure 4 |
| | | | 1.10 to 1.30 | 19.0 | 32.0 | 48.6 | 15.0 | 55.5 | | |
| | | | 1.40 to 1.60 | 18.0 | 31.0 | 47.1 | 14.0 | 52.3 | | |
| | | | 1.65 to 1.95 | 17.0 | 30.0 | 46.4 | 13.0 | 50.6 | | |
| | | | 2.30 to 2.70 | 16.0 | 29.0 | 45.9 | 12.0 | 49.2 | | |
| | | | 3.00 to 3.60 | 15.0 | 28.0 | 45.8 | 10.0 | 49.1 | | |
| t _{PHL} , t _{PLH} | Propagation Delay Output Translation V _{CC} (V) = 1.2 | C _L = 30 pF, R _L = 1 MΩ | 1.0 | – | 22.0 | – | – | – | ns | Figure 3, Figure 4 |
| | | | 1.10 to 1.30 | 11.0 | 19.0 | 29.0 | 10.0 | 46.5 | | |
| | | | 1.40 to 1.60 | 10.0 | 18.0 | 27.5 | 9.0 | 42.6 | | |
| | | | 1.65 to 1.95 | 9.0 | 17.0 | 26.7 | 8.0 | 36.7 | | |
| | | | 2.30 to 2.70 | 8.5 | 16.0 | 26.1 | 7.0 | 36.0 | | |
| | | | 3.00 to 3.60 | 8.0 | 16.0 | 26.0 | 6.0 | 35.9 | | |
| t _{PHL} , t _{PLH} | Propagation Delay Output Translation V _{CC} (V) = 1.5 | C _L = 30 pF, R _L = 1 MΩ | 1.0 | – | 16.0 | – | – | – | ns | Figure 3, Figure 4 |
| | | | 1.10 to 1.30 | 6.0 | 13.0 | 19.8 | 5.5 | 25.3 | | |
| | | | 1.40 to 1.60 | 5.8 | 12.0 | 18.3 | 5.0 | 23.0 | | |
| | | | 1.65 to 1.95 | 5.5 | 11.0 | 17.6 | 4.5 | 22.4 | | |
| | | | 2.30 to 2.70 | 5.0 | 10.0 | 17.0 | 4.0 | 21.7 | | |
| | | | 3.00 to 3.60 | 4.5 | 9.0 | 16.8 | 3.5 | 21.5 | | |
| t _{PHL} , t _{PLH} | Propagation Delay Output Translation V _{CC} (V) = 1.8 | C _L = 30 pF, R _L = 1 MΩ | 1.0 | – | 15.0 | – | – | – | ns | Figure 3, Figure 4 |
| | | | 1.10 to 1.30 | 5.0 | 11.0 | 16.2 | 5.5 | 20.4 | | |
| | | | 1.40 to 1.60 | 4.5 | 10.0 | 14.7 | 4.0 | 19.2 | | |
| | | | 1.65 to 1.95 | 4.0 | 9.0 | 13.9 | 3.5 | 18.5 | | |
| | | | 2.30 to 2.70 | 3.5 | 8.0 | 13.3 | 3.0 | 17.9 | | |
| | | | 3.00 to 3.60 | 3.5 | 8.0 | 13.1 | 2.5 | 17.6 | | |
| t _{PHL} , t _{PLH} | Propagation Delay Output Translation V _{CC} (V) = 2.5 | C _L = 30 pF, R _L = 1 MΩ | 1.0 | – | 13.0 | – | – | – | ns | Figure 3, Figure 4 |
| | | | 1.10 to 1.30 | 4.0 | 8.0 | 12.7 | 3.5 | 15.9 | | |
| | | | 1.40 to 1.60 | 3.5 | 7.0 | 11.2 | 3.0 | 14.3 | | |
| | | | 1.65 to 1.95 | 3.0 | 6.0 | 10.5 | 2.5 | 13.6 | | |
| | | | 2.30 to 2.70 | 2.5 | 5.0 | 9.9 | 2.0 | 12.8 | | |
| | | | 3.00 to 3.60 | 2.5 | 5.0 | 9.7 | 2.0 | 12.5 | | |
| t _{PHL} , t _{PLH} | Propagation Delay Output Translation V _{CC} (V) = 3.3 | C _L = 30 pF, R _L = 1 MΩ | 1.0 | – | 12.0 | – | – | – | ns | Figure 3, Figure 4 |
| | | | 1.10 to 1.30 | 3.0 | 8.0 | 11.7 | 2.0 | 15.0 | | |
| | | | 1.40 to 1.60 | 2.5 | 7.0 | 9.8 | 1.5 | 12.2 | | |
| | | | 1.65 to 1.95 | 2.0 | 6.0 | 8.9 | 1.0 | 11.5 | | |
| | | | 2.30 to 2.70 | 1.5 | 5.0 | 8.3 | 1.0 | 10.7 | | |
| | | | 3.00 to 3.60 | 1.5 | 5.0 | 8.1 | 1.0 | 10.4 | | |

CAPACITANCE

| Symbol | Parameter | Conditions | V _{CC} / V _{CC1} (V) | T _A = +25°C | Unit |
|------------------|-------------------------------|---|---|------------------------|------|
| | | | | Typ | |
| C _{IN} | Input Capacitance | | | 2 | pF |
| C _{I/O} | Input/Output Capacitance | | | 4 | pF |
| C _{PD} | Power Dissipation Capacitance | V _I = 0 V or V _{CC1} , f = 10 MHz, V _{CC} / V _{CC1} = 3.6 V | 1.0 to 3.60 | 8 | pF |

FXLP34

Translator Power-up Sequence Recommendations

To ensure that the system does not experience unnecessary I_{CC} current draw, bus contention, or oscillations during power-up; adhere to the following guidelines. This device is designed with the output pin(s) supplied by V_{CC} and the input pin(s) supplied by V_{CC1} . The first recommendation is to begin by powering up the input side of the device with V_{CC1} . The Input pin(s) should be ramped with or ahead of V_{CC1} or held LOW. This guards against bus contentions and oscillations as all inputs and the

input V_{CC1} are powered at the same time. The output V_{CC} can then be powered to the target voltage level to which the device will translate. The output pin(s) then translate to logic levels dictated by the output V_{CC} levels.

Upon completion of these steps, the device can be configured for the desired operation. Following these steps helps prevent possible damage to the translator device as well as other system components

AC Loadings and Waveforms

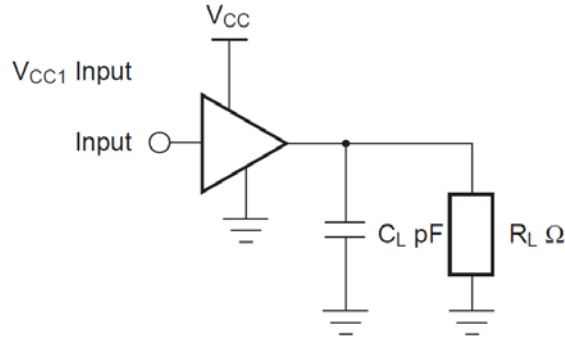


Figure 3. AC Test Circuit

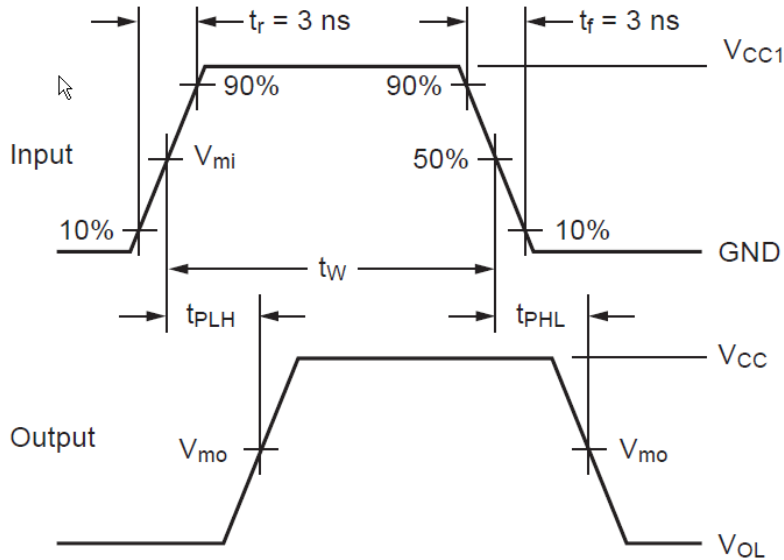


Figure 4. Waveform for Inverting and Non-Inverting Functions

Table 1. AC LOAD TABLE

| Symbol | V_{CC} | | | | | |
|----------|-------------------|-------------------|--------------------|--------------------|--------------------|-------------|
| | 3.3 V \pm 0.3 V | 2.5 V \pm 0.2 V | 1.8 V \pm 0.15 V | 1.5 V \pm 0.10 V | 1.2 V \pm 0.10 V | 1.0 V |
| V_{mi} | 1.5V | $V_{CC1}/2$ | $V_{CC1}/2$ | $V_{CC1}/2$ | $V_{CC1}/2$ | $V_{CC1}/2$ |
| V_{mo} | 1.5V | $V_{CC}/2$ | $V_{CC}/2$ | $V_{CC}/2$ | $V_{CC}/2$ | $V_{CC}/2$ |

FXLP34

ORDERING INFORMATION

| Part Number | Top Mark | Package Type | Shipping† |
|-------------|----------|---|--------------------|
| FXLP34P5X | X34 | 5-Lead SC70, EIAJ SC-88a, 1.25 mm Wide (Pb-Free) | 3000 / Tape & Reel |
| FXLP34L6X | X3 | SIP6, 6-Lead MicroPak, 1.00 mm Wide (Pb-Free) | 5000 / Tape & Reel |
| FXLP34FHX | X3 | UDFN6, 6-Lead, MicroPak2, 1x1 mm Body, .35 mm Pitch (Pb-Free) | 5000 / Tape & Reel |

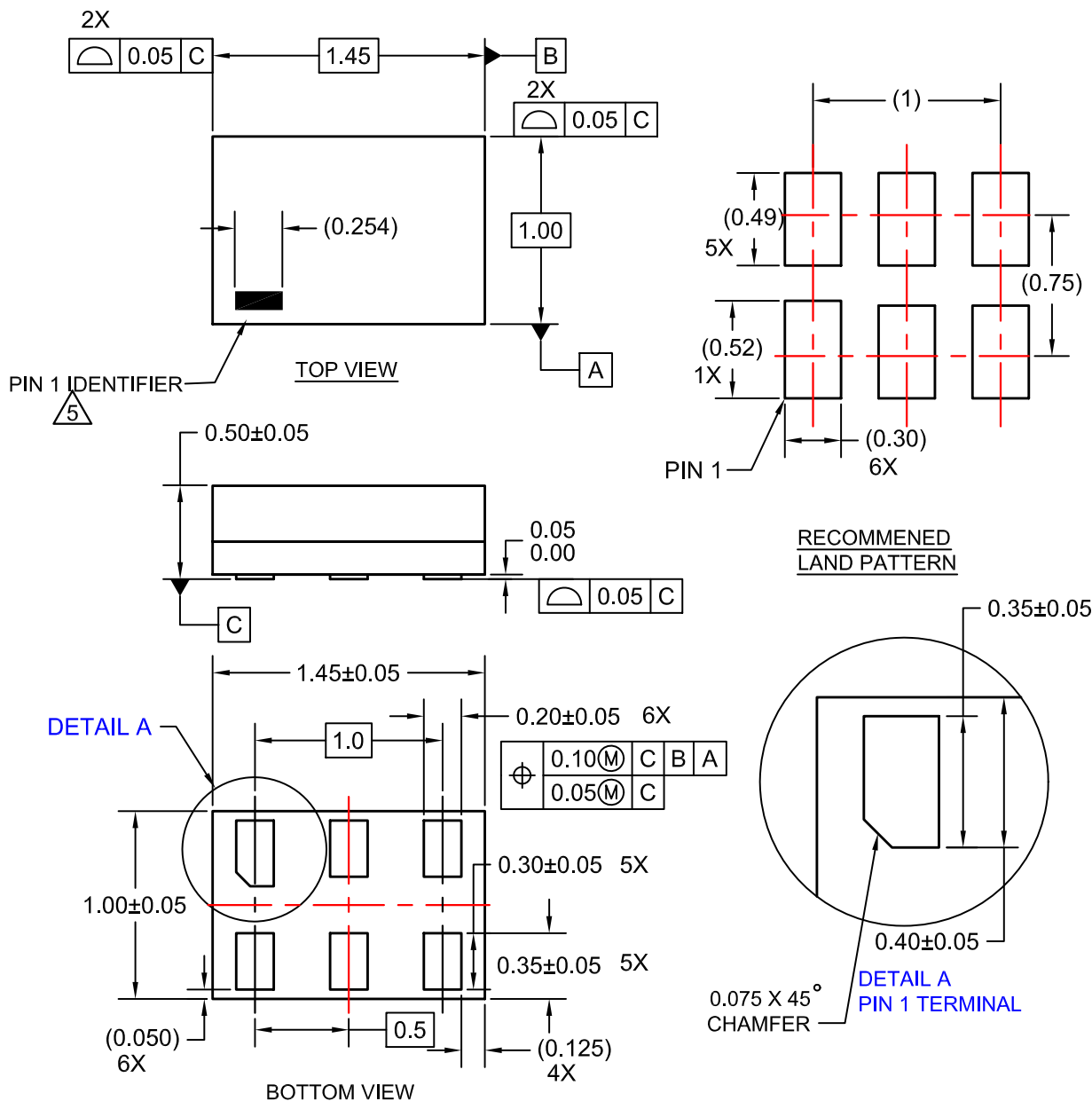
†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

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SIP6 1.45X1.0
CASE 127EB
ISSUE O

DATE 31 AUG 2016



NOTES:

1. CONFORMS TO JEDEC STANDARD MO-252 VARIATION UAAD
2. DIMENSIONS ARE IN MILLIMETERS
3. DRAWING CONFORMS TO ASME Y14.5M-2009
4. PIN ONE IDENTIFIER IS 2X LENGTH OF ANY OTHER LINE IN THE MARK CODE LAYOUT.

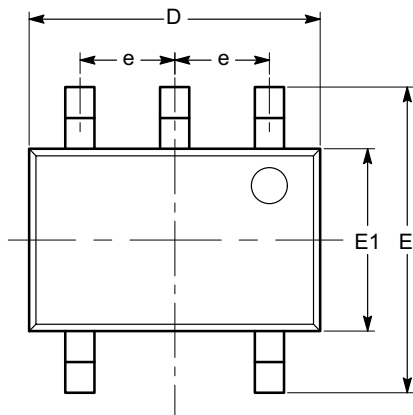
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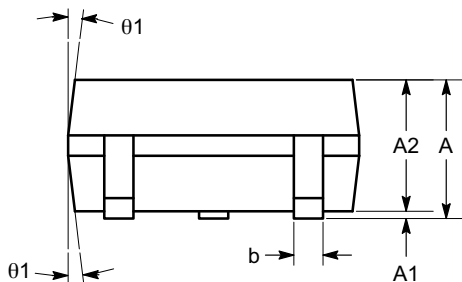
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CASE 419AC-01
ISSUE A

DATE 29 JUN 2010

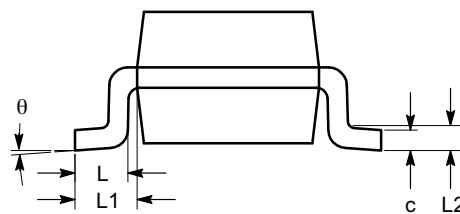


TOP VIEW

| SYMBOL | MIN | NOM | MAX |
|------------|----------|------|------|
| A | 0.80 | | 1.10 |
| A1 | 0.00 | | 0.10 |
| A2 | 0.80 | | 1.00 |
| b | 0.15 | | 0.30 |
| c | 0.10 | | 0.18 |
| D | 1.80 | 2.00 | 2.20 |
| E | 1.80 | 2.10 | 2.40 |
| E1 | 1.15 | 1.25 | 1.35 |
| e | 0.65 BSC | | |
| L | 0.26 | 0.36 | 0.46 |
| L1 | 0.42 REF | | |
| L2 | 0.15 BSC | | |
| θ | 0° | | 8° |
| $\theta 1$ | 4° | | 10° |



SIDE VIEW



END VIEW

Notes:

- (1) All dimensions are in millimeters. Angles in degrees.
- (2) Complies with JEDEC MO-203.

| | | |
|-------------------------|--------------------------------------|--|
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