Product Overview

Voltage Translating Gates

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Systems that require logic gates can have mismatched logic voltage levels resulting in the need for a voltage translating gate to enable communication between devices. For example, a singular LVxT device can be used instead of both a translator and gate, resulting in a decrease of board space and easier integration.

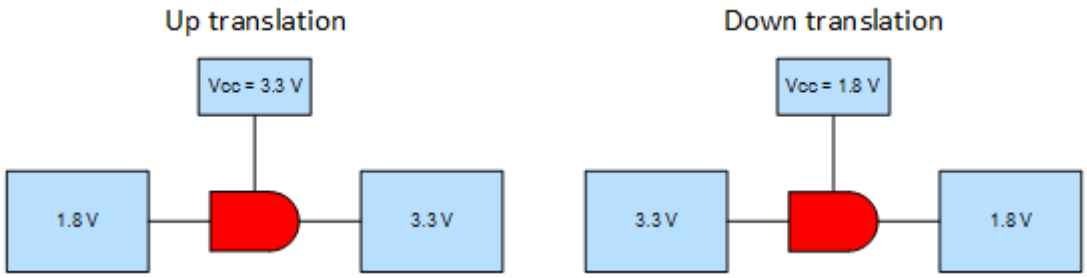

Figure 1. Voltage Translation Using an AND Gate

Left: block diagram for up translation Right: block diagram for down translation

Design Considerations

- Voltage translation is capable of performing both up and down translation with a single supply
- Ability to reduce the number of parts for qualification and assembly
- Board design is streamlined by obtaining the functionality of two devices in one
- Wide voltage range support systems with varied levels of logic coexisting including 1.8V, 2.5V, 3.3V and 5.0V
- For traces longer than 12cm (4760 mil), see *Drive Transmission Lines With Logic*
- *[FAQ] How does a slow or floating input affect a CMOS device?*
- *[FAQ] Where do I find maximum power dissipation for a device?*
- Ask a question on TI's *E2E*™ forums

Recommended Parts

Part Number	AEC-Q100	V_{CC} Range	Channels	Features
SN74AUP1T02		2.3V to 3.6V	1	Single 2-input Schmitt-trigger NOR gate
SN74AUP1T08		2.3V to 3.6V	1	Single 2-input Schmitt-trigger AND gate
SN74AUP1T32		2.3V to 3.6V	1	Single 2-input Schmitt-trigger OR gate
SN74LV1T08		1.65V to 5.5V	1	Single 2-input AND gate
SN74LV1T08-Q1	✓			
SN74LV1T32		1.65V to 5.5V	1	Single 2-input OR gate
SN74LV1T32-Q1	✓			
SN74LV4T08		1.65V to 5.5V	4	Quad 2-input AND gates
SN74LV4T08-Q1	✓			
SN74LV4T00		1.65V to 5.5V	4	Quad 2-input NAND gates
SN74LV4T00-Q1	✓			

For more devices, browse through the *online parametric tool* where you can sort by desired voltage, channel numbers, and other features.

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