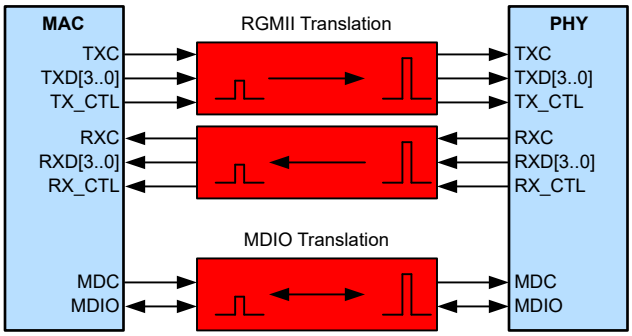
Product Overview

Translate Voltages for RGMII

RGMII is a high-bandwidth data bus protocol with very strict timing considerations. The following device recommendations are provided as a suggested solution as they can support the data rates required for RGMII interfaces; however, because the RGMII specification is defined without consideration for voltage level translation, board-level assessment of key timing parameters and assessment of performance within the system is encouraged.



Example of Using Voltage Translation with RGMII

Design Considerations

- Board layout is critical to the success of RGMII translation; we recommend using signal integrity simulations and prototyping for any design
- Use active translators for maximum data rate
- Use one device for all TX signals and one for all RX signals to minimize channel-to-channel skew
- See *Low Voltage Translation For SPI, UART, RGMII, JTAG Interfaces* for details regarding the performance of SN74AXC8T245 in RGMII applications
- Place translators closest to the low-voltage device, if possible, to improve signal integrity
- Consider source-terminating signals if sent over 12 cm (4700 mil) or longer traces
- Need additional assistance? Ask our engineers a question on the *TI E2E™ logic support forum*

Recommended Parts

Part Number	Automotive Qualified	RGMII Voltage Translation Range	Device Maximum Data Rate (Mbps)	Features
SN74AXC8T245		2.5 V to 3.3 V	380 Mbps	Glitch-free power supply sequencing Outputs are disabled when either supply is 0 V Active translation architecture
SN74AXC8T245-Q1	✓			
SN74AVC8T245		1.8 V to 3.3 V	320 Mbps	Active translation architecture
SN74AVC8T245-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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