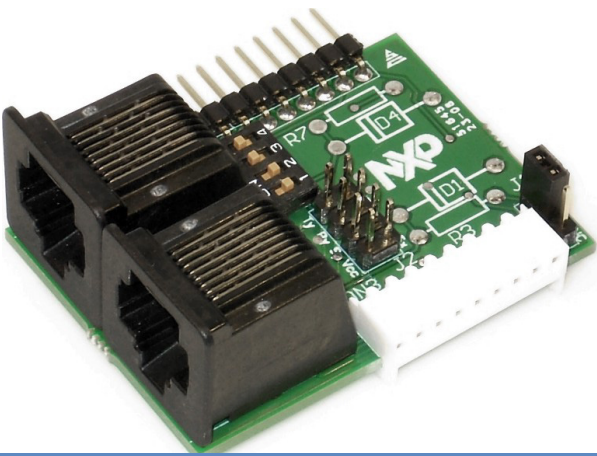


# NXP PCA9600 daughter card OM6293



## Easily test and demonstrate the PCA9600 dual bidirectional bus buffer

This add-on to NXP's I<sup>2</sup>C 2005-1 demo board makes it easy to test and design with the PCA9600, a Fast-mode Plus (Fm+) dual bidirectional bus buffer, that provides twisted pair cable extension to increase the range of your I<sup>2</sup>C-bus.

### Key features

- ▶ Easy-to-use daughter card adapt easily to the test environment
- ▶ On-board RJ-45 connectors for fast connection
- ▶ 1 MHz Fast-mode Plus I<sup>2</sup>C-bus serial interface
- ▶ Compliant with I<sup>2</sup>C-bus Fast-mode (400 kHz) and Standard-mode (100 kHz)
- ▶ Up to 15 V operation
- ▶ Loading up to 4,000 pF on dual-ended side, 400 pF on single-ended side
- ▶ Interfaces with opto-couplers to provide opto-isolation between I<sup>2</sup>C-bus nodes up to 1 MHz.

### Applications

- ▶ Transmitting I<sup>2</sup>C-bus signals over long-distance, twisted-pair cabling
- ▶ Galvanic/safety (opto) isolation of sections of the I<sup>2</sup>C-bus (with user supplied circuit)
- ▶ Interfacing between logic devices or buses on different voltages

- ▶ Hot-plugging bus interface protection
- ▶ I<sup>2</sup>C-bus signaling via differential bus hardware – CAN bus, RS485, etc. (with user supplied circuit)

The OM6293 demonstrates the true buffer functionality of the PCA9600 and extends the I<sup>2</sup>C-bus (and derivatives) capacitance beyond the 400 pF specification maximum.

The OM6293 separates the bidirectional I<sup>2</sup>C-bus signals into unidirectional components transmitting the SDA and SCL signals via balanced transmission lines (twisted pairs). The TX and RX signals may be directly connected to provide a bidirectional signal with I<sup>2</sup>C-bus Fm+ compatibility.

The OM6293 uses the industry-standard I<sup>2</sup>C/SMBus port to communicate with the host demonstration board. The card can be connected in series with other I<sup>2</sup>C-bus daughter cards, via a standard 9-pin connector, to create a complete evaluation system.



Evaluation software, which runs on a standard Windows PC platform, and other available daughter cards, let the user explore a wide range of options.

### Extensive usability

The daughter card is designed primarily to demonstrate the capability of driving long-distance, high-voltage, low-impedance or high capacitance I<sup>2</sup>C-buses. The TX/TY outputs have 60 mA sink capability which make it possible to have close to 1MHz operation over 20 meters of wire. In addition, the board has an external power pin to evaluate long distance communications at up to 15 V.

The OM6293 also demonstrates the use of normal I<sup>2</sup>C-bus devices on Fm+ buses. For example, it can extend the drive capability of the OM6275 I2C 2005-1 demo board from 3 mA to 30 mA allowing the user to connect more boards over long wires when creating an evaluation system. Conversely, the OM6293 can also be used to buffer normal slaves on buses with higher drive.

RJ45 jacks are set-up to demonstrate high-speed transmission using a unidirectional signal path allowing to drive longer cables at higher speeds. A unidirectional signal path can be used to minimize time-of-flight delays. Splitting the Tx and Rx signals requires four pairs of cables for the SDA and SCL signals (e.g., SDA Tx and GND, SDA Rx and supply/GND, SCL Tx and GND, SCL Rx and supply/GND).

With the addition of external circuits, the OM6293 can be used to evaluate high-speed differential signals with generic LSTTL differential line drivers, or multiplexing multiple signals using LVDS serializers/deserializers, or for galvanic isolation using opto couplers.

### Demonstration platforms

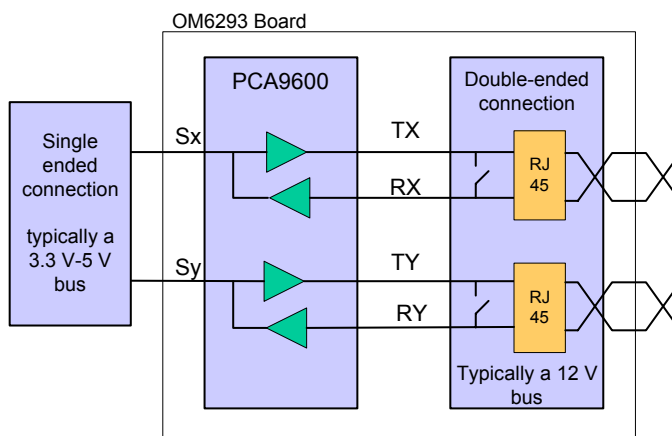
The OM6293 daughter card can be used with the Windows based OM6275 I2C 2005-1 demo board, the micro-controller based OM6299 industrial reference design, or stand alone in the user's application.

### Additional information

To order the daughter card or demonstration platforms, visit [www.digikey.com](http://www.digikey.com).

For downloadable support tools, visit [www.nxp.com/i2clogic](http://www.nxp.com/i2clogic)

For questions, email [i2c.support@nxp.com](mailto:i2c.support@nxp.com).



Block diagram of the PCA9600 daughter card

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