



26 November 2013

Product Brief

No.: 21

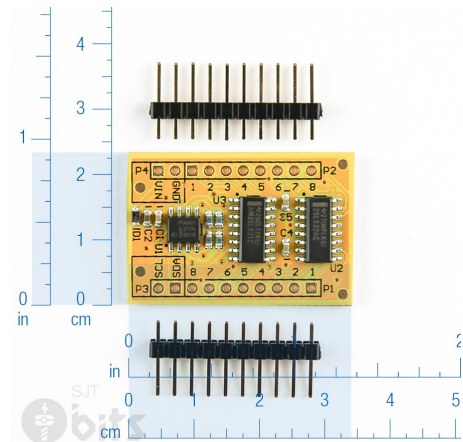
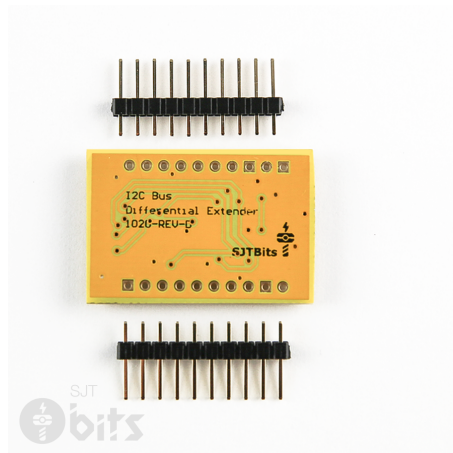
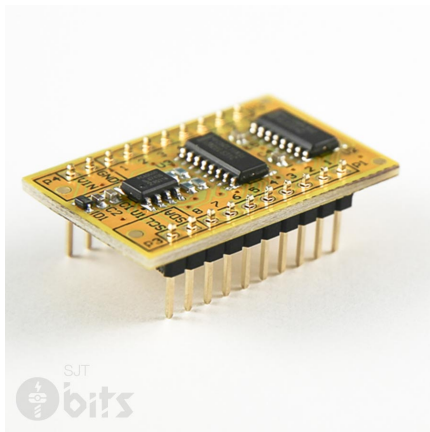
I²C Long Distance Differential Extender - "Version II"

Product Overview

This I²C to differential breakout board is a unique solution that enables the reliable use of I²C over long distances. This development board greatly expands the operational distance of I²C through use of differential signaling by transparently creating a differential signal between individual I²C devices. The board takes the data and clock lines, which make up the I²C (2 wire) bus, and divides them into inbound and outbound signals (4 wires). Each of these unidirectional signals is connected to either a differential line receiver or differential line transmitter, thus forming 4 sets of differential pairs (8 wires). This results in an increased range and noise immunity by taking advantage of the common mode rejection made possible by differential signaling and increasing the bus capacitance limit.

This product has externalized I²C pull up resistors allowing developers to pick the right pull up value for their device and bus speeds. The power, ground, clock and data lines match a standard 0.1 inch header spacing common to breadboards.

Note: The I²C differential extender works best with a 5V input on the VIN and the data/clock lines of the I²C bus. If your project needs the I²C bus to work at a higher or lower voltage level, a logic level converter is recommended.





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Product Dimensions

Size: (LxWxH)	34.55mm x 23.75 mm x 3.3 mm 1.36 in. x 0.935 in. x 0.13 in.
Weight:	3 g ¹

General specifications

Minimum logic voltage:	4.6 V
Maximum logic voltage:	5.2 V
Supply current:	150-250 mA

Notes:

- 1 Without included header pins (2 sets of 10).

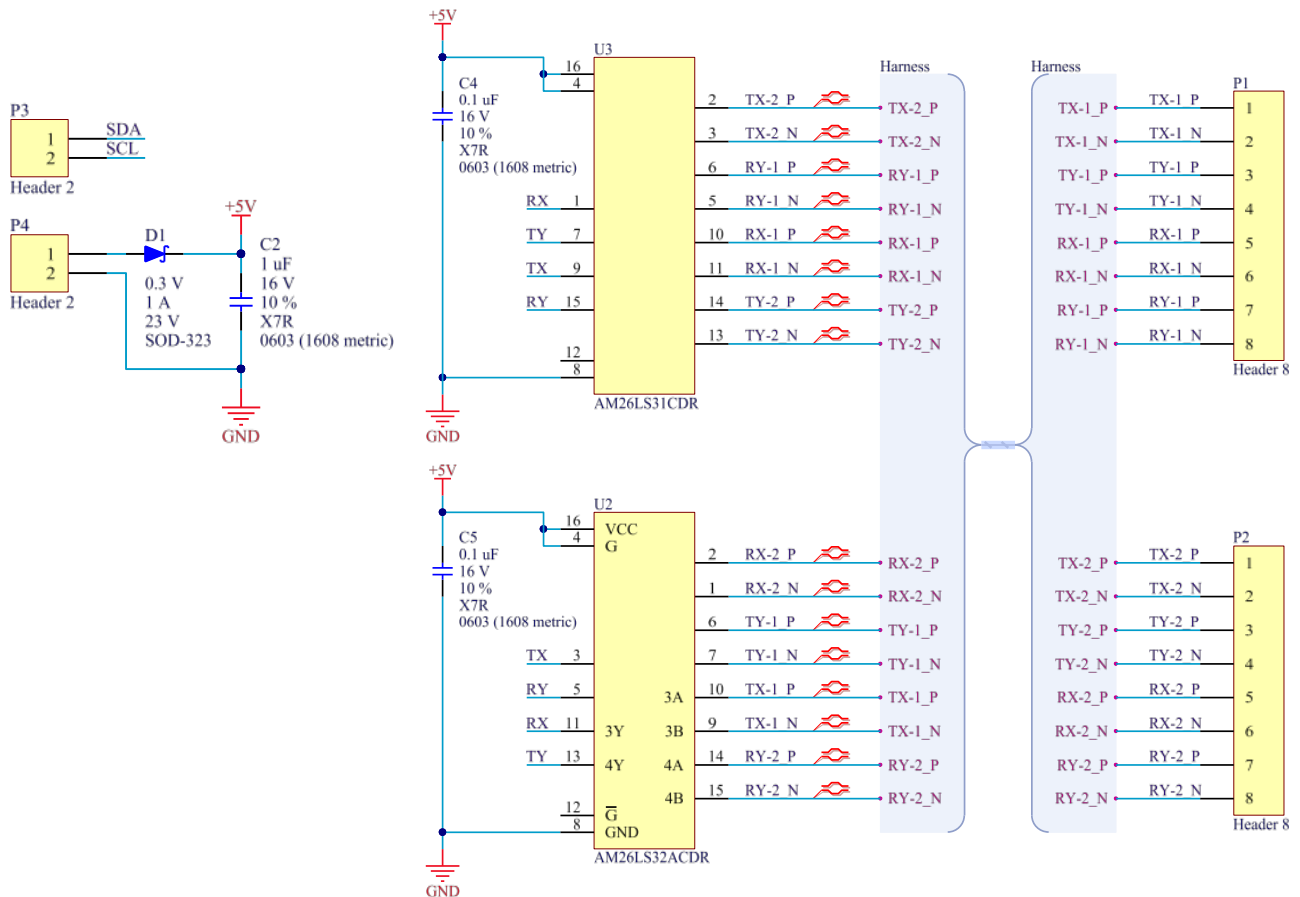
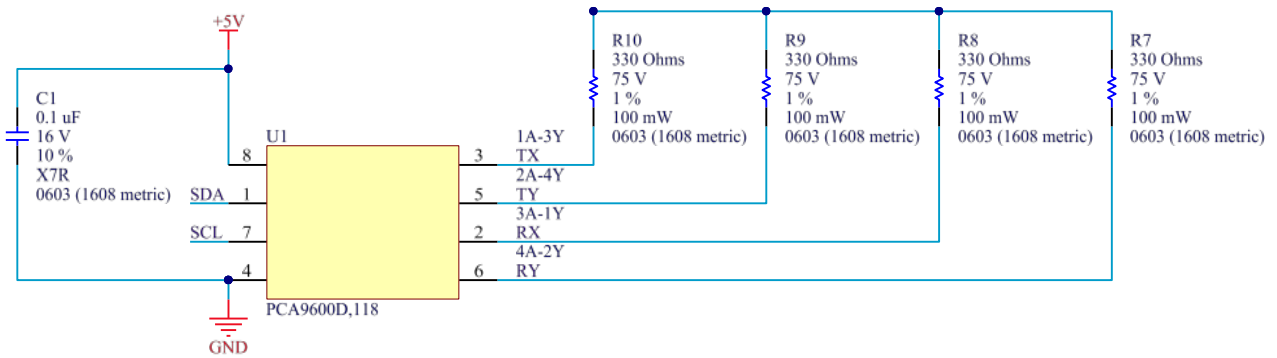


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Schematic - I²C Long Distance Differential Extender





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How to Use (Wiring Diagram)

Creating the Network

The design of the board requires the bus to contain one master located at the beginning of the bus. The master must connect to the balance of the bus slaves through Port 1. Any following slave's device connections require wiring Port 2 to Port 1. Ports are labeled P1 (Port 1) and P2 (Port 2). Depending on the I²C device selection, pull-up resistors will be required for I²C SCL (Clock) and CDA (Data) lines.

Field Testing

The I2C Long Distance Differential Extender has been tested at range for 150 feet using Cat5 at the I2C clock speed of 100 kHz. The maximum range possible will depend on the wire selection, shielded or unshielded, and clock speed.

