

FT2232H Breakout User Guide

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Introduction

Numato Lab's FT2232H Breakout is a versatile product for USB to multi-port JTAG, SPI and I2C interfaces (Two Multi-Protocol Synchronous Serial Engines available with the FT2232H) and USB to multi-port asynchronous serial interfaces. FT2232H is FTDI's 5th generation of USB device which is USB 2.0 Hi-Speed (480Mb/s) to UART/FIFO IC. It has the capability of being configured in a variety of industry standard serial or parallel interfaces.

Some of the possible uses of this module include

- Single chip USB to dual channel UART (RS232, RS422 or RS485)
- Single chip USB to dual channel FIFO
- Single chip USB to dual channel JTAG
- Single chip USB to dual channel SPI
- Single chip USB to dual channel I2C
- Single chip USB to dual channel Bit-Bang.
- Prototype development
- High-speed USB instrumentation

This product is compatible with the following operating systems.

- Windows XP and later
- Linux
- Mac
- And any other operating system that supports USB CDC devices

The drivers listed above are all available to download for free from <http://www.ftdichip.com/FTDrivers.htm>.

Features

- Single chip USB to dual serial / parallel ports with a variety of configurations.
- USB 2.0 High Speed (480Mbits/Second) and Full Speed (12Mbits/Second) compatible.
- Dual Multi-Protocol Synchronous Serial Engine (MPSSE) to simplify synchronous serial protocol (USB to JTAG, I2C, SPI or bit-bang) design.
- Entire USB protocol handled on the chip. No USB specific firmware programming required.
- Dual independent UART or FIFO or MPSSE ports.
- Single channel synchronous FIFO mode for transfers up to 40 M bytes/Sec
- FTDI's royalty-free Virtual Com Port (VCP) and Direct (D2XX) drivers eliminate the requirement for USB driver development in most cases.

How to Use the Breakout

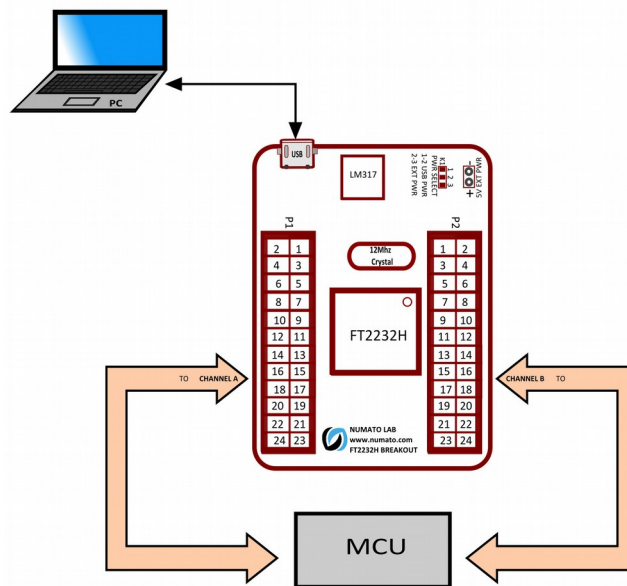
The following section describes how to use this Breakout.

Components/Tools required

Along with the module, you may need the items in the list below for easy and fast installation.

1. USB A to Micro B cable

Connection Diagram



Above image shows basic connection diagram that can be used in most of the situations. The following sections identify individual connections in detail.

USB Interface

The on board full speed USB controller that helps a PC/Linux/Mac computer to communicate and control this module seamlessly. Use a USB A to Micro B cable to connect with a PC. By default, the logic section of the module is powered from USB so make sure not to overcrowd unpowered USB hubs (the picture on the right shows USB Micro B connector).



Visit <http://numato.com/cables-accessories>. to buy cables and accessories for this product.

Pin Description

The Channel A and Channel B pin's shown in the above connection diagram are described in below table.

CHANNEL A		CHANNEL B	
Pin #	Pin Name	Pin #	Pin Name
1	GND	1	GND
2	VCC	2	5V
3	ADBUS1	3	$\overline{\text{PWREN}}$
4	ADBUS0	4	VCC
5	ADBUS3	5	BCBUS7
6	ADBUS2	6	BCBUS6
7	ADBUS5	7	BCBUS5
8	ADBUS4	8	BCBUS4
9	ADBUS7	9	BCBUS3
10	ADBUS6	10	BCBUS2
11	$\overline{\text{RESET}}$	11	BCBUS1
12	GND	12	BCBUS0
13	ACBUS1	13	GND
14	ACBUS0	14	GND
15	ACBUS3	15	BDBUS7
16	ACBUS2	16	BDBUS6
17	ACBUS5	17	BDBUS5
18	ACBUS4	18	BDBUS4
19	ACBUS7	19	BDBUS3
20	ACBUS6	20	BDBUS2
21	$\overline{\text{SUSPEND}}$	21	BDBUS1
22	GND	22	BDBUS0
23	GND	23	GND
24	VCC	24	VCC

DC Power Supply

This breakout uses single power supply to function properly. A +5V supply used for the logic circuit. **By default the board is configured to use +5V supply from USB. So an external +5V power is not required unless USB port is unable to supply enough current. In most cases USB ports are capable of providing enough current for the module.** If for any reason, an external 5V power supply needs to be used for the logic section of the module, the Power select should be configured properly before connecting the power supply. Please refer to the marking on the board for more details. Make sure to connect the power supply in **correct polarity**. Connect the **positive** terminal of the power supply to the **+5V** terminal on the module. Connect **negative** terminal of the power supply to **GND** terminal of the module.

EEPROM

The FT2232H Breakout utilizes an EEPROM which contains the USB configuration descriptors for the FT2232H. When the Breakout is plugged into a PC or a USB reset is performed, the PC will read these descriptors. The EEPROM on the FT2232H Breakout can be re-programmed over USB using the utility program FT_Prog. This can be downloaded from the <http://www.ftdichip.com/Support/Utilities.htm>.

FAQ

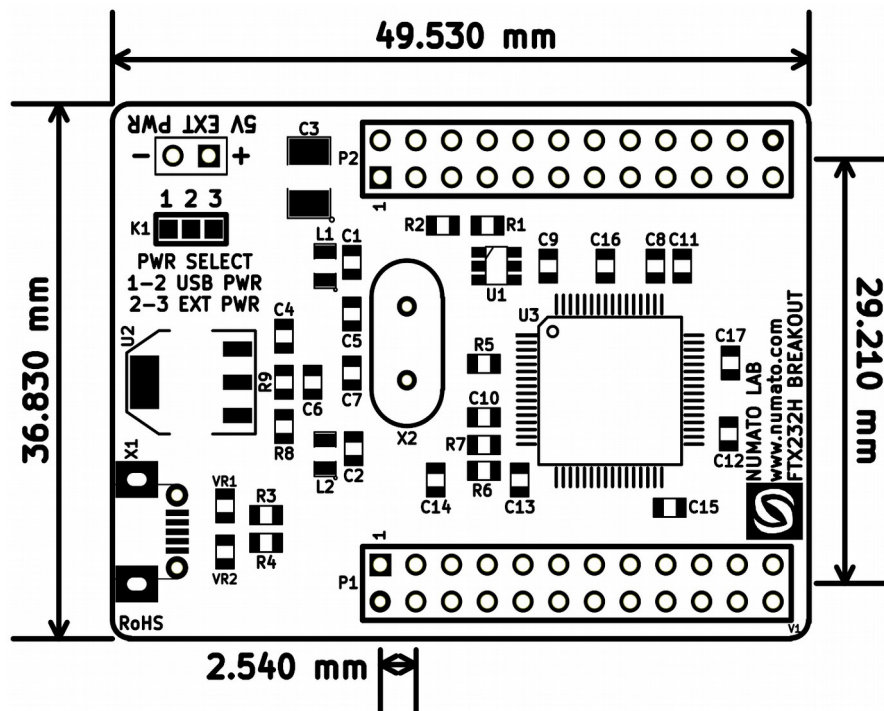
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Physical Dimensions



L x W x H : 49.530mm x 36.830mm x 14mm

Schematics

See next page.

