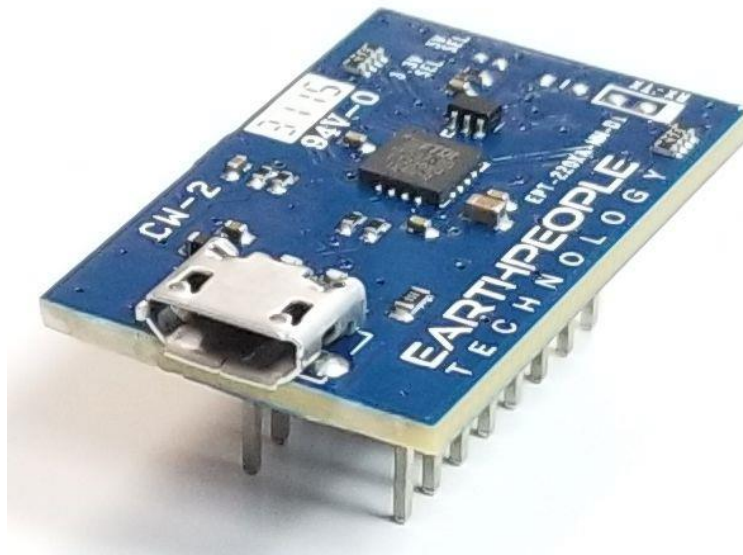


Data Sheet USB SPI Slave Breakout Board

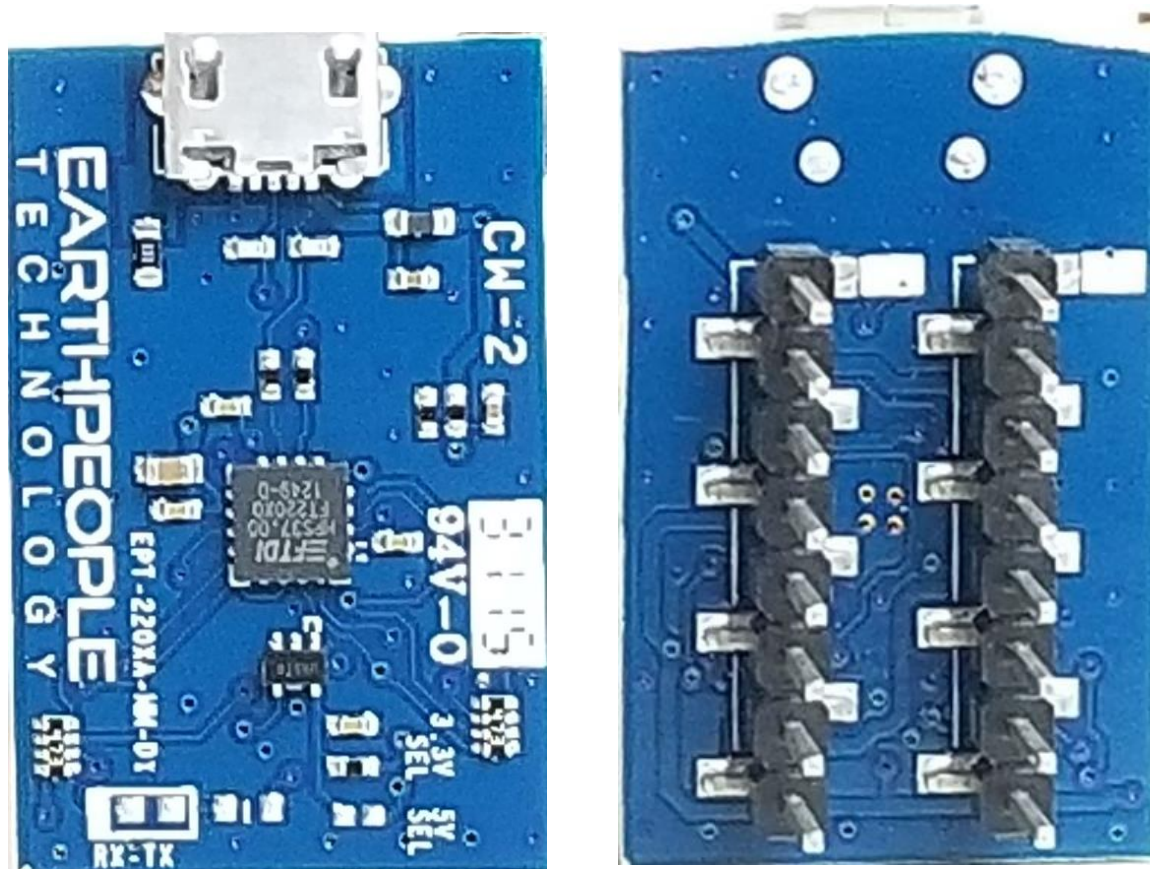
## USB SPI SLAVE BREAKOUT BOARD

### Data Sheet



The USB SPI Slave Breakout Board provides a simple interface for bi-directional communication with the PC from any MCU (including the Arduino family). It is designed to connect directly to the standard bread board with a reduced footprint. Once connected to an MCU, the MCU Master SPI bus connects to the FT220X chip. This chip connects the SPI bus to the USB bus. The PC communicates with the USB SPI Slave Breakout Board as COM Port. This allows any simple Terminal Window software (such as TeraTerm) to communicate directly with the MCU. Earth People provides sample software so the user can use the Arduino functions to send data to be graphed on the PC.

## 1 Hardware Description



The USB SPI Slave Breakout Board consists of the FT220X chip from FTDI. This single chip solution connects the Slave SPI bus directly to USB. The board includes a USB Micro B connector and two 1x8 0.1 inch headers. The board is powered from the USB port of the PC. It provides +3.3V regulated output to power up user MCU's or any other power need. Current from the +3.3V regulated output is 50mA. No external power is needed for the USB SPI Slave Breakout Board.

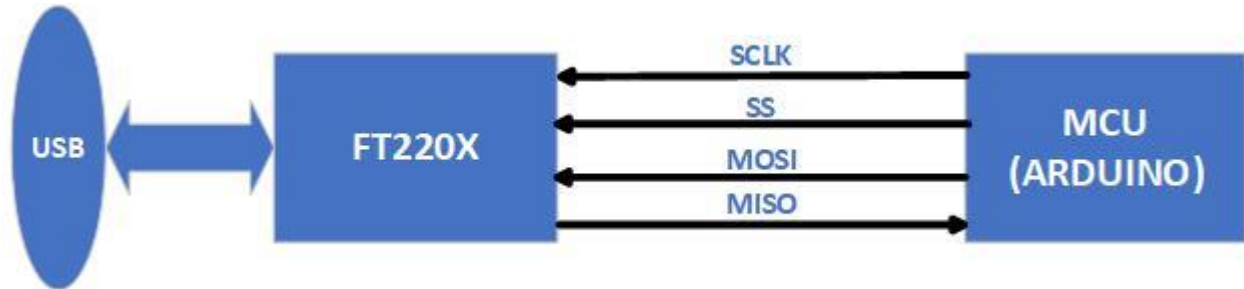
## 2 SPI Bus

The USB SPI Slave Breakout board uses a Slave SPI bus. The external MCU must provide the SPI Host activities. The board will respond to any Host SPI clock cycle up to 12MHz. The Slave Select signal, SS, must be asserted low before transmitting SCLK cycles to the FT220X chip. The chip will decode the SPI

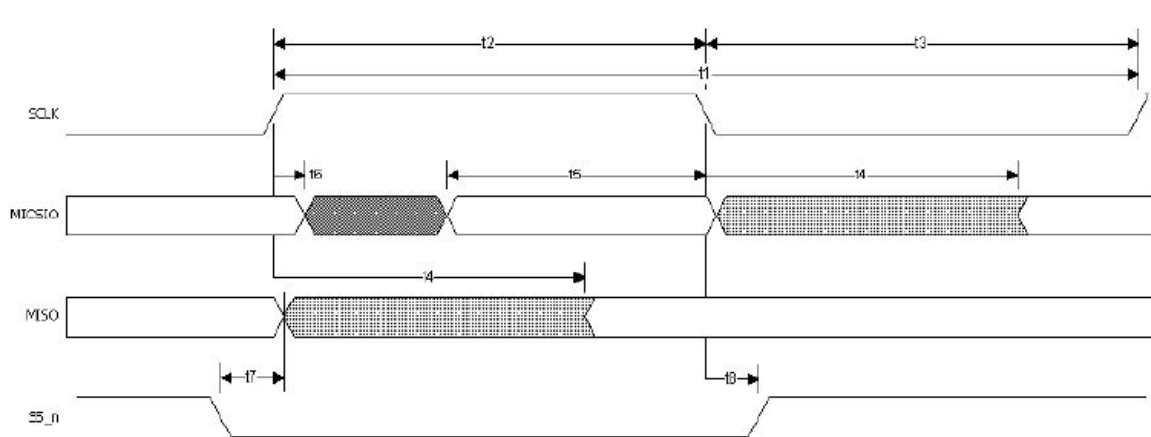


## Data Sheet USB SPI Slave Breakout Board

MOSI data as eight bit bytes. The chip will also transmit MISO data as eight bit bytes.



Slave SPI Signal timing is below.



	Min (ns)	Min (ns)	Typical (ns)	Max (ns)	Description
T1		83.3			SCLK Period
T2		41.6			SCLK High
T3		41.6			SCLK LOW

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T4		1	10		SCLK rising or falling driving edge to MIOSIO/MSIO
T5		20			MIOSIO setup time to rising or falling sample SCLK edge
T6		0			MIOSIO hold time from rising or falling sample SCLK edge
T7		5			SS_n setup time to rising or falling SCLK edge
T8		5			SS_n hold time from rising or falling sample SCLK edge

### 3 Electrical

Parameter	Value	Unit	Conditions
VCC Supply Voltage (Absolute Maximum Rating)	-0.3 to +5.5	V	
VCCIO IO Voltage (Absolute Maximum Rating)	-0.3 to +4.0	V	

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DC Input Voltage – High Impedance  Bi-directionals (powered from VCCIO)  (Absolute Maximum Rating)	-0.3 to +5.8	V	
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Parameter	Description	Minimum	Typical	Maximum	Units	Conditions
VCC	VCC Operating Supply Voltage	2.97	5	5.5	V	Normal Operation
VCC2	VCCIO Operating Supply Voltage	1.62	---	3.63	V	
Icc1	Operating Supply Current	9.7	10.5	12.3	mA	Normal Operation
Icc2	Operating Supply Current		125		μA	USB Suspend
3V3	3.3v regulator output	2.97	3.3	3.63	V	

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3V3 Output Current	3.3V regulator output Current		50		mA	
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## 4 Connectors

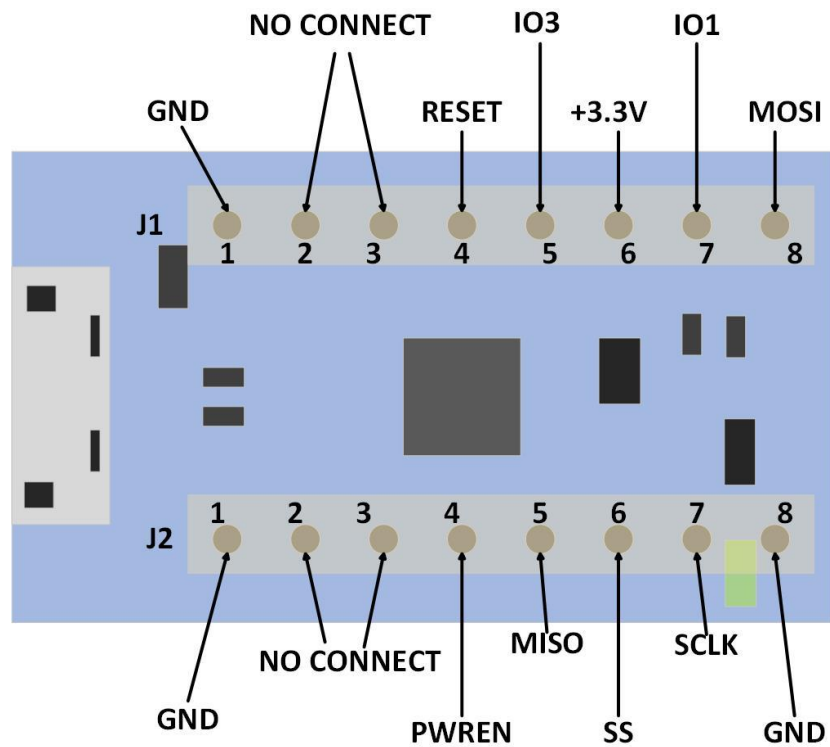
The USB SPI Slave Breakout board has three connectors:

- USB Micro B connector
- J1 Header on the bottom of the board – 1x8 0.1 Inch Header
- J2 Header on the bottom of the board – 1x8 0.1 Inch Header

J1 and J2 contain all the connections for communications with external MCU. The Micro B provides the connection to the PC USB Port.

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TOP VIEW



J1 AND J2 ARE LOCATED ON THE BOTTOM OF THE BOARD