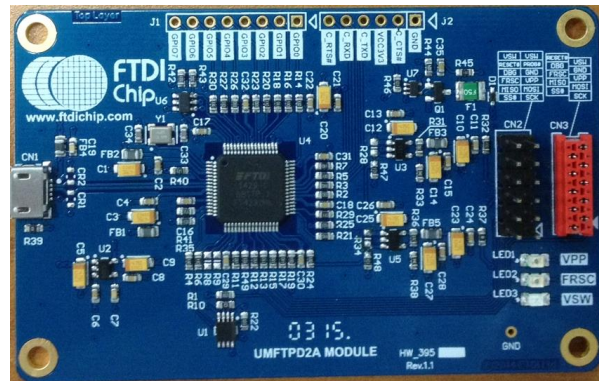# Future Technology Devices International

UMFTPD2A

UMFTPD2A is a module used for FT90x programming, debugging and EFUSE burning.

The UMFTPD2A is a module with an FT4232HL Hi-Speed USB2.0 to multipurpose UART/MPSSE converter. The UMFTPD2A module features a single line half-duplex UART signal with no handshake (One-Wire interface), one MPSSE interface, one UART interface and a Bit-Bang port.

The module has configured the FT4232HL Channel A as a UMFTPD2A one-wire interface for MM900EVxA evaluation board firmware / application download, or GDB debugging.

The FT4232HL Channel B is configured as a UMFTPD2A MPSSE interface with 4 GPIO control signals. This allows the UMFTPD2A to implement MM900EVxA evaluation board EFUSE program, or firmware / application upload as well.

The FT4232HL Channel C is optional. It is configured as a UART that can capture the messages from MM900EVxA evaluation board in software debugging.

The FT4232HL Channel D is reserved as a Bit-Bang interface for generic GPIO purposes.

The FT90x program utility can activate the required channels corresponding to the operations.

The UMFTPD2A has the following features:

- Hi-Speed USB to one-wire interface converter
- Hi-Speed USB to MPSSE interface converter
- Hi-Speed USB to UART interface converter
- Provides H/W Reset# signal
- Provide multiple generic GPIO control signals
- PWREN# line to control +5V power supply
- Fuse protected with 0.5A hold current and schottky diode on the output power line.
- Two dedicated GPIOs to control VPP and FRSC power supplies
- Three LEDs for power supply indication
- 2X5 way 1.27mm pitch Micro-MaTch socket
- 2X6 way 2.54mm pitch through hole pin header
- Mirco-B type USB port
- Micro-MaTch Male to Male 10 pin ribbon cable
- All components used are Pb-free (RoHS compliant)

Table of Contents

1 Driver Support

Royalty free D2XX Direct Drivers (USB Drivers + DLL S/W Interface)

- Windows 10   32, 64-bit
- Windows 8.1   32, 64-bit
- Windows 8   32, 64-bit
- Windows 7   32, 64-bit

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

For driver's installation, please refer to http://www.ftdichip.com/Support/Documents/InstallGuides.htm.

2 Programming Utility Support

The programming utility is provided as part of the free FT90x toolchain.

Visit FTDI's website at http://www.ftdichip.com/Products/ICs/FT90x.html for more information.

3 Ordering Information

Module Code	Description
UMFTPD2A	FTDI Programmer/Debugger Module

4 UMFTPD2A Signals

4.1 UMFTPD2A Pin Out

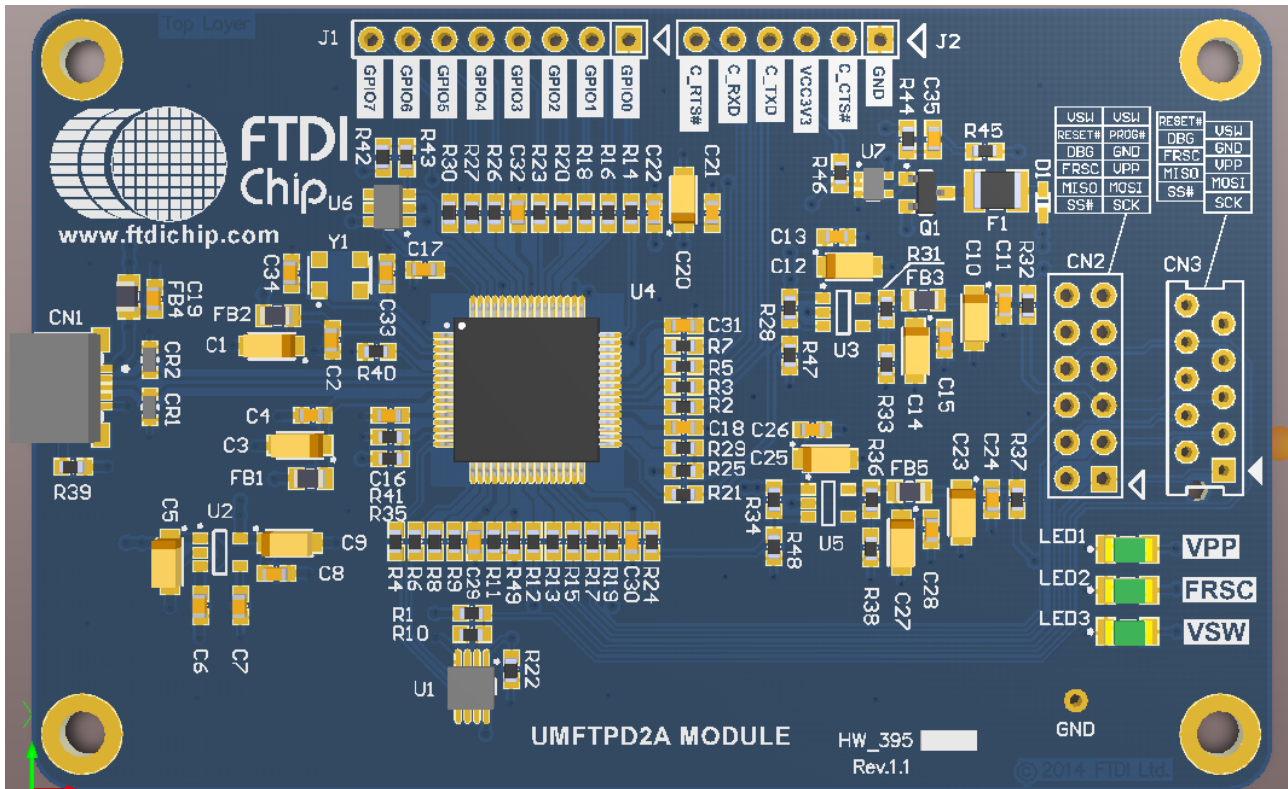**Figure 4.1 – UMFTPD2A Module Pin Out**

Figure 1 illustrates the signals available on J1, J2 pin header and CN2, CN3 connector of the UMFTPD2A.

There are 3 LED indicators for the different power supplies.

LED1 is for the VPP power supply.

LED2 is for the FRSC power supply.

LED3 is for the VSW (+5V) power output.

LED1 and LED2 only will be turned on when the system is programming the FT90x chip EFUSE.

4.2 Signal Descriptions

Pin No.	Name	Type	Description
CN2-1	SCK	Signal output	Serial clock output for SPI.
CN2-2	SS#	Signal output	Slave select output for SPI.
CN2-3	MOSI	Signal Output	Master out slave in for SPI.
CN2-4	MISO	Signal input	Master in slave out for SPI.
CN2-5	VPP	Power Out	Typically +1.85V power output when adjustable LDO is enabled.
CN2-6	FRSC	Power Out	Typically +3.7V power output when adjustable LDO is enabled.
CN2-7	GND	Ground	0V Ground.
CN2-8	DBG	Signal Input/Output	One-wire debugger interface input/output.
CN2-9	PROG#	Signal Output	Feature reserved for future use.
CN2-10	RESET#	Signal Output	Active low reset output.
CN2-11	VSW	Power Out	+5V power output. Outputs the power source from the USB bus when the FT4232HL has enumerated.
CN2-12	VSW	Power Out	+5V power output. Outputs the power source from the USB bus when the FT4232HL has enumerated.

Table 1 - CN2 Connector Pin Out Description

Pin No.	Name	Type	Description
CN3-1	SCK	Signal Output	Serial clock output for SPI.
CN3-2	SS#	Signal Output	Slave select output for SPI.
CN3-3	MOSI	Signal Output	Master out slave in for SPI.
CN3-4	MISO	Signal Input	Master in slave out for SPI.
CN3-5	VPP	Power Out	Typically +1.85V power output when adjustable LDO is enabled.
CN3-6	FRSC	Power Out	Typically +3.7V power output when adjustable LDO is enabled.
CN3-7	GND	Ground	0V Ground.
CN3-8	DBG	Signal Input/Output	One-wire debugger interface input/output.
CN3-9	VSW	Power Out	+5V power output. Outputs the power source from the USB bus when the FT4232HL has enumerated.
CN3-10	RESET#	Signal Output	Active low reset output.

Table 2 - CN3 Connector Pin Out Description

Pin No.	Name	Type	Description
J1-0	GPIO0	Signal Input/Output	Generic GPIO pin 0
J1-1	GPIO1	Signal Input/Output	Generic GPIO pin 1
J1-2	GPIO2	Signal Input/Output	Generic GPIO pin 2
J1-3	GPIO3	Signal Input/Output	Generic GPIO pin 3
J1-4	GPIO4	Signal Input/Output	Generic GPIO pin 4
J1-5	GPIO5	Signal Input/Output	Generic GPIO pin 5
J1-6	GPIO6	Signal Input/Output	Generic GPIO pin 6
J1-7	GPIO7	Signal Input/Output	Generic GPIO pin 7

Table 3 - J1 Header Pin Out Description

Pin No.	Name	Type	Description
J2-1	GND	Ground	0V ground
J2-2	C_CTS#	Signal Input	Active low clear to send input for UART
J2-3	VCC3V3	Power out	+3.3V power output
J2-4	C_TXD	Signal Output	Active high transmitter output for UART
J2-5	C_RXD	Signal Input	Active high receiver input for UART
J2-6	C_RTS#	Signal Output	Active low request to send output for UART

Table 4 - J2 Header Pin Out Description
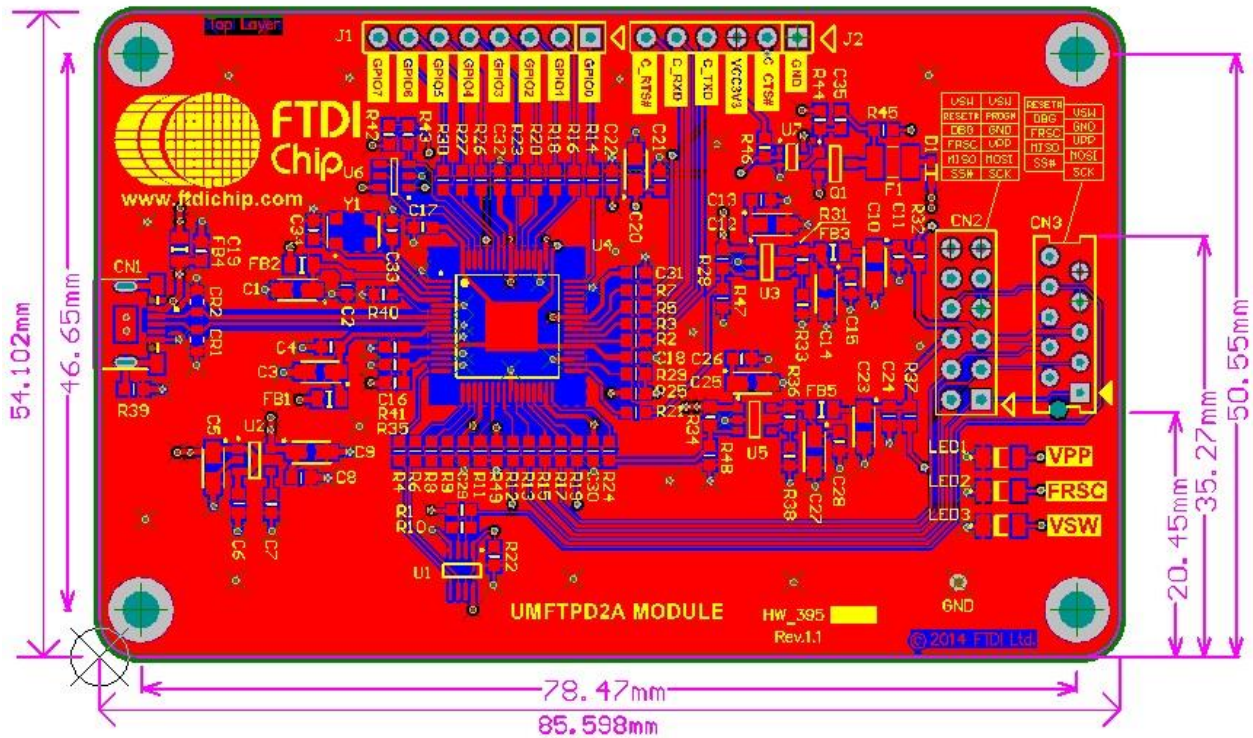
5 Module Dimensions

Figure 5.1 – UMFTPD2A Module Dimensions

All dimensions are given in millimetres. Hole size diameter = 3.2mm.

The UMFTPD2A module exclusively uses lead free components, and is fully compliant with European Union directive 2002/95/EC.
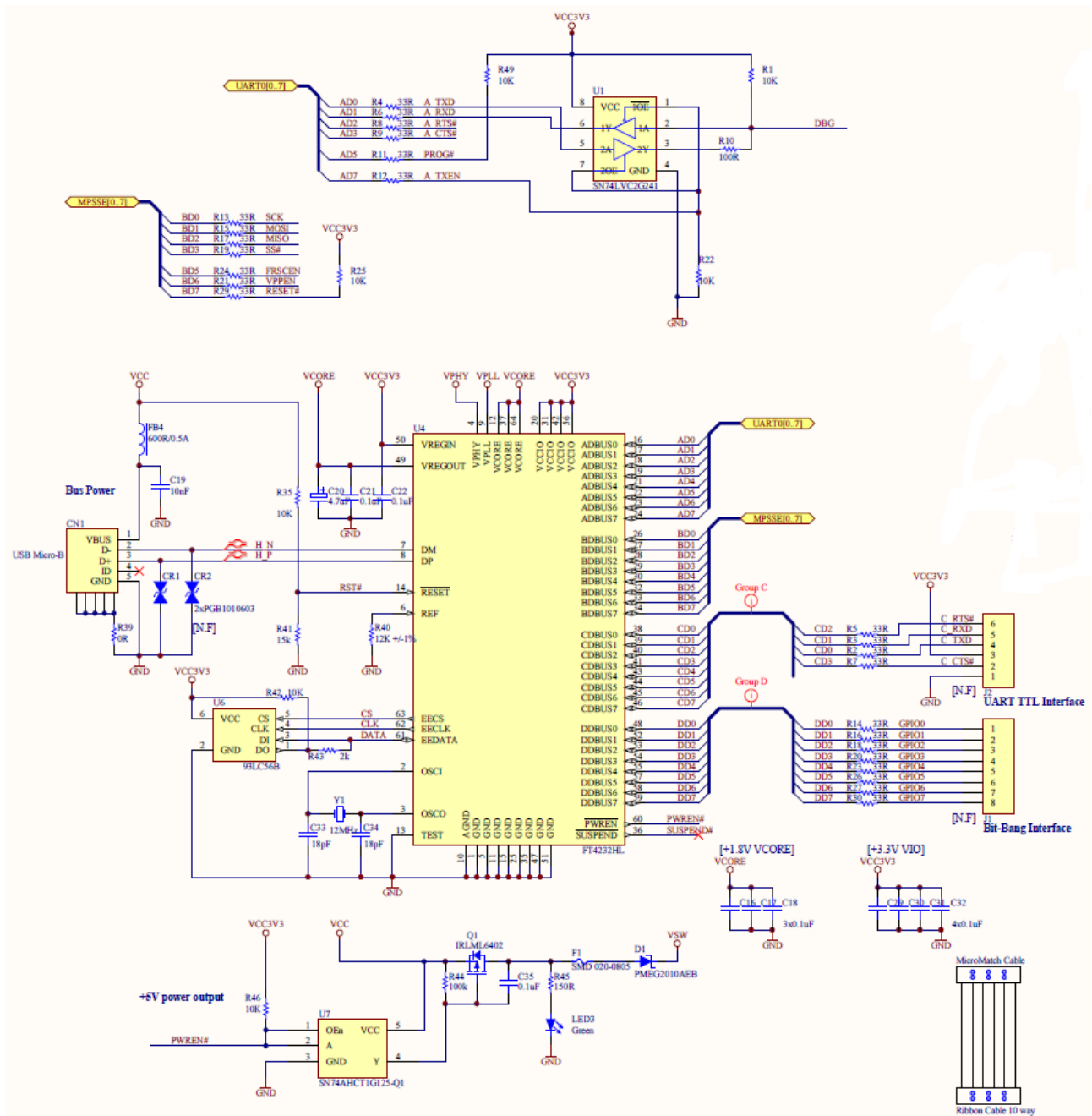
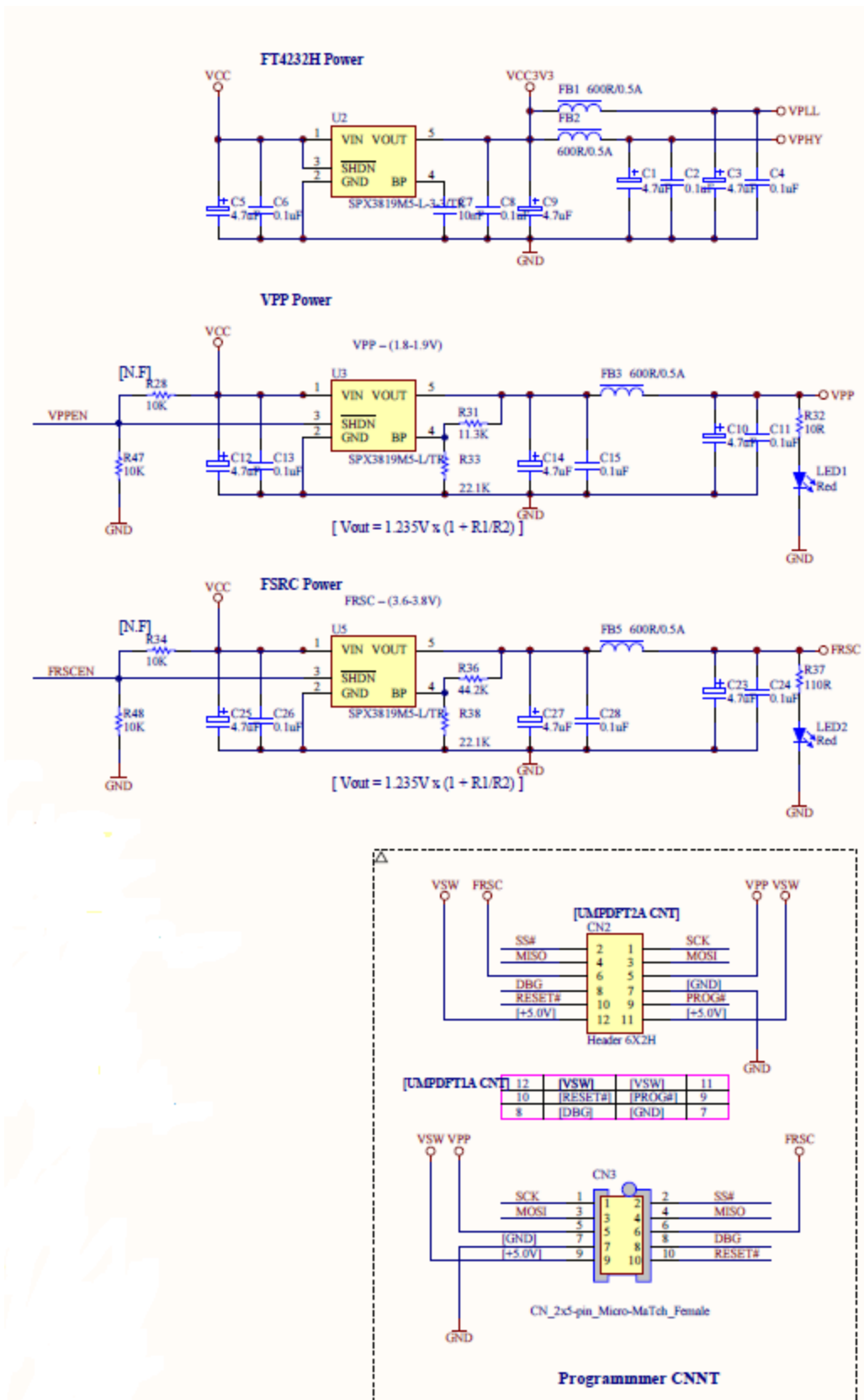# 6 UMFTPD2A Module Circuit Schematic

Figure 6.1 - Schematic part 1

Figure 6.2 - Schematic part 1

7 Hardware Setup Guide

7.1 Module Connect to PC

The first time the UMFTPD2A module is connected to a Windows OS PC, the USB device drivers need to install. This should happen automatically if you are connected to a network but you can also download from the FTDI Website.

Before the FT900 programming utility uses this module, make sure the D2xx device driver installation completes successfully.

7.2 FT900 Programming Utility

Run the FT90x programming utility (Figure 4) to download firmware / application after the whole setup (Figure 5) is ready. Please refer to AN_325 FT90X Toolchain Guide for tool operation.
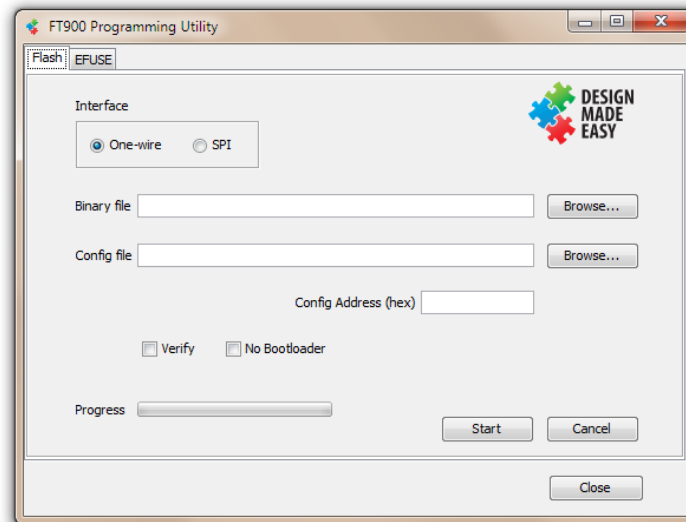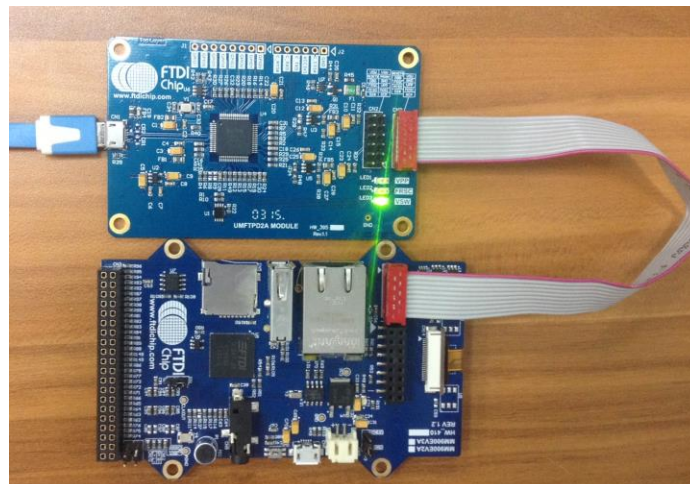

Figure 7.1 – FT90x Progamming Utility

Figure 7.2 – MM900EVxA Module Connection

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Distributor and Sales Representatives

Please visit the Sales Network page of the FTDI Web site for the contact details of our distributor(s) and sales representative(s) in your country.

Appendix A – References

Document References

FT90x datasheet: FT900/FT901/FT902/FT903 Datasheet

FT900 tool chain installation guide document: AN_325 FT900 Tool Chain Installation Guide

Acronyms and Abbreviations

Terms	Description
DLL	Dynamic Link Library
GPIO	General Purpose Input/Output
LED	Light Emitting Diode
MPSSE	Multi-Protocol Synchronous Serial Engine
OS	Operating System
PC	Personal Computer
RoHS	Restriction of Hazardous Substances
UART	Universal Asynchronous Receiver Transmitter
USB	Universal Serial Bus

Appendix B – List of Figures and Tables

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List of Tables

Appendix C – Revision History

Document Title   :   UMFTPD2A Program Module

Document Reference No.   :   FT_001187

Clearance No.   :   FTDI#465

Product Page   :   http://www.ftdichip.com

Document Feedback   :   Send Feedback

Revision	Changes	Date
1.0	Initial Release	2015-09-21
1.1	Updated schematic image	2015-09-30
1.2	Corrected the Typo Big Bang to Bit Bang on the Title page	2016-04-07