

Future Technology Devices International

Datasheet

ME812A-WH50R Display Module



General Purpose Multi Media Controller

1 Introduction

The ME812A-WH50R is a development module for FTDI's FT812, Embedded Video Engine (EVE) graphics controller IC. This module behaves as an SPI slave, and requires a SPI Master for proper micro-controller interface and system integration.

The ME812A-WH50R module includes a 5.0 inch 800*480 TFT LCD panel with resistive touch screen, and an audio amplifier to drive 8Ω speaker.

1.1 Features

The ME812A-WH50R module utilises the FT812, FTDI's 2nd generation EVE chip. Graphic, audio and touch functions of the FT812 can be accessed with the ME812A-WH50R. For a full list of the FT812's features, please see the [FT81x datasheet](#).

The ME812A-WH50R has the following features:

- Ready to use 5 inch WVGA LCD module.
- Supports portrait and landscape display mode.
- Bright backlight LED with dimming.
- Supports resistive touch with pressure sensing.
- Supports mono audio from FT812 or external source.
- On board audio amplifier for driving an external 1W speaker.
- +5.0V single power supply.
- Support direct connectivity to MM900EV series modules as a display add-on.
- Comes with bezel with four mounting holes for easy system assembly.

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2 Ordering Information

Part No.	Description
ME812A-WH50R	FT812 module, with Quad SPI host connector, 5.0 inch 800*480 TFT LCD resistive touch panel preinstalled. Black bezel.
CleO-SPK1	An 8Ω 1W speaker enclosure with connecting wires to ME812A-WH50R.

Table 2-1 – Ordering information

Note: This module is recommended as an accessory to the MM900EV series for development purposes.

For more information on the MM900EV series, refer to:
<http://www.ftdichip.com/Products/Modules/MCUModules.htm>.

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3 Board Interface Description

The ME812A-WH50R module is intended for direct use into existing applications that require a display.

This module is suitable for interfacing with an external microcontroller (e.g. MM900EV series) that has a SPI Master channel (single, dual or quad data bus).

3.1 Board Profile

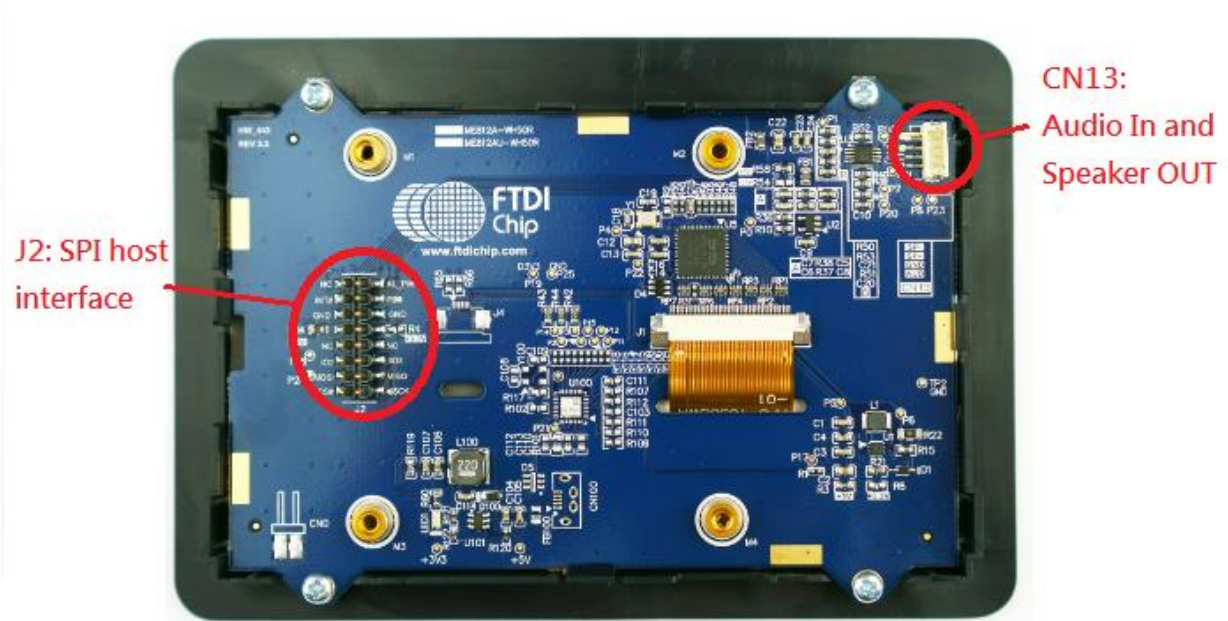


Figure 3-1 – ME812A-WH50R board bottom view

3.2 J2- SPI slave interface

J2 is an 8x2 pin header which provides power inputs and SPI slave interface signals. An MCU board with SPI master can easily add a display panel by connecting to the ME812A-WH50R through J2. If an MM900EV series module is used, it can be directly plugged into J2 and secured with 4 standoff mounting holes.

Pin No.	Name	Type	Description
1	MA_SCK	I	SPI clock input
2	MA_CS#	I	SPI chip select, active low
3	MA_MISO	I/O	SPI master input, slave output or Quad SPI IO1
4	MA_MOSI	I/O	SPI master output, slave input or Quad SPI IO0
5	MA_IO3	I/O	GPIO1 or Quad SPI IO3
6	MA_IO2	I/O	GPIO0 or Quad SPI IO2
7	-	-	NC
8	-	-	NC
9	-	-	NC
10	MA_5V	P	5V power supply input
11	GND	P	Ground
12	GND	P	Ground
13	MA_PD#	I	Powers down input, active low. Connect to 3.3V if not used.
14	MA_INT#	O	Interrupts output, active low. On board 4.7kΩ pull-up to 3.3V.
15	AL_PWM	O	PWM audio output from FT812
16	-	-	NC

Table 3-1 – J2 pin description

3.3 CN13- Audio connector

The ME812A-WH50R supports a mono speaker output through CN13. A PWM audio signal from the FT812 goes through a 3-stage RC filters and the audio amplifier, to drive the 8Ω speaker if connected. Maximum output power to the speaker is 1 Watt. A readymade speaker module (CleO-SPR1) is available from FTDI.

An alternative, mono line-in audio input is also provided on CN13. Users can drive in their own audio source to the on board power amplifier.

Pin No.	Name	Type	Description
1	SP-	O	8Ω speaker minus terminal
2	SP+	O	8Ω speaker plus terminal
3	AGND	P	Audio ground
4	AUD_IN	I	Audio Line IN

Table 3-2 – CN13 pin description

4 Specifications

4.1 Electrical Specification

Parameter	Description	Minimum	Typical	Maximum	Units	Notes
VCC	VCC supply voltage	4.75	5.0	5.25	V	J2 pin 9
Icc1	VCC operating current	-	350	-	mA	With LCD and Backlight LED on
Icc2	VCC operating current	-	750	-	mA	With 1W speaker
Voh	Output Voltage High	2.4	-	-	V	
Vol	Output Voltage Low	-	-	0.4	V	
Vih	Input High Voltage	2.0	-	-	V	
Vil	Input Low Voltage	-	-	0.8	V	
T	Operating temperature	-20	-	+70	°C	

Table 4-1 - Operating Voltage and Current

4.2 Display Specification

Item	Spec	Units	Notes
LCD Type	TFT active matrix	-	
Display Colours	16.7M	-	
Display active area	108.0(H) * 64.8(V)	mm	5.0 inch diagonal
Number of Pixels	800(RGB)*480	dots	
Pixel pitch	0.135(H) * 0.135(V)	mm	
Backlight	18 white LEDs	-	
Touch screen	4-wire resistive touch	-	

Table 4-2 - LCD and Touch Information

4.3 Optical Specification

Item	Symbol	Condition	Min.	Typ.	Max.	Unit	
Brightness (With TP)	Bp	$\theta=0^\circ$ $\Phi=0^\circ$		400	-	Cd/m ²	
Uniformity	Δ Bp		75	-	-	%	
Viewing Angle	3:00	Cr \geq 10	-	60	-	Deg	
	6:00		-	45	-		
	9:00		-	60	-		
	12:00		-	60	-		
Contrast Ratio	Cr		300	500		-	
Response Time	T _r	$\theta=0^\circ$ $\Phi=0^\circ$	-	10	-	ms	
	T _f		-	10	-	ms	
Color of CIE Coordinate	W	x		0.28		-	
		y		0.33		-	
	R	x		0.51		-	
		y		0.34		-	
	G	x	$\theta=0^\circ$ $\Phi=0^\circ$		0.31		-
		y			0.56		-
	B	x			0.15		-
		y			0.14		-
NTSC Ratio	S		50	60	-	%	

Table 4-3 - 5.0" TFT Optical specification

Note: The definition of viewing angle: refer to the figures below (if looking at the reverse side of the module the FTDI logo on the PCB is facing down).

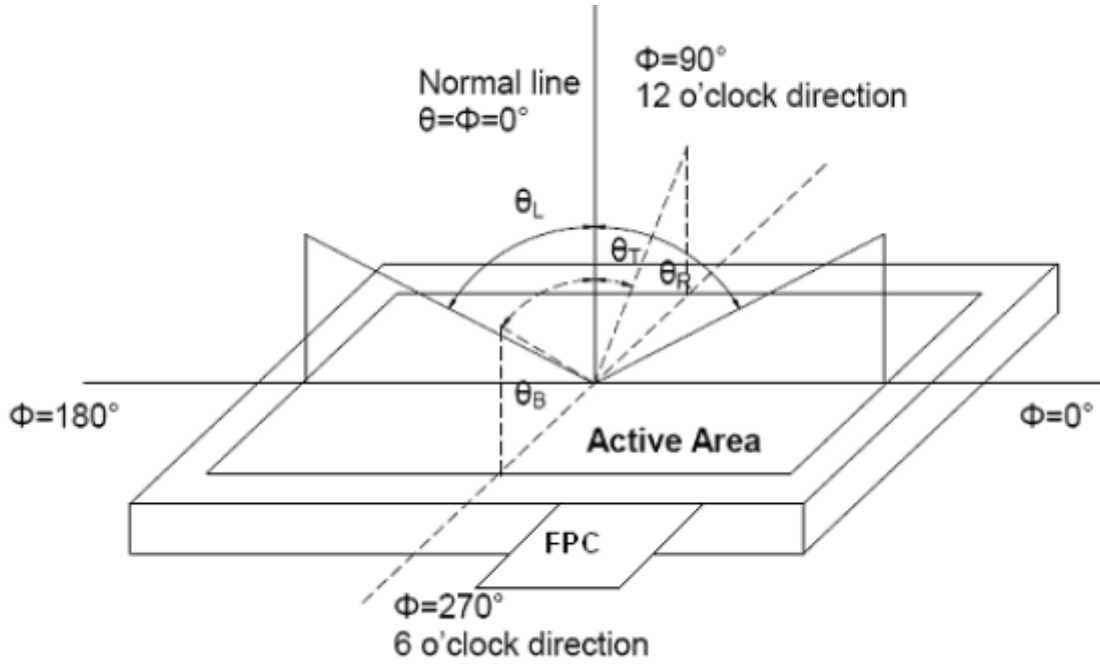
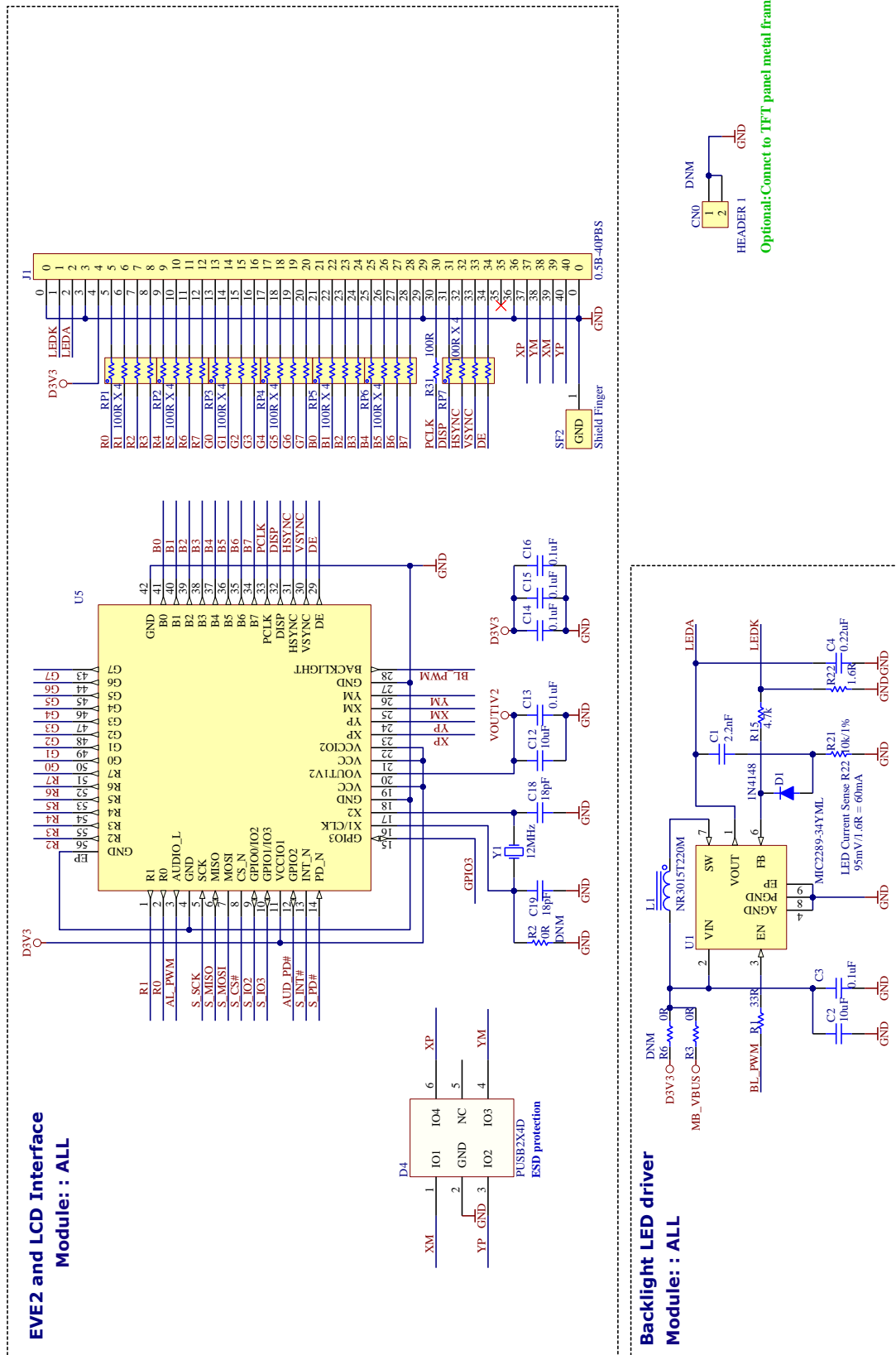


Figure 4-1 – Viewing Angle definition



Figure 4-2 – Module orientation for viewing angle

5 Board Schematics



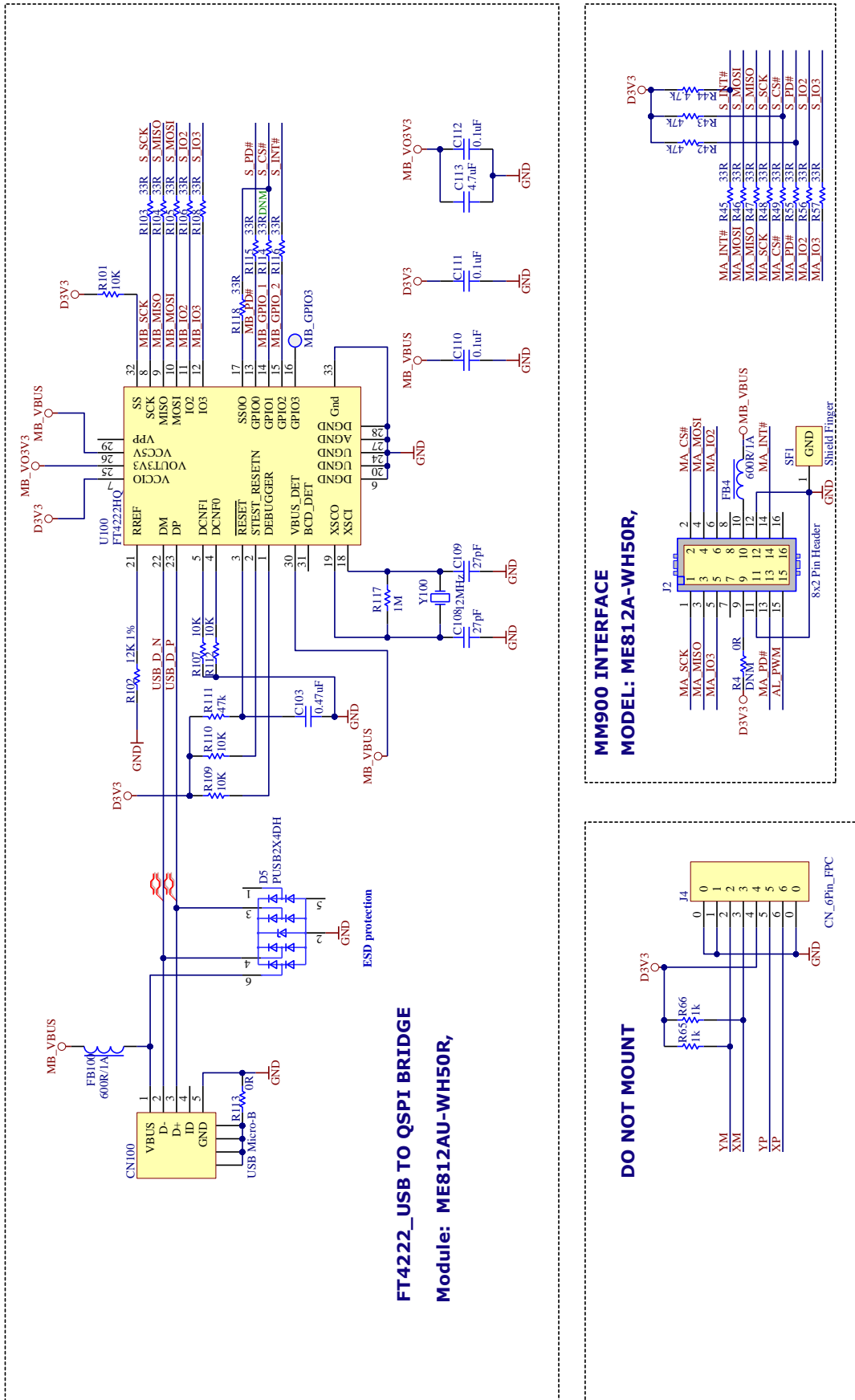


Figure 5-3 – Board Schematic (page 3)

6 Mechanical Dimensions

6.1 Module Dimensions

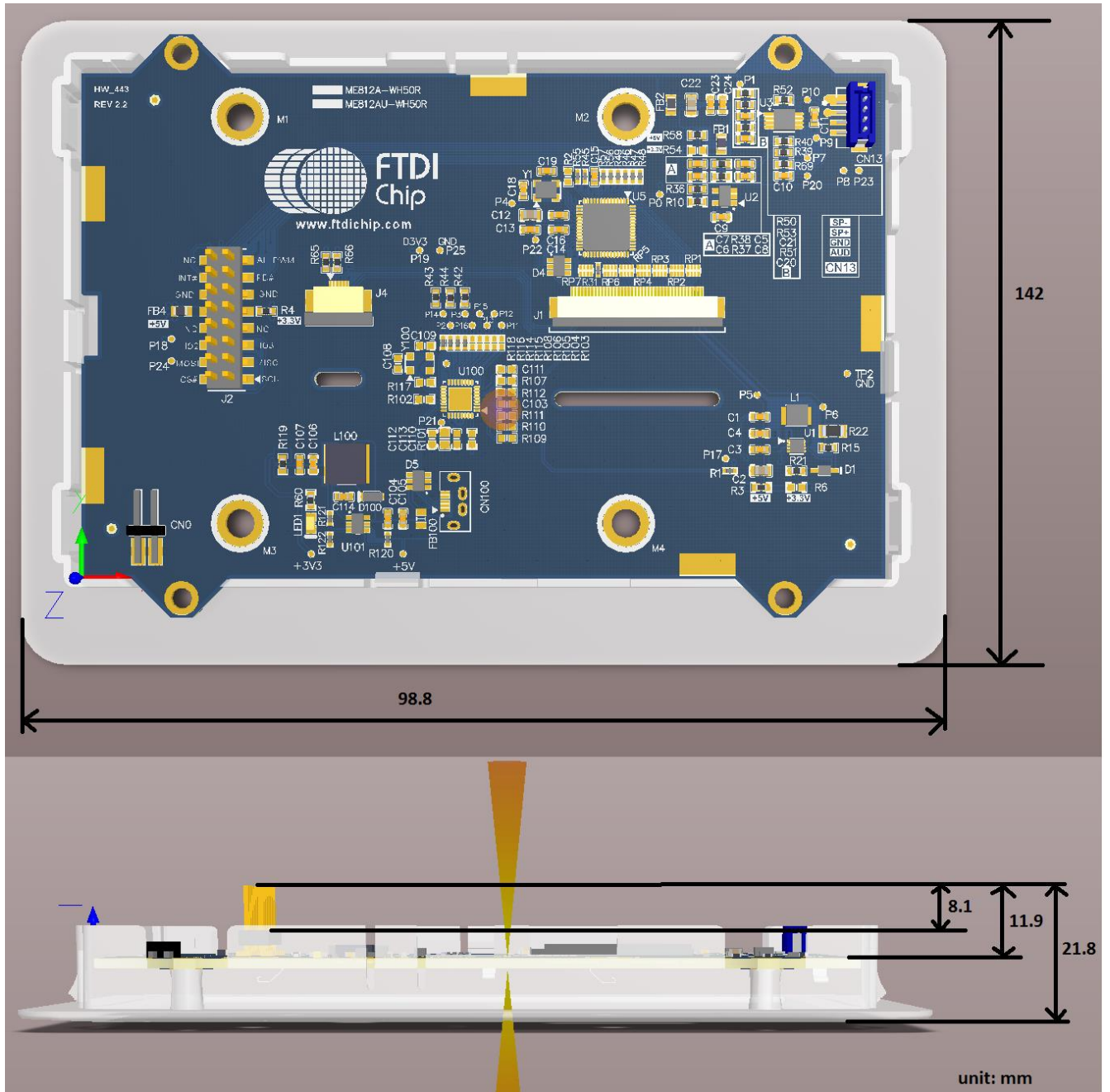


Figure 6-1 – Module Dimensions

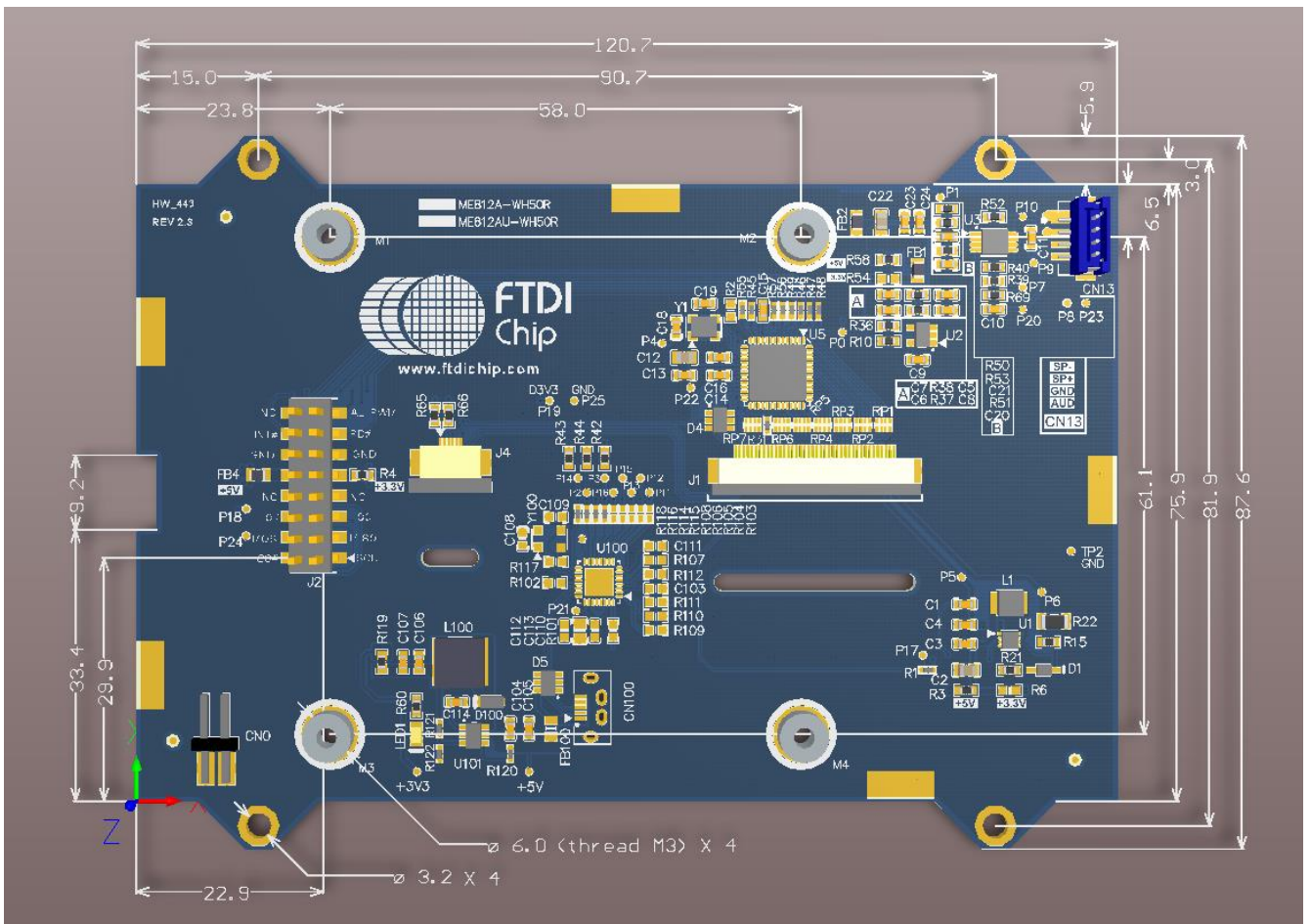


Figure 6-2 – PCB Dimensions

7 Application Example

7.1 Getting Start With an MM900EV Module

As a quick start with the ME812A-WH50R development board, connecting to an MM900EV module development platform is recommended. Demo applications are provided for users to experiment and experience the FT812 in the MM900EV+ME812A system. The following paragraphs provide a short description for development procedures.

The MM900EV series of FT900 MCU evaluation platforms allows users to develop various applications with rich peripheral interfaces. The following MM900EV modules are compatible:

- **MM900EV1A:** with a 32-bit high performance FT900 MCU, 10/100Mbps Ethernet, USB2.0 Host, USB2.0 Device, SD3.0, Audio Codec, SPI Master Quad Interface, and 40-pin external GPIOs.
- **MM900EV-Lite:** Tiny board with a 32-bit high performance FT900 MCU, USB2.0 Device, SD3.0, SPI Master Quad Interface, and 40-pin external GPIOs.

Detailed information of MM900EV module can be found at:

<http://www.ftdichip.com/Products/Modules/MCUModules.htm>

7.2 Hardware Setup

Figure 7-1 shows the ME812A-WH50R module connected to an MM900EV1A module.

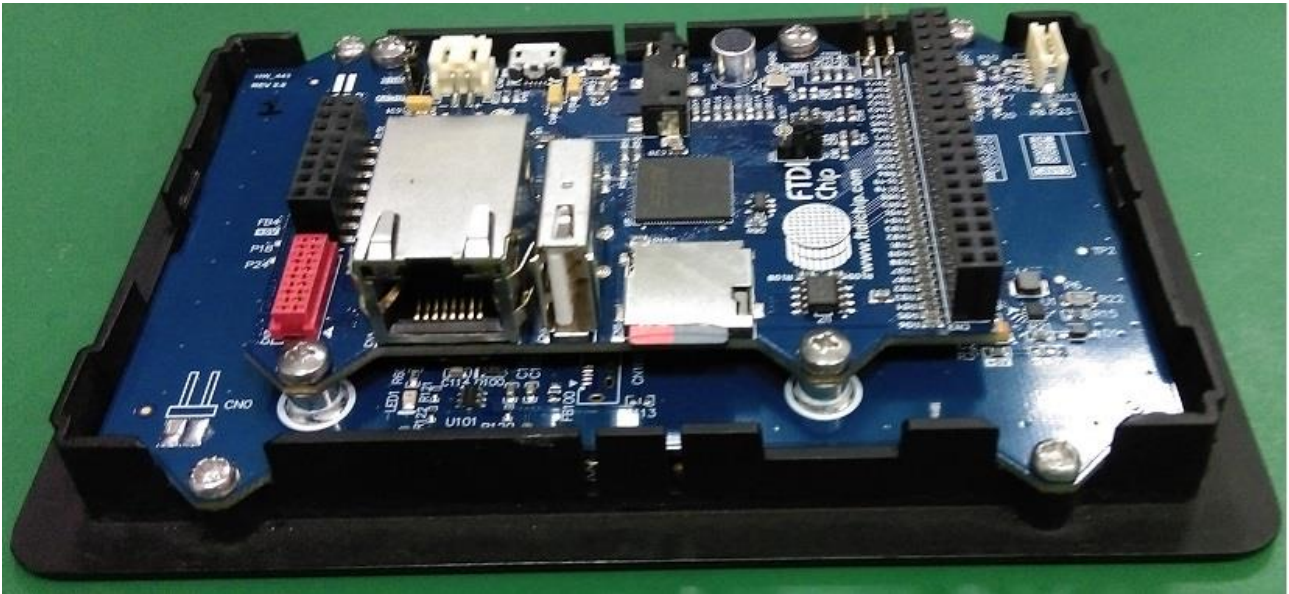


Figure 7-1 – ME812A-WH50R connects to MM900EV1A Module

The ME812A-WH50R **J2** pin header connects to the MM900EV module **J2** dual-enter socket (See **Error! Reference source not found.** for pin mapping).

- Connect a USB cable or Power Supply to the MM900EV module to power the system.

Pin number	ME812A J2 Signal	MM900EV J2 Signal
1	MA_SCK	SPIM_SCK
2	MA_CS#	SPIM_SS0
3	MA_MISO	SPIM_MISO
4	MA_MOSI	SPIM_MOSI
5	MA_IO3	SPIM_IO3
6	MA_IO2	SPIM_IO2
7	-	DCX
8	-	CS1#
9	-	VDD_3V3
10	MA_5V	VDD_5V
11	GND	GND
12	GND	GND
13	MA_PD#	PWD#
14	MA_INT#	INT#
15	AL_PWM	AUD_LIN
16	-	DISP

Table 7-1 – ME812A-WH50R J2 and MM900EV J2 pin mapping

7.3 Software Setup

- Download the FT90x toolchain and sample application for ME812A-WH50R from the FTDI website at <http://www.ftdichip.com/Products/ICs/FT90x.html>.
- Install the FT90x toolchain on a Windows PC.
- Download the sample application binary file to the MM900EV module.

The sample applications will demonstrate display, touch and audio functions of the ME812A-WH50R module. Refer to http://www.ftdichip.com/Support/SoftwareExamples/FT800_Projects.htm for more details.

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Appendix A – References

Document References

For module related documentations, please refer to URL below:

FT81x datasheet: [DS_FT81x](#)

FT81x software programming guide: [FT81x Programmer Guide](#)

Acronyms and Abbreviations

Terms	Description
EVE	Embedded Video Engine
IC	Integrated Circuit
LCD	Liquid Crystal Display
LED	Light Emitting Diode
MCU	Micro-Controller Unit
PC	Personal Computer
PCB	Printed Circuit Board
PWM	Pulse Width Modulation
SPI	Serial Peripheral Interface
TFT	Thin Film Transistor
TP	Touch Panel

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Appendix C – Revision History

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Document Feedback: [Send Feedback](#)

Revision	Changes	Date
1.0	Initial Release	2016-10-18

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