

# Future Technology Devices International Datasheet ME813AU-WH50C Display Module



*General Purpose Multi Media Controller*

## 1 Introduction

The ME813AU-WH50C is a development module for Bridgetek's FT813, Embedded Video Engine (EVE) graphics controller IC. This module behaves as a USB device, with an FT4222H USB to SPI bridge built on-board so that the module can be accessed from a PC or any other USB host.

The ME813AU-WH50C module includes a 5.0 inch 800\*480 TFT LCD panel with capacitive touch screen, and an audio amplifier to drive an 8Ω/1W speaker.

### 1.1 Features

The ME813AU-WH50C module utilises the FT813, Bridgetek's 2<sup>nd</sup> generation EVE chip. Graphic, audio and touch functions of the FT813 can be accessed with the ME813AU-WH50C. For a full list of the FT813's features, refer to the [FT81x datasheet](#).

The ME813AU-WH50C has the following features:

- Ready to use 5 inch WVGA LCD module.
- Supports portrait and landscape display mode.
- Bright backlight LED with dimming.
- Supports capacitive touch up to 5 fingers.
- Supports mono audio from FT813 or external source.
- On board audio amplifier for driving an external 8Ω /1W speaker.
- Support USB bus power.
- Support USB high speed connection to PC or other USB host.

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## 2 Ordering Information

Part No.	Description
ME813AU-WH50C	FT813 module, with FT4222H USB interface, 5.0 inch 800*480 TFT LCD capacitive touch panel preinstalled.
CleO-SPK1	Accessory – An 8Ω/1W speaker enclosure with connecting wires to ME813AU-WH50C.
VA-FC-1M-BKW	Accessory – Flat USB A to Micro B Cable 1M- Black and White
VA-FC-1M-BLW	Accessory – Flat USB A to Micro B Cable 1M- Blue and White

**Table 2-1 – Ordering information**

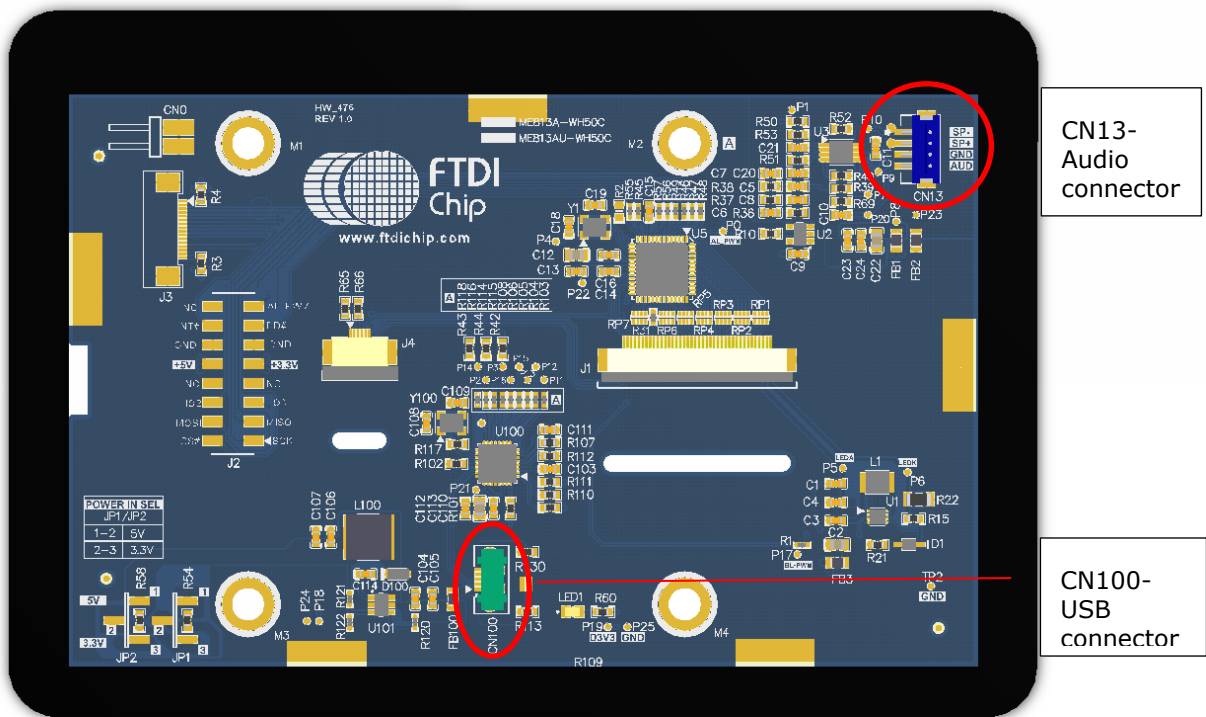
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### 3 Board Interface Description

The ME813AU-WH50C module is intended for direct use into existing applications that require a display. This module is suitable for interfacing with a PC or other USB host.

#### 3.1 Board Profile



**Figure 3-1 – ME813AU-WH50C board connectors**

#### 3.2 CN100- Micro USB receptacle

CN100 is a micro USB connector. When the USB host is connected, the host controls the ME813AU-WH50C module functions through the FT4222H USB-to-SPI bridge.

Pin No.	Name	Type	Description
1	VBUS	P	USB VBUS +5V power supply
2	D-	I/O	USB D- data line
3	D+	I/O	USB D+ data line
4	NC	-	No connection
5	GND	P	Ground

**Table 3-1 – CN100 pin description**

### 3.3 CN13- Audio connector

The ME813AU-WH50C supports a mono speaker output through CN13. A PWM audio signal from the FT813 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 Bridgetek.

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	VBUS supply voltage	4.5	5.0	5.5	V	USB power
Icc1	VBUS operating current	-	400	-	mA	With LCD and Backlight LED on
Icc2	VBUS operating current	-	800	-	mA	Add 1W speaker (assumes powered from a USB charging hub or USB3.0 port)
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	5-finger capacitive touch	-	

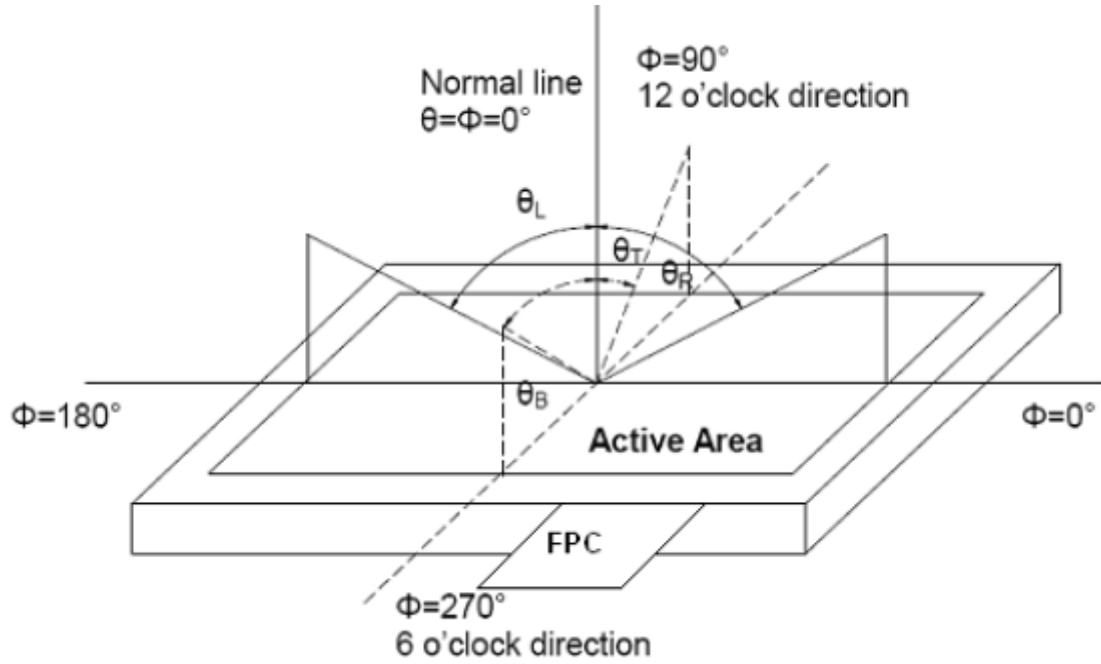
**Table 4-2 - LCD and Touch Information**

### 4.3 Optical Specification

Item	Symbol	Condition	Min	Typ	Max	Unit	
View Angles	$\theta_T$	$CR \geq 9$		65	--	Degree	
	$\theta_B$			55	--		
	$\theta_L$			65	--		
	$\theta_R$			65	--		
Contrast Ratio	CR	$\theta=0^\circ$	400	500	--		
Response Time	Tr	25°C	--	20	30	ms	
	Tf						
Chromaticity (CIE1931)	White	x	Backlight is on	0.274	0.324	0.374	-
		y		0.295	0.345	0.395	
	Red	x		0.544	0.594	0.644	
		y		0.301	0.351	0.401	
	Green	x		0.299	0.349	0.399	
		y		0.531	0.581	0.631	
	Blue	x		0.92	0.152	0.202	
		y		0.053	0.93	0.153	
Uniformity	U	-	75	80	--	%	
NTSC ratio	-	-	45	50	--	%	
Luminance	L	-	350	420	--	cd/m <sup>2</sup>	

**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

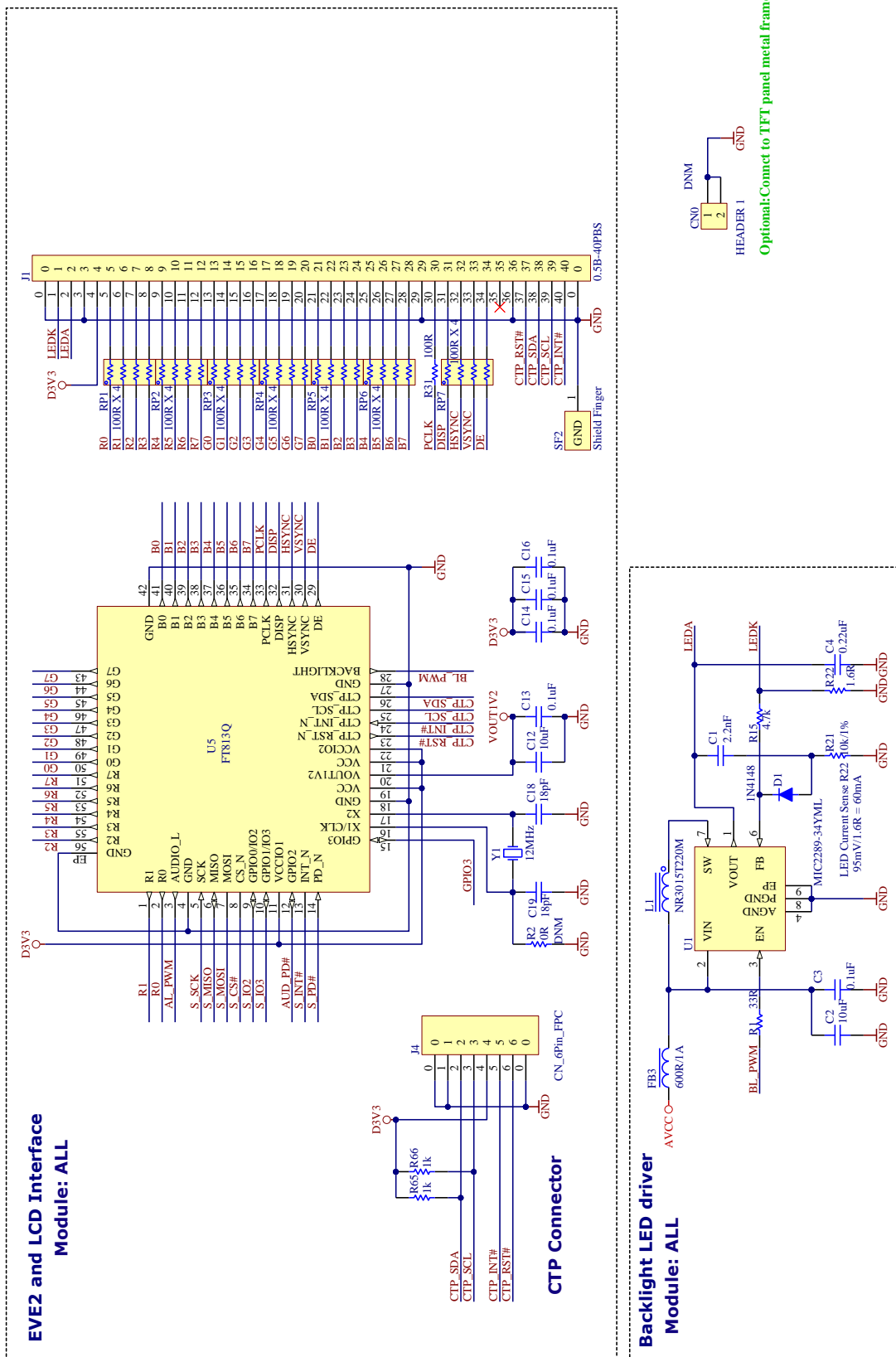
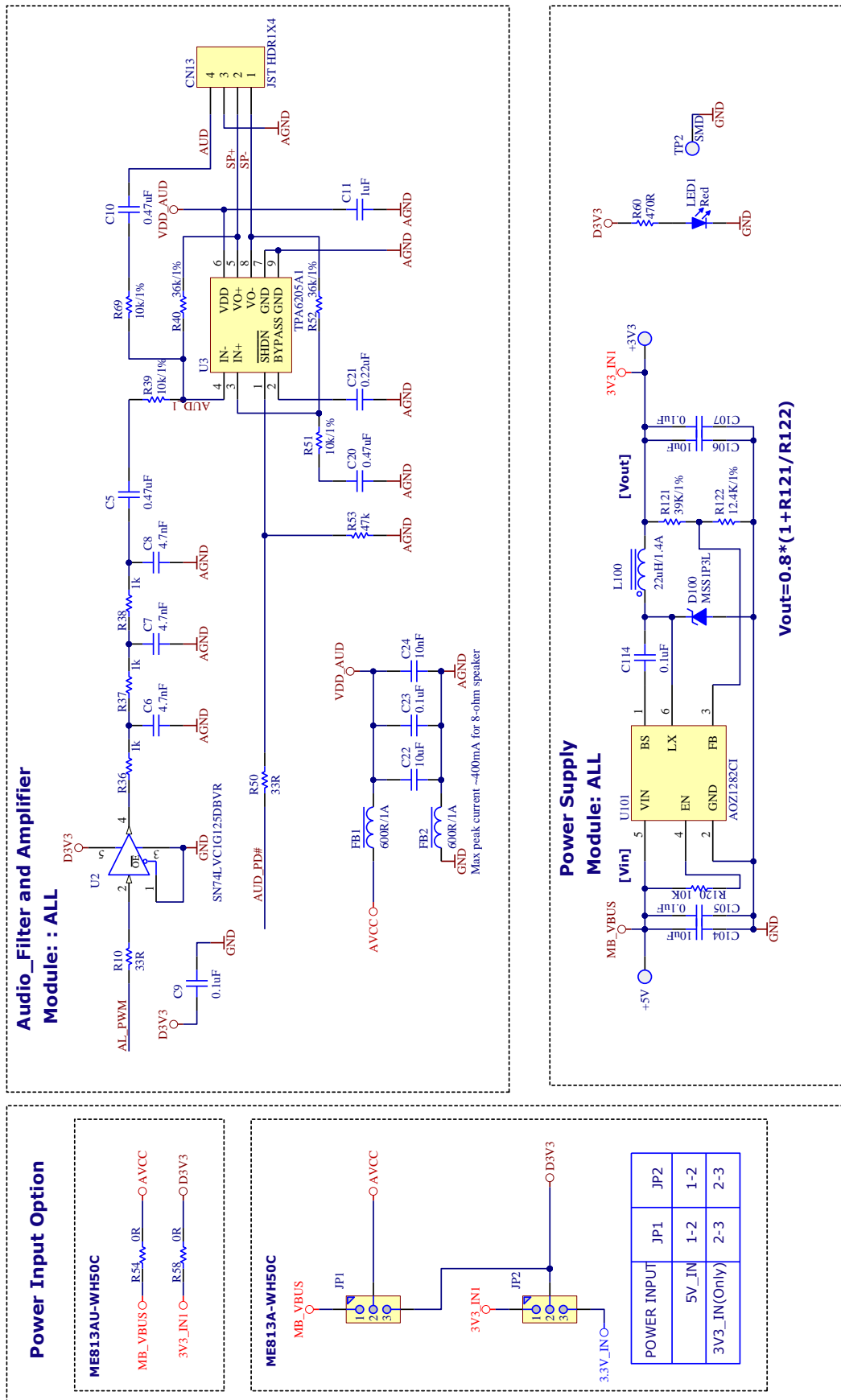


Figure 5-1 – Board Schematic (page 1)



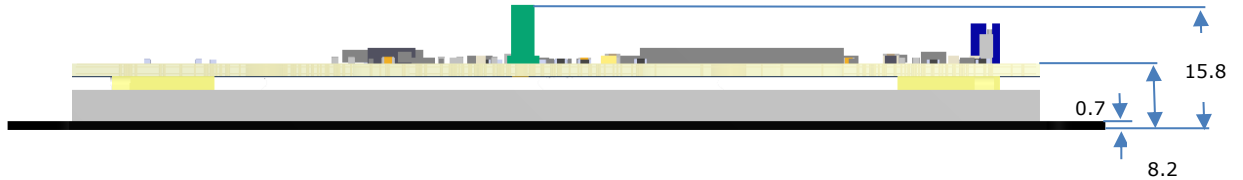
**Figure 5-2 – Board Schematic (page 2)**



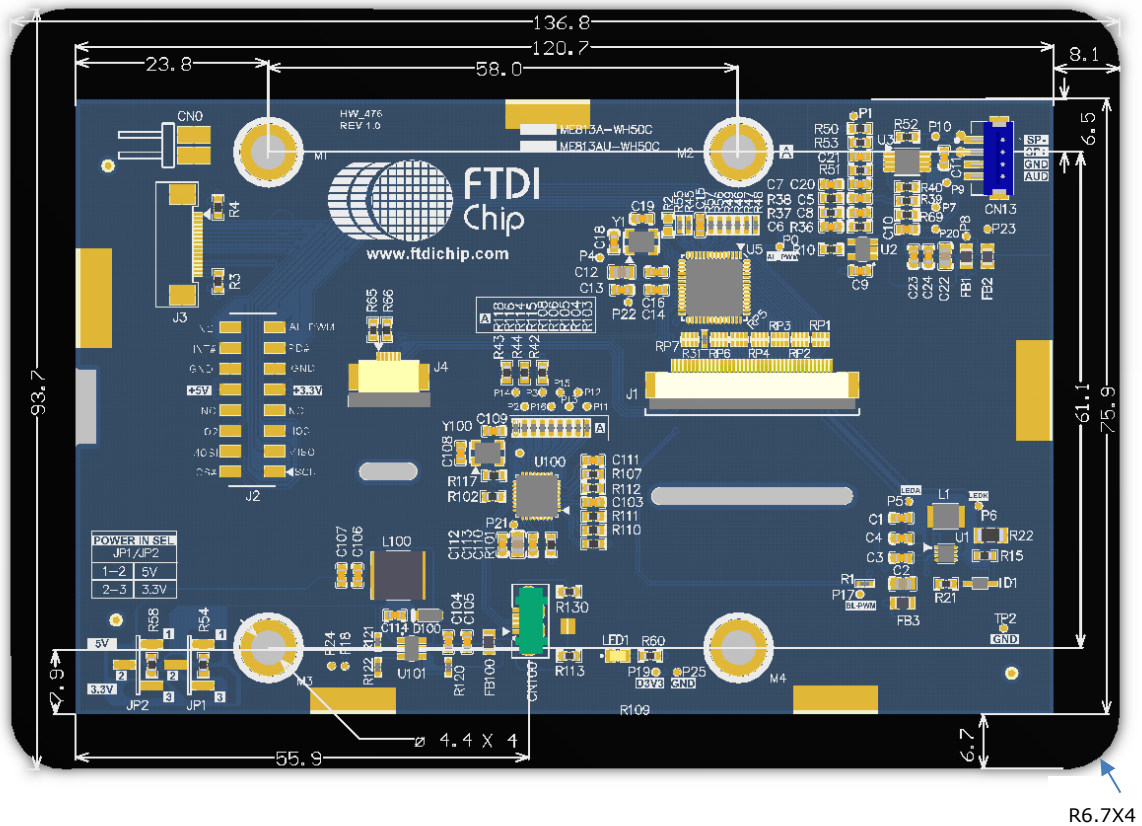
## 6 Mechanical Dimensions

### 6.1 Module Dimensions

All units are in millimeters (mm).



**Figure 6-1 – Module Dimensions(side view)**

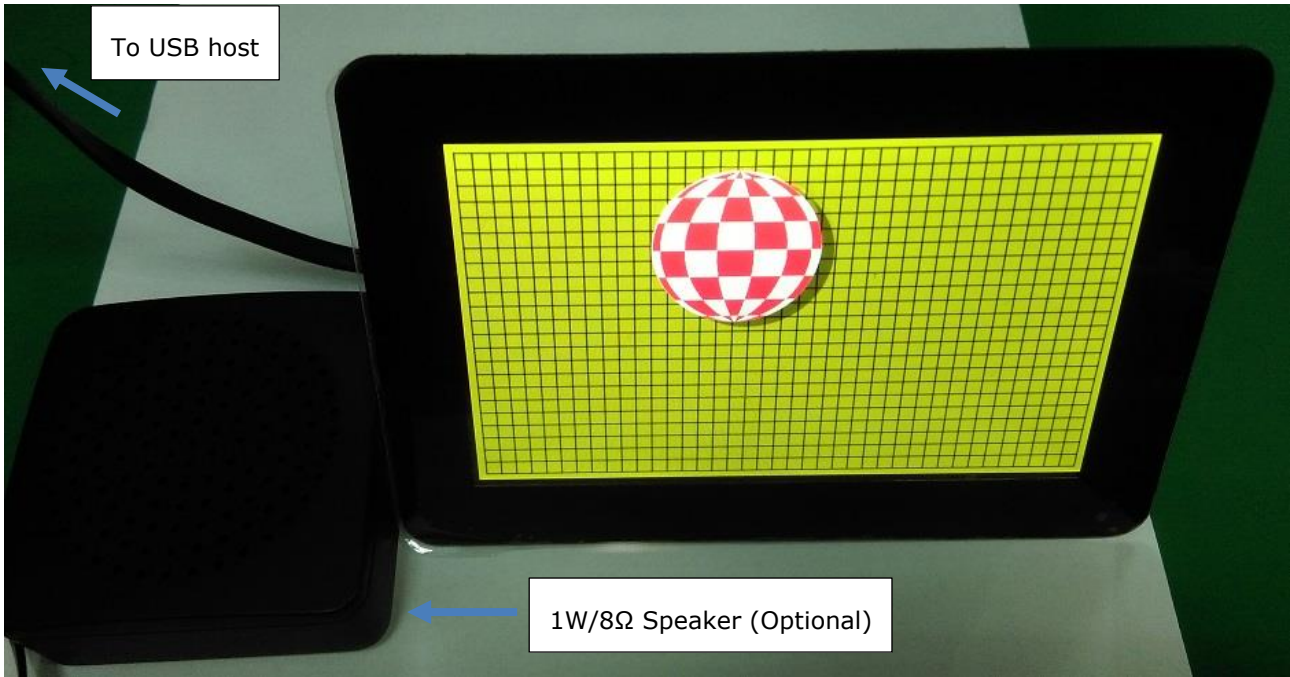


**Figure 6-2 – Module Dimensions (bottom view)**

## 7 Application Example

### 7.1 Hardware Setup

**Error! Reference source not found.** shows the ME813AU-WH50C module connected to the PC USB host port or self-powered hub port through a USB cable (suggest FTDI accessory VA-FC-1M-BKW or VA-FC-1M-BLW). The 1W speaker is optional (suggest Bridgetek accessory CleO-SPK1). Note that if the 1W speaker is used, the USB power shall be able to supply at least 900mA current.



**Figure 7-1 – ME813AU-WH50C connects to USB host**

### 7.2 Software Setup

- Download the sample application for ME813AU-WH50C from the Bridgetek website at <http://brtchip.com/eve-projects/>.
- Install the FT4222H driver on a Windows PC. (downloadable at <http://www.ftdichip.com/Products/ICs/FT4222H.html>)
- Launch the demo application from the PC.

The sample applications will demonstrate display, touch and audio functions of the ME813AU-WH50C module. Refer to [AN 418 ME81XAU SampleApp PC Introduction](#) for more details.

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## Appendix A – References

### Document References

[FT81x Datasheet](#)

[FT81x software programming guide](#)

[FT4222H Datasheet](#)

[FT81x sample applications](#)

### 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
USB	Universal Serial Bus

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## Appendix C – Revision History

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Revision	Changes	Date
1.0	Initial Release	2017-02-21