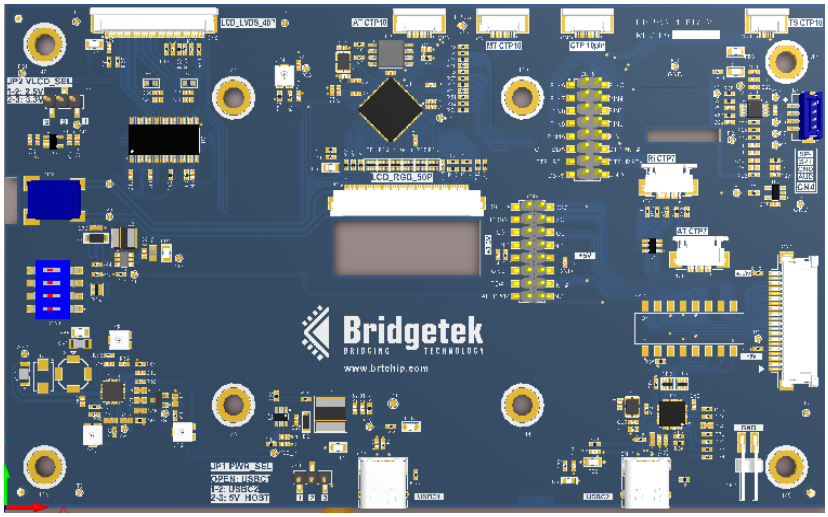
ME817EV BT817 Evaluation Board

Datasheet



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1 Introduction

The ME817EV is a customer evaluation board for Bridgetek's 4th generation EVE chip, BT817. The ME817EV is used to develop and demonstrate BT817's graphics, touch, and audio functionalities. The board is capable of supporting LCD panels with 40-pin LVDS interface, or 50-pin RGB interface. Backlight LED current can be adjusted using dip switches. Capacitive touch screens can be connected to the board through a 10-pin or 6-pin FPC connector. An Audio filter and amplifier are included on-board, allowing a 1/8W speaker to be driven. Audio source can be supplied from the BT817, or through a line-in connector.

The ME817EV board supports 2 types of host controller: MCU with SPI/QSPI master, or USB host, selectable through dip switches. The SPI option of the board behaves as a SPI slave and requires a SPI Master for proper micro-controller interfacing and system integration. The USB option of the board behaves as a USB High-speed device using the FTDI FT4222H, and requires control from a USB host through the Type-C connector.

For a full list of the BT817's features, refer to the BT817_8 Datasheet.

1.1 Features

The ME817EV has the following features:

- Supports 40-pin LVDS display up to 1280x800
- Supports 50-pin RGB display up to 1024x600
- Trimmable on board LCD biasing voltages
- On board LCD backlight LED Driver
- On board audio power amplifier and audio connector for external speaker support
- On board 16Mbyte NOR Flash Memory
- 10-pin or 6-pin FPC connector for capacitive touch screen
- Supports SPI host interface through 2x8 pin header or 20pin FPC connector
- Supports USB High-speed connection with FT4222H
- 5V power supply via SPI host connector, or via USB Type-C port

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2 Part Numbers / Ordering Information

Part #	Part Name / Description
ME817EV	BT817 customer evaluation board

Table 1 - Part Numbers / Ordering Information

Part #	Part Name / Description
MM900EV1B, MM930Lite, MM932LC	FT9xx Development module
MM2040EV	RP2040 EVE controller board
VA-1001-01A	Generic LCD Adapter Board for EVE modules
DP-0701-01A,	TFT Display 7 inch (800 x 480 resolution) with Capacitive Touch Panel
DP-1011-02A	TFT Display 10.1 inch (1280 x 800 resolution) with Capacitive Touch Panel– Outline 248mm x 165mm
CleO-SPK1	Accessory - CleO speaker enclosure with connecting wires

Table 2 - Accessories Part Numbers / Ordering Information

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3 Hardware Description

Please refer to section 3.2.2 for connector settings. Some ME817EV jumpers must be set to work properly with your system.

3.1 ME817EV Board

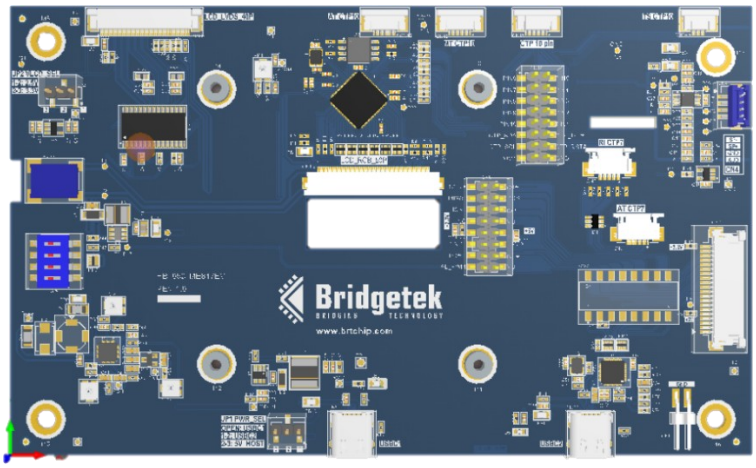


Figure 1 - ME817EV Board Top View

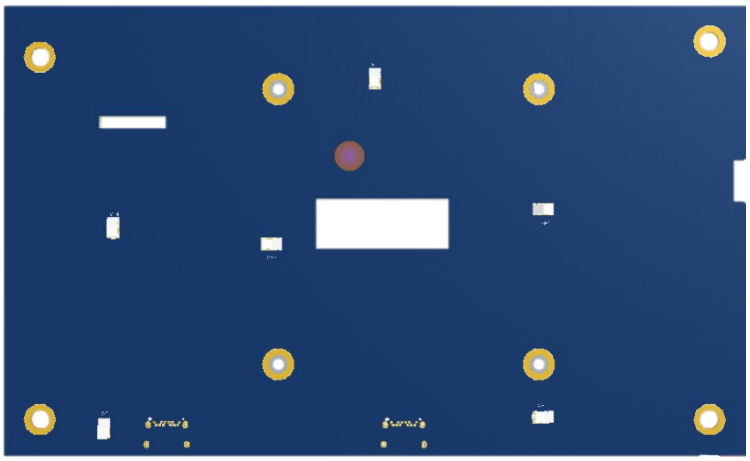


Figure 2 - ME817EV Board Bottom View

The main functions of the ME817EV are as follows:

- USB Type-C or SPI connector for power supply
- 3.3V regulator. Takes 5V input and outputs 3.3V for on-board circuits
- AVDD/VGH/VGL/VCOM biasing voltages for LCD power
- LCD backlight driver. Drive current 120mA – 280mA with over voltage protection (OVP) of 35V
- 3 stage audio filter and power amplifier
- Audio connector for external speaker and audio line in
- 10-pin and 6-pin FPC connector for capacitive touch screen
- On board 16M byte SPI NOR flash memory
- FT4222H USB to QSPI master bridge
- 2x8 pin header for MM900 series microcontroller modules or generic MCU
- 20-pin 1.0mm FPC connector for generic MCU

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3.2 Physical Descriptions

3.2.1 PCB Layout

The ME817EV is a 160mm x 100mm, four-layer printed circuit board. Board thickness is approximately 1.6mm.

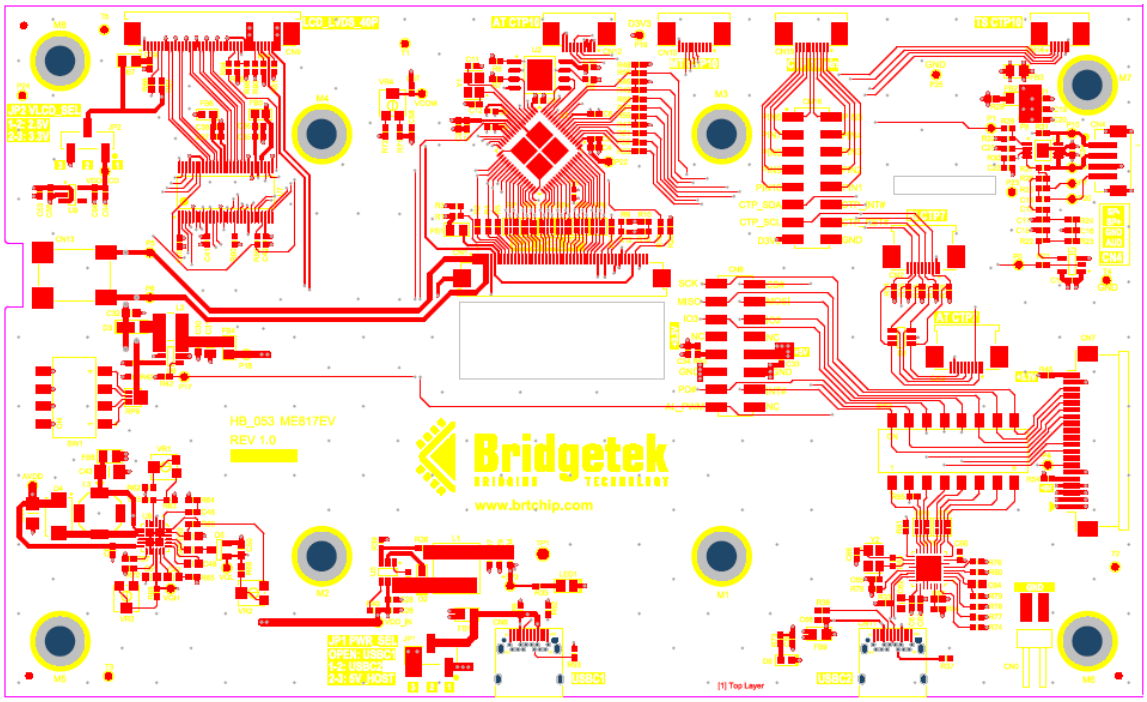


Figure 3 - ME817EV Board Top Layer

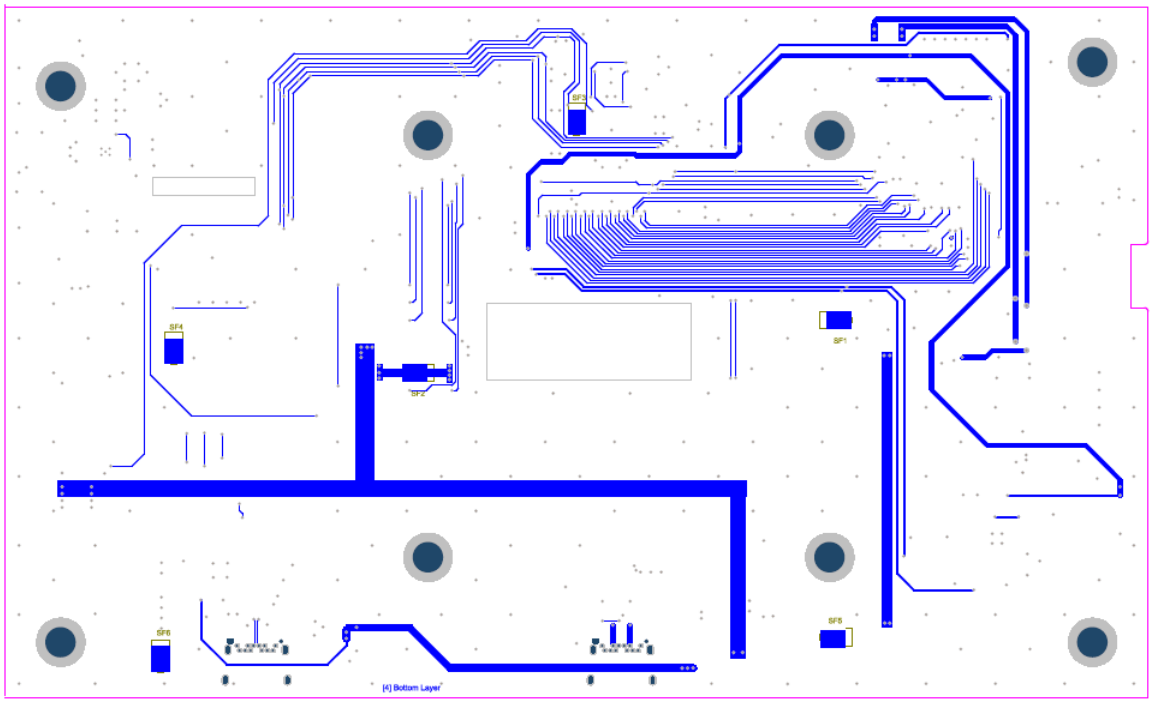


Figure 4 - ME817EV Board Bottom Layer

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3.2.2 ME817EV Connectors

Connectors and jumpers are described in the following sections.

- **JP1 – Power source select for the board**

JP1 is the jumper option for users to select the 5V power supply source for the board.

Pin Option	Description
OPEN	5V Power from CN6 USBC1 VBUS
1-2 SHORT	5V Power from CN11 USBC2 VBUS (CN6 must not connect)
2-3 SHORT	5V Power from CN7 or CN8 5V_HOST (CN6 must not connect)

Table 3 - JP1 Pin Options

- **JP2 – Power source select for the 40-pin LVDS panel**

JP2 is the jumper option for users to select the 2.5V/3.3V power supply for the 40-pin LVDS panel (CN9).

Pin Option	Description
1-2 SHORT	Select 2.5V power supply
2-3 SHORT	Select 3.3V power supply

Table 4 - JP2 Pin Options

- **CN1 – 50-pin RGB LCD Flex Cable connector, 0.5mm, bottom contact**

This connector is the interface between the BT817 IC and the LCD Module. Compatible with many LCD panels with 50-pin RGB interface.

Pin No.	Name	Type	Description
1-2	LEDA	P	Power for LED backlight (Anode)
3-4	LEDK	P	Power for LED backlight (Cathode)
5	GND	P	Ground
6	VCOM	P	Common voltage
7	DVDD	P	Power for digital circuit, 3.3V
8	MODE	O	DE/SYNC mode select
9	DE	O	Data enable
10	VS	O	Vertical Sync
11	HS	O	Horizontal Sync
12	B7	O	RGB Blue data
13	B6	O	RGB Blue data
14	B5	O	RGB Blue data
15	B4	O	RGB Blue data
16	B3	O	RGB Blue data
17	B2	O	RGB Blue data
18	B1	O	RGB Blue data
19	B0	O	RGB Blue data
20	G7	O	RGB Green data
21	G6	O	RGB Green data
22	G5	O	RGB Green data
23	G4	O	RGB Green data
24	G3	O	RGB Green data
25	G2	O	RGB Green data
26	G1	O	RGB Green data
27	G0	O	RGB Green data

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Pin No.	Name	Type	Description
28	R7	O	RGB Red data
29	R6	O	RGB Red data
30	R5	O	RGB Red data
31	R4	O	RGB Red data
32	R3	O	RGB Red data
33	R2	O	RGB Red data
34	R1	O	RGB Red data
35	R0	O	RGB Red data
36	GND	P	Ground
37	DCLK	O	Pixel clock
38	GND	P	Ground
39	L/R	O	Left/Right selection
40	U/D	O	Up/Down selection
41	VGH	P	Gate ON Voltage
42	VGL	P	Gate OFF Voltage
43	AVDD	P	Power for analog circuits
44	DISP	O	LCD Enable
45	NC	-	No connection
46	VCOM	P	Common voltage
47	NC	-	No connection
48	GND	P	Ground
49	NC	-	No connection
50	NC	-	No connection

Table 5 - CN1 Pinout

- **CN2 – FPC-10 0.5mm connector, top contact**

This connector is for the capacitive touch panel connection.

Pin No.	Name	Type	Description
1	VSS	P	Ground
2	VDD	P	3.3V power supply
3	SCL	I/O	I2C SCL line
4	NC	NA	No connection
5	SDA	I/O	I2C SDA line
6	NC	NA	No connection
7	RST#	I/O	Touch reset
8	WAKE#	I/O	Pull-up to 3.3V with 3.3K resistor
9	INT#	I/O	Touch interrupt
10	VSS	P	Ground

Table 6 - CN2 Pinout

- **CN4 – Audio connector**

ME817EV supports mono audio output through CN4. A ready-made speaker module (*CleO*-SPK1) is available from Bridgetek. Visit Bridgetek's on-line shop for more information.

Pin No.	Name	Type	Description
1	SP-	O	Audio speaker out negative
2	SP+	O	Audio speaker out positive
3	AGND	P	Audio Ground
4	LINE_IN	I	External audio line in

Table 7 - CN4 Pinout

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- **CN6 – USB Type-C receptacle**

USB 5V power input. Type-C 5V/1.5A sink.

Pin No.	Name	Type	Description
A4,B4,A9,B9	VBUS	P	5V power input
A1, B1, A12, B12	GND	P	Ground
A5	CC1	I/O	USB CC1 line, 5.1K pull down resistor.
B5	CC2	I/O	USB CC2 line, 5.1K pull down resistor.

Table 8 - CN6 Pinout

- **CN7 and CN8 - SPI host interface**

This is the interface where the SPI control and data signals are routed. There are also power and ground pins on this interface. CN8 is a 2x8 pin header, compatible with the Bridgetek MM900, MM2040EV and MM4222-QSPI series modules. CN7 is a 20-pin FPC connector which can be used to connect to the MCU board through an FPC cable.

Pin No (CN8)	Pin No (CN7)	Name	Type	Description
1	18	MA_SCK	I	SPI clock input
2	15	MA_CS#	I	SPI chip select, active low
3	17	MA_MISO	I/O	SPI master input, slave output, or Quad SPI IO1
4	16	MA_MOSI	I/O	SPI master output, slave input, or Quad SPI IO0
5	9	MA_IO3	I/O	GPIO1 or Quad SPI IO3
6	10	MA_IO2	I/O	GPIO0 or Quad SPI IO2
7-8	11-12	NC	-	No connection
9	5,20	NC	-	No connection
10	3,4	5V_HOST	P	5V power supply
11	1,2	GND	P	Ground
12	6,19	GND	P	Ground
13	13	MA_PD#	I	Powers down and reset input, active low. Connect to 3.3V if not used.
14	14	MA_INT#	O	Interrupts output, active low. On board 4.7kΩ pull-up to 3.3V.
15	-	AUDIO_L	O	AUDIO_L output from BT817
16	8	NC	-	No connection
-	7	GPIO3	I/O	GPIO3 pin of BT817

Table 9 - CN7 & CN8 Pinout

- **CN9 – 40-pin LVDS LCD Flex Cable connector, 0.5mm, top contact**

This connector is the interface between the RGB-LVDS converter IC and the LCD Module. Compatible with many LCD panels with 40-pin LVDS interface.

Pin No.	Name	Type	Description
1	VCOM	P	Common voltage
2-3	VDD	P	Power supply, 2.5V or 3.3V
4	GND	P	Ground
5	DISP	O	Display enable
6	STDBY	O	Standby mode, pulled-high
7	GND	P	Ground
8	TX0_N	O	LVDS data output

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Pin No.	Name	Type	Description
9	TX0_P	O	LVDS data output
10	GND	P	Ground
11	TX1_N	O	LVDS data output
12	TX1_P	O	LVDS data output
13	GND	P	Ground
14	TX2_N	O	LVDS data output
15	TX2_P	O	LVDS data output
16	GND	P	Ground
17	TXCLK_N	O	LVDS clock output
18	TXCLK_P	O	LVDS clock output
19	GND	P	Ground
20	TX3_N	O	LVDS data output
21	TX3_P	O	LVDS data output
22	GND	P	Ground
23-24	NC	-	No connection
25	GND	P	Ground
26-27	NC	-	No connection
28	NC	-	No connection
29	AVDD	P	Power for analog circuits
30	GND	P	Ground
31-32	LEDK	P	Power for LED backlight (Cathode)
33	L/R	O	Left/Right selection, pulled-high
34	U/D	O	Up/Down selection, pulled-low
35	VGL	P	Gate OFF Voltage
36-37	NC	-	No connection
38	VGH	P	Gate ON Voltage
39-40	LEDA	P	Power for LED backlight (Anode)

Table 10 - CN9 Pinout

- **CN10 – FPC-10 0.5mm connector, bottom contact**

This connector is for capacitive touch panel connection.

Pin No.	Name	Type	Description
1-4	NC	NA	No connection
5	RST#	I/O	Touch reset
6	INT#	I/O	Touch interrupt
7	SCL	I/O	I2C SCL line
8	SDA	I/O	I2C SDA line
9	GND	P	Ground
10	VCC	P	3.3V power supply

Table 11 - CN10 Pinout

- **CN11 – USB Type-C receptacle**

USB data and 5V power input. Type-C 5V/1.5A sink.

Pin No.	Name	Type	Description
A4,B4,A9,B9	VBUS	P	5V power input
A1, B1, A12, B12	GND	P	Ground
A6, B6	D+	I/O	USB D+ data line
A7, B7	D-	I/O	USB D- data line

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Pin No.	Name	Type	Description
A5	CC1	I/O	USB CC1 line, 5.1K pull down resistor.
B5	CC2	I/O	USB CC2 line, 5.1K pull down resistor.

Table 12 - CN11 Pinout

- **CN12 – FPC-10 0.5mm connector, bottom contact**

This connector is for the capacitive touch panel connection.

Pin No.	Name	Type	Description
1-2	GND	P	Ground
3-4	VCC	P	3.3V power supply
5	SCL	I/O	I2C SCL line
6	SDA	I/O	I2C SDA line
7	RST#	I/O	Touch reset
8	INT#	I/O	Touch interrupt
9-10	GND	P	Ground

Table 13 - CN12 Pinout

- **CN13 – Backlight LED Connector**

This connector is for the Backlight LED connection.

Pin No.	Name	Type	Description
1	LEDA	P	Power for LED backlight (Anode)
2	LEDK	P	Power for LED backlight (Cathode)

Table 14 - CN13 Pinout

- **CN14 – FPC-6 0.5mm connector, bottom contact**

This connector is for the capacitive touch panel connection.

Pin No.	Name	Type	Description
1	SDA	I/O	I2C SDA line
2	SCL	I/O	I2C SCL line
3	RST#	I/O	Touch reset output
4	INT#	I/O	Touch interrupt input
5	GND	P	Ground
6	VDD	P	3.3V power supply

Table 15 - CN14 Pinout

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4 Board Schematics

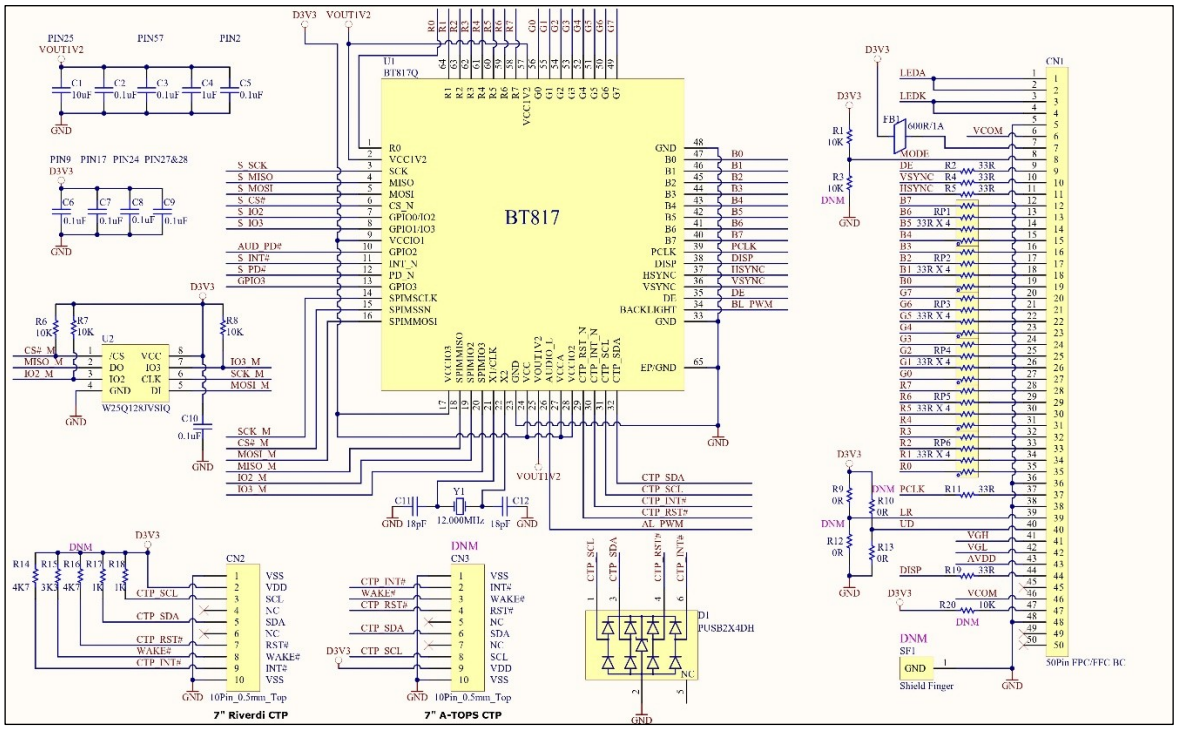


Figure 5 - BT817 IC and RGB Connector

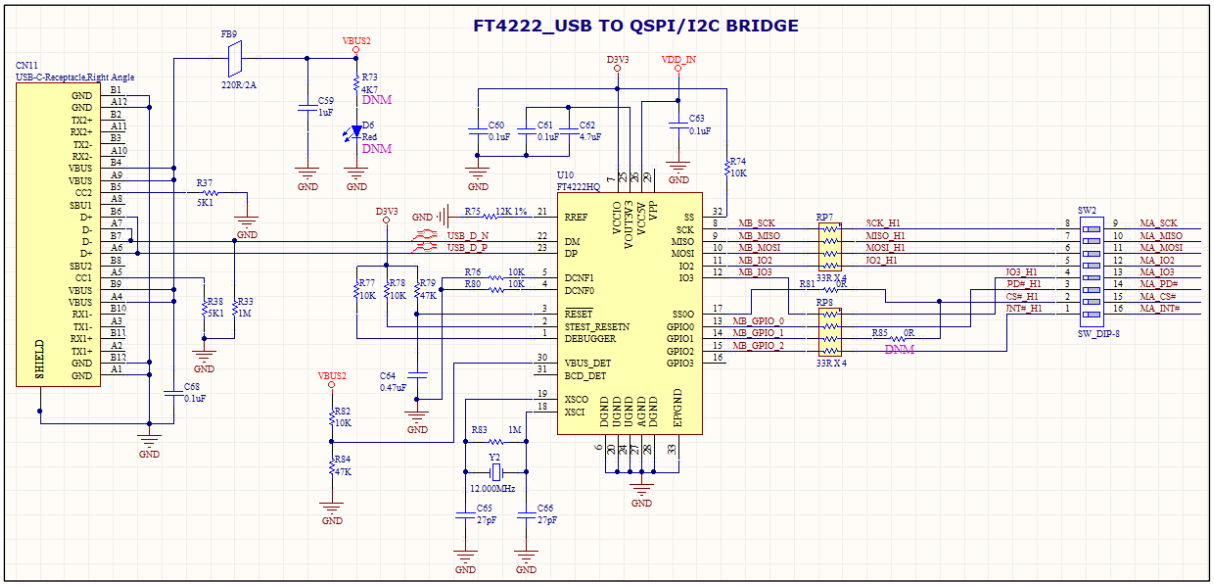


Figure 6 - FT4222 USB Bridge Circuit

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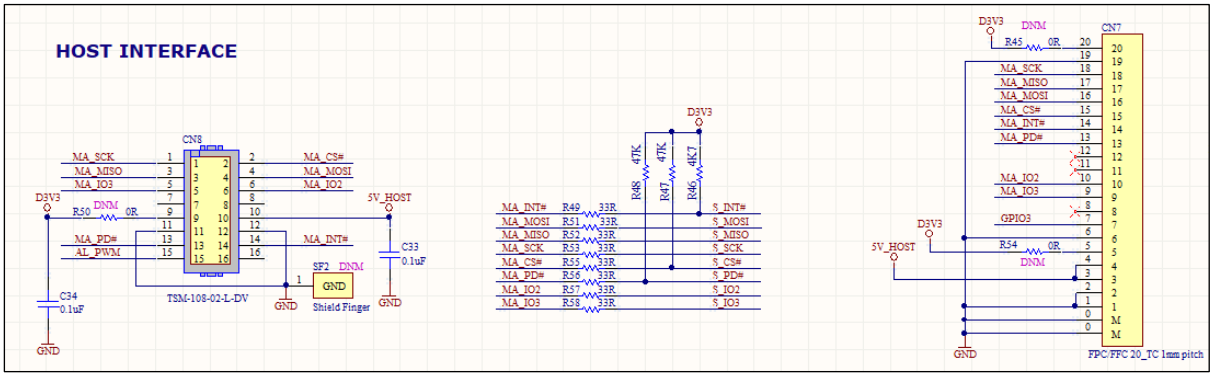


Figure 7 - Host Interface Connectors

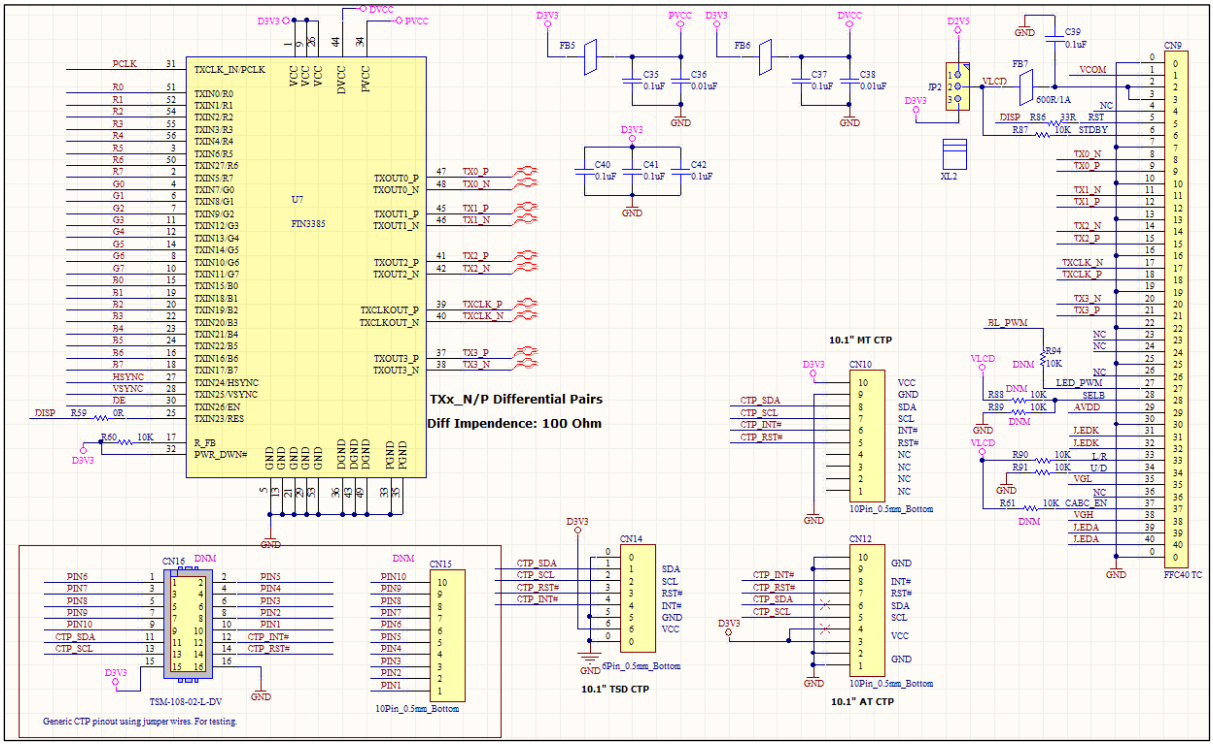


Figure 8 - RGB to LVDS Converter

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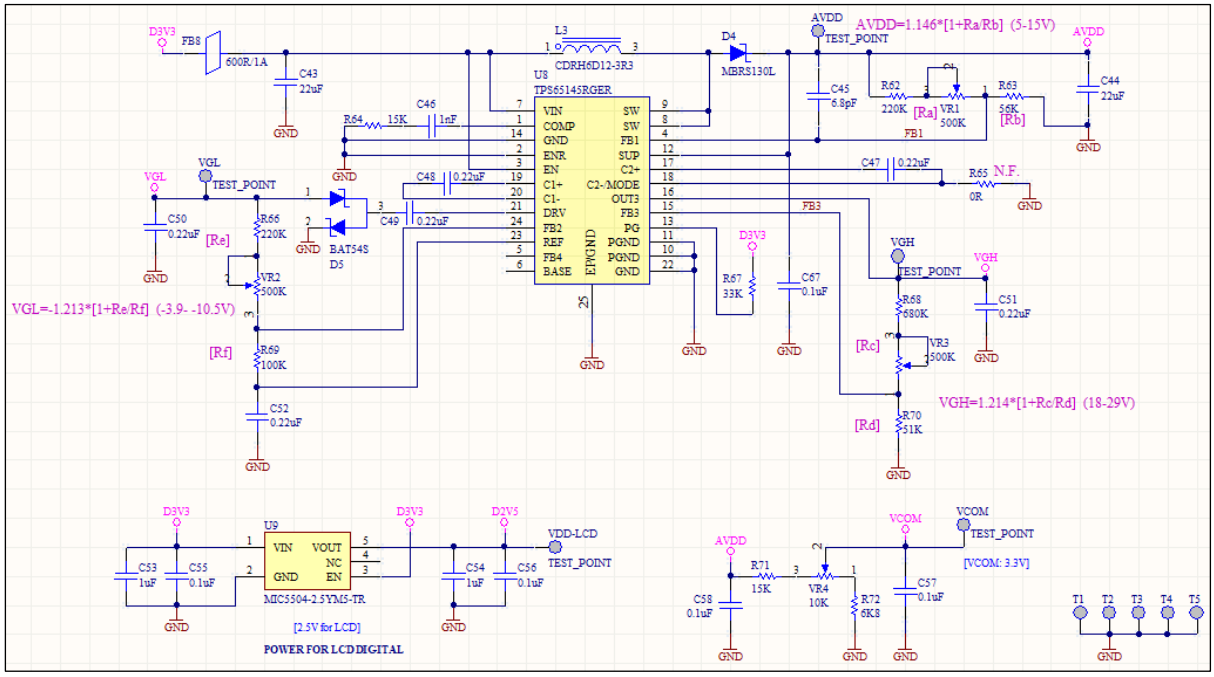


Figure 9 - LCD Biasing Voltages

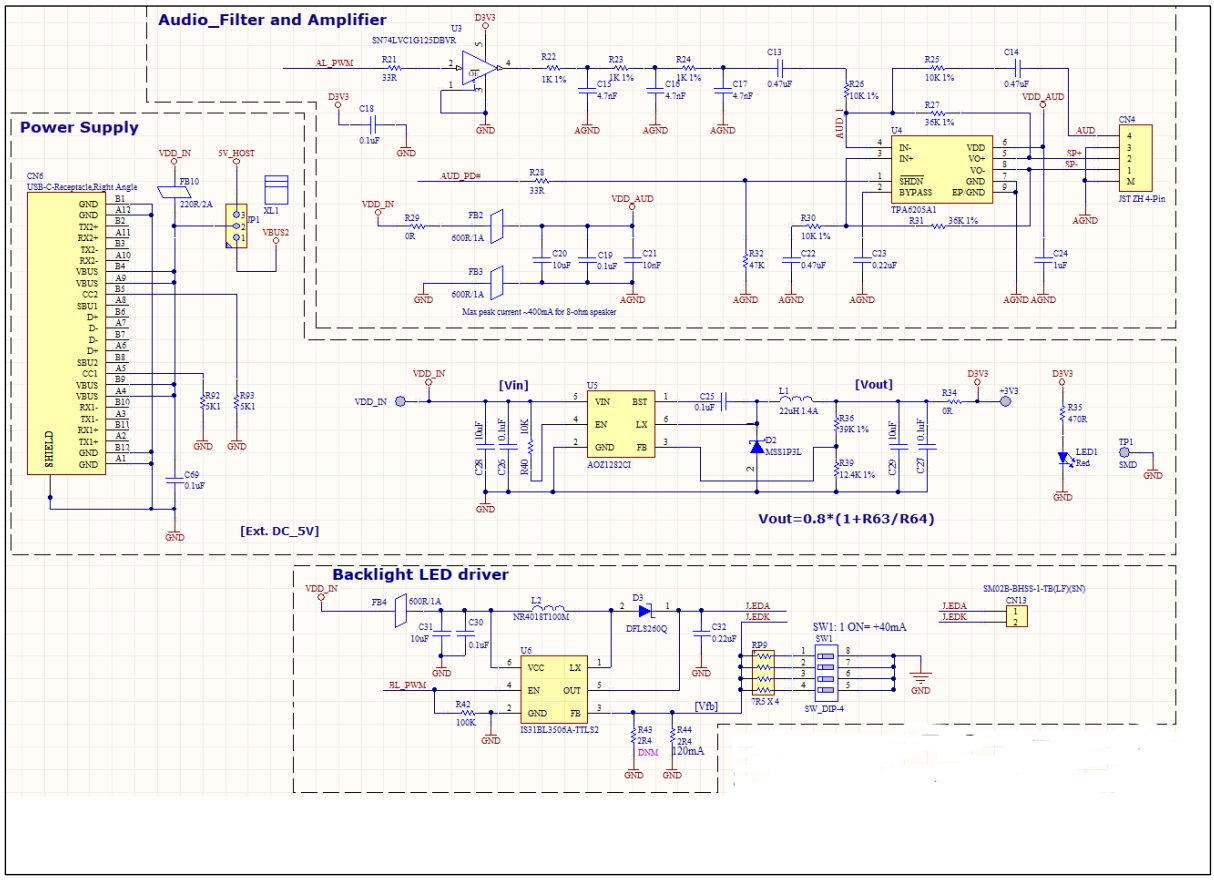


Figure 10 - Power and Audio Circuits

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5 Hardware Setup

5.1 Power Configuration

There are 3 methods of powering the ME817EV board.

1) PC USB port Power(5V) - Connect to PC via Type-C cable to CN11
2) USBC charger Power(5V) - Connect USB charger with Type-C cable to CN6
3) Power from MCU host board(5V) - Connect 5V to CN8 pin 10 or CN7 pin 3&4

The following table summarises how to power the ME817EV board using the various methods.

Power Method	CN11	CN6	CN8 Pin 10 (or CN7 pin3&4)	JP1
PC USB port power (5V)	5V	Must not connect	Do not care	Short pin 1-2
USBC charger power **(5V)**	Do not care	5V	Do not care	open
MCU host board power **(5V)**	Do not care	Must not connect	5V	Short pin 2-3

Table 16 - Board Power Configuration

5.2 Backlight LED Current Configuration

The ME817EV module has a backlight LED driver circuit on-board. The driver takes 5V as an input power source, and the regulator produces the output voltage so that the backlight LED can draw the desired total output. Users can select backlight current up to a maximum of 280mA via dip switch SW1. By default, with all the 4 switches in SW1 turned OFF, resistor R44 (2.4 Ohm) is setting the minimum backlight current at 120mA. The switches in S12 are connected to array resistor RP9 (4 x 7.5 Ohm). Turning ON each switch will provide an additional backlight current of 40mA per switch.

Backlight LED array	Vled voltage	Vled current	SW1 Number of ON position	Comment
6 x 6	19.2V	120mA	0	
8 x 3	9.6V	160mA	1	
10 x 3	9.6V	200mA	2	
12 x 3	9.6V	240mA	3	
14 x 3	9.6V	280mA	4	

Table 17 - Backlight LED Configuration

5.3 Compatible LCD Panel

The ME817EV supports 2 types of LCD interface:

1. LVDS panel with 40-pin 0.5mm FPC cable or connector
2. RGB panel with 50-pin 0.5mm FPC cable or connector

In addition to LCD modules that are directly supported, Bridgetek has developed the VA-1001-01A Generic LCD Adaptor to extend compatibility with LCD modules that use standard LCD pinouts. The adaptor enables the ME817EV to support a wider range of LCD panels through the use of appropriate extension flex cables and wires. For example, the DP-0701-01A LCD module listed in Table 5-3 is supported using the VA-1001-01A Generic LCD Adaptor.

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For further information on the VA-1001-01A Generic LCD Adaptor and how it can be paired with the ME817EV to support a wider range of LCD modules, refer to the *VA-1001-01A datasheet*.

Table 18 lists a few LCD panels which have been tested as working with the ME817EV board.

Bridgetek Part No.	Size	Resolution	Cap Touch IC/ Connector	Display Interface	Remark
DP-0701-01A	7″	800x480	FT5426/CN2	RGB-50	Supported via VA-1001-01A Generic LCD adaptor and extension cable
-	7″	1024x600	FT5426/CN2	RGB-50	Third party LCD
DP-1011-02A	10.1″	1280x800	ILI2132/CN12	LVDS-40	Direct support

Table 18 - Compatible LCD List

5.4 Hardware Setup Example 1: ME817EV with DP-0701-01A

This example uses Bridgetek's DP-0701-01A, a 7-inch TFT-LCD module with an 800 × 480 resolution and a capacitive touch panel. It demonstrates how the ME817EV uses the generic LCD adapter board and a 10-pin extension cable to support a wide range of LCD panels with standard pinouts. This setup delivers the same functionality as Bridgetek's IDK-BT817-70A Intelligent Display Kit.

Hardware Setup

Jumper/ Switch Settings:

- Generic LCD Adaptor**:** Set jumpers JP14, JP16, and JP17 to the bottom position to select 3.3 V supply for the LCD panel.
- ME817EV: Configure the 4-position DIP switch SW1 with only SW1-1 set to ON and the remaining three switches SW1-2/3/4 set to OFF to configure the LED current to 160 mA.
  Set all positions on the 8-position DIP switch SW2 to ON to route EVE communication path to the onboard FT4222 bridge IC.
  Ensure jumper on JP1 is set to pins 1-2 to source power from the USBC2 connector.

System Assembly:

- Generic LCD Adaptor: Use the supplied 10 cm, 50-position flex cable (same-side contacts) to connect the EVE development board to the LCD adapter board.
  - *ME817EV side:* Insert one end of the cable into CN1 with the contact pads facing downward.
  - *Adaptor board side***:** Insert the other end into CN2 with the contact pads facing upward
- LCD Panel: Insert the LCD flex cable into connector CN7 on the Generic LCD adaptor board with the contact pads facing downward.
- Touch Panel: Insert the touch panel flex cable into the 10P extension cable with the contact pads facing downward.
  Connect the 10P extension cable to connector CN2 on the EVE development board with the contact pads facing upward.
- Connect the USB-C cable from the PC to the USBC2 connector on ME817EV to turn on the power.

Software Setup

- Download EVE Toolchain, EVE Screen Designer (ESD) from https://brtchip.com/esd/.
- Install and setup the software.
- Launch ESD and select IDK-BT817-70A from the list of available board configurations.

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For additional information, refer to the VA-1001-01A Generic LCD Adaptor and Intelligent Display Kit Solutions datasheets.

EVE Screen Designer (ESD) includes built-in guides and example projects to help you design and develop graphical user interfaces (GUIs) for your application.

Figure 11 illustrates the system configuration with code executed via ESD to display an image.

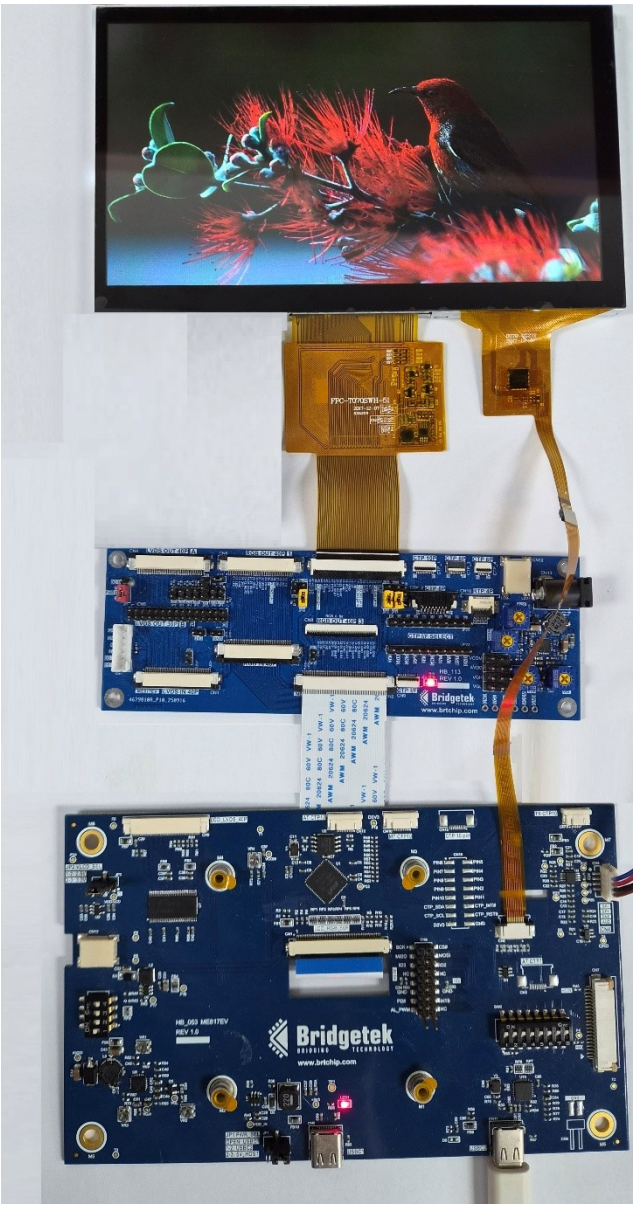


Figure 11 - ME817EV Setup with DP-0701-01A

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5.5 Hardware Setup Example 2: ME817EV with DP-1011-02A

This example uses Bridgetek's DP-1011-02A, a 10-inch TFT-LCD module featuring a 1280 × 800 resolution and a capacitive touch panel. A PC serves as the host and communicates with the module through the onboard FTDI FT4222H USB-to-QSPI bridge.

Hardware Setup

Jumper / Switch Settings:

- Configure the 4-position DIP switch SW1 with only SW1-1 set to ON and the remaining three switches SW1-2/3/4 set to OFF to configure the LED current to 160 mA.
- Set jumper on JP2 to position 2-3 to configure VLCD to use the 3.3V power source
- Set the positions on the 8-position DIP switch SW2 to ON to route the communication path to the onboard FT4222 bridge IC.
- Set jumper on JP1 to position 1-2 to source power from the USBC2 connector.

System Assembly:

- LCD Panel: Insert the 40-position flex cable into the FPC connector on the LCD panel with contact pads facing downward. Then insert the other end of the flex cable into connector CN9 on ME817EV with the contact pads facing upward.
- Touch Panel: Insert the touch panel flex into connector CN12 with the contact pads facing downward.
- Connect a USB-C cable to the USBC2 connector to provide power and communication.

Software Setup

- Download EVE Toolchain, EVE Screen Designer (ESD) from https://brtchip.com/esd/.
- Install and setup the software.
- Launch ESD and select IDK-BT817-101A from the list of available board configurations.

Figure 12 illustrates the system configuration with code executed via ESD to display an image.

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Figure 12 - ME817EV Setup with DP-1011-02A

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6 Mechanical Dimensions

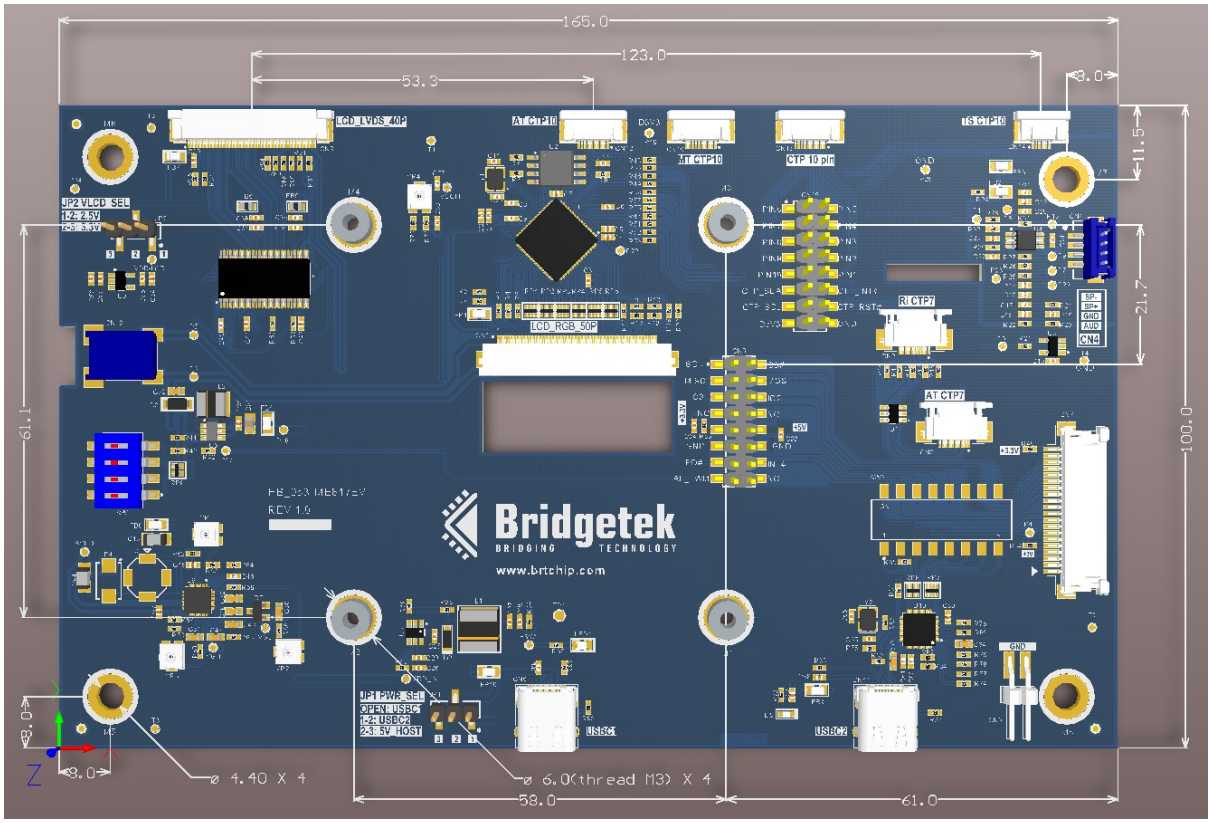


Figure 13 - PCB Mechanical Dimensions

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7 Specifications

7.1 Electrical Specifications

Parameter	Description	Minimum	Typical	Maximum	Units	Notes
VCC_5V	5V supply voltage	4. 5	5.0	5. 5	V	
Icc1_5V	VCC=5V operating current	-	200	-	mA	Without LCD/speaker
Icc2_5V	VCC=5V operating current	-	950	-	mA	With 7” LCD and 1/8W speaker
Icc3_5V	VCC=5V operating current	-	1200	-	mA	With 10.1” LCD and 1/8W speaker
Voh	Output Voltage High	2.4	-	-	V	
Vol	Output Voltage Low	-	-	0.4	V	
Vih	Input High Voltage	2.0	-	5.25	V	
Vil	Input Low Voltage	-	-	0.8	V	

Table 19 - Operating Voltage and Current

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8 Contact Information

Refer to https://brtchip.com/contact-us/ for contact information.

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Appendix A – References

Document/Web References

https://brtchip.com/product/me817ev/

BT817_8 Datasheet

BT81X Programming Guide

FT9xx Modules

DP-0701-01A

DP-1011-02A

Acronyms and Abbreviations

Terms	Description
EVE	Embedded Video Engine
LCD	Liquid Crystal Display
PC	Personal Computer
SPI	Serial Peripheral Interface
TFT	Thin Film Transistor
USB	Universal Serial Bus

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Appendix C – Revision History

Document Title: ME817EV BT817 Evaluation Board Datasheet

Document Reference No.: BRT_000325

Clearance No.: BRT#157

Product Page: https://brtchip.com/product/me817ev/

Document Feedback: Send Feedback

Revision	Changes	Date
1.0	Initial release	11-11-2020
1.1	Updated the following – Display Reference Section 8 – Contact Information	30-07-2025
1.2	**Change Summary** 1. Updated Table 3.8 Pin 28, by removing the "pull low" definition. 2. Updated the schematic to reflect the DMN for R89. 3. Updated Table 2.2 to include additional accessories. 4. Update Table 5.3 to reflect the supported LCDs using Bridgetek display panels 5. Updated Section 5.4 to use panel DP-0701-01A as the example. 6. Updated Section 5.5 to use panel DP-1011-02A as the example.	07-09-2026

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