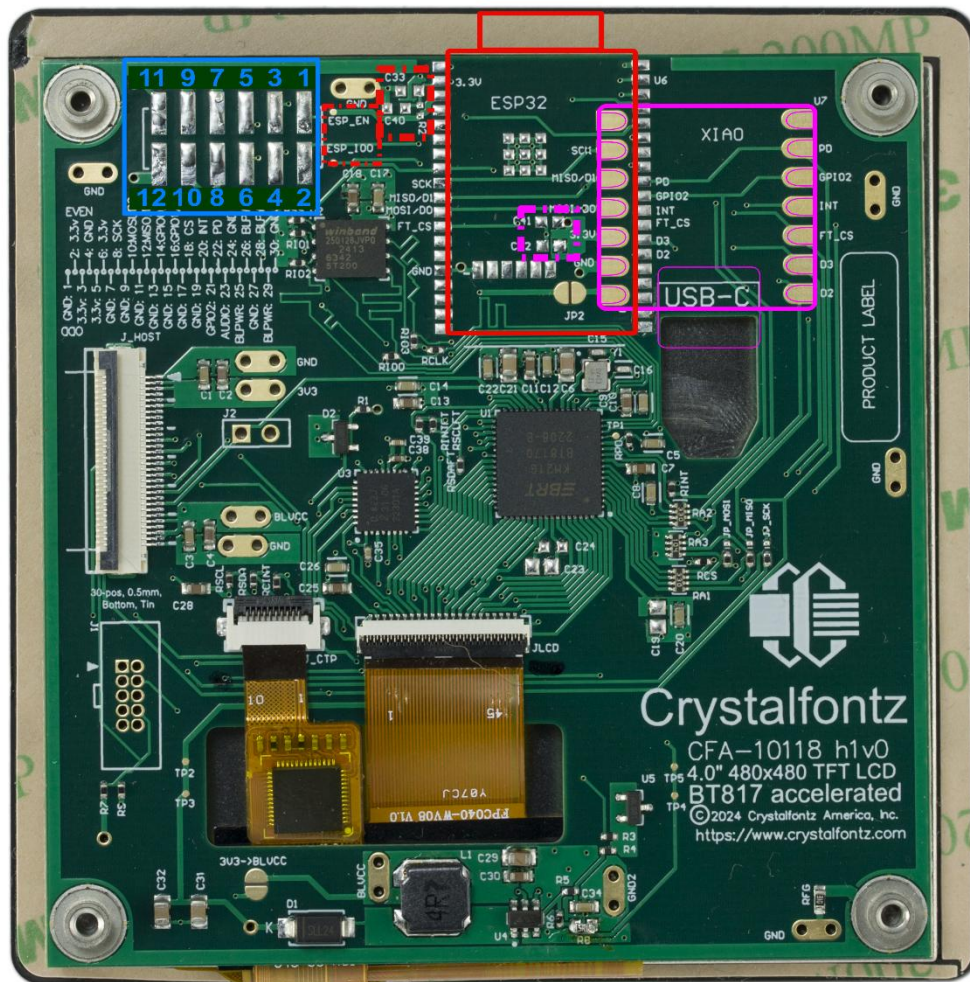




ESP32 and XIAO App Note for EVE BT817Q CFA10118 boards:

This app note provides the details necessary to use an [Espressif ESP32](#) or [Seeed Studio XIAO](#) microprocessor board with a [Crystalfontz 4-inch EVE module](#). The PCB used in the CFA480480Ex-040Sx modules is the CFA10118, as referenced below.

In the image below, the ESP32 land is outlined in red, the necessary hardware changes in red dashes. The XIAO land is outlined in pink, the necessary hardware changes in pink dashes. The relevant header (J3) is outlined in blue.





Espressif ESP32

J3 Header Table for ESP32 Pins.

Pin	Function	Description
1	TxD0	Tx pin for Serial Interface
2	RxD0	Rx pin for Serial Interface
3	IO22	GPIO pin 22
4	IO21	GPIO pin 21
5	IO23	GPIO pin 23
6	IO19	GPIO pin 19
7	3V3	3V3 Power
8	BLVCC	Backlight Power. Consult the display datasheet for min and max ratings.
9	3V3	3V3 Power
10	BLVCC	Backlight Power. Consult the display datasheet for min and max ratings.
11	GND	Ground
12	GND	Ground

ESP32 Pinout Table – all pins not mentioned are no-connect.

Pin	ESP32 Function	CFA10118 Function	Description
1, 15, 38-39	GND	GND	Logic and Power Ground
2	3V3	3V3	3V3 Power
3	EN	EN	Enable Pin
9	IO33	SCK	SPI Clock
10	IO25	MISO/D1	SPI MISO / Quad SPI D1
11	IO26	MOSI/D0	SPI MOSI / Quad SPI D0
25	IO0	GPIO0/D2	GPIO 0 / Quad SPI D2
26	IO4	GPIO1/D3	GPIO 1 / Quad SPI D3
27	IO16	FT_CS	Chip Select
28	IO17	INT	Interrupt Pin
29	IO5	GPIO2	GPIO 2
30	IO18	PD_HOST	Power Down pin from Host (reset)
31	IO19	IO19	GPIO 19 on J3
33	IO21	IO21	GPIO 21 on J3
34	RXD0	R XD0	Serial Rx Pin on J3
35	TXD0	TXD0	Serial Tx Pin on J3
36	IO22	IO22	GPIO 22 on J3
37	IO23	IO23	GPIO 23 on J3



Hardware Modifications for the ESP32-WROOM and ESP32-WROVER:

Populate R2 with a 10kohm pull up 0402 resistor.

Populate C33 and C40 with sufficient decoupling 0603 capacitors. A 1uF and a 0.1uF can be used.

Programming the ESP32:

The serial pins are brought out on pins 1 and 2 of J3 and can be used to program the ESP32. The enable (EN) pin is brought out on the ESP_EN test point and the IO0 pin is brought out on the ESP_IO0 test point.

Standard ESP32 programming procedure at the time of this writing:

1. Pull EN and IO0 to ground
2. Release EN
3. Release IO0
4. Send firmware via UART
5. Pull EN to ground and release to reset the device

For further reference, see Espressif's documentation about programming an ESP32 device.

<https://docs.espressif.com/projects/esptool/en/latest/esp32/advanced-topics/boot-mode-selection.html?highlight=boot>



Seeed Studio XIAO

J3 Header Table for XIAO Pins – Most pins are reserved for the ESP32.

Pin	Function	Description
1	N/A	Used for ESP32 only
2	N/A	Used for ESP32 only
3	N/A	Used for ESP32 only
4	N/A	Used for ESP32 only
5	N/A	Used for ESP32 only
6	N/A	Used for ESP32 only
7	3V3	3V3 Power
8	BLVCC	Backlight Power. Consult the display datasheet for min and max ratings.
9	3V3	3V3 Power
10	BLVCC	Backlight Power. Consult the display datasheet for min and max ratings.
11	GND	Ground
12	GND	Ground

XIAO Pinout Table

Pin	XIAO Function	CFA10118 Function	Description
0	D0/A0/DAC	GPIO0/D2	GPIO 0 / Quad SPI D2
1	D1/A1	GPIO1/D3	GPIO 1 / Quad SPI D3
2	D2/A2	FT_CS	Chip Select
3	D3/A3	INT	Interrupt Pin
4	D4/A4/SDA	GPIO2	GPIO 2
5	D5/A5/SCL	PD_HOST	Power Down pin from Host (reset)
6	D6/A6/Tx	NC	
7	D7/A7/Rx	NC	
8	D8/A8/SCK	SCK	SPI Clock
9	D9/A9/MISO	MISO/D1	SPI MISO / Quad SPI D1
10	D10/A10/MOSI	MOSI/D0	SPI MOSI / Quad SPI D0
11	3V3	3V3	3V3 Power
12	GND	GND	Ground
13	VUSB	BLVCC	Backlight Power. Consult the display datasheet for min and max ratings.

Hardware Modifications for the XIAO Boards:

Populate C41 and C42 with sufficient decoupling 0603 capacitors. A 1uF and a 0.1uF can be used.

Programming the Xiao:

It is expected to use the USB header on a XIAO board for programming.