QSFP-DD MCB and QSFP-DD MXP Hardware Manual

Rev 1.0
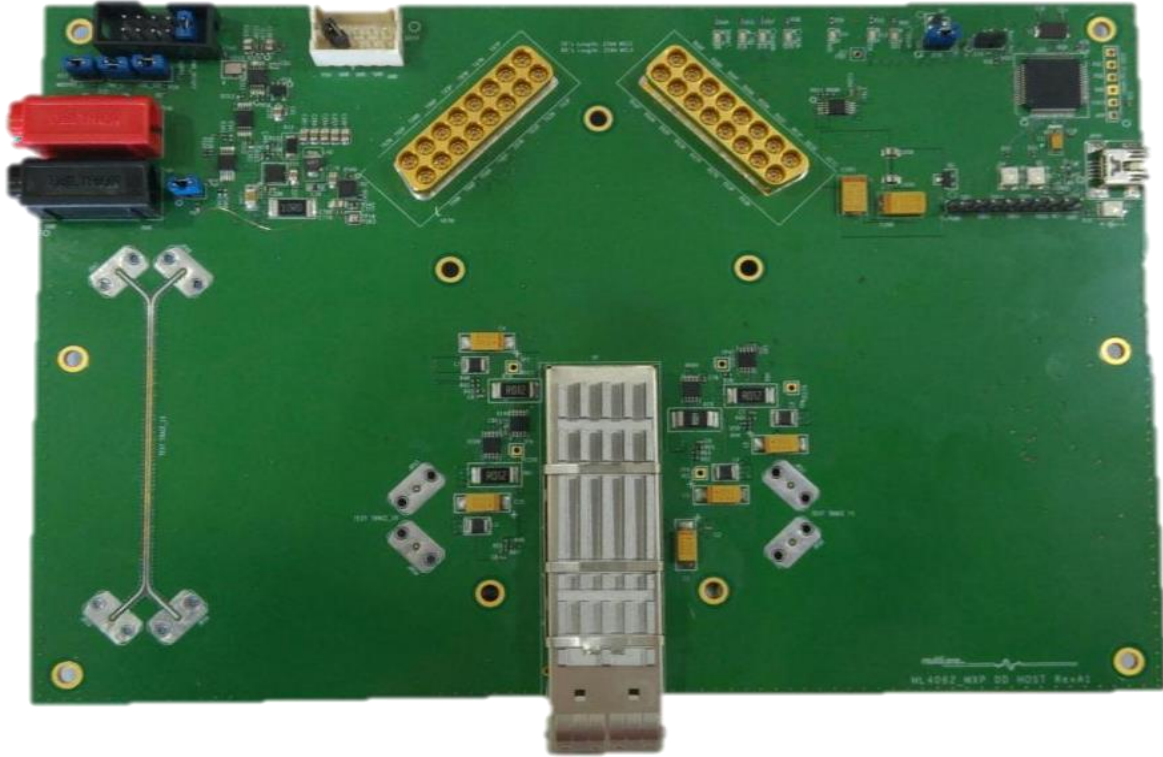
QSFP-DD MCB-MXP
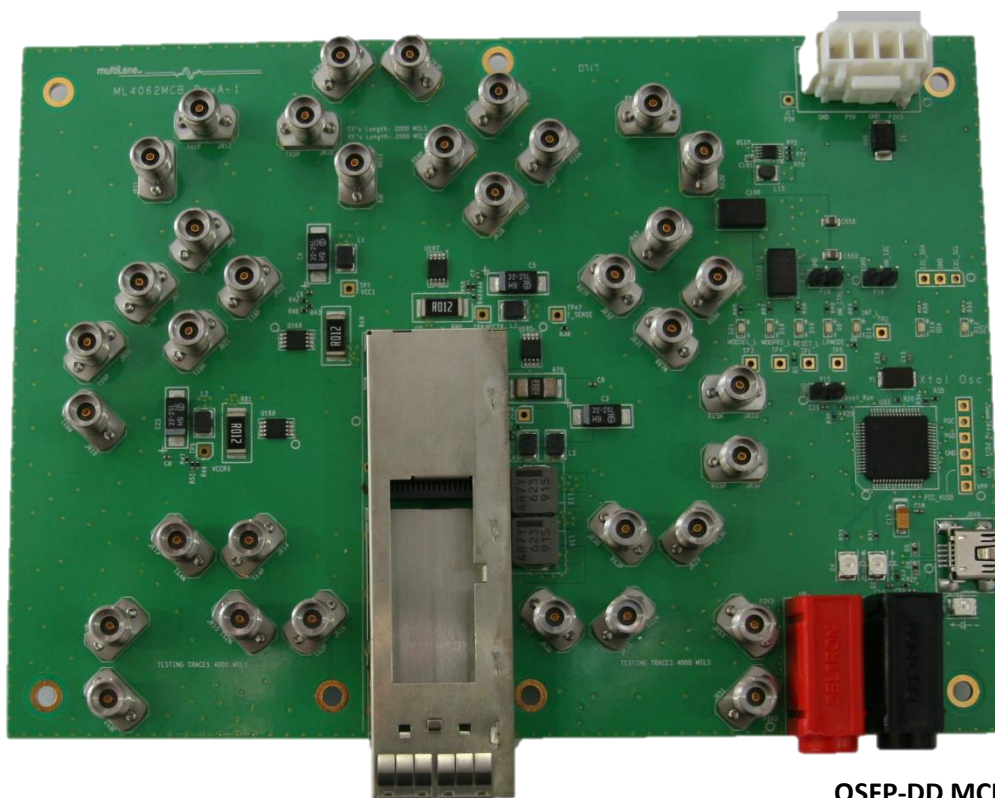
QSFP-DD MCB

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1. ML4062-MCB

1.1 Test board-Key Features

- ✓ Supports 8x50G interfaces
- ✓ I2C master driven from both on board microcontroller or external pin headers
- ✓ 40 GHz Bo-Jiang 2.92mm K Connectors
- ✓ Current Sense
- ✓ Matched differential trace length
- ✓ All 8 channels comes with matching trace length
- ✓ High performance signal integrity traces from K connectors to QSFP-DD host connector.
- ✓ On-board LEDs display MSA output alarm states
- ✓ On-board buttons/jumpers for MSA input control signals
- ✓ User friendly GUI for I2C R/W commands and loading custom MSA memory maps
- ✓ Four corner testing capability
- ✓ USB interface

1.2 Power up

To operate the QSFP-DD host, follow the following steps:

- Place the host as to see the Multilane logo on top.

- Plug the host to a 3.3 V power supply using banana plugs.

- Plug the host to your computer using the USB plug.

1.3 Operating conditions

Parameter	Symbol	Conditions	Min	Typical	Max	Unit
+3.3V power supply	Vcc	Main Supply voltage	3	3.3	3.6	V
I/O Load resistance	RI	AC-Coupled, Differential	90	100	110	Ω

1.4 LED indicators

The LED D3 indicates whether a USB cable is plugged or not.

The other two LEDs, D2 and D4, are used for diagnostic purposes.

- o If the green LED, D2, is on: USB is locked and device is recognized by the USB driver.
- o If the red LED, D4, is on: USB not connected or USB driver not found.
- o If both LEDs are off: Board not powered correctly or firmware is corrupted.

1.5 Bootloader

You can access the bootlaoder to reprogram the microcontroller, to do that, simply:

1. Connect a jumper on (P15) situated between the USB plug and the red power plug.

2. Connect a USB cable between the PC and Board.

3. Power up the board with a +3.3V supply.

4. LEDs (D2, D4) start blinking.

5. Remove jumper.

6. Open the software "Microchip USB HID Bootloader v2.3".

7. Click on "Open Hex File".

8. Choose the new FW to download.

9. Click on "Program/Verify".

10. Once the software finishes programming press on "Reset Device".

11. After reset the Firmware is successfully updated.

## 1.6   QSFP-DD HW Signaling Pins

Hardware alarm pins, hardware control pins and I2C pins can be accessed from the software via USB or through on-board LEDs and pin headers.

1. All Hardware Alarm signals of ML4062 MCB can be accessed through the pin headers or LEDs shown below:
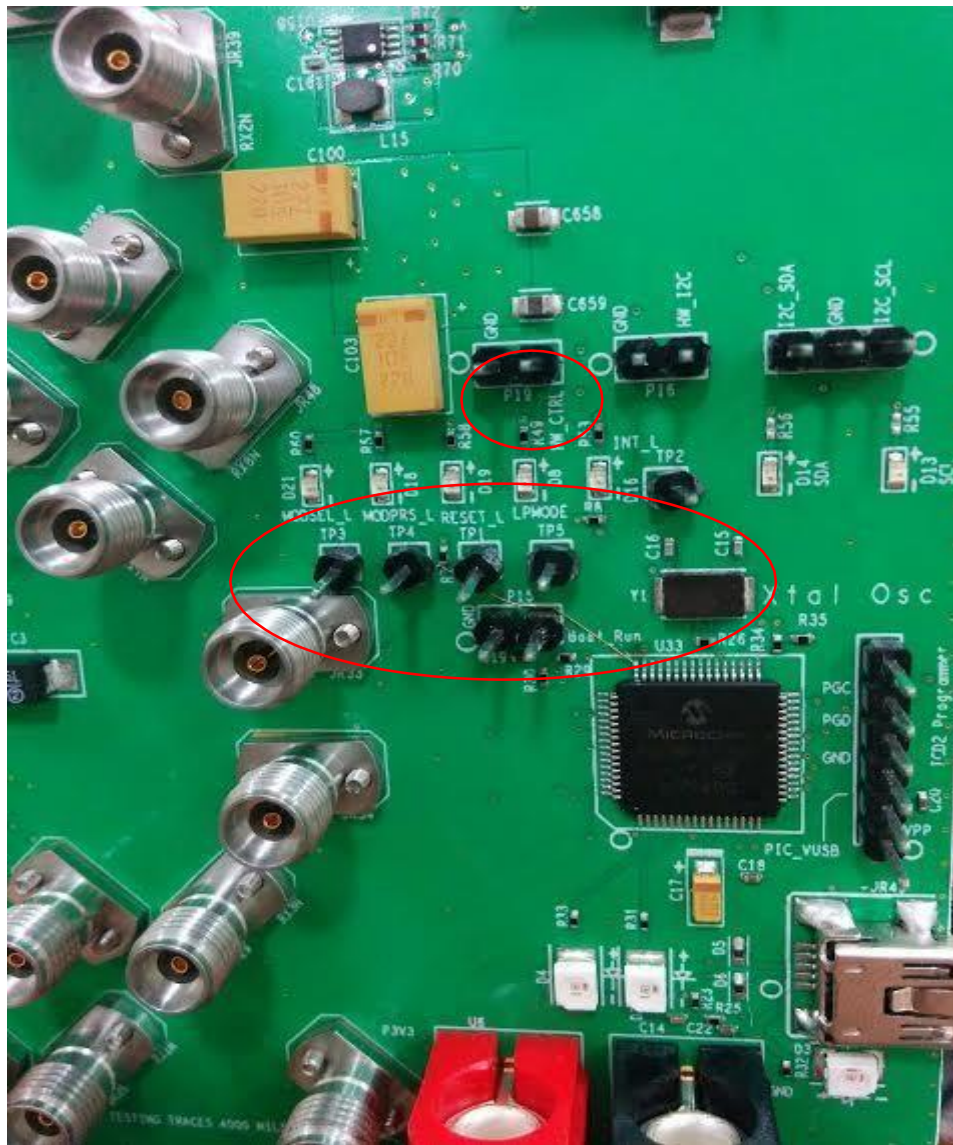
Hardware control signals can be driven through the jumpers. A jumper is placed on **P19** HW_CTRL to be able to control hardware signals from the pins.

- MODSEL_L, RESET_L, MODPRS_L and INT_L pins, when driven through jumpers, set their respective signals to 0, and their respective LEDs are on.
- LPMODE pin, when driven through a jumper set its signal to 0, and its LED is off.

2. To control I2C, a jumper is placed on **P16** HW_I2C. Then the external I2C is driven through I2C_SCL and I2C_SDA pins shown below:
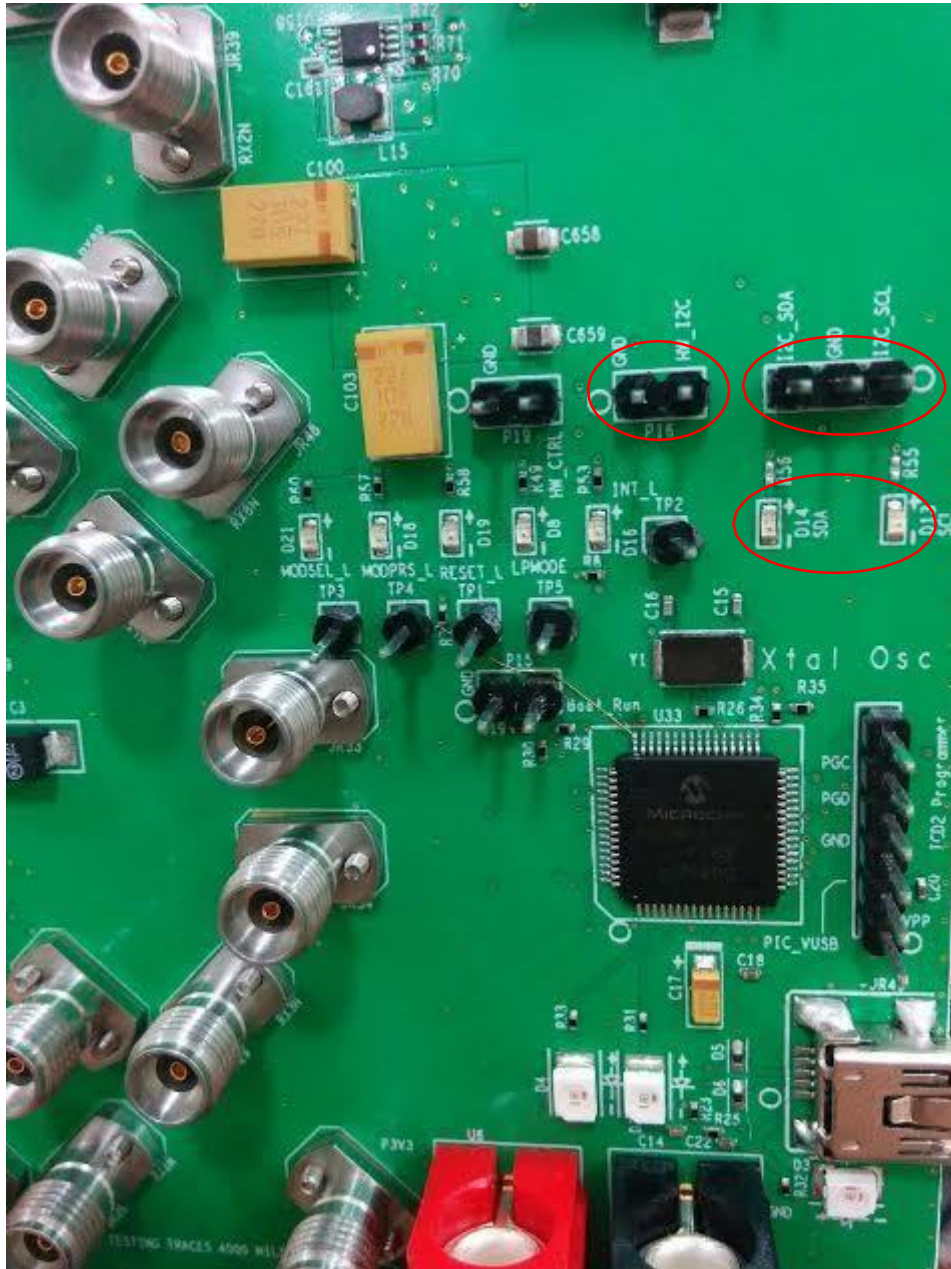
2. ML4062-MCB-MXP

2.1 Test board-Key Features

- ✓ Supports 8x50G interfaces
- ✓ I2C master driven from both on board microcontroller or external pin headers
- ✓ 2x8 Huber+Suhner MXP Connector rows
- ✓ Current Sense
- ✓ Internal noise injection option through a programmable switching regulator
- ✓ Power can be fed through an external source (5V)
- ✓ Power margining between 3.1V and 3.6V
- ✓ Matched differential trace length

- ✓ All 8 channels comes with matching trace length
- ✓ High performance signal integrity traces from MXP connectors to QSFP-DD host connector.
- ✓ On-board LEDs display MSA output alarm states
- ✓ On-board buttons/jumpers for MSA input control signals
- ✓ User friendly GUI for I2C R/W commands and loading custom MSA memory maps
- ✓ Four corner testing capability
- ✓ USB interface

2.2 Power up

To operate the QSFP-DD host, follow the following steps:

- Place the host as to see the Multilane logo on top.
- Plug the host to a 5 V power supply using banana plugs.
- Plug the host to your computer using the USB plug.

2.3 Operating conditions

Parameter	Symbol	Conditions	Typical	Unit
+5V power supply	Vcc	Main Supply voltage	5	V

In order to apply an external 3.3V to the QSFP-DD, connect a jumper between the pins LDOS_Off and P5V to disable the internal regulator, and apply your 3.3V to the 4 pins. The row on the top is 3.3V and on the row on the bottom is GND. Make sure to keep the external 5V to turn on the micro and others features.
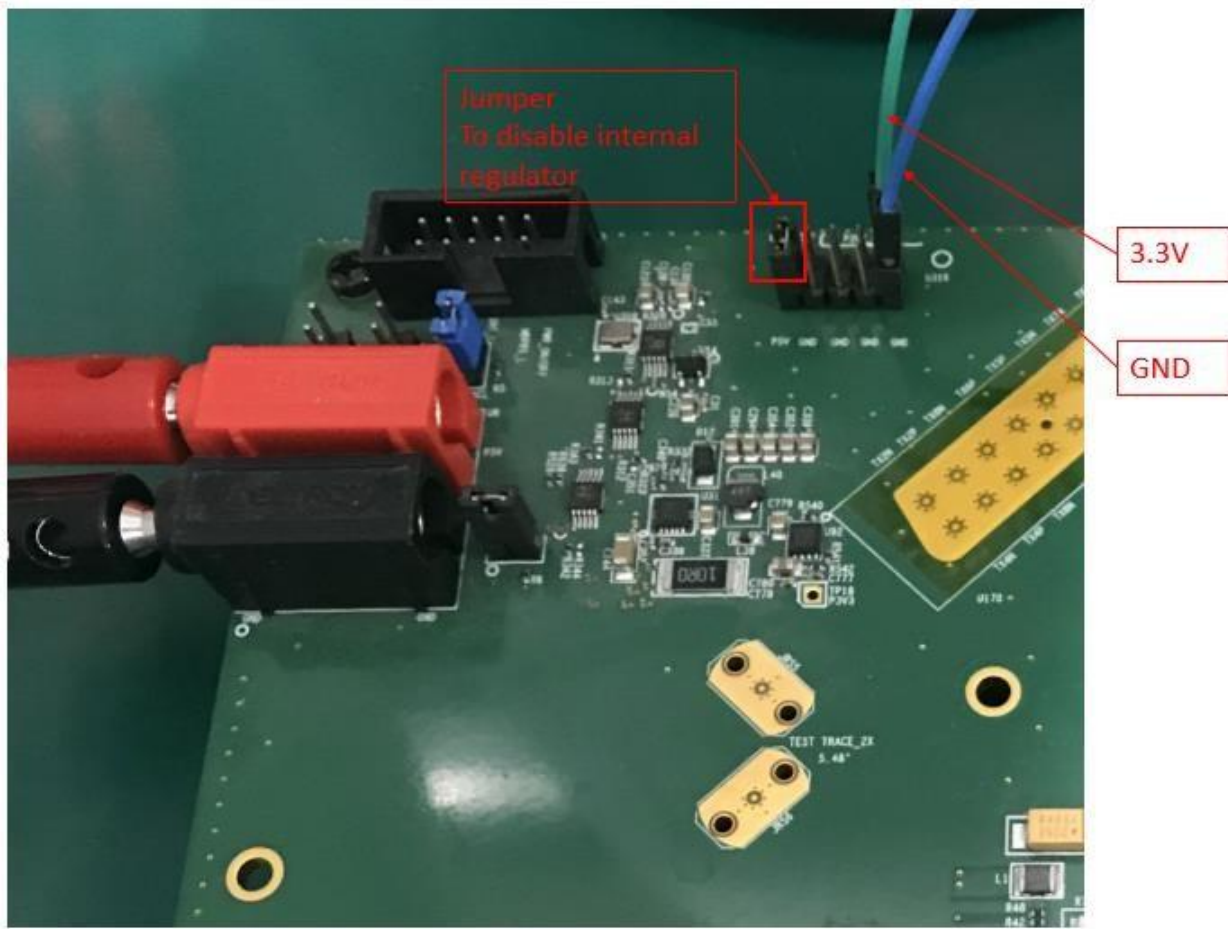
2.4 LED indicators

The LED D3 indicates whether a USB cable is plugged or not.

The other two LEDs, D2 and D4, are used for diagnostic purposes.

- o If the green LED, D2, is on: USB is locked and device is recognized by the USB driver.
- o If the red LED, D4, is on: USB not connected or USB driver not found.
- o If both LEDs are off: Board not powered correctly or firmware is corrupted.

2.5 Bootloader

You can access the bootloader to reprogram the microcontroller, to do that, simply:

12. Connect a jumper on (P15) situated between the USB plug and the red power plug.

13. Connect a USB cable between the PC and Board.

14. Power up the board with a +3.3V supply.

15. LEDs (D2, D4) start blinking.

16. Remove jumper.

17. Open the software "Microchip USB HID Bootloader v2.3".

18. Click on "Open Hex File".

19. Choose the new FW to download.

20. Click on "Program/Verify".

21. Once the software finishes programming press on "Reset Device".

22. After reset the Firmware is successfully updated.

2.6   QSFP-DD HW Signaling Pins

Hardware alarm pins, hardware control pins and I2C pins can be accessed from the software via USB or through on-board LEDs and pin headers.

3.   All Hardware Alarm signals of ML4062 MCB-MXP can be accessed through the pin headers or LEDs shown below:
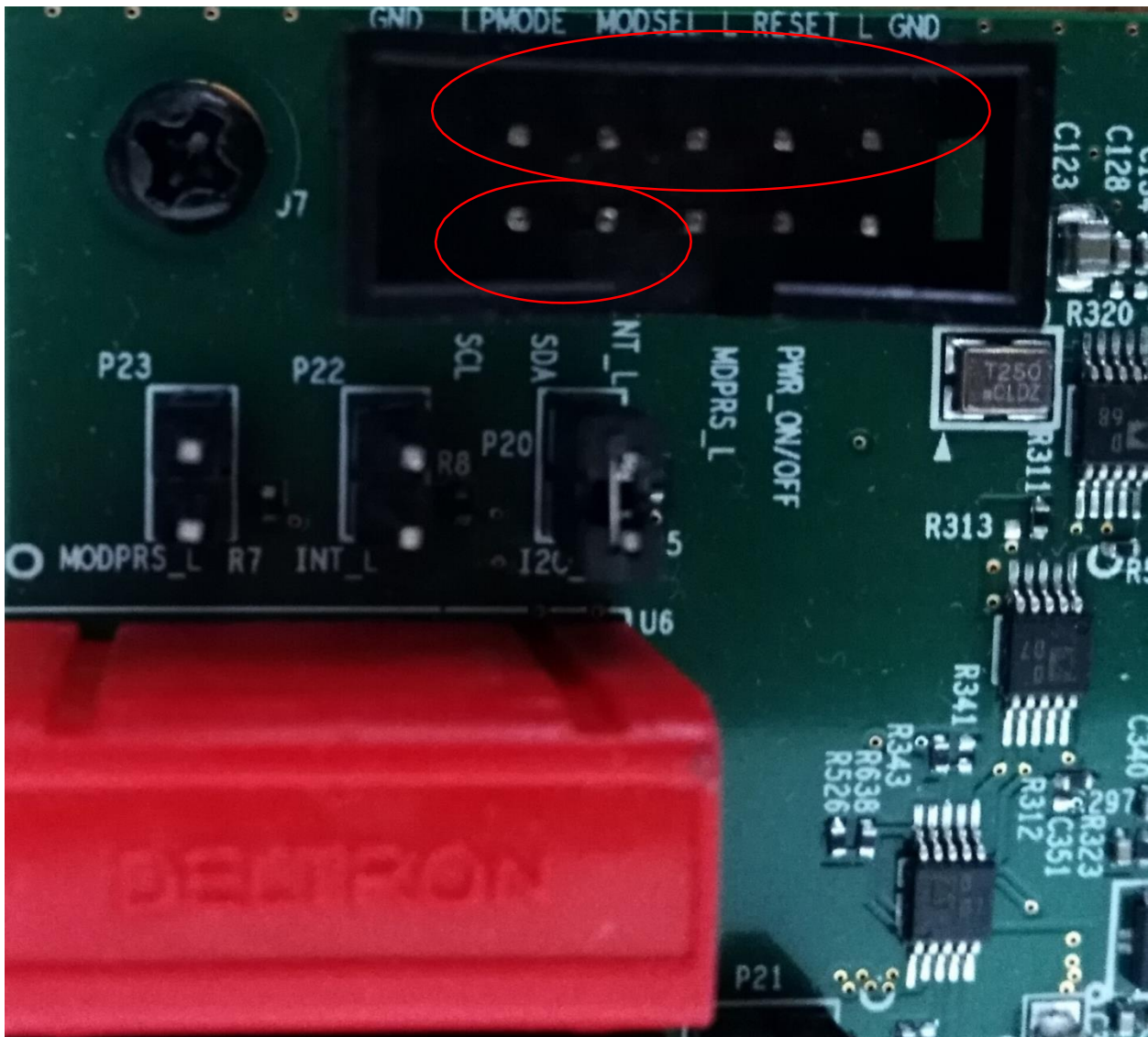
Hardware control signals can be driven through the jumpers. A jumper is placed on **P19** HW_CTRL to be able to control hardware signals from the pins.

- MODSEL_L, RESET_L, MODPRS_L and INT_L pins, when driven through jumpers, set their respective signals to 0, and their respective LEDs are on.
- LPMODE pin, when driven through a jumper set its signal to 0, and its LED is off.

4. P20 and P21 are used to connect the pull up resistors for I2C SCL and SDA signals. Then the external I2C is driven through I2C_SCL and I2C_SDA pins shown above.