FLIR Boson Development Board

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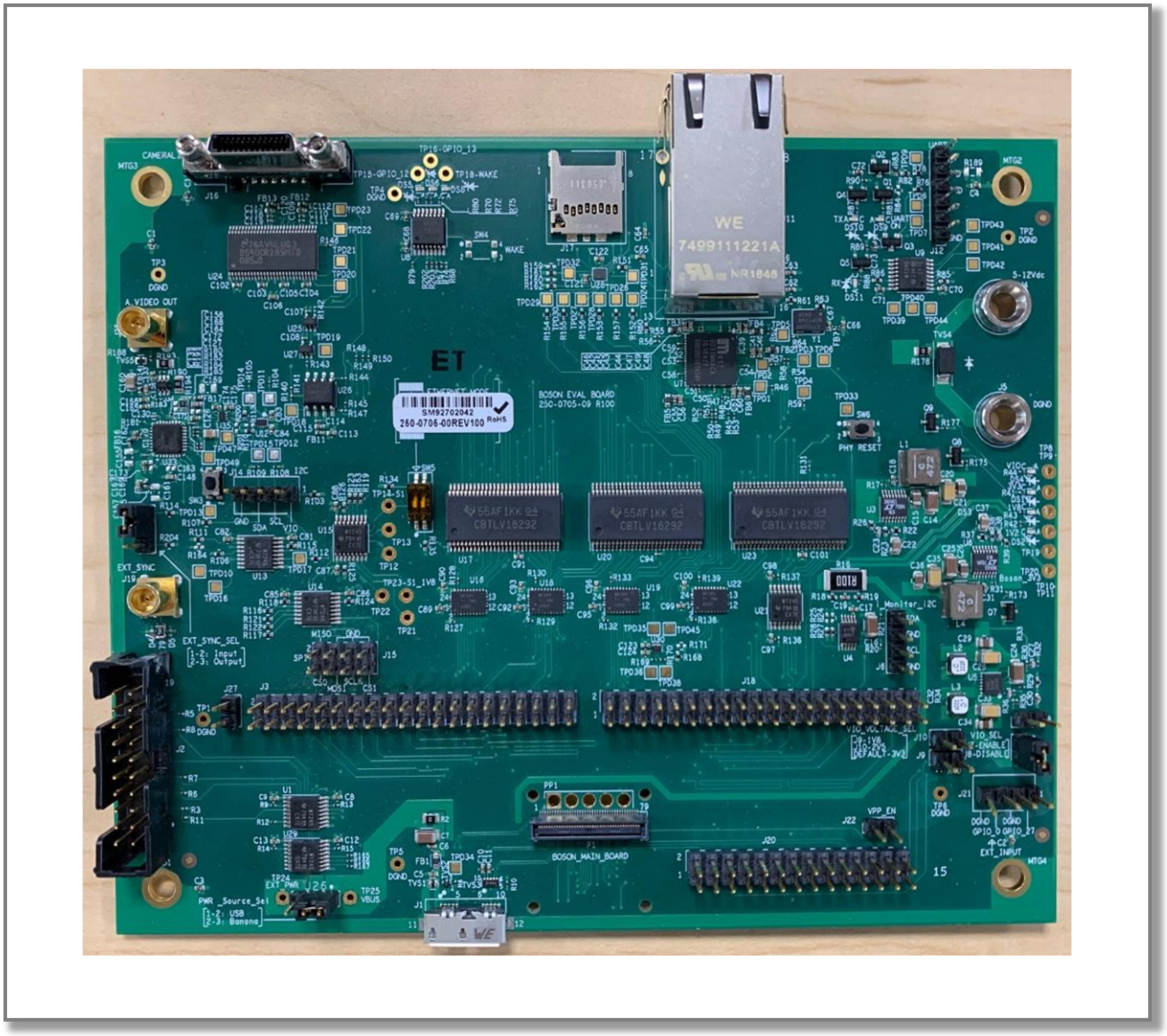
Official Expiration Date: Until Next Release

Disclaimer: This app note applies to version 250-0705-00 R100 of the Boson Development Board. Previous versions/revisions of the app note are obsolete and should not be followed.



Document Revision: R200

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Revision History

Version	Date	Comments
100	12/06/2016	Initial Release
111	6/20/2017	Updated Formatting
112	5/24/2018	Added notes about unreleased features, Removed <9Hz from title
113	12/18/2018	Updated footer for export statement Added information regarding “cmos_data_valid” signal not available on current revision of development board
??? (0705)	9/4/2019	Added sections and notes on USB power, External Sync, Analog/Digital video interface, Myriad Data Enable signal breakout Updated board pictures

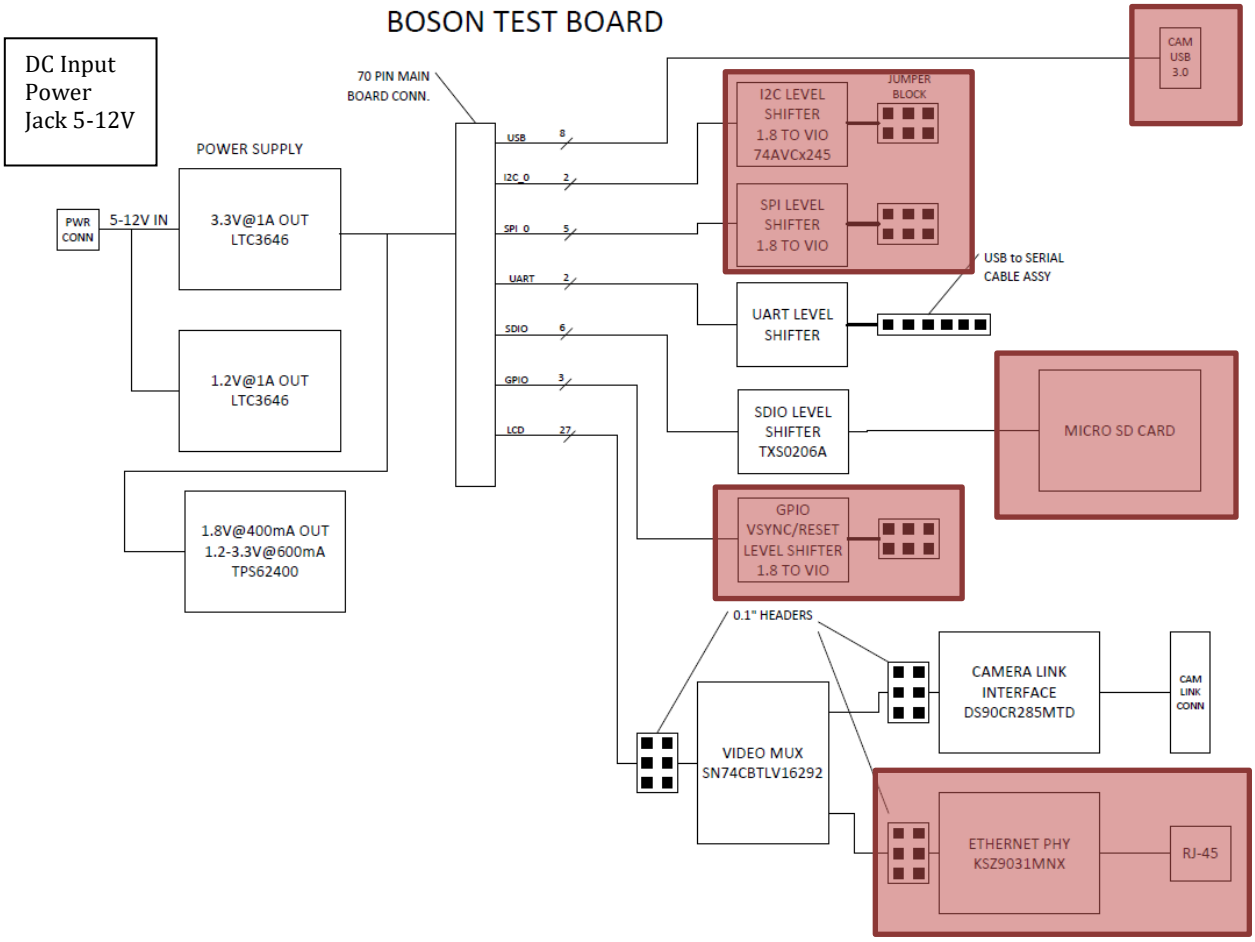
Scope

This note is intended to provide a better understanding of the Boson Development board and how to use it to connect to the various SW interfaces available to Boson. For details regarding the SW interface, please refer to the Datasheet (Ref 1) and Software IDD (Ref 2). Please note: many modules listed in this guide are not currently implemented in Boson code, and many will not be implemented in the near term.

FLIR Boson Development Board

Block Diagram Overview

The below Block Diagram shows all of the interfaces available on the development PCB. Please note that not all interfaces are implemented in the Boson software. Interfaces that have not been implemented are marked below in red and please refer to the datasheet for the updated Boson interface specification. The 80 Pin Main Board Connector can be interfaced with directly by using the header pins J3 and J18. Alternatively, the Boson Test Board has alternate interfaces shown below, features in RED are not currently supported:



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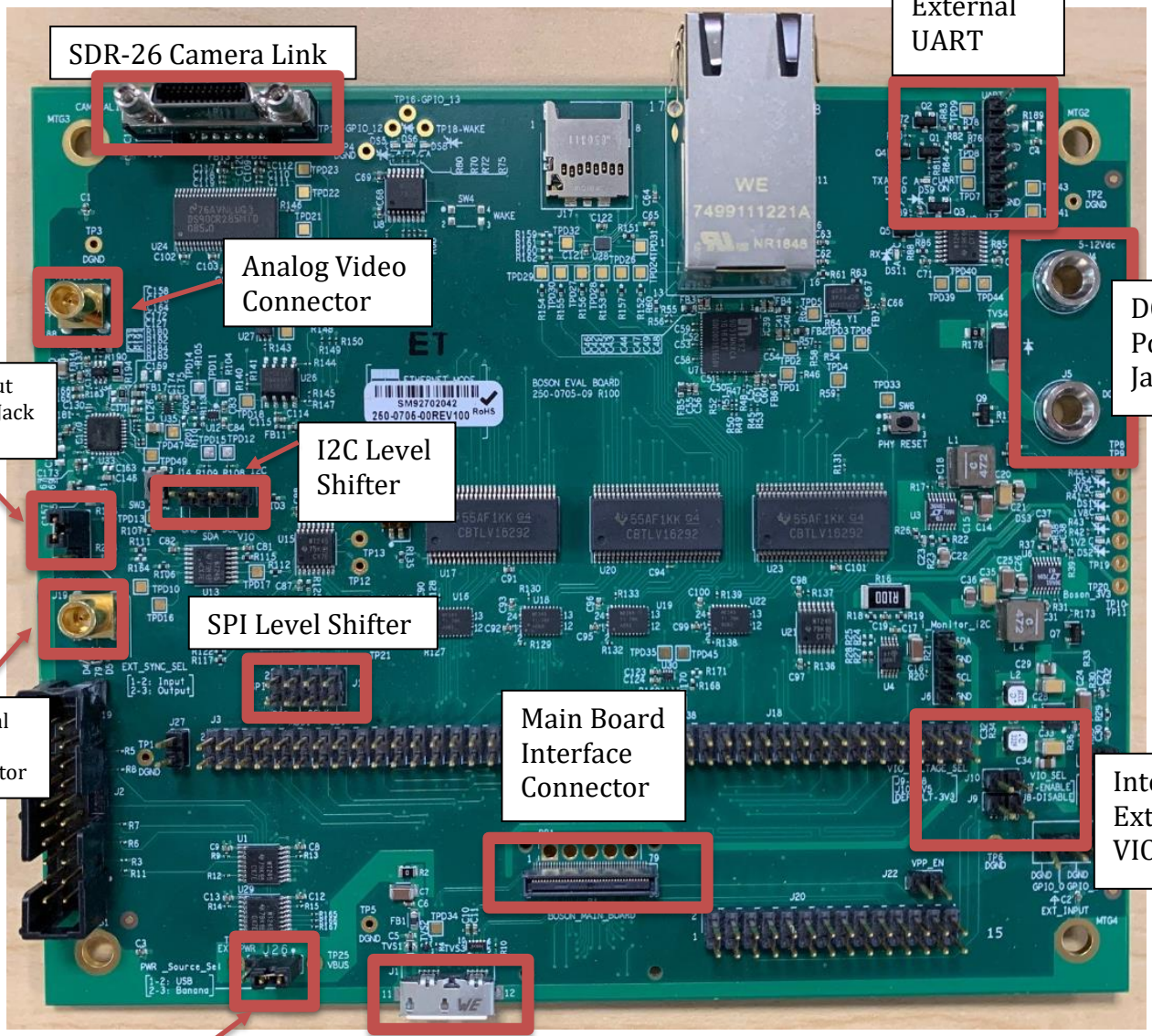
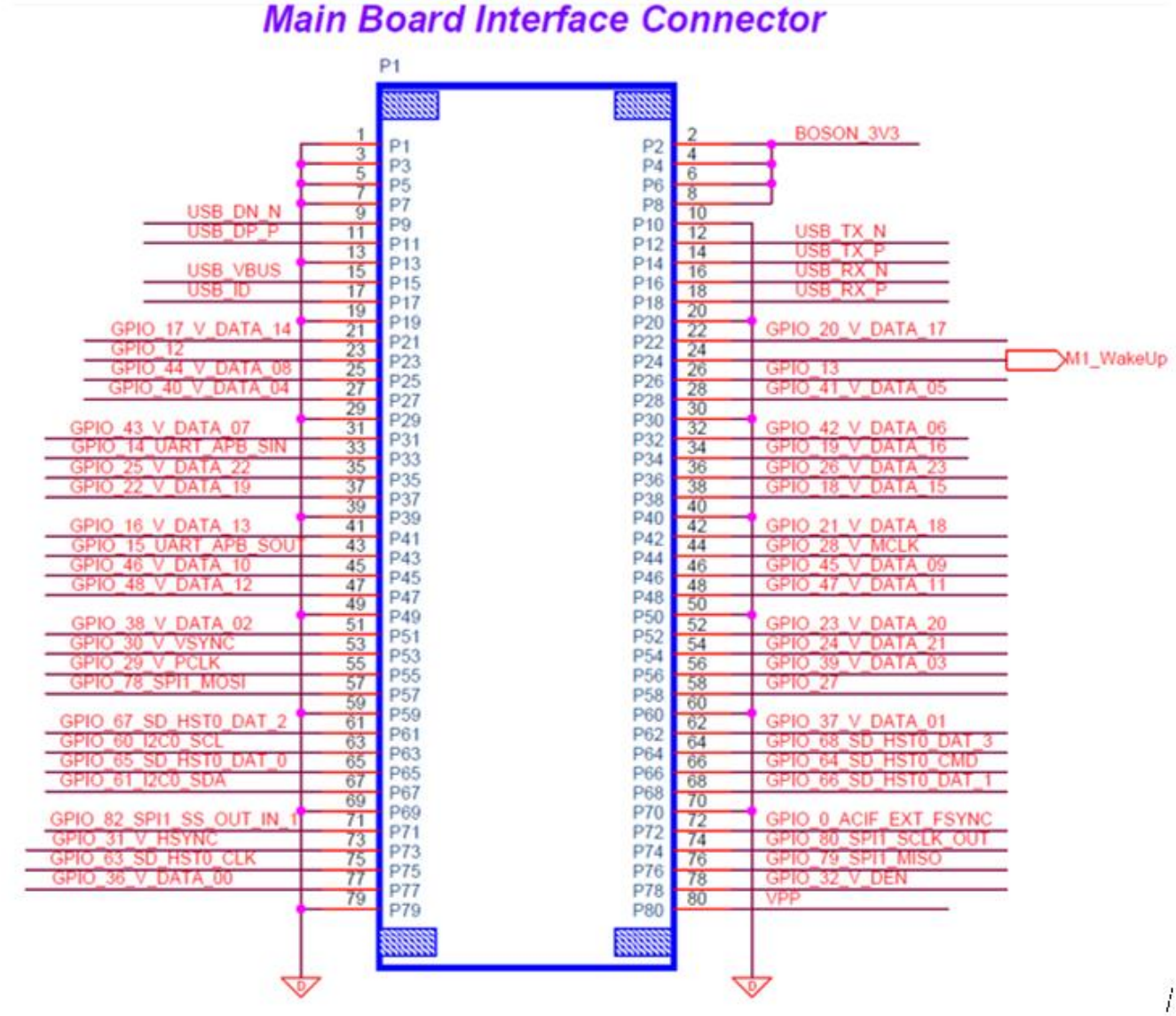


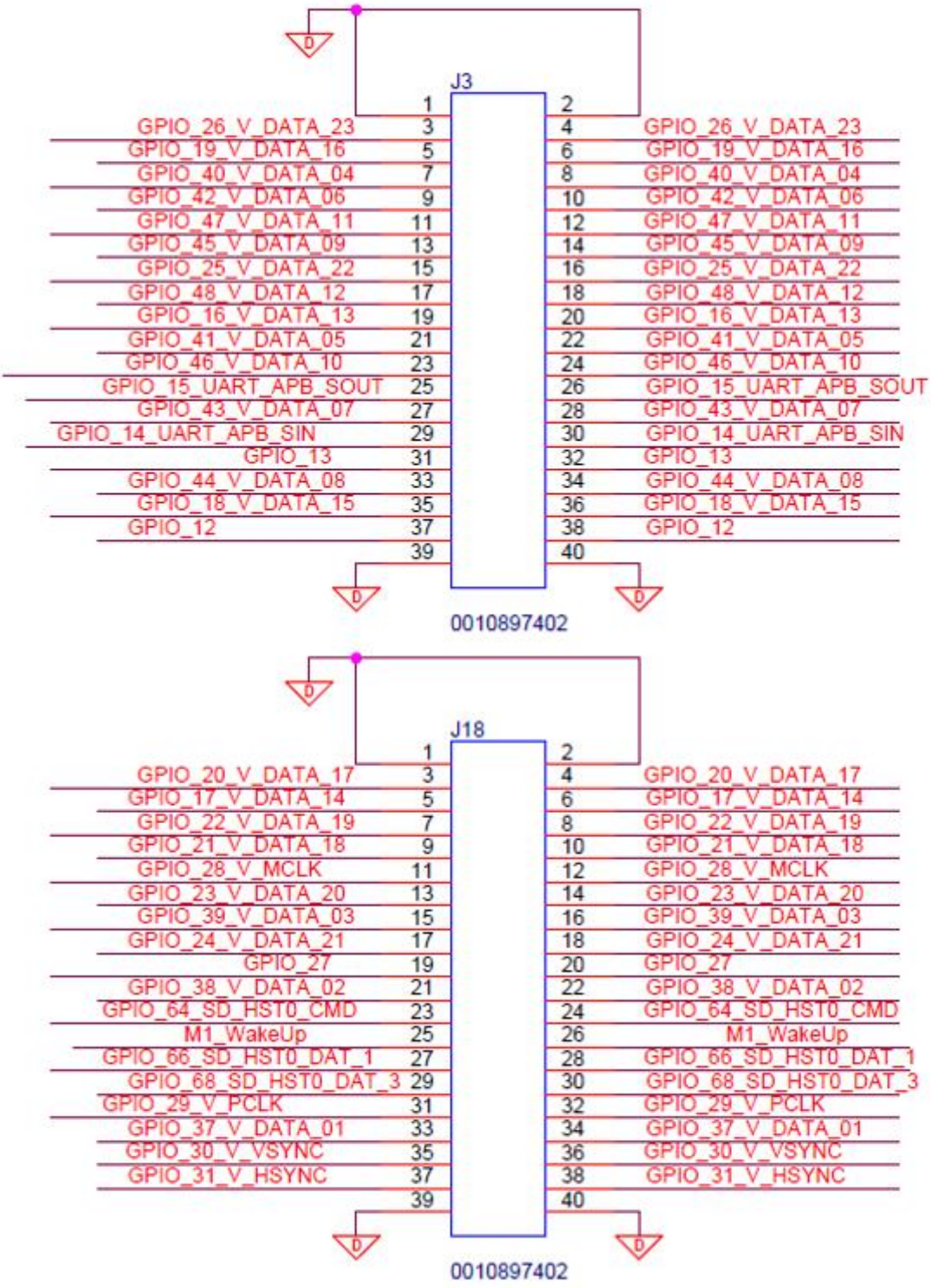
Pinout Description

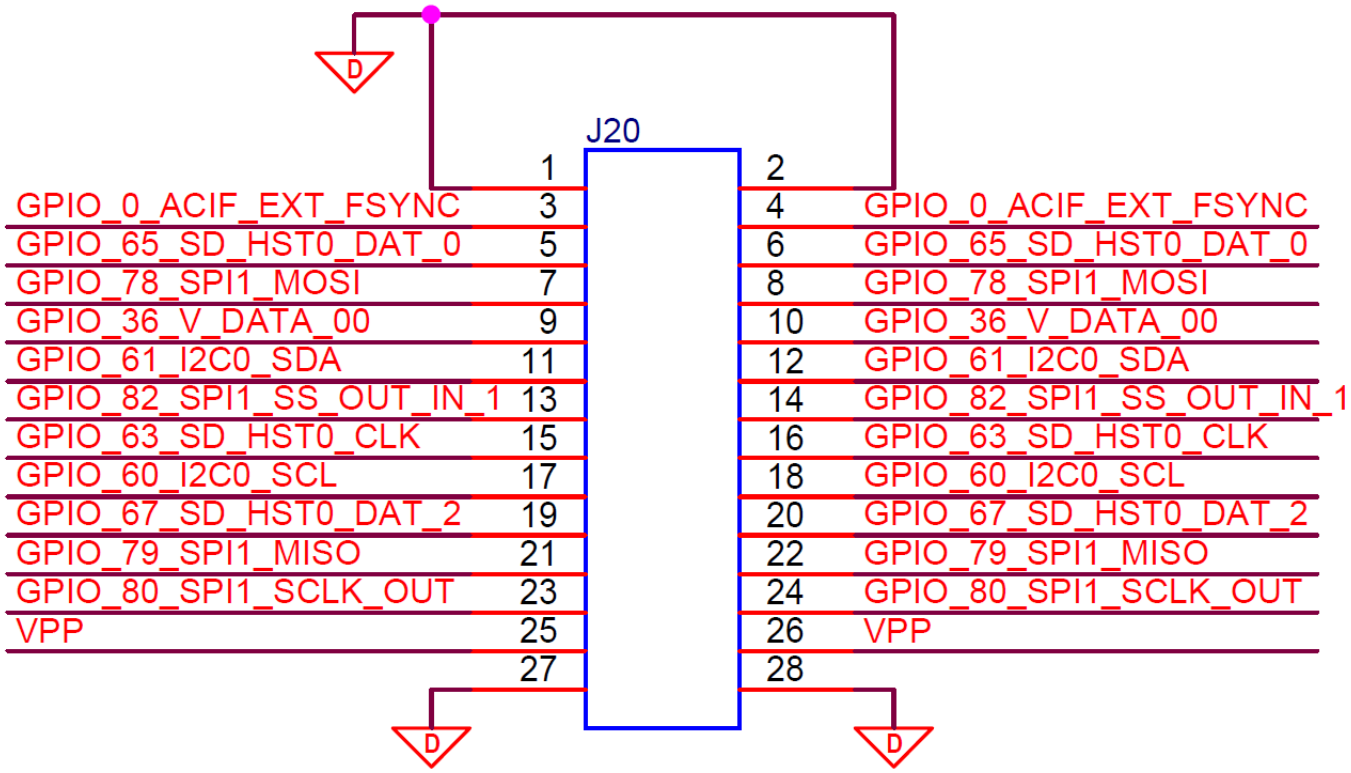
The Following sections briefly describe each module and provide a pinout diagram.

Main Board Interface Connector

The Header connectors J3, J18, and J20 connect directly to the Boson's 80 Pin Main Board Interface. For the pinout definition on the Boson, please refer to the Datasheet for more details. **Please Note:** Pin 78, "cmos_data_valid" is not routed to the header connectors on the current revision of Boson development board. The pinout between headers J3, J18, J20 and Main connector P1:







DC Input Power

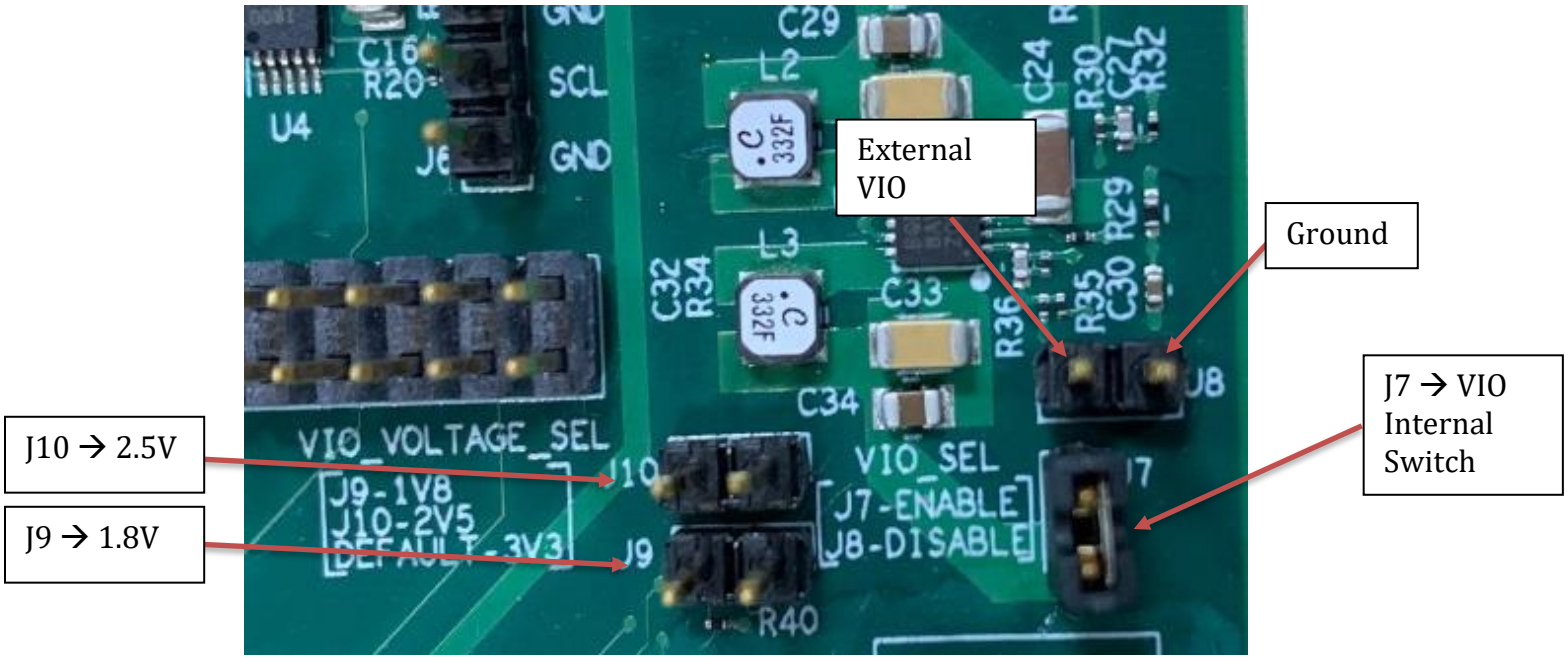
The Banana plug inputs for DC power take 5-12 Volts of input voltage. This drives a 3.3V power supply for the Boson's input power. Additionally, the DC power input drives an internal IO Voltage (VIO) power supply used for the I2C and SPI level shifter.

IO Voltage

The IO voltage used in the SPI and I2C Level shifters can be driven by the Dev Board power supply by connecting across the J7 jumper. If the VIO is supplied by the dev board power supply, then connecting across the following jumpers will yield the following IO Voltage:

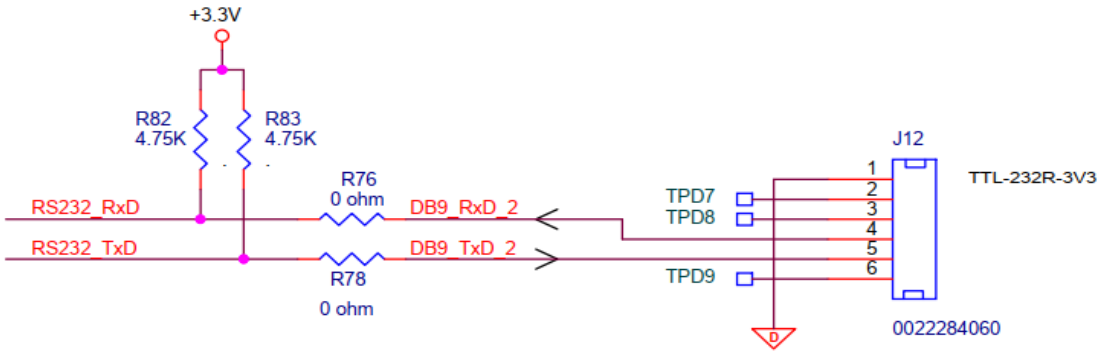
J9	→ 1.8 Volts
J10	→ 2.5 Volts
Neither	→ 3.3 Volts

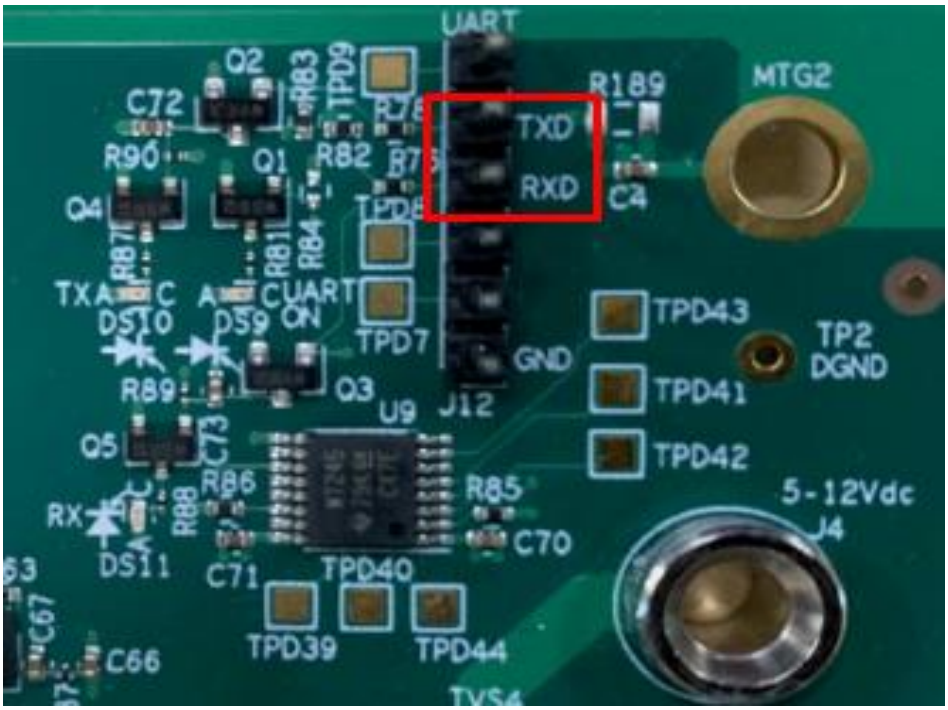
If a user desires to set VIO by an external power supply, then jumper J7 should be disconnected and the external IO voltage should be applied across J8. Note: External VIO input must be greater than 1.8V



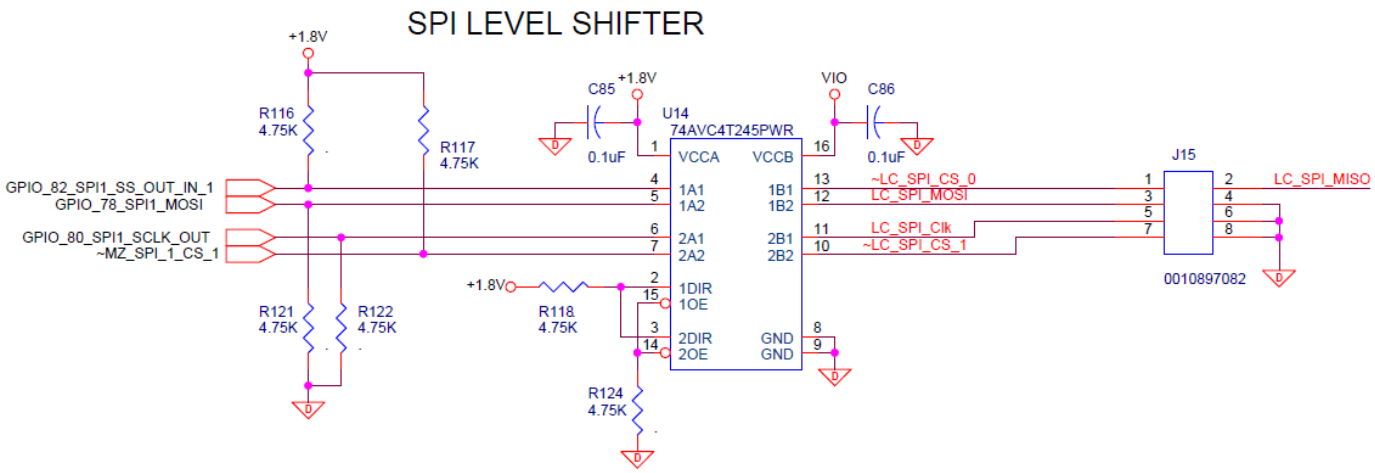
External UART

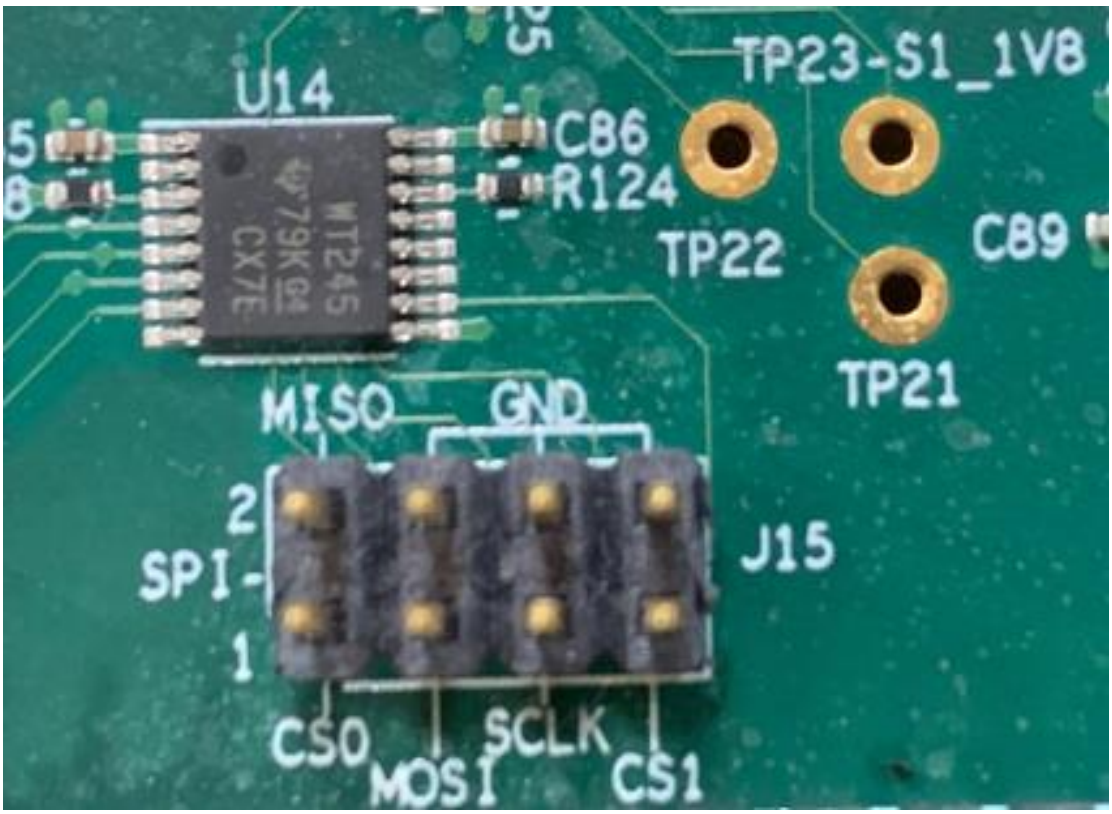
The external UART interface takes 3.3V serial communication. This signal is level shifted down to 1.8V to be sent to the boson. Additionally, a signal mux is available to switch the Boson UART input between the External UART and the Ethernet PHY. By default the mux is set to the External UART. Additionally, Ethernet support is currently not available on Boson. The schematic For J12 is shown below:



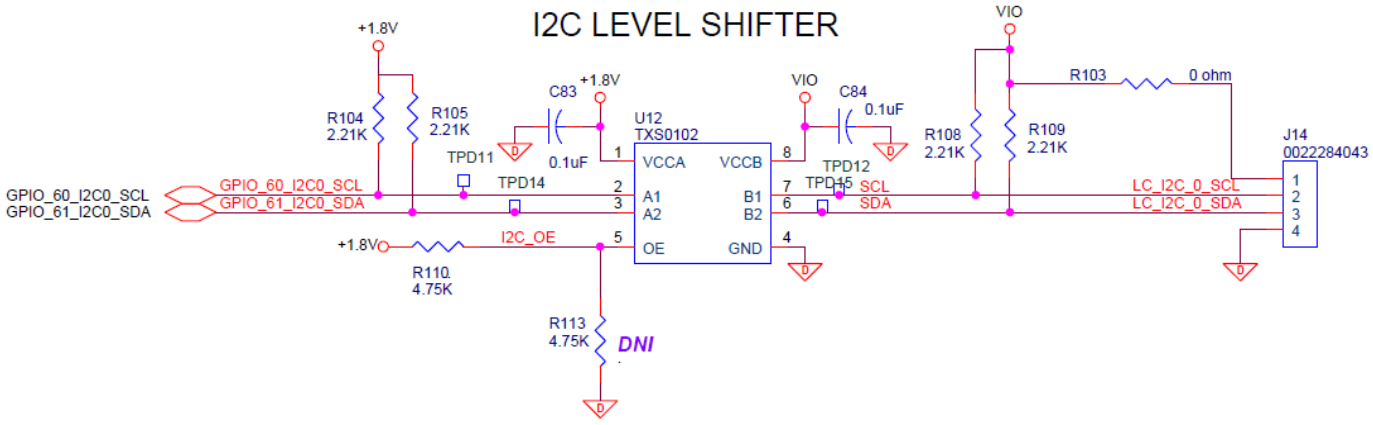


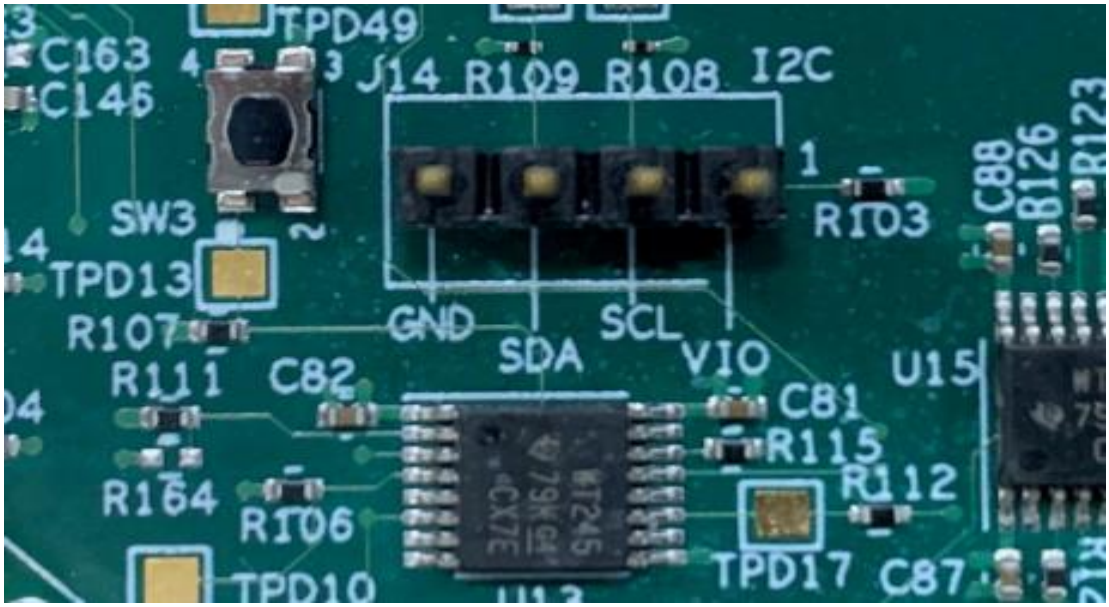
SPI Level Shifter (Will not be implemented in the near term)
The input voltage of the SPI interface is defined by The IO Voltage described in section 3.3. This input voltage is level shifted down to the appropriate 1.8 volts specified by the Boson GPIO input. The schematic for J15 is shown below:





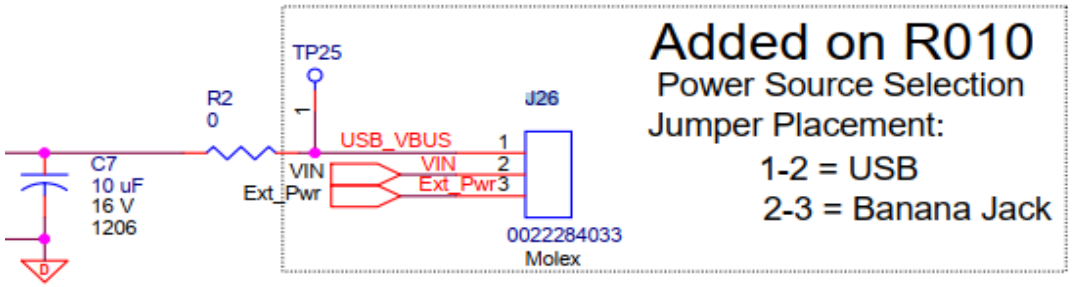
I2C Level Shifter (Will not be implemented in the near term)
Similar to the SPI Level shifter, the input voltage of the I2C interface is defined by the IO Voltage described in section 3.3. This input voltage is level shifted down to the appropriate 1.8 bolts specified by the Boson GPIO input. The schematic for J14 is shown below:

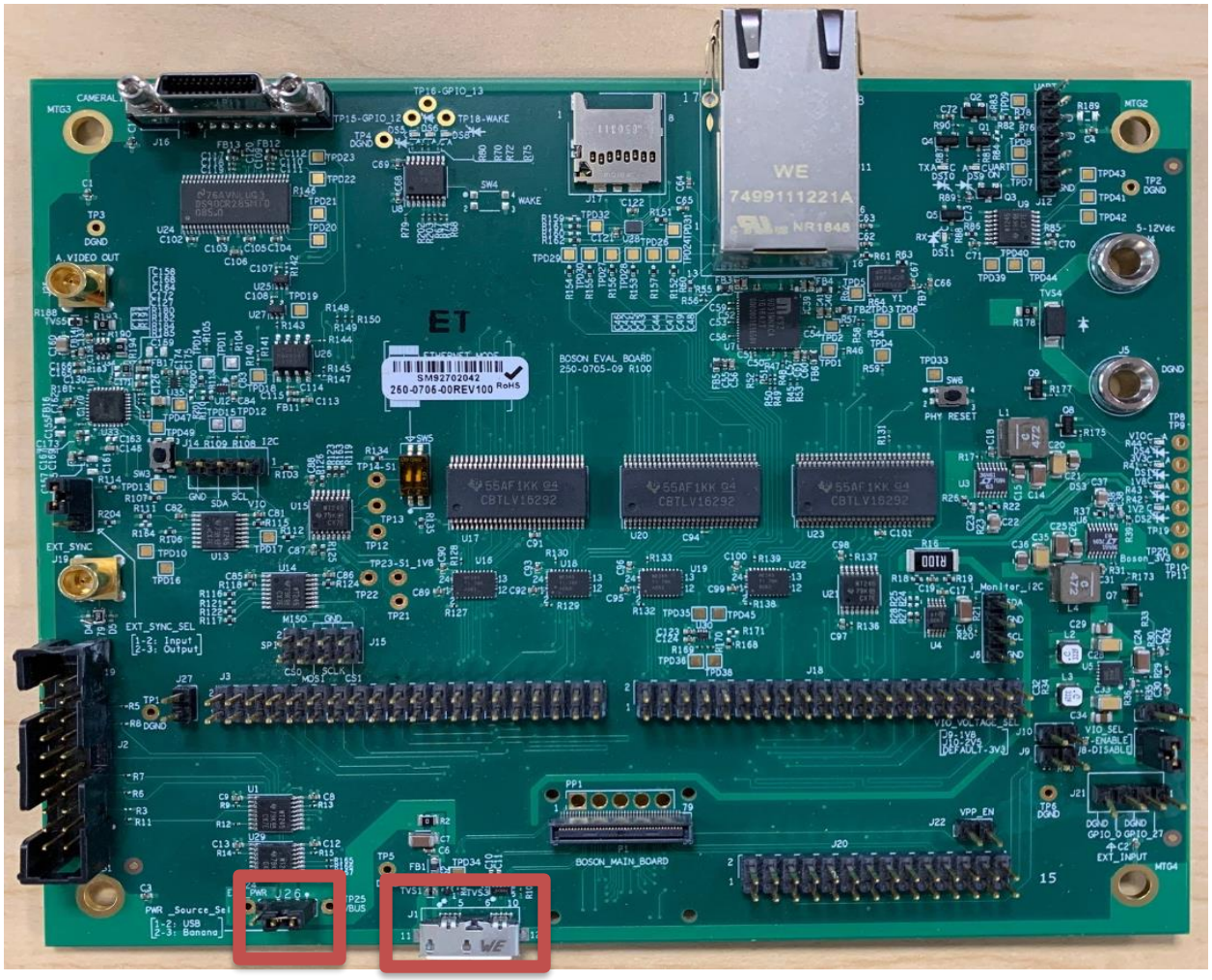




USB Interface

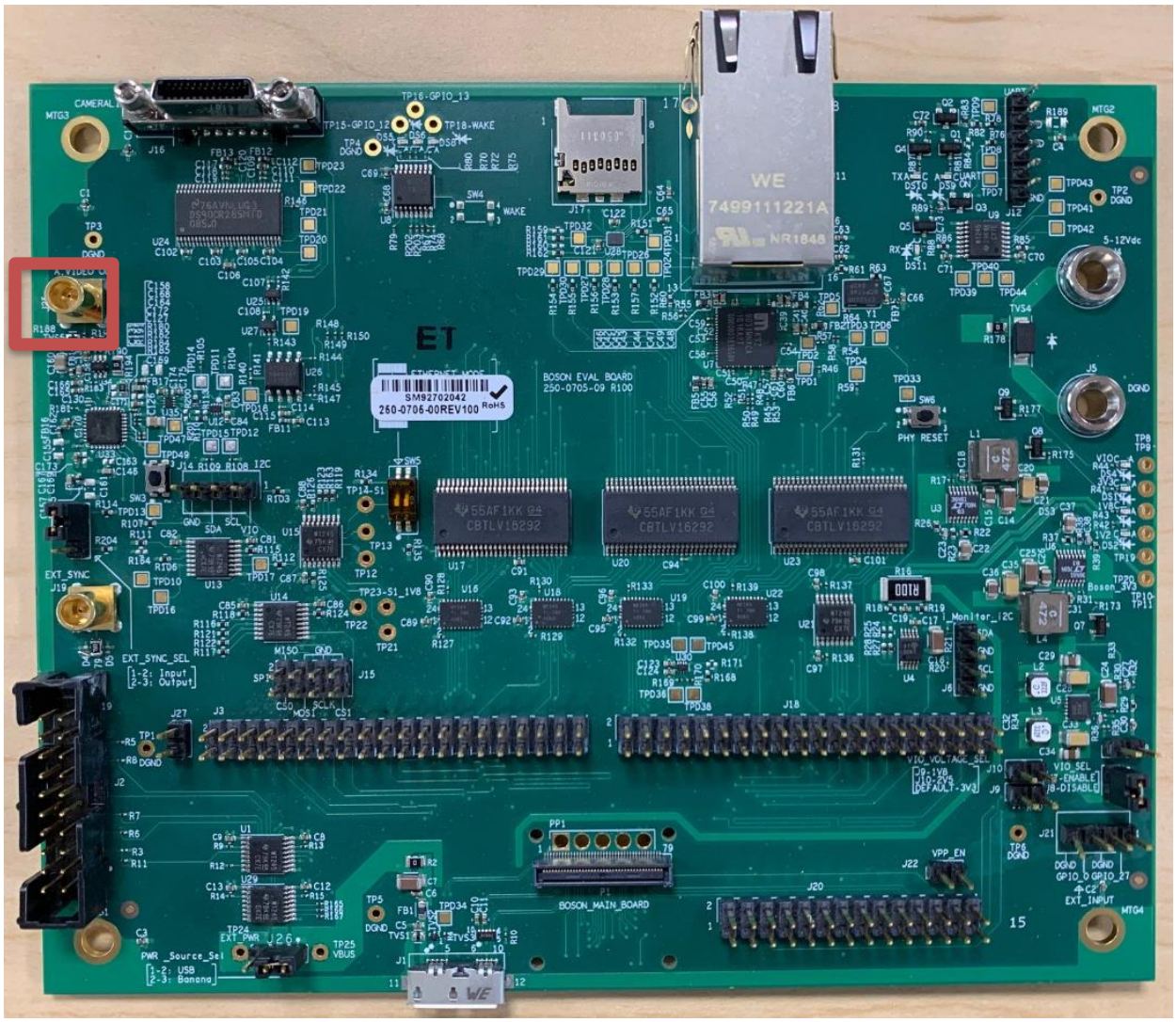
Input power can now be supplied via USB. To power the Boson Development Board using USB, first move the shunt jumper on J26 to short pins 1 & 2. Next, connect a USB cable from J1 to a laptop. If input power via banana jacks is desired, simply move the shunt jumper on J26 to short pins 2 & 3 and apply power. The schematic and physical locations of J26 and the USB port are shown below:





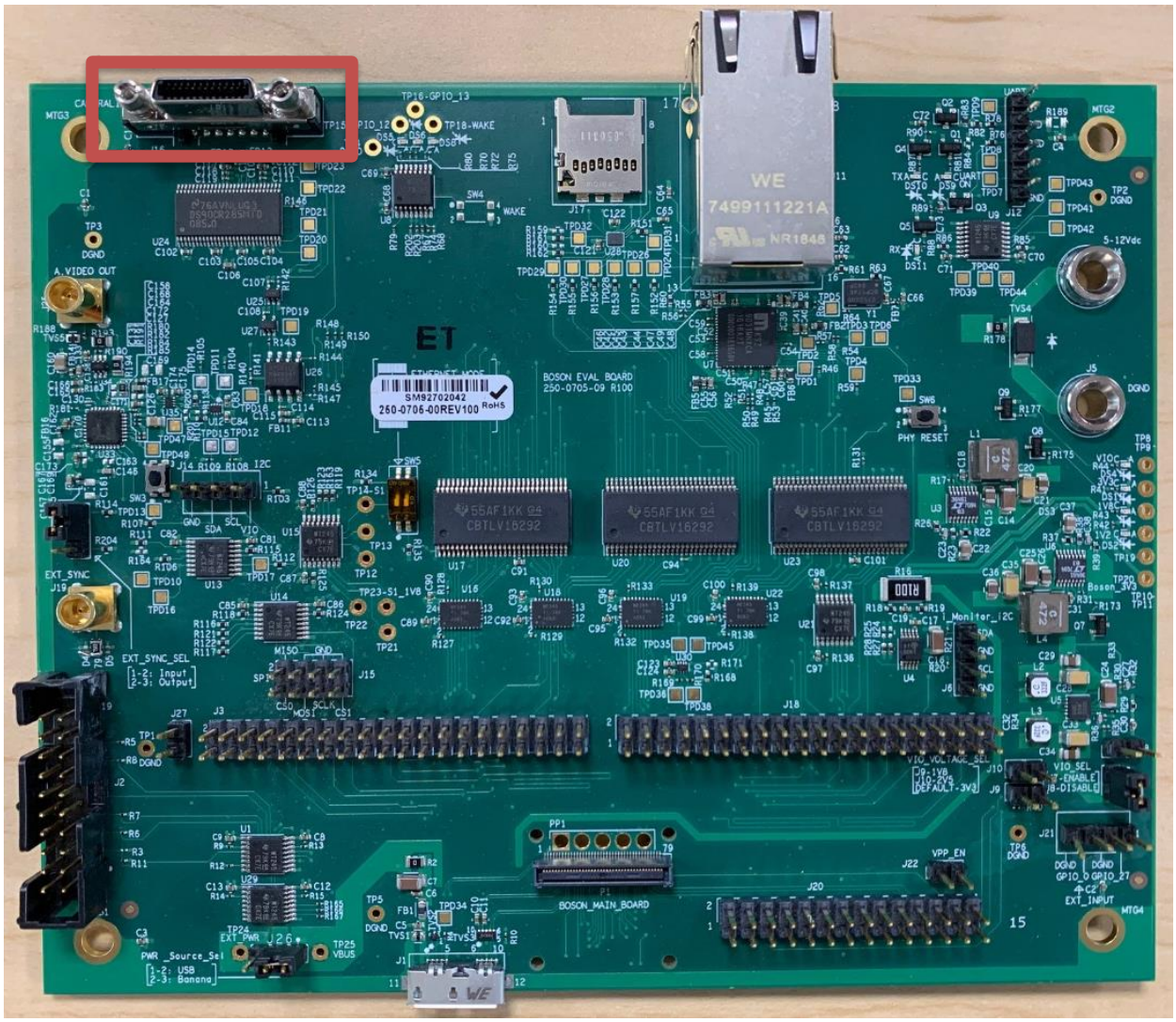
Analog Video

The Boson Development Board supports analog video streaming (PAL & NTSC formats). To enable analog video, first ensure a Boson unit is properly mounted and that power is applied to the board. Next, connect an analog monitor to J25, the Analog Video Connector, via a MCX to BNC cable. Finally, select the desired format (PAL or NTSC) on the Boson Engineering GUI. The physical location of J25 is shown below:



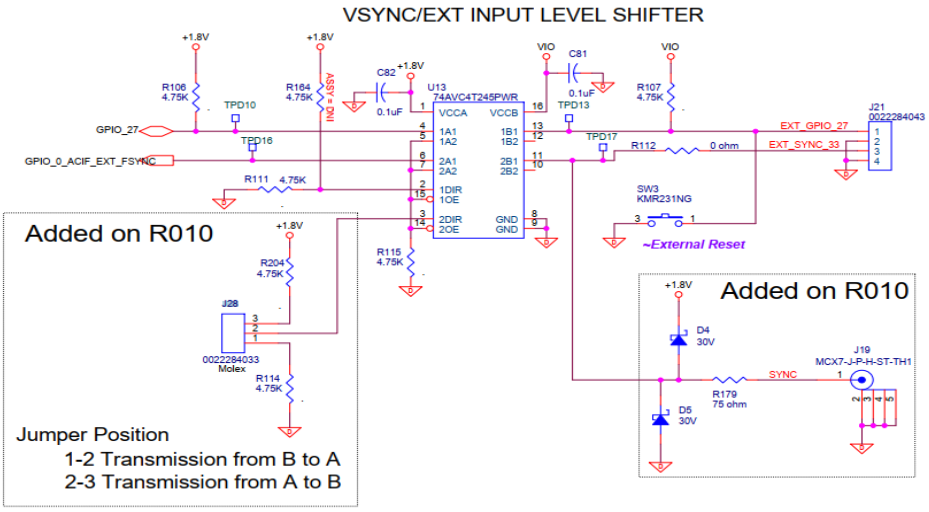
Digital Video

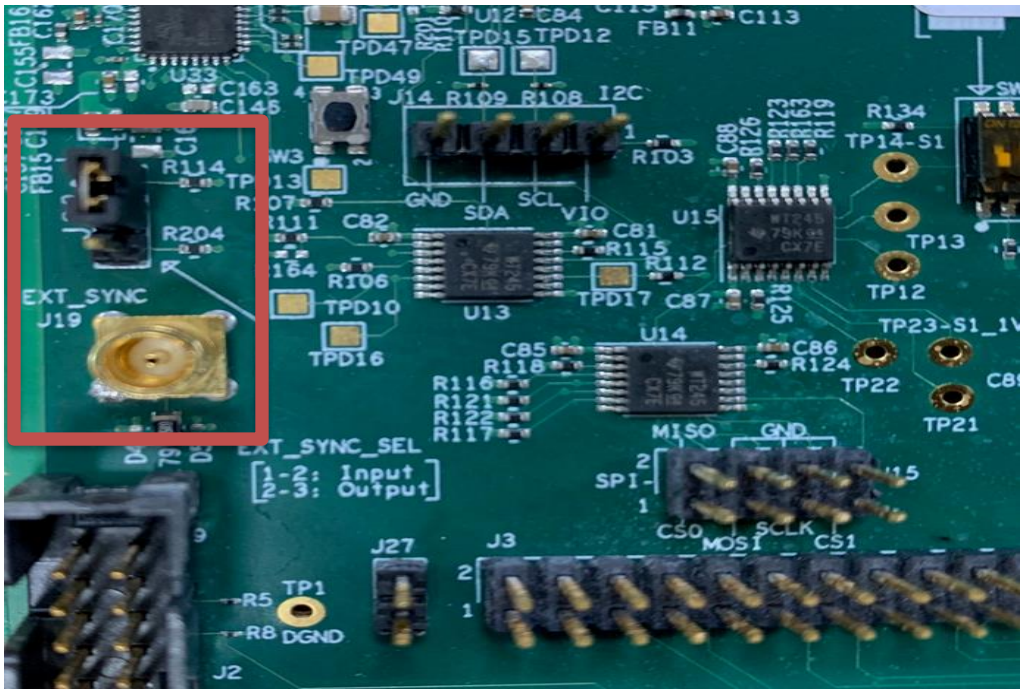
The Boson Development Board supports digital video streaming via a frame grabber cable. To enable digital video, power the Boson Development Board via USB by installing the shunt jumper on J26 onto pins 1 & 2 and connect a frame grabber cable to J16. A frame grabber GUI or video streaming software such as VLC Media Player should be used to verify that digital video is streaming. The physical location of J16 is shown below:



External Sync

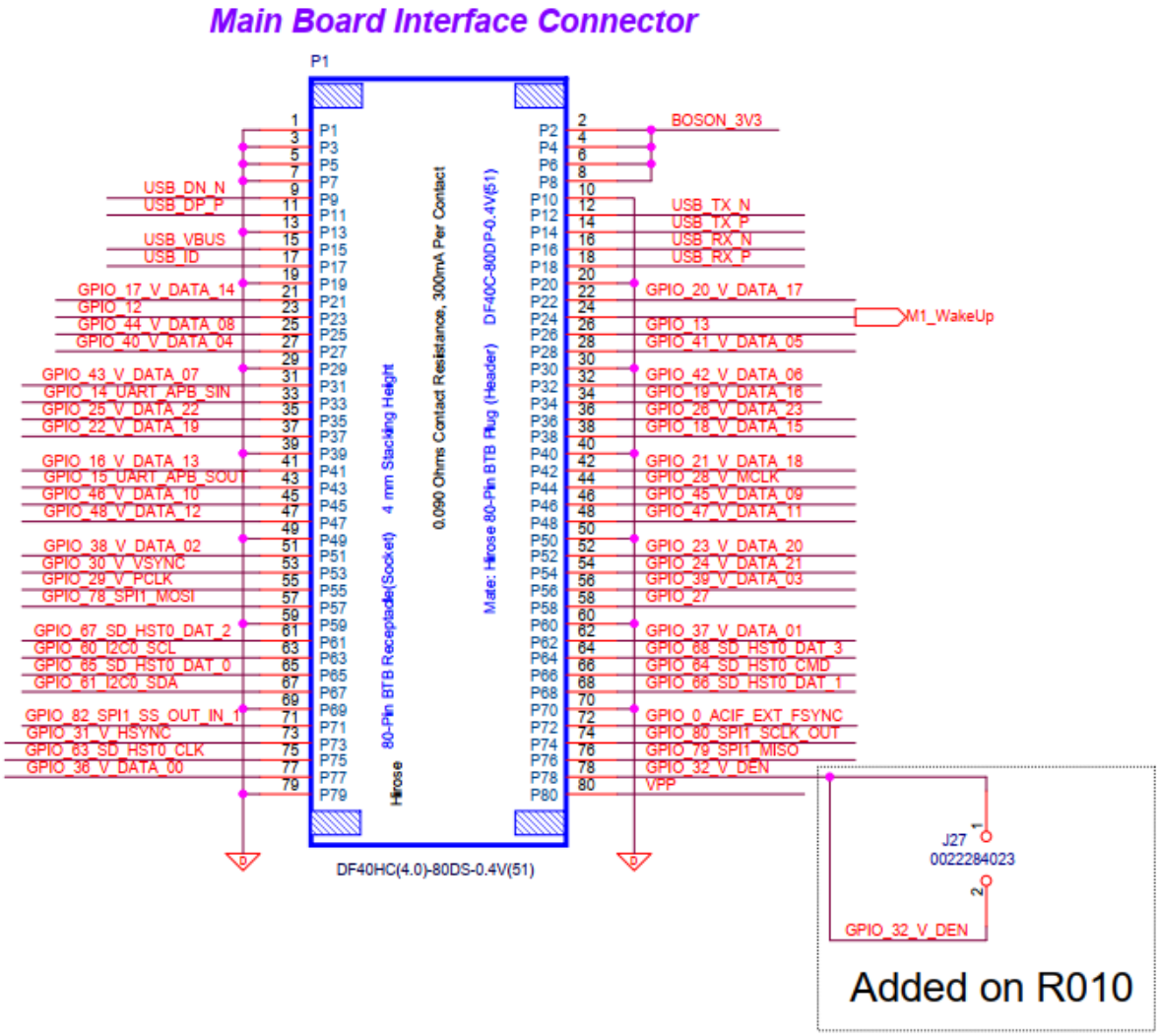
Boson can be synced as a master or slave via a shunt jumper on J28. To sync Boson as a master/output, select the "Master" option under "External Sync" in the Boson Engineering GUI and install the shunt jumper on J28 onto pins 2 & 3. To sync Boson as a slave/input, select the "Slave" option instead and install the shunt jumper onto pins 1 & 2. After selecting Master/Slave, connect a MCX to BNC cable to J19, the External Sync input/output, which can then be connected to an external system. The schematic of External Sync and the physical location of J28 are shown below:





Myriad Data Enable Signal Breakout

The data enable signal from the Myriad (GPIO_32) is now brought out to a two-pin header, J27. The schematic and physical location of J27 are shown below:



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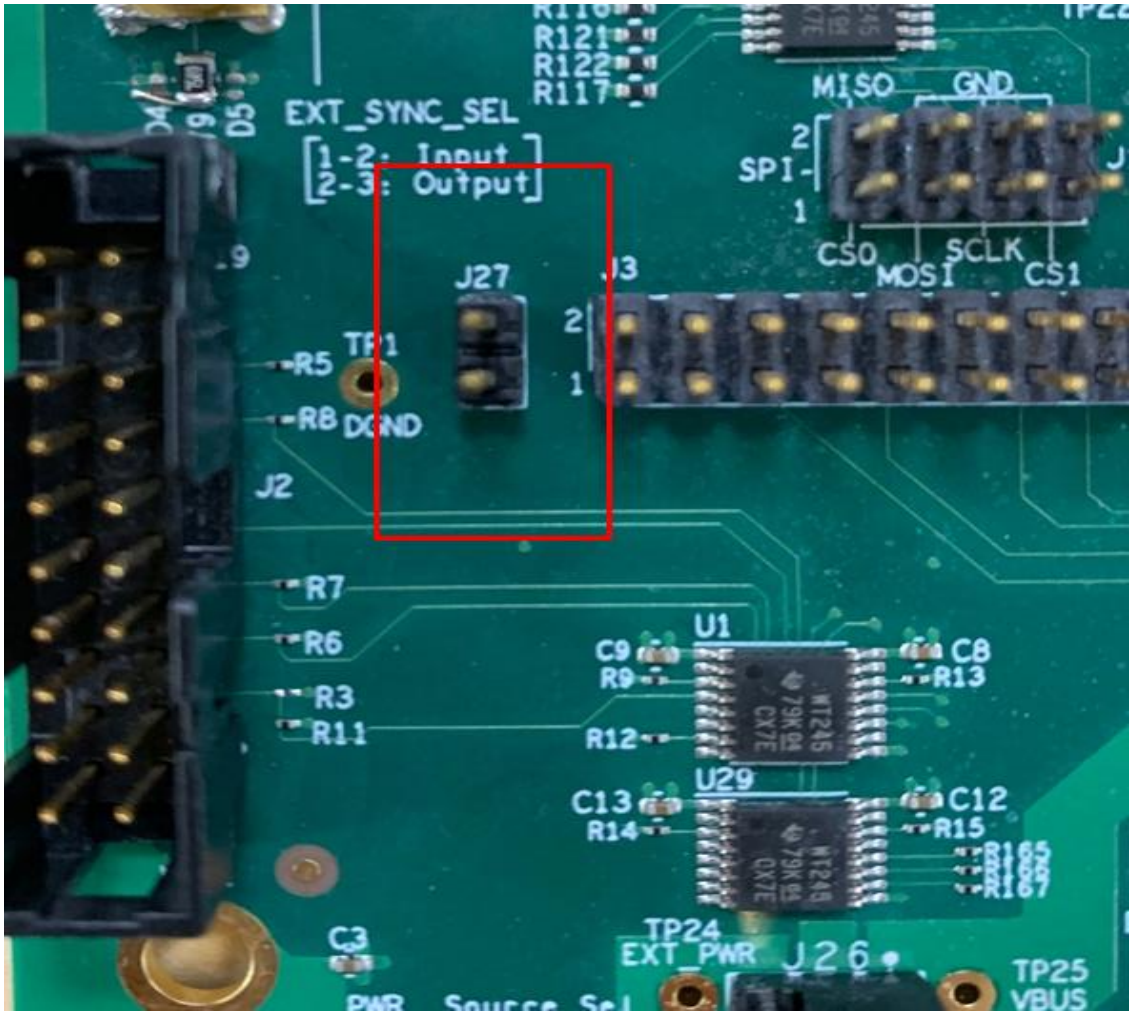

Ethernet (Will not be implemented in the near term)
Currently Not Implemented

SD Card Interface (Will not be implemented in the near term)
Currently not implemented