

# iW-RainboW-G30D

## Zynq Ultrascale+ MPSoC SOM Development Platform Hardware User Guide



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## Table of Contents

<b>1. INTRODUCTION .....</b>	<b>8</b>
1.1 Purpose .....	8
1.2 Overview .....	8
1.3 List of Acronyms .....	8
1.4 Terminology Description.....	10
1.5 References.....	10
<b>2. ARCHITECTURE AND DESIGN .....</b>	<b>11</b>
2.1 Zynq Ultrascale+ MPSoC SOM Carrier Board Block Diagram .....	11
2.2 Zynq Ultrascale+ MPSoC SOM Carrier Board Features.....	12
2.3 Board to Board Connectors.....	14
2.3.1 Board to Board Connector1.....	14
2.3.2 Board to Board Connector2.....	15
2.4 PS Interface Features.....	16
2.4.1 PS-GTR Transceivers.....	16
2.4.1.1 PCIe x4 Connector .....	18
2.4.1.2 Display Port Connector.....	21
2.4.1.3 USB Type-C Connector .....	23
2.4.1.4 M.2 SATA Connector .....	26
2.4.2 Gigabit Ethernet Port1 .....	29
2.4.3 Gigabit Ethernet Port2 .....	30
2.4.4 USB2.0 OTG Port.....	31
2.4.5 Standard SD Port.....	32
2.4.6 CAN0 Header .....	33
2.4.7 Debug UART .....	34
2.5 PL Interface Features .....	35
2.5.1 GTH High Speed Transceivers .....	35
2.5.1.1 SFP+ Connector .....	36
2.5.1.2 SDI Video IN .....	38
2.5.1.3 SDI Video OUT.....	39
2.5.2 FMC HPC Connector1 .....	40
2.5.3 FMC HPC Connector2 .....	55
2.5.4 Pmod Host Port Connectors .....	69
2.6 Additional Features .....	71
2.6.1 Clock Synthesizer/Generator .....	71
2.6.2 IO Expander .....	73
2.6.3 JTAG Connector.....	74
2.6.4 GPIO Header.....	76
2.6.5 I2C Tree .....	78
2.6.6 Power ON/OFF Switch.....	79
2.6.7 Reset Switch .....	80
2.6.8 RTC Coin Cell Holder.....	81

<b>3. TECHNICAL SPECIFICATION</b> .....	<b>82</b>
3.1 Power Input Requirement.....	82
3.2 Power Output Specification .....	83
3.3 Environmental Characteristics .....	84
3.3.1 <i>Environmental Specification</i> .....	84
3.3.2 <i>RoHS Compliance</i> .....	84
3.3.3 <i>Electrostatic Discharge</i> .....	84
3.4 Mechanical Characteristics .....	85
3.4.1 <i>Carrier Board Mechanical Dimensions</i> .....	85
3.4.2 <i>Guidelines to insert and remove the Zynq Ultrascale+ SoC SOM with Carrier Board</i> .....	86
3.4.3 <i>Fan Sink Fixing procedure on SOM with Carrier Board</i> .....	87
<b>4. ORDERING INFORMATION</b> .....	<b>88</b>

## List of Figures

Figure 1: Zynq Ultrascale+ MPSoC SOM Carrier Board Block Diagram .....	11
Figure 2: Board to Board Connector1 .....	14
Figure 3: Board to Board Connector2 .....	15
Figure 4: PS-GTR External Switch Connectivity.....	16
Figure 5: PS-GTR Lane Selection Switch .....	17
Figure 6: PCIe x4 Connector .....	18
Figure 7: Display Port Connector .....	21
Figure 8: USB Type-C Connector.....	24
Figure 9: M.2 SATA Connector (Key B).....	26
Figure 10: Gigabit Ethernet Connector1 .....	29
Figure 11: Gigabit Ethernet Connector2 .....	30
Figure 12: USB OTG Connector.....	31
Figure 13: Standard SD Connector .....	32
Figure 14: CAN0 Header.....	33
Figure 15: Debug UART Connector .....	34
Figure 16: GTH Transceiver Connections .....	35
Figure 17: SFP+ Connector with Cage .....	36
Figure 18: SDI Video IN HD BNC Connector .....	38
Figure 19: SDI Video OUT HD BNC Connector .....	39
Figure 20: FMC Connector1.....	40
Figure 21: FMC HPC Connector1 Pin Out .....	41
Figure 22: FMC Connector2.....	55
Figure 23: FMC HPC Connector2 Pin Out .....	56
Figure 24: Pmod Host Port Connectors.....	69
Figure 25: Clock Tree.....	72
Figure 26: JTAG Connector .....	74
Figure 27: GPIO Header.....	76
Figure 28: I2C Tree .....	78
Figure 29: Power On/Off Switch .....	79
Figure 30: Reset Switch .....	80
Figure 31: RTC Coin Cell Holder .....	81
Figure 32: Power Jack.....	82
Figure 33: Carrier Board Mechanical dimension – Top and Bottom Views .....	85
Figure 34: Carrier board Mechanical dimension – Side Views .....	85
Figure 35: Zynq Ultrascale+ SoC SOM Insert and Removal Procedure .....	86
Figure 36: Zynq Ultrascale+ SOM with Fan Sink fixing procedure .....	87

## List of Tables

Table 1: Acronyms & Abbreviations.....	8
Table 2: Terminology .....	10
Table 3: PS-GTR Lane Selection Switch Setting .....	17
Table 4: PCIe x4 Connector Pin Assignment.....	19
Table 5: Display Port Connector Pin Assignment.....	22
Table 6: USB Type-C Pin Assignment .....	25
Table 7: M.2 SATA Connector Pin Assignment .....	27
Table 8: CAN0 Header Pin Assignment .....	33
Table 9: SFP+ Connector Pin Assignment.....	37
Table 10: FMC HPC Connector1 Pin Assignment .....	42
Table 11: FMC HPC Connector2 Pin Assignment.....	57
Table 12: Pmod Connector1 Pin Assignment .....	70
Table 13: Pmod Connector2 Pin Assignment .....	70
Table 14: Clock Synthesizer Output Clocks .....	71
Table 15: IO Expander pinout details.....	73
Table 16: JTAG Header Pin Assignment .....	75
Table 17: GPIO Header Pin Assignment .....	76
Table 18: Power Input Requirement.....	82
Table 19: Power Output Specification .....	83
Table 20: Environmental Specification.....	84
Table 21: Orderable Product Part Numbers.....	88

## 1. INTRODUCTION

### 1.1 Purpose

The Zynq Ultrascale+ MPSoC SOM Development platform incorporates Zynq Ultrascale+ MPSoC based SOM and High-Performance Carrier board for complete validation of Zynq Ultrascale+ MPSoC functionality. This document is the Hardware User Guide for the Zynq Ultrascale+ MPSoC Carrier Board and provides detailed information on the overall design & usage of the Carrier Board from a Hardware Systems perspective. The details about the Zynq Ultrascale+ MPSoC SOM hardware is explained in another document “iW-RainboW-G30M-Zynq-Ultrascale+MPSoC-SOM-HardwareUserGuide”.

### 1.2 Overview

iWave's Zynq Ultrascale+ MPSoC Development platform incorporates Zynq Ultrascale+ MPSoC SOM which is based on Xilinx's Zynq Ultrascale+ MPSoC and the High-Performance Carrier Board. The development board can be used for quick prototyping of various applications targeted by the Zynq Ultrascale+ MPSoC. With the 130mmx140mm size, carrier board is packed with all the necessary on-board connectors to validate the features of Zynq Ultrascale+ MPSoC SOM.

### 1.3 List of Acronyms

The following acronyms will be used throughout this document.

**Table 1: Acronyms & Abbreviations**

Acronyms	Abbreviations
ARM	Advanced RISC Machine
B2B	Board to Board
CAN	Controller Area Network
CH	Channel
CMOS	Complementary Metal Oxide Semiconductor Signal
DP	Display Port
FPGA	Field Programmable Gate Array
FMC	FPGA Mezzanine Card
Gbps	Gigabits per sec
GEM	Gigabit Ethernet Controller
GPIO	General Purpose Input Output
HPC	High Pin Count
I2C	Inter-Integrated Circuit
IC	Integrated Circuit
JTAG	Joint Test Action Group
LVCMOS	Low Voltage Complementary Metal Oxide Semiconductor Signal
LVDS	Low Voltage Differential Signal



Acronyms	Abbreviations
Mbps	Megabits per sec
MHz	Mega Hertz
NC	No Connect
NPTH	Non Plated Through Hole
PCB	Printed Circuit Board
PCIe	Peripheral Component Interconnect Express
PD	Pull Down
PMOD	Peripheral Module
PTH	Plated Through Hole
PU	Pull Up
RGMII	Reduced Gigabit Media Independent Interface
RX	Receiver
SATA	Serial Advanced Technology Attachment
SDI	Serial Digital Interface
SDIO	Secure Digital Input Output
SDHI	SD Card Host Interface
SFP	Small Form-factor Pluggable
SOM	System On Module
TXVR	Transceiver
TX	Transmitter
UART	Universal Asynchronous Receiver/Transmitter
USB	Universal Serial Bus
USB OTG	USB On The Go

## 1.4 Terminology Description

In this document, wherever Signal Type is mentioned, below terminology is used.

**Table 2: Terminology**

Terminology	Description
I	Input Signal
O	Output Signal
IO	Bidirectional Input/output Signal
CMOS	Complementary Metal Oxide Semiconductor Signal
DIFF	Differential Signal
OD	Open Drain Signal
OC	Open Collector Signal
Analog	Analog Signal
Power	Power Pin
PU	Pull Up
PD	Pull Down
NA	Not Applicable
NC	Not Connected

*Note: Signal Type does not include internal pull-ups or pull-downs implemented by the chip vendors and only includes the pull-ups or pull-downs implemented on board.*

## 1.5 References

- Zynq Ultrascale+ MPSoC Datasheet & Reference Manual
- Zynq Ultrascale+ MPSoC SOM Hardware User Guide

## 2. ARCHITECTURE AND DESIGN

This section provides detailed information about the Zynq Ultrascale+ MPSoC Development platform carrier board features with high level block diagram and detailed information about each block.

### 2.1 Zynq Ultrascale+ MPSoC SOM Carrier Board Block Diagram

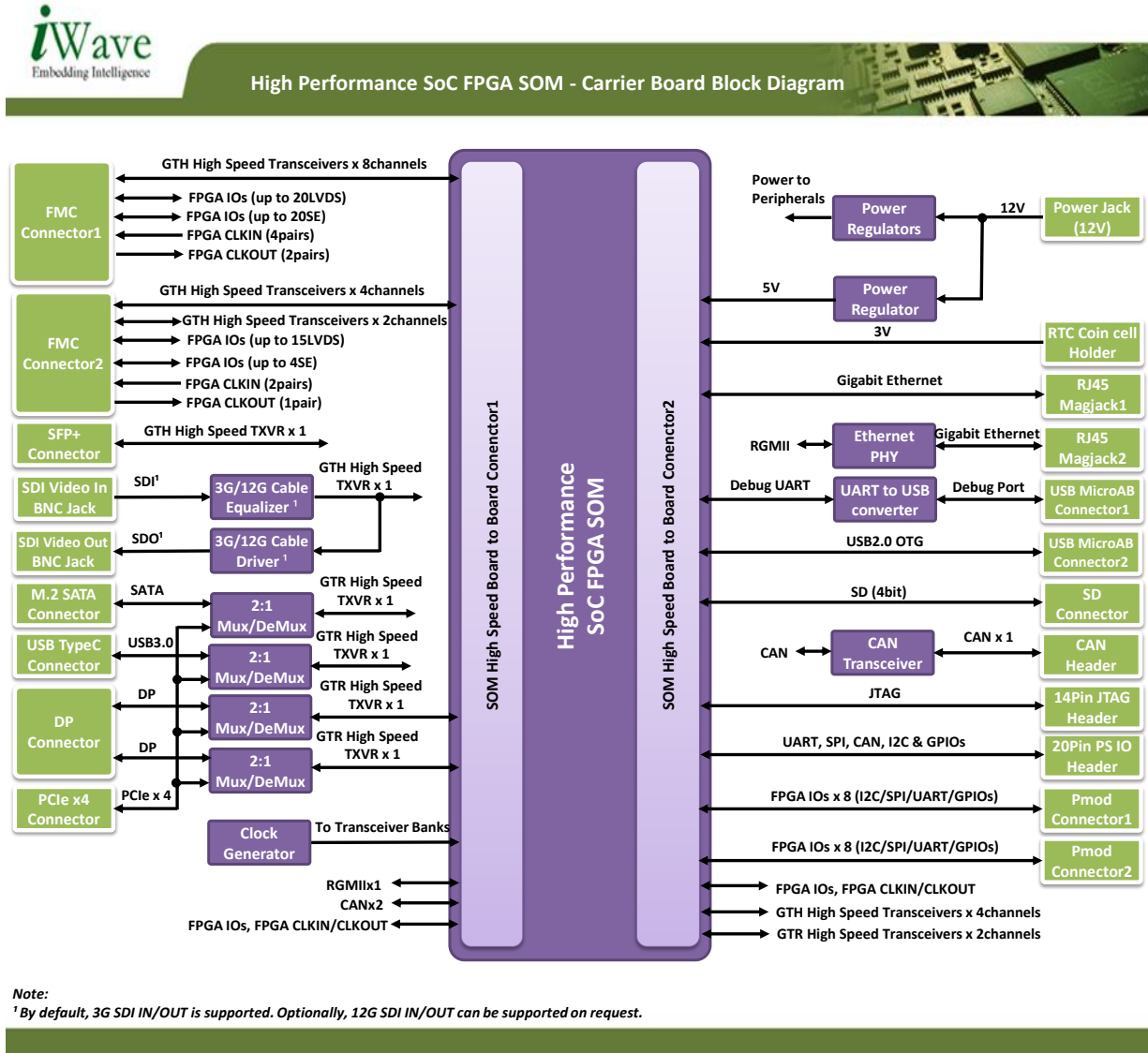


Figure 1: Zynq Ultrascale+ MPSoC SOM Carrier Board Block Diagram

## 2.2 Zynq Ultrascale+ MPSoC SOM Carrier Board Features

The Zynq Ultrascale+ MPSoC Carrier board supports the following features to validate the Zynq Ultrascale+ MPSoC SOM supported interfaces.

### PS Interface Features

- PS GTR Features:
  - PCIe1 Connector x 1
  - Display Port Connector x 1
  - USB 3.0 OTG through Type-C Connector x 1
  - M.2 SATA Connector x 1
- Gigabit Ethernet through RJ45MagJack (GEM0) x 1
- Gigabit Ethernet through RJ45MagJack (GEM3) x 1
- USB2.0 OTG through MicroAB Connector x 1
- Standard SD Connector x 1
- CAN Header x 1
- Debug UART through USB MicroAB Connector x 1

### PL Interface Features

- SFP+ Connector x 1
- SDI Video IN through HD BNC Connector x 1
- SDI Video OUT through HD BNC Connector x 1
- FMC High Pin Count (HPC) Connector1
  - 8 GTH High Speed Transceivers
  - 2 GTH Reference Clock
  - Upto 20 LVDS IOs/40 Single ended (SE) IOs
  - Upto 20 Single ended (SE) IOs
  - 4 Clock Input Capable LVDS/SE pins
  - 2 Clock Output Capable LVDS/SE pins
- FMC High Pin Count (HPC) Connector2
  - 6 GTH High Speed Transceivers
  - 2 GTH Reference Clock Capable
  - Upto 15 LVDS IOs/30 Single ended (SE) IOs
  - Upto 4 Single ended (SE) IOs
  - 2 Clock Input Capable LVDS/SE pins
  - 1 Clock Output Capable LVDS/SE pins
- PMOD Connector x 2

## Additional Features

- Clock Synthesizer/Generator
- 16-Bit IO Expander
- JTAG Connector x 1
- 20 Pin GPIO Header x 1
- Power ON/OFF DIP Switch x 1
- Reset Pushbutton Switch x 1
- RTC Coin Cell Holder x 1

## General Specification

- Power Supply : DC 12V, 5A Power Input Jack
- Form Factor : 130mmX140mm

## 2.3 Board to Board Connectors

The Zynq Ultrascale+ MPSoC Carrier board supports two 240 Pin Board to Board mating connectors for Zynq Ultrascale+ MPSoC SOM attachment. This 240 pin Board to Board connector is capable of handling high-speed serialized signals and can be used for size constrained embedded applications.

### 2.3.1 Board to Board Connector1

Board to Board Connector1 (J10) is physically located at the top of the board as shown below.

*Note: For the Board to Board Connector1 pinout, refer the Zynq Ultrascale+ MPSoC SOM Hardware User Guide.*

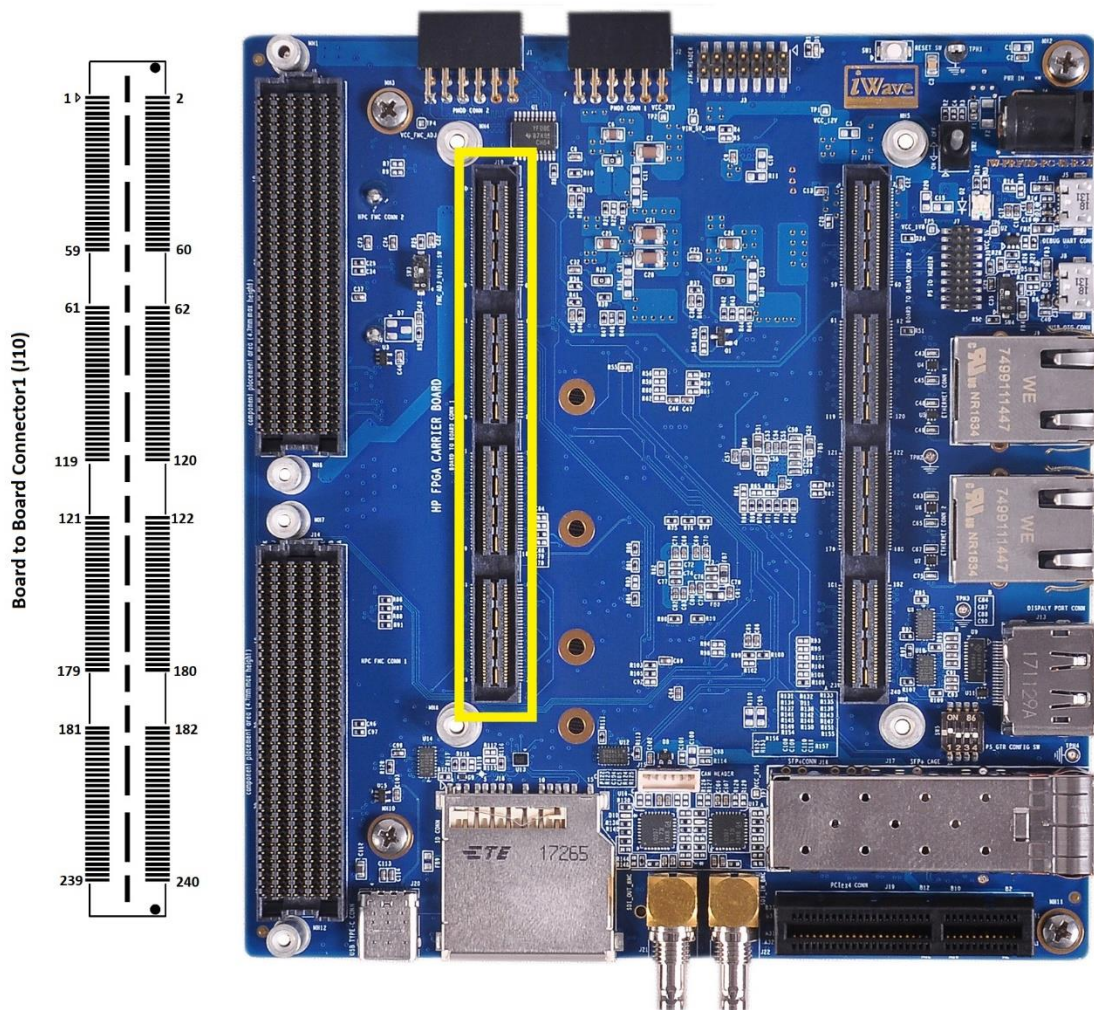


Figure 2: Board to Board Connector1

## 2.3.2 Board to Board Connector2

Board to Board Connector2 (J11) is physically located at the top of the board as shown below.

*Note: For the Board to Board Connector2 pinout, refer the Zynq Ultrascale+ MPSoC SOM Hardware User Guide.*

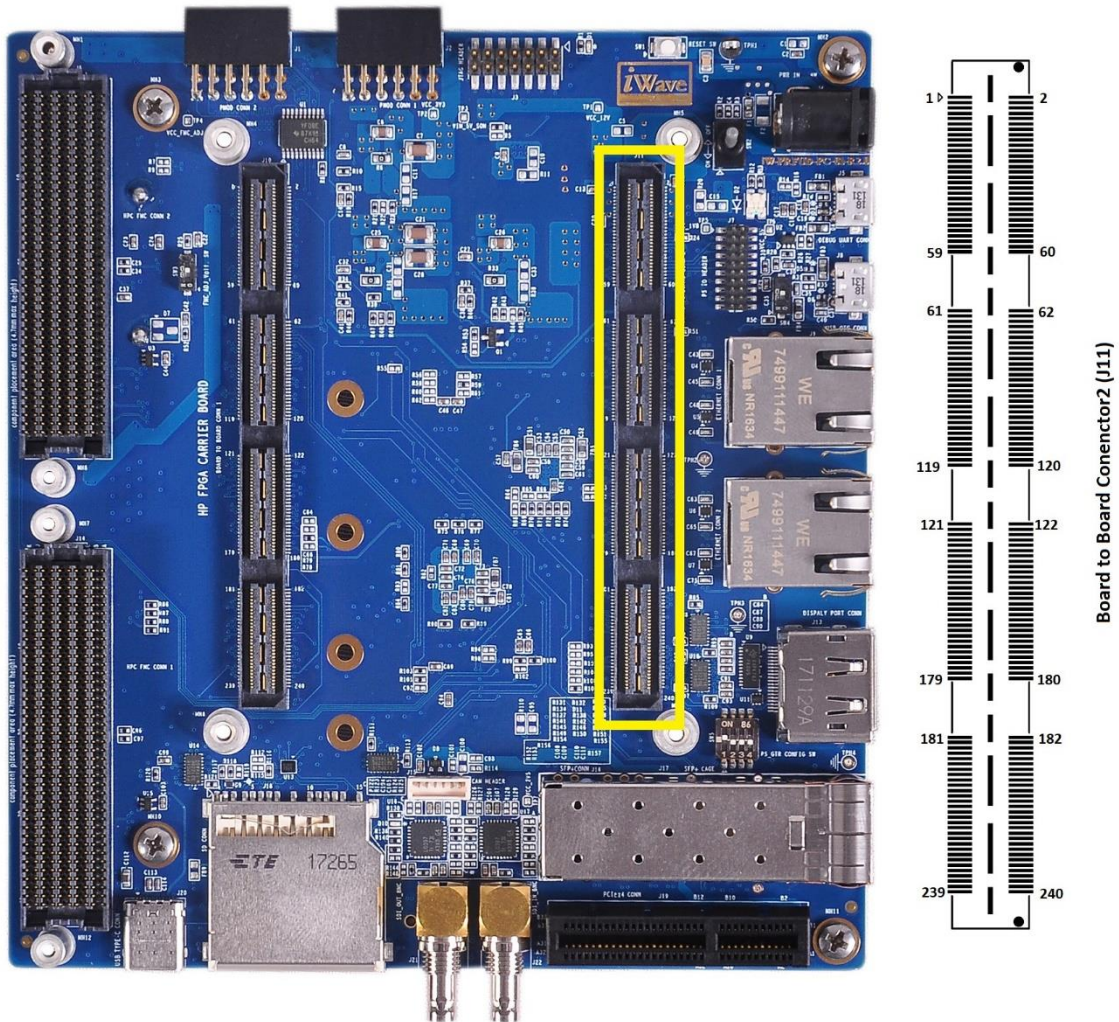


Figure 3: Board to Board Connector2

## 2.4 PS Interface Features

The features which are supported from Zynq Ultrascale+ MPSoC's PS is explained in the following section.

### 2.4.1 PS-GTR Transceivers

The Zynq Ultrascale+ MPSoC Carrier board supports different high speed interfaces through four PS-GTR lanes (two from B2B-1 and two from B2B-2). Each PS-GTR lane is connected to High speed MUX/DEMUX IC to support different high speed interfaces as mentioned below.

- x1, x2, or x4 lane of PCIe at Gen1 (2.5Gb/s) or Gen2 (5.0Gb/s) rates
- 1 or 2 lanes of DisplayPort (TX only) at 1.62Gb/s, 2.7Gb/s, or 5.4Gb/s
- 1 SATA port at 1.5Gb/s, 3.0Gb/s, or 6.0Gb/s
- 1 USB3.0 port at 5.0Gb/s

The MUX/DEMUX connection and interface selection option is shown below for easy understanding. The selection control of each MUX IC is connected to PS-GTR Lane selection 4bit DIP switch (SW5).

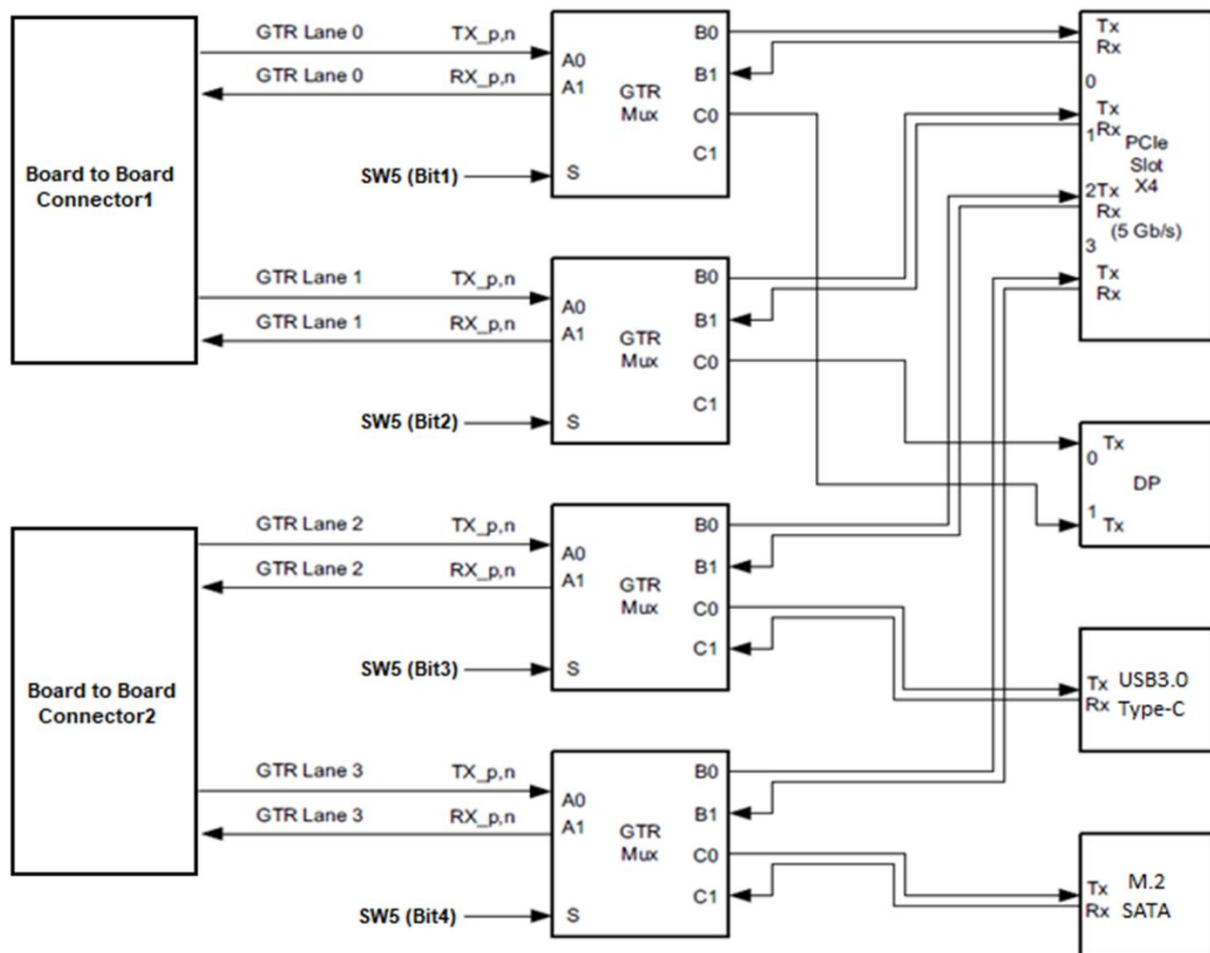


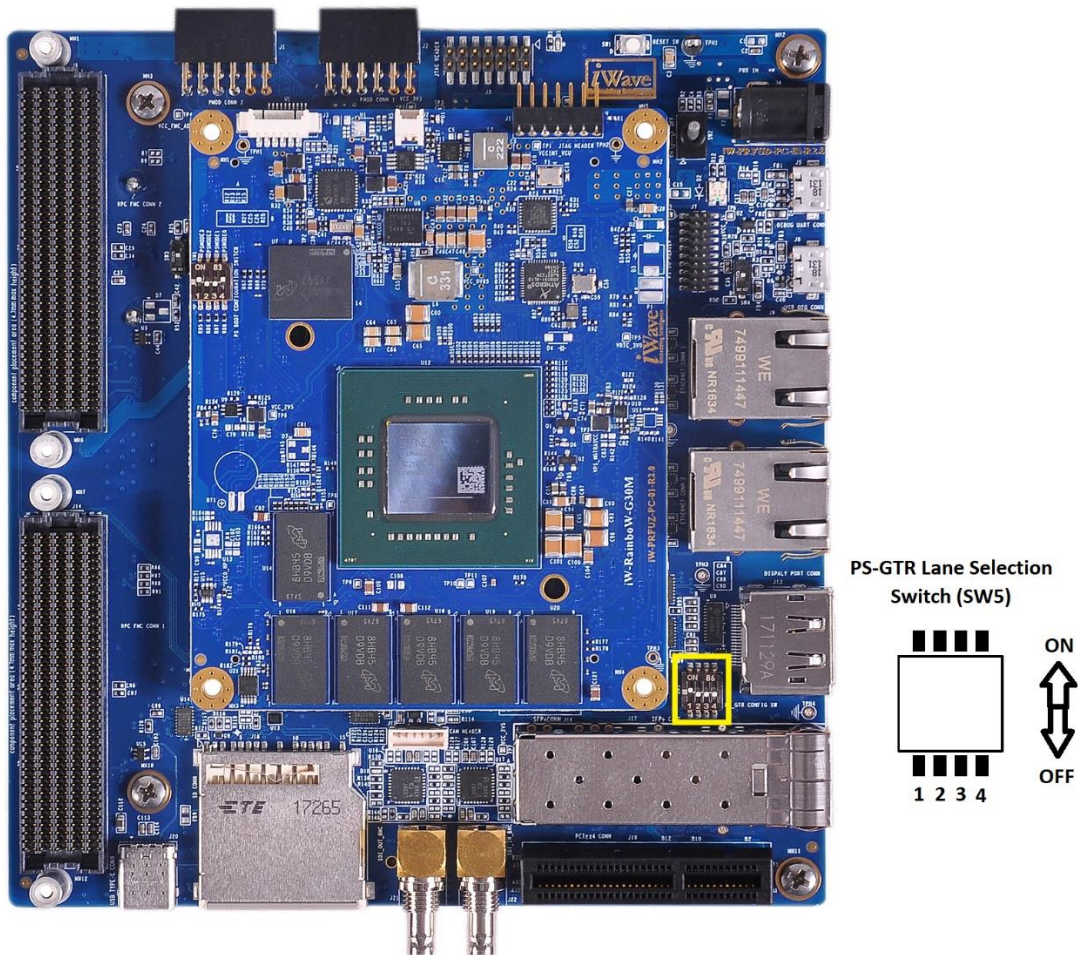
Figure 4: PS-GTR External Switch Connectivity.



The PS-GTR Lane selection switch (SW5) setting and corresponding interface selection option is explained below.

**Table 3: PS-GTR Lane Selection Switch Setting**

PS-GTR Lanes	PS-GTR Lane Selection Switch (SW5)		
	Switch Bit Number	Switch Bit Position	
		ON	OFF
Lane0	Bit1	PS-GTR Lane0 is connected to Lane0 of PCIe x4 connector (default)	PS-GTR Lane0 is connected to Lane1 of DP connector
Lane1	Bit2	PS-GTR Lane1 is connected to Lane1 of PCIe x4 connector	PS-GTR Lane1 is connected to Lane0 of DP connector (default)
Lane2	Bit3	PS-GTR Lane2 is connected to Lane2 of PCIe x4 connector	PS-GTR Lane2 is connected to Lane1 of USB3.0 TypeC connector (default)
Lane3	Bit4	PS-GTR Lane3 is connected to Lane3 of PCIe x4 connector	PS-GTR Lane3 is connected to M.2 SATA connector (default)



**Figure 5: PS-GTR Lane Selection Switch**

## 2.4.1.1 PCIe x4 Connector

The Zynq Ultrascale+ MPSoC Carrier board supports one PCIe x4 connector through PS-GTR Lanes of Zynq Ultrascale+ MPSoC PS. All the four PS-GTR lanes from Board to Board Connectors are connected to PCIe x4 connector to support x1, x2 & x4 PCIe devices. The PS-GTR Lane selection to PCIe x4 connector is done through PS-GTR Lane Selection Switch (SW5). The Carrier board provides 100MHz reference clock to PCIe x4 connector from on board Clock Synthesizer. This PCIe x4 connector (J19) is physically located at the top of the board as shown below.

*Note: For more details on PS-GTR Lane selection options, refer **Table 3**.*

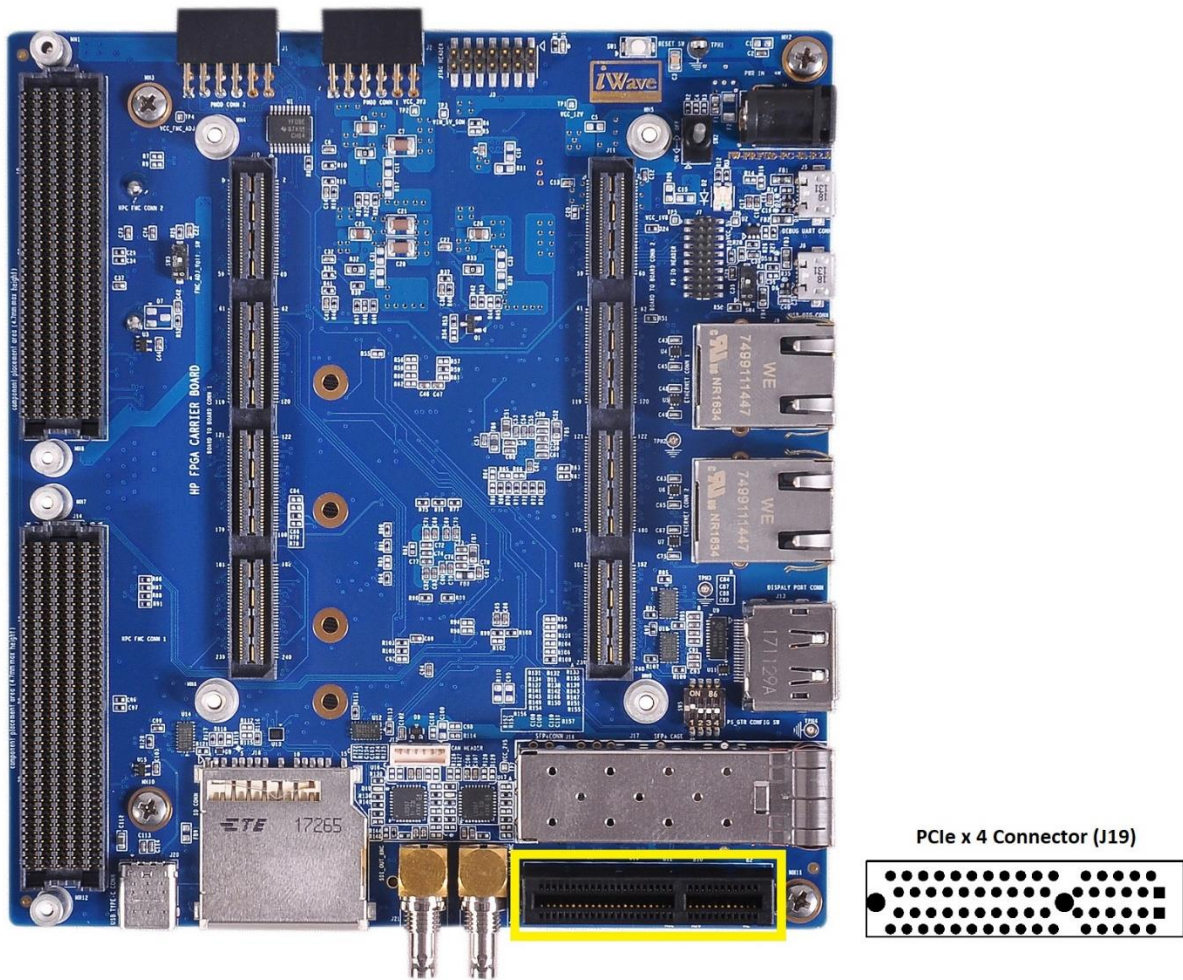


Figure 6: PCIe x4 Connector

**Table 4: PCIe x4 Connector Pin Assignment**

Pin No	Pin Name	Signal Name	Signal Type/ Termination	Description
A1	PRSNT1#	NA	NA	Default Grounded.
A2	+12V	VCC_12V	O, 12V Power	12V Supply Voltage.
A3	+12V	VCC_12V	O, 12V Power	12V Supply Voltage.
A4	GND	GND	Power	Ground.
A5	TCK	NA	NA	NC.
A6	TDI	NA	NA	NC.
A7	TDO	NA	NA	NC.
A8	TMS	NA	NA	NC.
A9	+3V3	VCC_3V3	O, 3.3V Power	3.3V Supply Voltage.
A10	+3V3	VCC_3V3	O, 3.3V Power	3.3V Supply Voltage.
A11	PERST#	PL_H14_LVDS46_L4P	O, 3.3V CMOS	PCIe Reset through PL Bank IO.
A12	GND	GND	Power	Ground.
A13	REFCLK+	PCIe_REFCLKP	O, DIFF	100MHz PCIe Reference Clock positive.
A14	REFCLK-	PCIe_REFCLKn	O, DIFF	100MHz PCIe Reference Clock negative.
A15	GND	GND	Power	Ground.
A16	PERp0	PS_MGTRRXPO_505	I, DIFF	PCIe Lane0 Receive pair positive.
A17	PERn0	PS_MGTRRXNO_505	I, DIFF	PCIe Lane0 Receive pair negative.
A18	GND	GND	Power	Ground.
A19	RSVD	NA	NA	NC.
A20	GND	GND	Power	Ground.
A21	PERp1	PS_MGTRRXP1_505	NA	PCIe Lane1 Receive pair positive.
A22	PERn1	PS_MGTRRXN1_505	NA	PCIe Lane1 Receive pair negative
A23	GND	GND	Power	Ground.
A24	GND	GND	Power	Ground.
A25	PERp2	PS_MGTRRXP2_505	NA	PCIe Lane2 Receive pair positive.
A26	PERn2	PS_MGTRRXN2_505	NA	PCIe Lane2 Receive pair negative.
A27	GND	GND	Power	Ground.
A28	GND	GND	Power	Ground.
A29	PERp3	PS_MGTRRXP3_505	NA	PCIe Lane3 Receive pair positive.
A30	PERn3	PS_MGTRRXN3_505	NA	PCIe Lane3 Receive pair negative.
A31	GND	GND	Power	Ground.
A32	RSVD	NA	NA	NC.
B1	+12V	VCC_12V	O, 12V Power	12V Supply Voltage.
B2	+12V	VCC_12V	O, 12V Power	12V Supply Voltage.
B3	RSVD	NA	NA	NC.
B4	GND	GND	Power	Ground.
B5	SMCLK	I2C0_SCL(PS_MIO10_500)	O, 3.3V CMOS	SMB Clock.
B6	SMDAT	I2C0_SDA(PS_MIO11_500)	IO, 3.3V CMOS	SMB DATA.
B7	GND	GND	Power	Ground.
B8	+3V3	VCC_3V3	O, 3.3V Power	3.3V Supply Voltage.
B9	TRST#	NA	NA	NC.

Pin No	Pin Name	Signal Name	Signal Type/ Termination	Description
<b>B10</b>	3V3AUX	VCC_3V3_AUX	O, 3.3V Power	3.3V Supply Voltage
<b>B11</b>	WAKE#	PL_G14_LVDS46_L4N	O, 3.3V CMOS	PCIe Wake through PL Bank IO.
<b>B12</b>	RSVD	NA	NA	NC.
<b>B13</b>	GND	GND	Power	Ground.
<b>B14</b>	PETp0	PS_MGTRTXP0_505	O, DIFF	PCIe Lane0 Transmit pair positive.
<b>B15</b>	PETn0	PS_MGTRTXN0_505	O, DIFF	PCIe Lane0 Transmit pair negative.
<b>B16</b>	GND	GND	Power	Ground.
<b>B17</b>	PRSNT2	NA	NA	NC.
<b>B18</b>	GND	GND	Power	Ground.
<b>B19</b>	PETp1	PS_MGTRTXP1_505	NA	PCIe Lane1 Transmit pair positive.
<b>B20</b>	PETn1	PS_MGTRTXN1_505	NA	PCIe Lane1 Transmit pair negative
<b>B21</b>	GND	GND	Power	Ground.
<b>B22</b>	GND	GND	Power	Ground.
<b>B23</b>	PETp2	PS_MGTRTXP2_505	NA	PCIe Lane2 Transmit pair positive.
<b>B24</b>	PETn2	PS_MGTRTXN2_505	NA	PCIe Lane2 Transmit pair negative
<b>B25</b>	GND	GND	Power	Ground.
<b>B26</b>	GND	GND	Power	Ground.
<b>B27</b>	PETp3	PS_MGTRTXP3_505	NA	PCIe Lane3 Transmit pair positive.
<b>B28</b>	PETn3	PS_MGTRTXN3_505	NA	PCIe Lane3 Transmit pair negative
<b>B29</b>	GND	GND	Power	Ground.
<b>B30</b>	RSVD	NA	NA	NC.
<b>B31</b>	PRSNT#2	NA	NA	NC.
<b>B32</b>	GND	GND	Power	Ground.

## 2.4.1.2 Display Port Connector

The Zynq Ultrascale+ MPSoC Carrier board supports one Display port connector through PS-GTR Lanes of Zynq Ultrascale+ MPSoC PS. PS-GTR Lane0 & Lane1 from Board to Board Connector1 is connected to Display Port connector to support single or dual lane display port. The PS-GTR Lane selection to Display port connector is done through PS-GTR Lane Selection Switch (SW5).

The Display port connector supports AUX+ & AUX- signals from the PL Bank IOs. Also it supports Hot plug detect signal and connected to PL Bank IO. This Display Port connector (J13) is physically located at the top of the board as shown below.

*Note: For more details on PS-GTR Lane selection options, refer Table 3.*

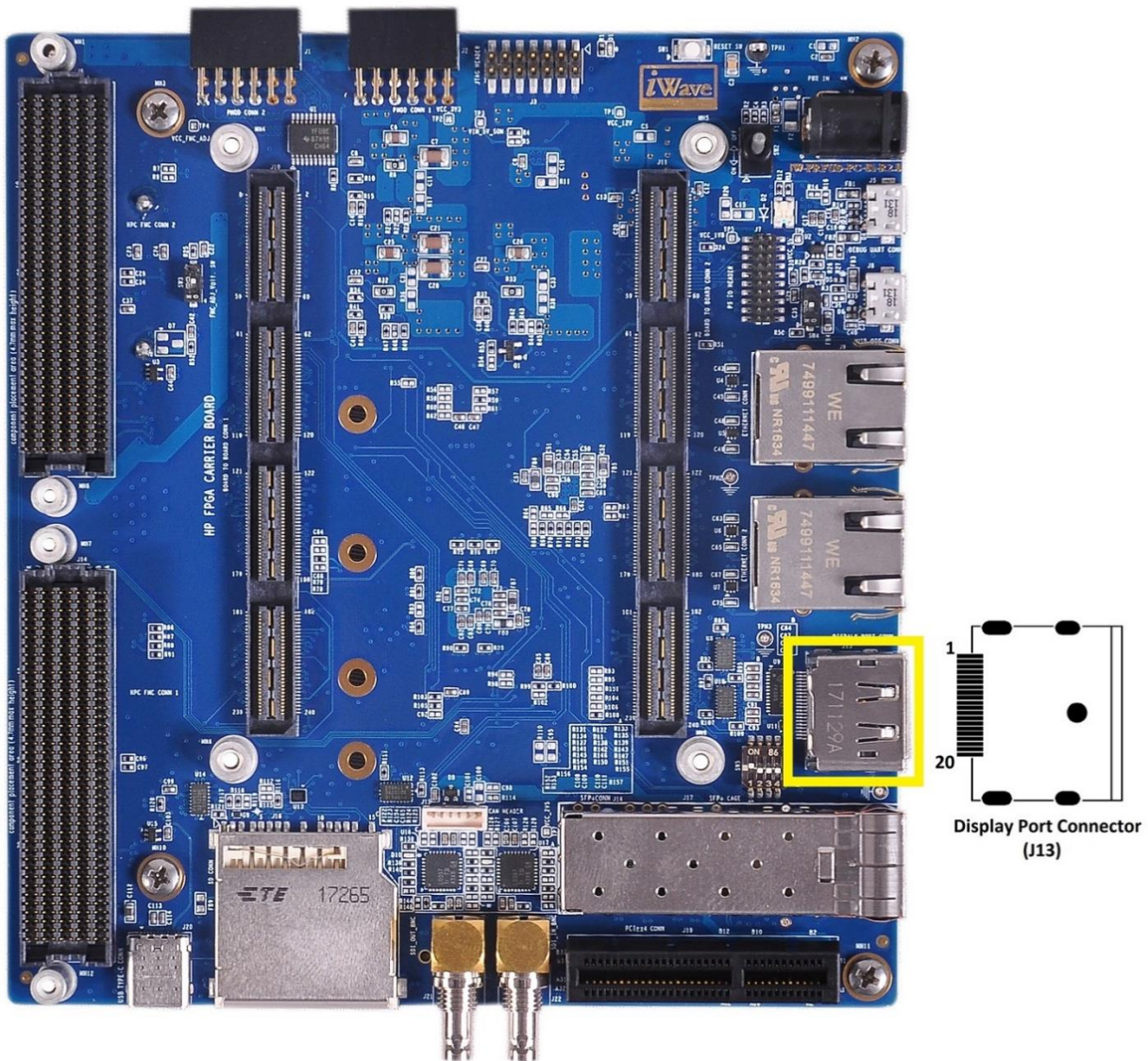


Figure 7: Display Port Connector

**Table 5: Display Port Connector Pin Assignment**

Pin No	Pin Name	Signal Name	Signal Type/ Termination	Description
1	DP_L0+	PS_MGTRTXP1_505	O, DIFF	Display Port Lane0 Transmit pair positive.
2	GND	GND	Power	Ground.
3	DP_L0-	PS_MGTRTXN1_505	O, DIFF	Display Port Lane0 Transmit pair negative.
4	DP_L1+	PS_MGTRTXP0_505	O, DIFF	Display Port Lane1 Transmit pair positive.
5	GND	GND	Power	Ground.
6	DP_L1-	PS_MGTRTXN0_505	O, DIFF	Display Port Lane1 Transmit pair negative.
7	DP_L2+	NA	NA	NC.
8	GND	GND	Power	Ground.
9	DP_L2-	NA	NA	NC.
10	DP_L3+	NA	NA	NC.
11	GND	GND	Power	Ground.
12	DP_L3-	NA	NA	NC.
13	CONFIG1	NA	1M PD	Configuration Pin.
14	CONFIG2	NA	1M PD	Configuration Pin.
15	AUX_CH+	PL_Y10_LVDS66_L6P	IO, DIFF/ 100K PD	Auxiliary channel positive.
16	GND	GND	Power	Ground.
17	AUX_CH-	PL_AA10_LVDS66_L6N	IO, DIFF/ 100K PU	Auxiliary channel negative.
18	HOT_PLUG	PL_C12_LVDS46_L9N	O,3.3V CMOS/ 100K PD	Hot Plug Detect.
19	RETURN	NA	NA	NC.
20	DP_PWR	DP_PWR	O, 3.3V Power	3.3V Supply Voltage.

## 2.4.1.3 USB Type-C Connector

The Zynq Ultrascale+ MPSoC Carrier board supports one Super Speed USB3.0 OTG through USB Type-C connector. The PS-GTR Lane2 of Zynq Ultrascale+ MPSoC PS from Board to Board Connector2 is used for USB3.0 OTG interface. The PS-GTR Lane2 selection to USB Type-C connector is done through PS-GTR Lane Selection Switch (SW5). For more details on PS-GTR Lane selection options, refer **Table 3**.

The Zynq Ultrascale+ MPSoC Carrier board supports “FUSB302” USB Type-C controller for port detection & cable orientation and controlled through I2C0 interface of MPSoC PS. To support double-way plug in on USB Type-C connector, PS-GTR Lane2 is connected to “FUSB340” 2:1 data Switch and then connected to USB Type-C connector. The lane selection to Type-C connector (top or bottom port) is controlled through PL Bank IO “PL\_C14\_LVDS46\_L10P” from Board to Board Connector1 pin70.

Also USB2.0 OTG interface of MPSoC PS is connected to USB Type-C connector for backward compatible USB2.0 support. The USB2.0 PHY Transceiver output signals from Board to Board connector2 is connected to “FUSB340” USB Switch for selecting the USB2.0 OTG connection between USB2.0 MicroAB connector (J8) and USB3.0 Type-C connector (J20). The selection can be done by setting the Single bit DIP switch (SW4). If the DIP switch (SW4) is set to ON, USB2.0 OTG is connected to MicroAB connector (J8) and if the DIP switch (SW4) is set to OFF, USB2.0 OTG is connected to USB3.0 TypeC connector (J20).

The USB3.0 OTG port can be used as full functional OTG functionality which supports USB3.0 host and USB2.0 device based on Type-C. The VBUS power of this USB Type-C connector is connected through current limit power switch which can be used to switch On/Off the power based on the device or Host and also limits the current above 900mA in host mode. Enable pin of the USB Power switch is connected to the PS GPIO “PS\_MIO25\_500” from Board to Board connector2 pin38. This USB Type-C connector (J20) is physically located at the top side of the board as shown below.

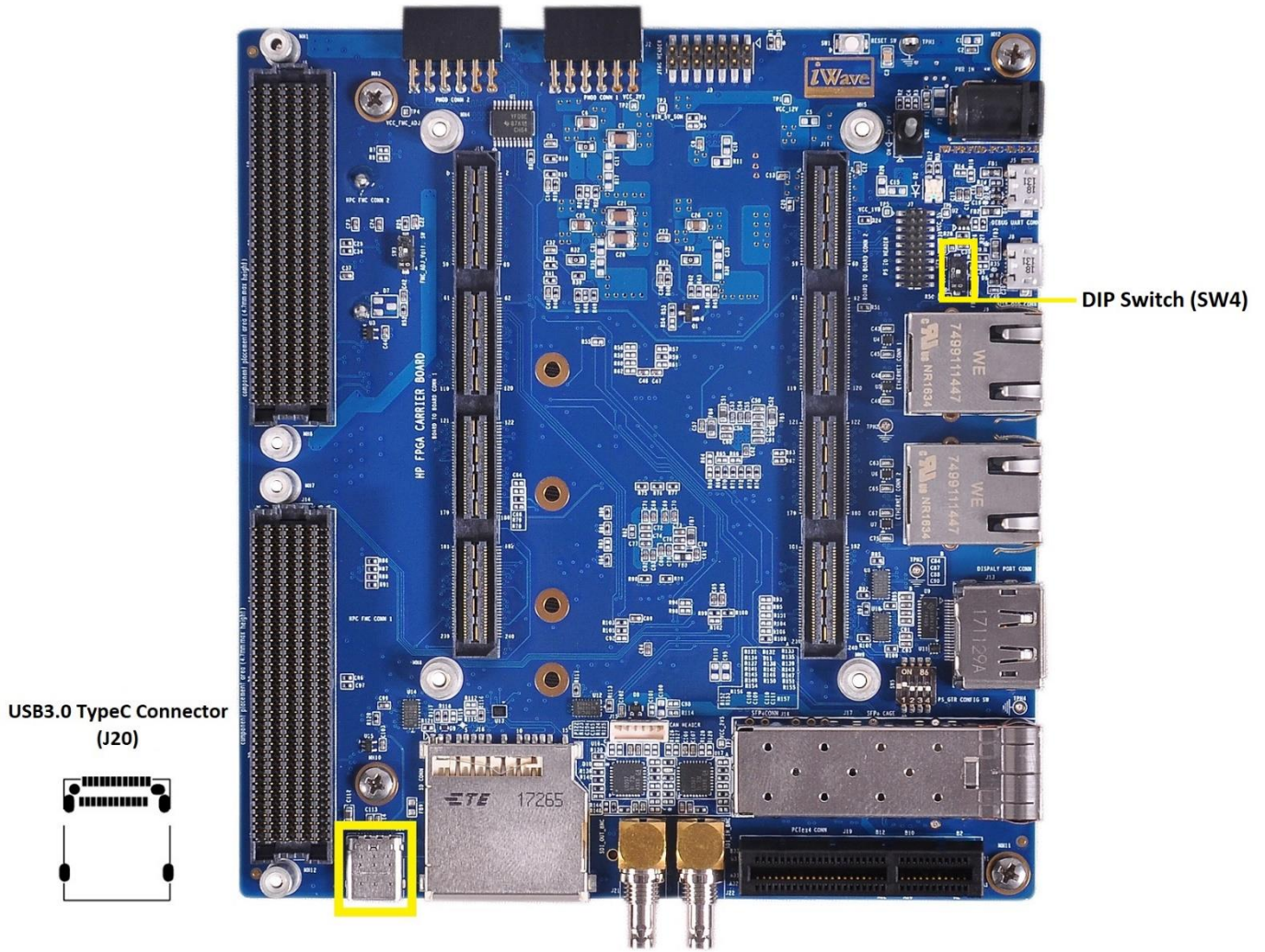


Figure 8: USB Type-C Connector



**Table 6: USB Type-C Pin Assignment**

Pin No	Pin Name	Signal Name	Signal Type/ Termination	Description
<b>A1</b>	GND	GND	Power	Ground.
<b>A2</b>	SSTXp1	PS_MGTRTXP2_505	O, DIFF	USB3.0 Super Speed Transmit Data Positive.
<b>A3</b>	SSTXn1	PS_MGTRTXN2_505	O, DIFF	USB3.0 Super Speed Transmit Data Negative.
<b>A4</b>	VBUS	VBUS_USB3.0	Power	5V Power Supply.
<b>A5</b>	CC1	CC1	O, 5V CMOS	Configuration Channel pin1.
<b>A6</b>	Dp1	USB_OTG_DP	IO, DIFF	USB2.0 Transmit Data Positive.
<b>A7</b>	Dn1	USB_OTG_DN	IO, DIFF	USB2.0 Transmit Data Negative.
<b>A8</b>	SBU1	NC	NC	NC.
<b>A9</b>	VBUS	VBUS_USB3.0	Power	5V Power Supply.
<b>A10</b>	SSRXn2	PS_MGTRRXN2_505	I, DIFF	USB3.0 Super Speed Receive Data Negative.
<b>A11</b>	SSRXp2	PS_MGTRRXP2_505	I, DIFF	USB3.0 Super Speed Receive Data Positive.
<b>A12</b>	GND	GND	Power	Ground.
<b>B1</b>	GND	GND	Power	Ground.
<b>B2</b>	SSTXp2	PS_MGTRTXP2_505	O, DIFF	USB3.0 Super Speed Transmit Data Positive.
<b>B3</b>	SSTXn2	PS_MGTRTXN2_505	O, DIFF	USB3.0 Super Speed Transmit Data Negative.
<b>B4</b>	VBUS	VBUS_USB3.0	Power	5V Power Supply.
<b>B5</b>	CC2	CC2	O, 5V CMOS	Configuration Channel pin2.
<b>B6</b>	Dp2	USB_OTG_DP	IO, DIFF	USB2.0 Transmit Data Positive.
<b>B7</b>	Dn2	USB_OTG_DN	IO, DIFF	USB2.0 Transmit Data Negative.
<b>B8</b>	SBU2	NC	NC	NC.
<b>B9</b>	VBUS	VBUS_USB3.0	Power	5V Power Supply.
<b>B10</b>	SSRXn1	PS_MGTRRXN2_505	I, DIFF	USB3.0 Super Speed Receive Data Negative.
<b>B11</b>	SSRXp1	PS_MGTRRXP2_505	I, DIFF	USB3.0 Super Speed Receive Data Positive.
<b>B12</b>	GND	GND		Mechanical Pin.

## 2.4.1.4 M.2 SATA Connector

The Zynq Ultrascale+ MPSoC Carrier board supports one SATA interface through M.2 (KeyB) SATA connector. PS-GTR3 Lane of Zynq Ultrascale+ MPSoC PS is used for SATA interface. MPSoC's SATA supports SATA Specification revision 3.1 with Gen1 (1.5Gbps), Gen2 (3Gbps) & Gen3 (6Gbps) datarates. The PS-GTR Lane selection to M.2 SATA connector is done through PS-GTR Lane Selection Switch (SW5). For more details on PS-GTR Lane selection options, refer **Table 3**. The M.2 SATA Connector (J24) is physically located at the bottom side of the board as shown below.

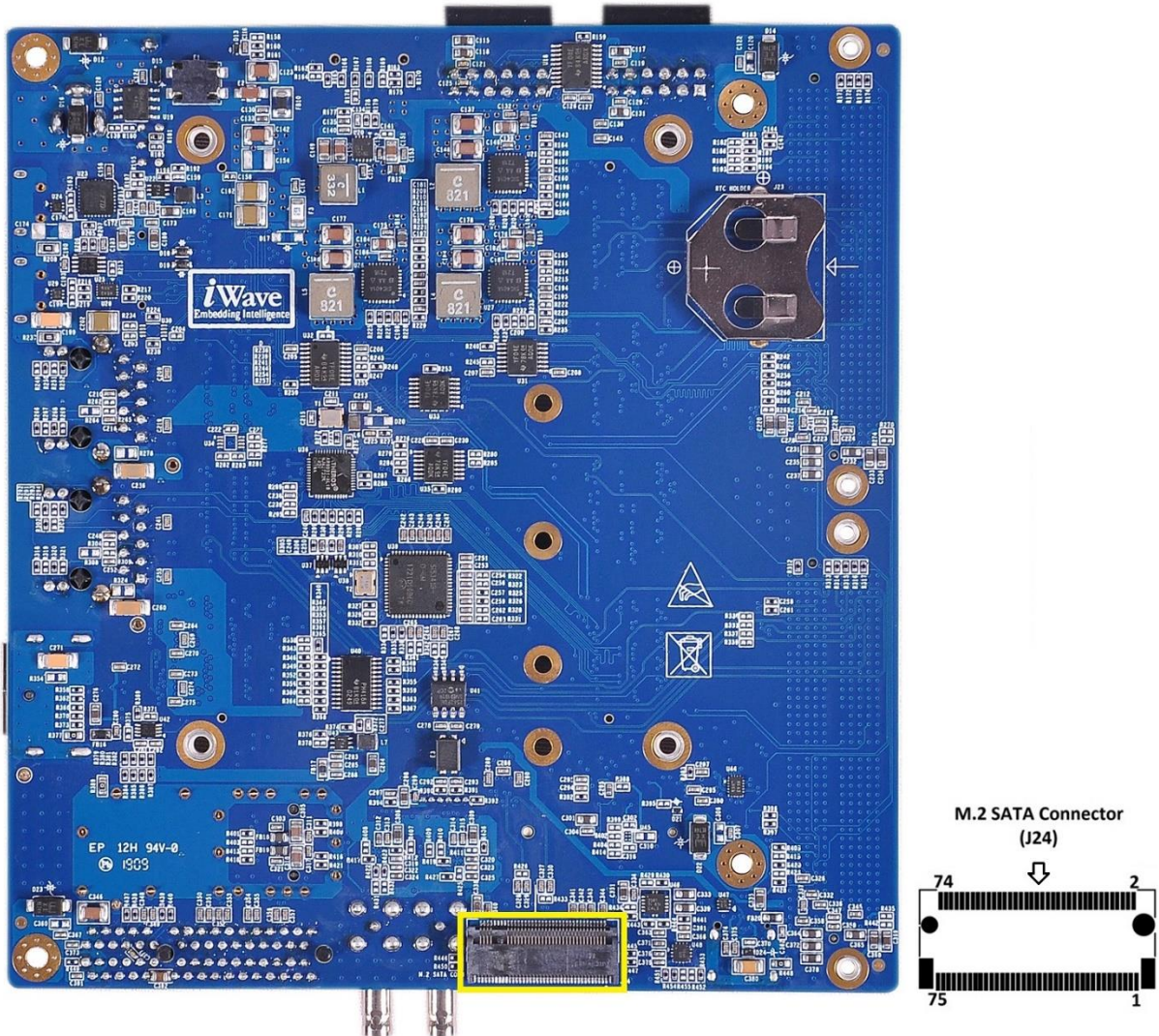


Figure 9: M.2 SATA Connector (Key B)

**Table 7: M.2 SATA Connector Pin Assignment**

Pin No	Pin Name	Signal Name	Signal Type/ Termination	Description
1	CONFIG_3	NA	NA	This pin is connected to Ground.
2	3.3V	VCC_3V3	O, 3.3V Power	Supply Voltage.
3	GND	GND	Power	Ground.
4	3.3V	VCC_3V3	O, 3.3V Power	Supply Voltage.
5	PERn3	NA	NA	NC.
6	N/A1	NA	NA	NC.
7	PERp3	NA	NA	NC.
8	N/A2	NA	NA	NC.
9	GND	GND	Power	Ground.
10	DAS/DSS	NA	NA	NC.
11	PETn3	NA	NA	NC.
12	3.3V	VCC_3V3	O, 3.3V Power	Supply Voltage.
13	PETp3	NA	NA	NC.
14	3.3V	VCC_3V3	O, 3.3V Power	Supply Voltage.
15	GND	GND	Power	Ground.
16	3.3V	VCC_3V3	O, 3.3V Power	Supply Voltage.
17	PERn2	NA	NA	NC.
18	3.3V	VCC_3V3	O, 3.3V Power	Supply Voltage.
19	PERp2	NA	NA	NC.
20	N/A3	NA	NA	NC.
21	CONFIG_0	NA	NA	This pin is connected to Ground.
22	N/A4	NA	NA	NC.
23	PETn2	NA	NA	NC.
24	N/A5	NA	NA	NC.
25	PETp2	NA	NA	NC.
26	N/A6	NA	NA	NC.
27	GND	GND	Power	Ground.
28	N/A7	NA	NA	NC.
29	PERn1	NA	NA	NC.
30	N/A8	NA	NA	NC.
31	PERp1	NA	NA	NC.
32	N/A9	NA	NA	NC.
33	GND	GND	Power	Ground.
34	N/A10	NA	NA	NC.
35	PETn1	NA	NA	NC.
36	N/A11	NA	NA	NC.
37	PETp1	NA	NA	NC.
38	DEVSLP	NA	NA	NC.
39	GND	GND	Power	Ground.
40	N/A12	NA	NA	NC.
41	SATA-B+/PERn0	PS_MGTRRXP3_505	I, DIFF	SATA Receive pair positive.

Pin No	Pin Name	Signal Name	Signal Type/ Termination	Description
42	N/A13	NA	NA	NC.
43	SATA-B-/PERp0	PS_MGTRRXN3_505	I, DIFF	SATA Receive pair negative.
44	N/A14	NA	NA	NC.
45	GND	GND	Power	Ground.
46	N/A15	NA	NA	NC.
47	SATA-A-/PETn0	PS_MGTRTXN3_505	O, DIFF	SATA Transmit pair negative.
48	N/A16	NA	NA	NC.
49	SATA-A+/PETp0	PS_MGTRTXP3_505	O, DIFF	SATA Transmit pair positive.
50	PERST#	NA	NA	NC.
51	GND	GND	Power	Ground.
52	CLKREQ#	NA	NA	NC.
53	REFCLKN	NA	NA	NC.
54	PEWAKE#	NA	NA	NC.
55	REFCLKP	NA	NA	NC.
56	MFG1	NA	NA	NC.
57	GND	GND	Power	Ground.
58	MFG2	NA	NA	NC.
59	M1	NA	NA	NC.
60	M2	NA	NA	NC.
61	M3	NA	NA	NC.
62	M4	NA	NA	NC.
63	M5	NA	NA	NC.
64	M6	NA	NA	NC.
65	M7	NA	NA	NC.
66	M8	NA	NA	NC.
67	N/A17	NA	NA	NC.
68	SUSCLK	NA	NA	NC.
69	CONFIG_1	NA	NA	This pin is connected to Ground.
70	3.3V	VCC_3V3	O, 3.3V Power	Supply Voltage.
71	GND	GND	Power	Ground.
72	3.3V	VCC_3V3	O, 3.3V Power	Supply Voltage.
73	GND	GND	Power	Ground.
74	3.3V	VCC_3V3	O, 3.3V Power	Supply Voltage.
75	CONFIG_2	NA	NA	This pin is connected to Ground.

## 2.4.2 Gigabit Ethernet Port1

The Zynq Ultrascale+ MPSoC SOM Carrier board supports two 10/100/1000Mbps Ethernet ports. First Ethernet port is supported through GEM0 interface of Zynq Ultrascale+ MPSoC PS. Ethernet PHY output signals from Board to Board connector2 is directly connected to RJ45 Magjack (J9). The Ethernet supports Speed (Yellow) and Link/Activity (Green) LED indications on RJ45 Magjack connector. This RJ45 Magjack connector (J9) is physically located at the top of the board as shown below.

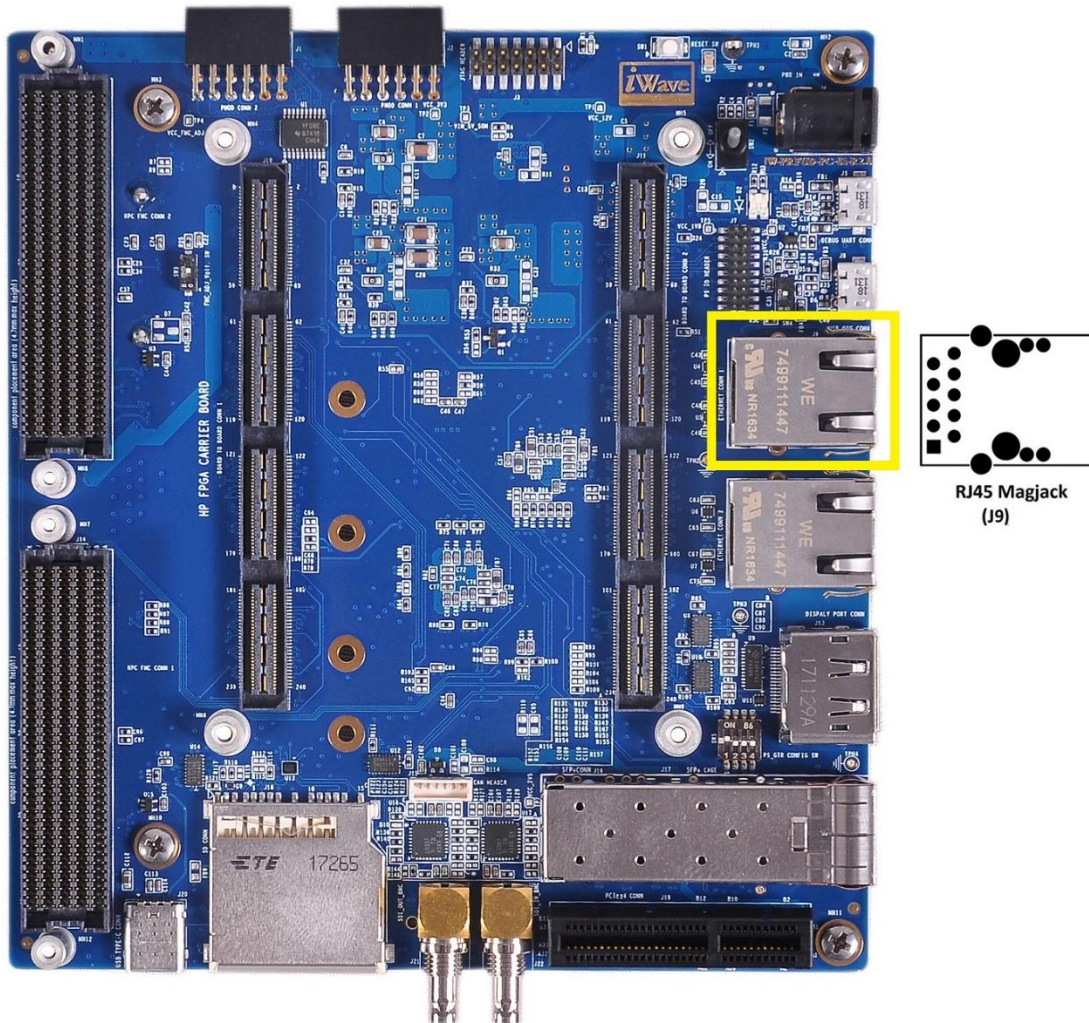


Figure 10: Gigabit Ethernet Connector1

## 2.4.3 Gigabit Ethernet Port2

The Zynq Ultrascale+ MPSoC SOM Carrier board supports two 10/100/1000Mbps Ethernet ports. The second Ethernet port is supported through GEM3 interface of Zynq Ultrascale+ MPSoC PS. The MAC is integrated in the Zynq-Ultrascale+ MPSoC PS and connected to the external Gigabit Ethernet PHY “AR8031” on Carrier Board through Board to Board Connector1. This PHY is interfaced with GEM3 interface of MPSoC’s PS through MIO pins and works at 1.8V IO voltage level.

The Gigabit Ethernet PHY also supports MDC, MDIO, Reset and Interrupt Signals for control. These signals are used through PL Bank EMIO pins from Board to Board Connector1 pins 124, 126, 92 & 94 respectively. Ethernet PHY output is directly connected to RJ45 Magjack (J12). Also it supports Speed (Yellow) and Link/Activity (Green) LED indications on RJ45 Magjack connector. This RJ45 Magjack connector is physically located at the top of the board as shown below.

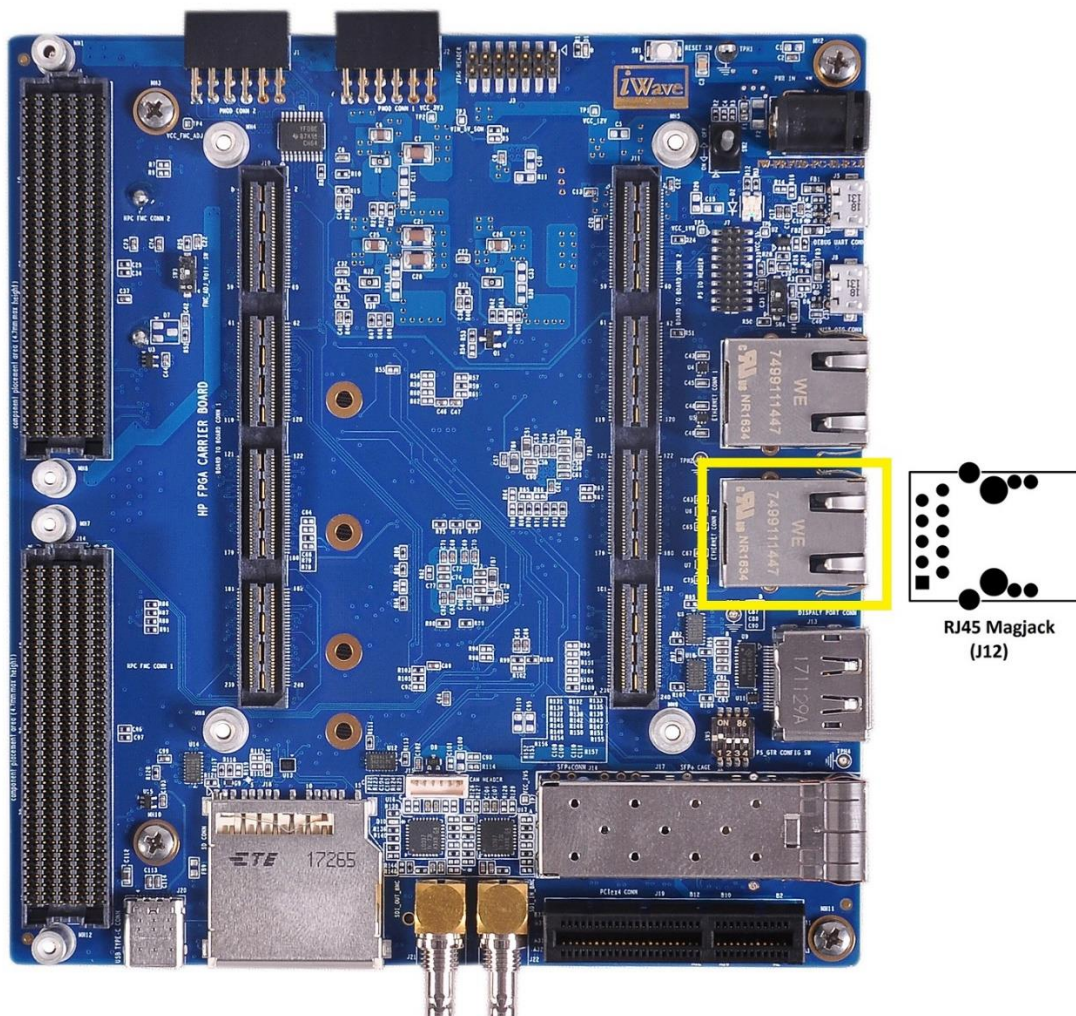


Figure 11: Gigabit Ethernet Connector2

## 2.4.4 USB2.0 OTG Port

The Zynq Ultrascale+ MPSoC carrier Board supports USB2.0 High Speed OTG interface through USB0 OTG Controller of Zynq Ultrascale+ MPSoC PS. This USB2.0 OTG interface is supported through USB2.0 MicroAB connector (J8). The USB PHY Transceiver output signals from Board to Board connector2 is connected to “FUSB340” USB Switch for selecting the USB2.0 OTG connection between USB2.0 MicroAB connector (J8) and USB3.0 TypeC connector (J20). The selection can be done by setting the Single bit DIP switch (SW4). If the DIP switch (SW4) is set to ON, USB2.0 OTG is connected to MicroAB connector (J8) and if the DIP switch (SW4) is set to OFF, USB2.0 OTG is connected to USB3.0 TypeC connector (J20).

The USB2.0 OTG port can be used as full functional OTG functionality which supports USB2.0 host and USB2.0 device based on USB ID pin status. The VBUS power of this USB2.0 MicroAB connector is connected through current limit power switch which can be used to switch On/Off the power based on the device or Host and also limits the current above 900mA in host mode. The USB PHY transceiver in SOM detects the USB functionality through USB ID pin (34<sup>th</sup> pin of B2B-2) and controls the power using the USB\_PWR\_EN pin (32<sup>nd</sup> pin of B2B-2). This USB2.0 OTG connector (J13) is physically located at the top of the board as shown below.

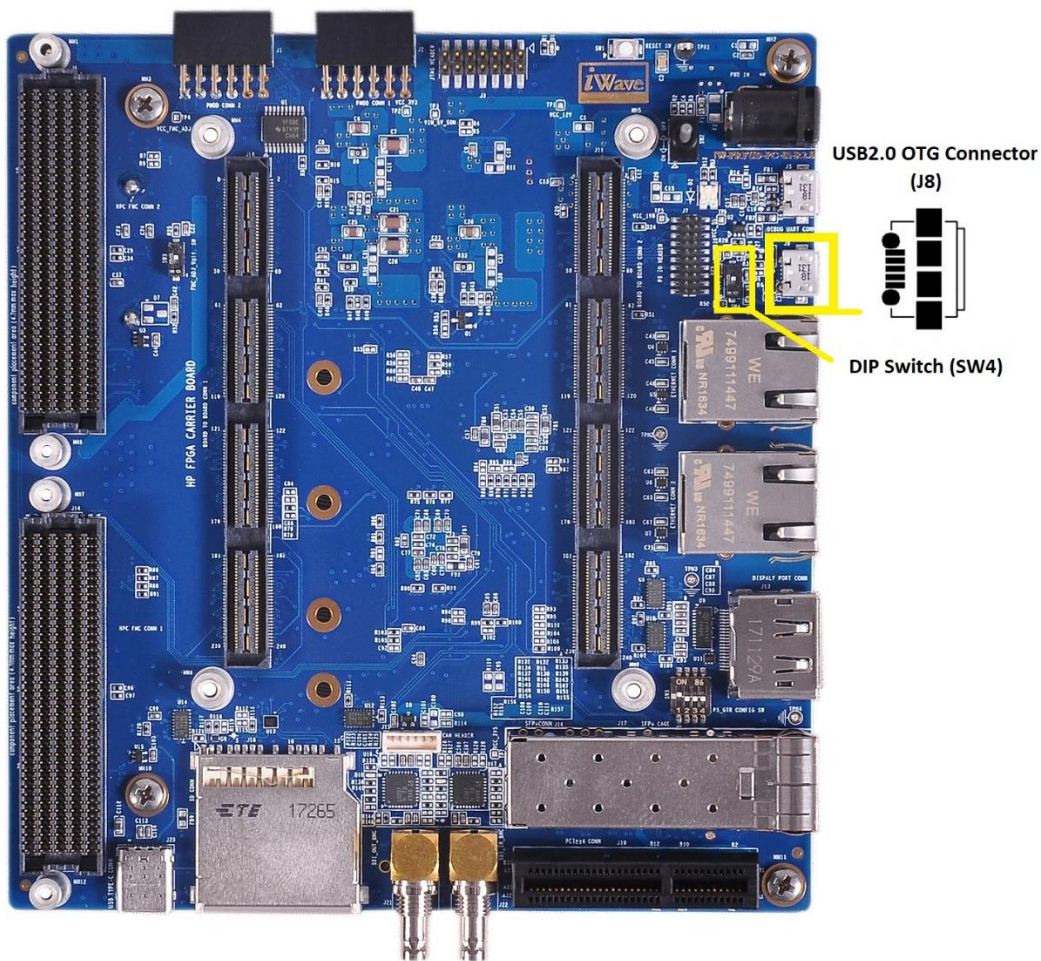


Figure 12: USB OTG Connector

## 2.4.5 Standard SD Port

The Zynq Ultrascale+ MPSoC Carrier Board supports one SD interface through SD1 interface of Zynq Ultrascale+ MPSoC PS. This SD1 signals from Board to Board Connector2 is connected to Standard SD connector (J18) through auto-direction control memory card voltage level translator to support both 1.8V and 3.3V supported cards. It supports up to 4-Bit data transfer with card detect and write protect.

The memory card voltage level translator's voltage selection is controlled through PS GPIO (PS\_MIO43\_501) pin from Board to Board Connector2 pin44. If PS\_MIO43\_501 is set to low, then 3.3V IO level is selected for SD1 signals to SD connector. If PS\_MIO43\_501 is set to high, then 1.8V IO level is selected for SD1 signals to SD connector. The Standard SD connector (J18) is physically located at the top of the board as shown below.

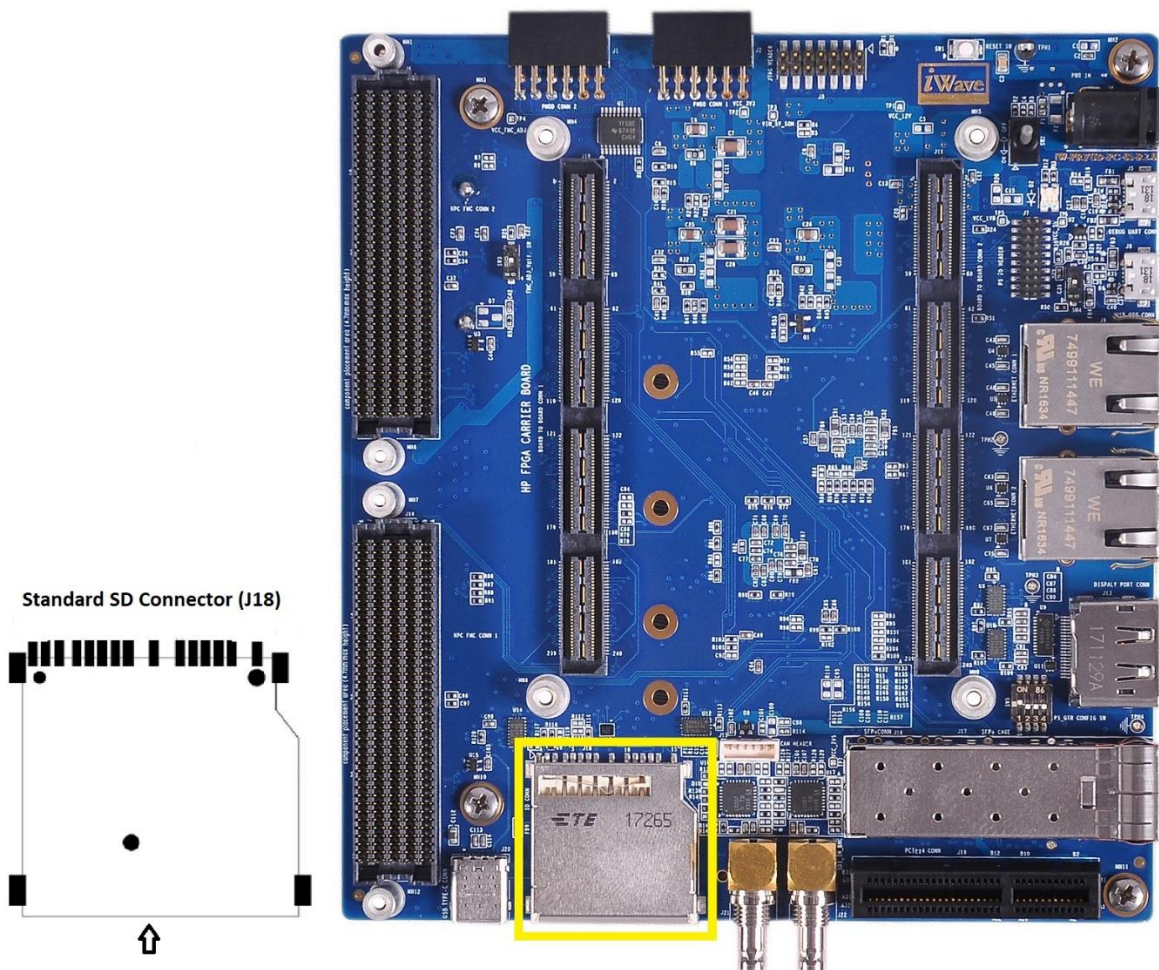


Figure 13: Standard SD Connector



## 2.4.6 CAN0 Header

The Zynq Ultrascale+ MPSoC Carrier board supports one CAN interface through CAN0 interface of Zynq Ultrascale+ MPSoC PS. This CAN0 signals are connected from Board to Board connector1 to CAN Bus Transceiver “MCP2562FD”. The output of CAN transceiver is connected to 6 pin custom CAN Header (J15). Standby pin of the CAN Bus transceiver is controlled through PL Bank IO (PL\_D12\_LVDS46\_L9P) from Board to Board Connector1 Pin74. This CAN Header is physically located at the top of the board as shown below.

- Number of Pins - 6
- Connector Part - 53047-0610 from Molex
- Mating Connector - 0510210600 from Molex with crimping pins

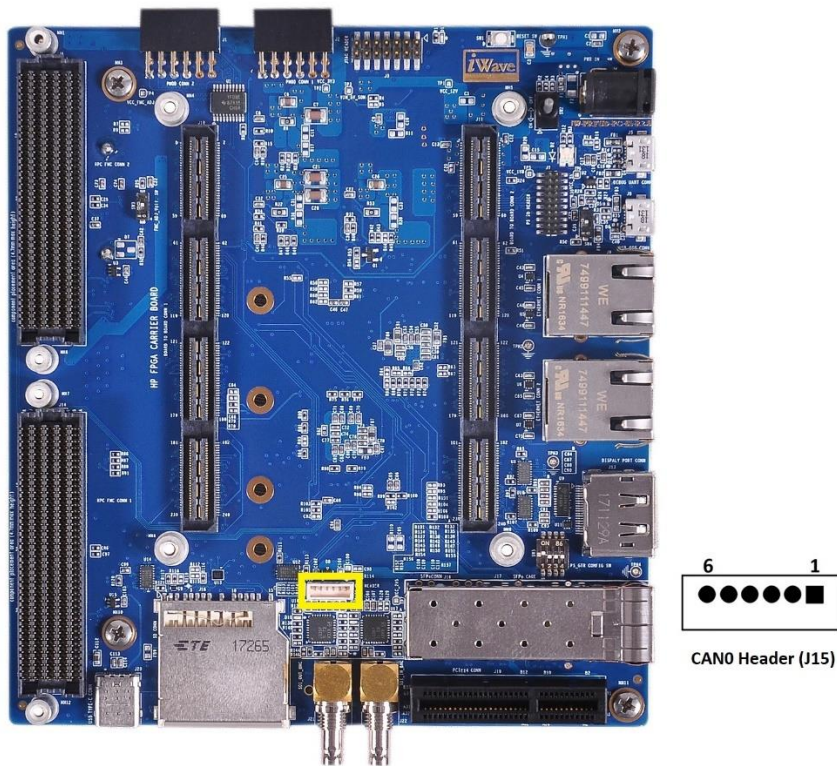


Figure 14: CAN0 Header

Table 8: CAN0 Header Pin Assignment

Pin No	Pin Name	Signal Type/ Termination	Description
1	VCC_5V	O, 5V Power	5V Supply Voltage.
2	VCC_12V	-	NC. <i>Note: Optionally connected to on board 12V through resistor and by default not populated.</i>
3	CANL	IO, DIFF	CAN Differential negative.
4	GND	Power	Ground.
5	CANH	IO, DIFF	CAN Differential positive.
6	GND	Power	Ground.

## 2.4.7 Debug UART

The Zynq Ultrascale+ MPSoC Carrier Board supports debug interface through UART0 interface of Zynq Ultrascale+ MPSoC PS. This UART0 signals from Board to Board Connector2 is connected to UART to USB Converter “FT232RQ”. The output of the USB convetor is conected to USB MicroAB Connector (J5). This USB MicroAB Connector can be used for Debug purpose which is is physically located at the top of the board as shown below.

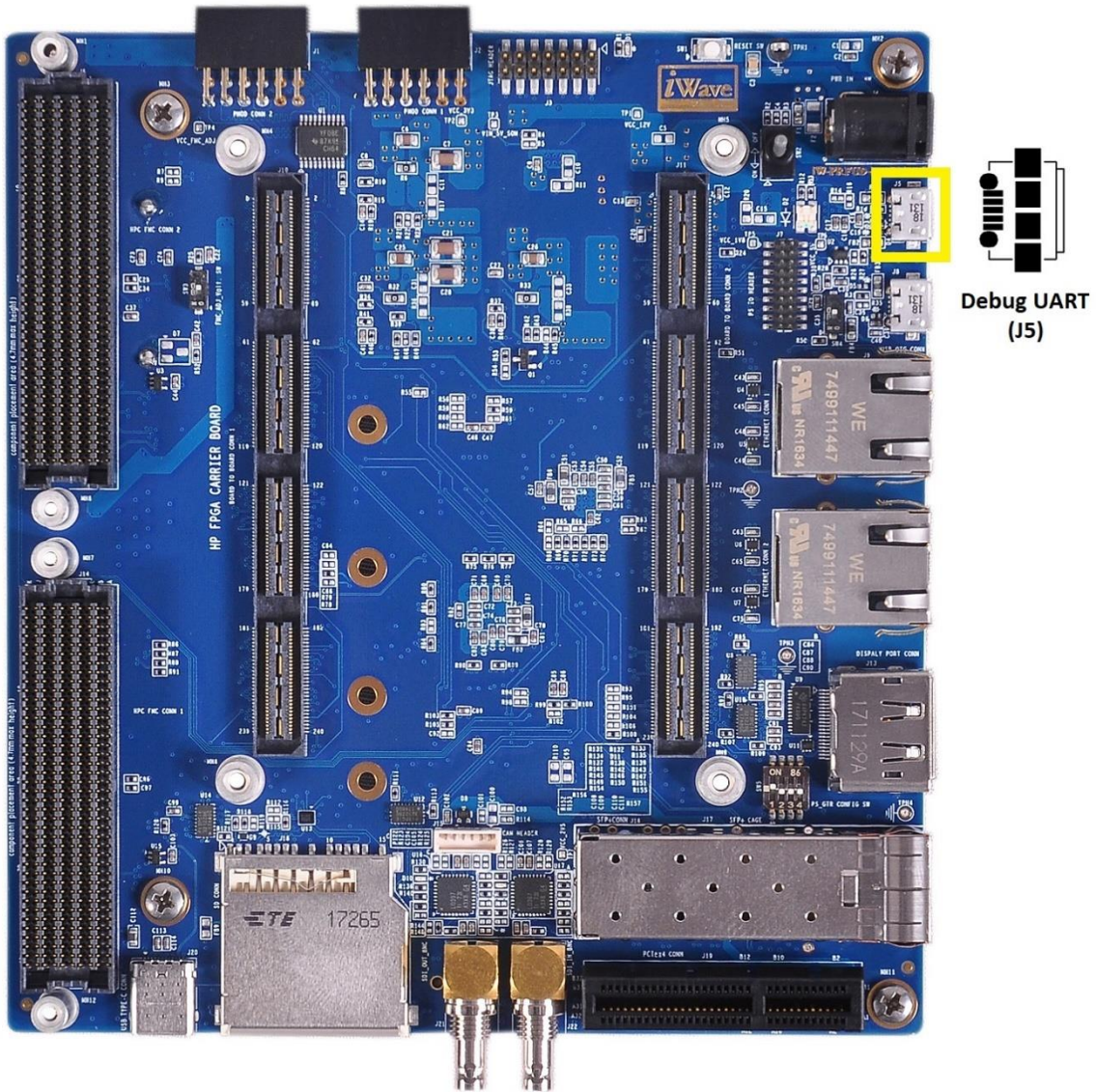


Figure 15: Debug UART Connector

## 2.5 PL Interface Features

The features which are supported from Zynq Ultrascale+ MPSoC's PL is explained in the following section.

### 2.5.1 GTH High Speed Transceivers

The Zynq Ultrascale+ MPSoC Carrier board supports different high speed interfaces through 16 GTH Transceivers (12 from B2B-1 and 4 from B2B-2) as mentioned below.

- SFP+ Connector (1 GTH Transceivers)
- 3G/12G SDI Video IN (1 GTH Transmitter)
- 3G/12G SDI Video OUT (1 GTH Receiver)
- Dual FMC HPC Connectors (14 GTH Transceivers)

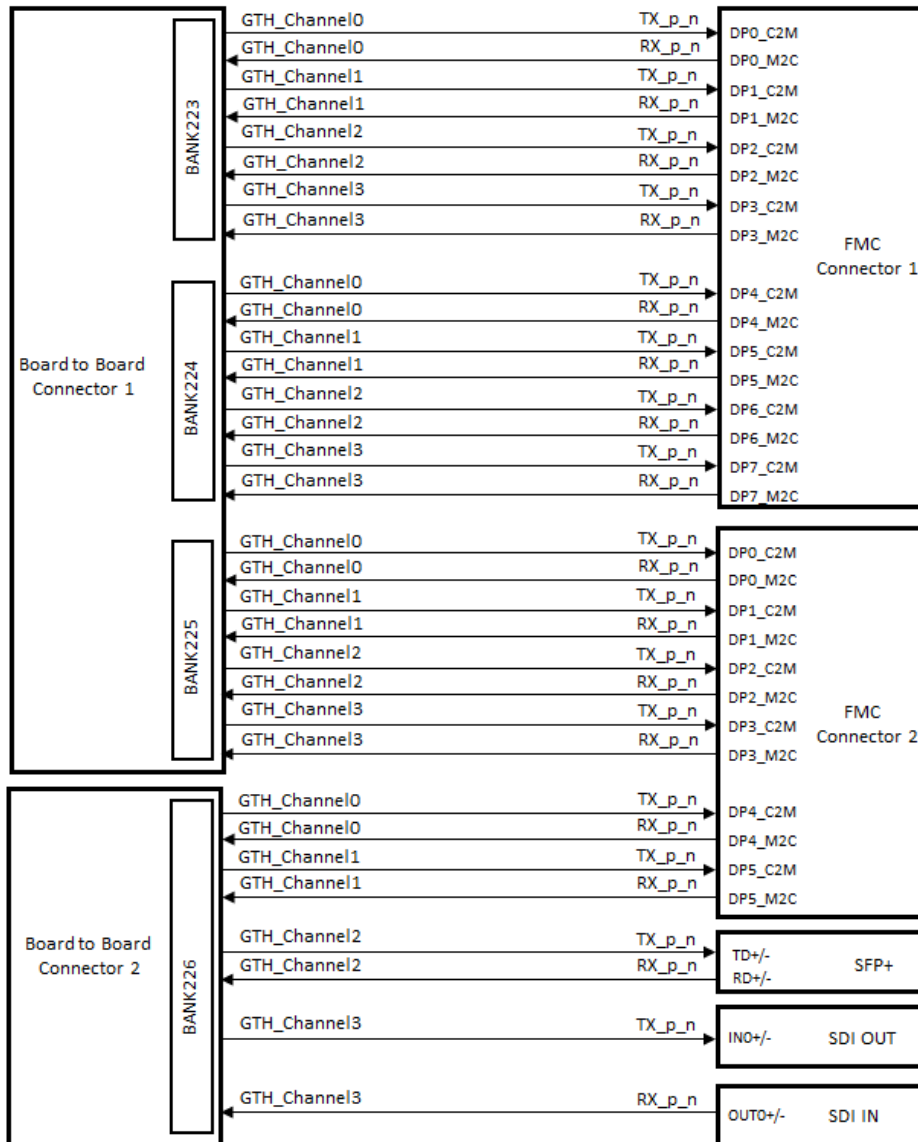


Figure 16: GTH Transceiver Connections

## 2.5.1.1 SFP+ Connector

The Zynq Ultrascale+ MPSoC Carrier board supports one SFP+ Connector through GTH transceiver of Zynq Ultrascale+ MPSoC PL. GTH transceiver of PL Bank226 Channel2 from Board to Board Connector2 is connected to SFP+ connector. Also PS I2C0 is connected to this connector for control and configuration. All other control signals of SFP+ connector is connected from IO Expander. This SFP+ connector (J16) is physically located at the top of the board as shown below.

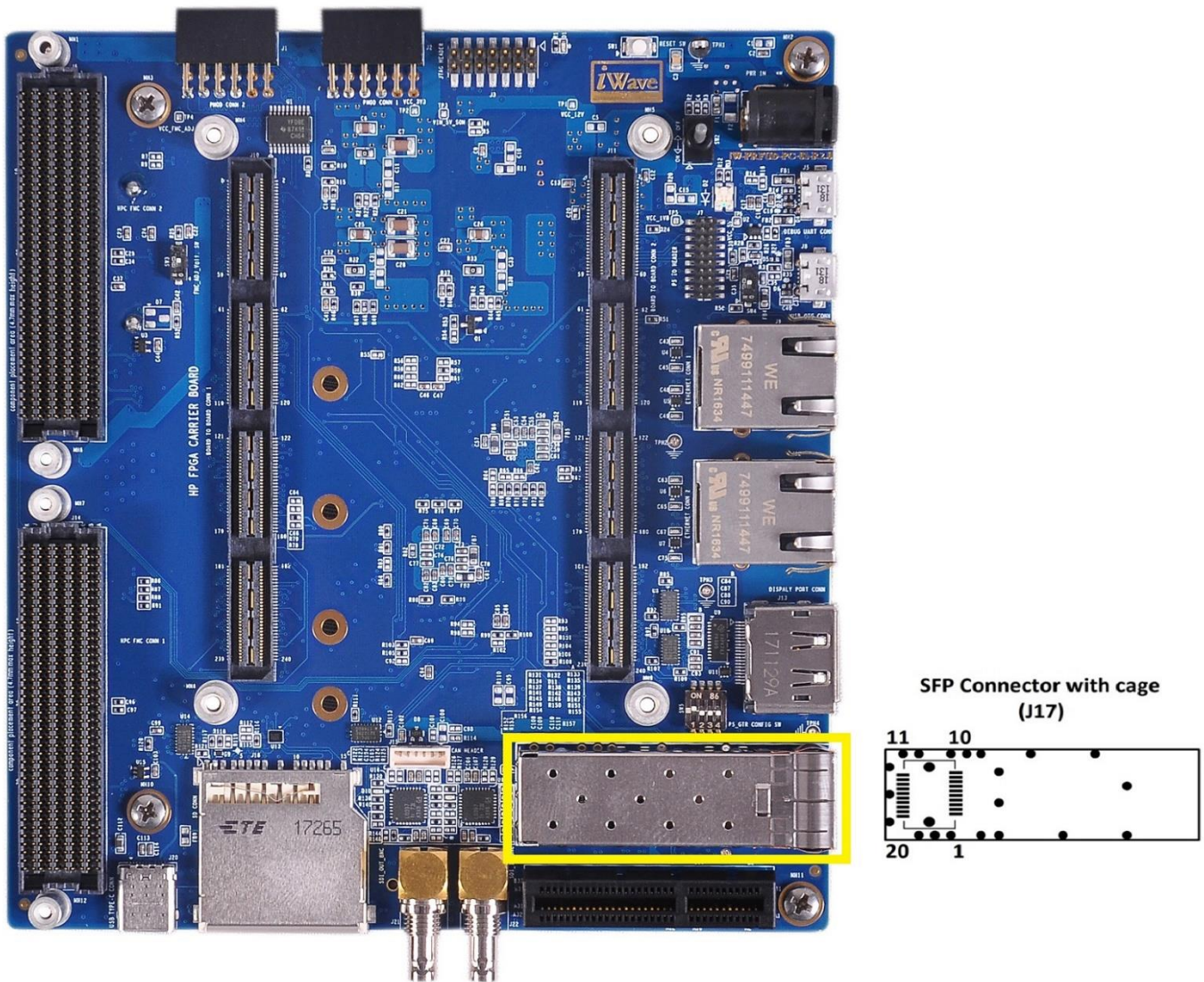


Figure 17: SFP+ Connector with Cage

**Table 9: SFP+ Connector Pin Assignment**

Pin No	Pin Name	Signal Name	Signal Type/ Termination	Description
1	VEET1	GND	Power	Ground.
2	TFAULT	IOEXP_P00_SFP_TFAULT	I, LVTTTL/ 4.7K PU	Module Transmitter Fault. This Pin is connected to IO Expander Port 0 for software access if required.
3	TDIS	IOEXP_P05_SFP_TDIS	O, LVTTTL/ 4.7K PD	Transmitter Disable. This Pin is connected to IO Expander Port 5 for software control if required.
4	SDA	I2CO_SDA(PS_MIO11_500)	IO, 3.3V CMOS	I2C Data.
5	SCL	I2CO_SCL(PS_MIO10_500)	O, 3.3V CMOS	I2C Clock.
6	MOD_ABS	IOEXP_P02_SFP_MOD_ABS	I, 3.3V CMOS/ 4.7K PU	Module Definition. This Pin is connected to IO Expander Port 2 for software access if required.
7	RS0	IOEXP_P04_SFP_RS0	O, 3.3V CMOS/ 4.7K PU	Rate select 0. This Pin is connected to IO Expander Port 4 for software control if required.
8	RX_LOS	IOEXP_P01_SFP_RX_LOS	I, 3.3V CMOS/ 4.7K PU	Receiver loss of signal indication. This Pin is connected to IO Expander Port 1 for software access if required.
9	RS1	IOEXP_P03_SFP_RS1	O, 3.3V CMOS/ 4.7K PU	Rate select 1. This Pin is connected to IO Expander Port 3 for software control if required.
10	VEER1	GND	Power	Ground.
11	VEER2	GND	Power	Ground.
12	RD-	GTHRXN2_226	I, DIFF	SFP+ Receiver Data Negative
13	RD+	GTHRXP2_226	I, DIFF	SFP+ Receiver Data Positive
14	VEER3	GND	Power	Ground.
15	VCCR	VCC_3V3	O, 3.3V Power	3.3V Receiver Supply Voltage
16	VCCT	VCC_3V3	O, 3.3V Power	3.3V Transmitter Supply Voltage
17	VEET2	GND	Power	Ground.
18	TD+	GTHTXP2_226	O, DIFF	SFP+ Transmit Data Positive
19	TD-	GTHTXN2_226	O, DIFF	SFP+ Transmit Data Negative
20	VEET3	GND	Power	Ground.

## 2.5.1.2 SDI Video IN

The Zynq Ultrascale+ MPSoC Carrier board supports one 3G/12G SDI Video IN interface through HD BNC connector (J22). The Video input signals from HD BNC Connector is directly connected to Adaptive Cable Equalizer chip and then connected to PL Bank226 Channel3 GTH receiver of Zynq Ultrascale+ MPSoC through Board to Board Connector2.

The Zynq Ultrascale+ MPSoC Carrier board supports Video Input Lock status LED (D11) for presence and absence of the Video Input signal on HD BNC connector (J22). This LED will glow when the Video Input signal is detected on HD BNC connector (J22). Also PS I2C0 is connected to Adaptive Cable Equalizer chip for control and configuration with I2C address 0x2D. SDI Video IN HD BNC connector (J22) is physically located at the top of the board as shown below.

*Note: By default, 3G Adaptive Cable Equalizer chip “LMH0397” is supported on the board. To support 12G Adaptive Cable Equalizer chip “LMH1297”, contact iWave.*

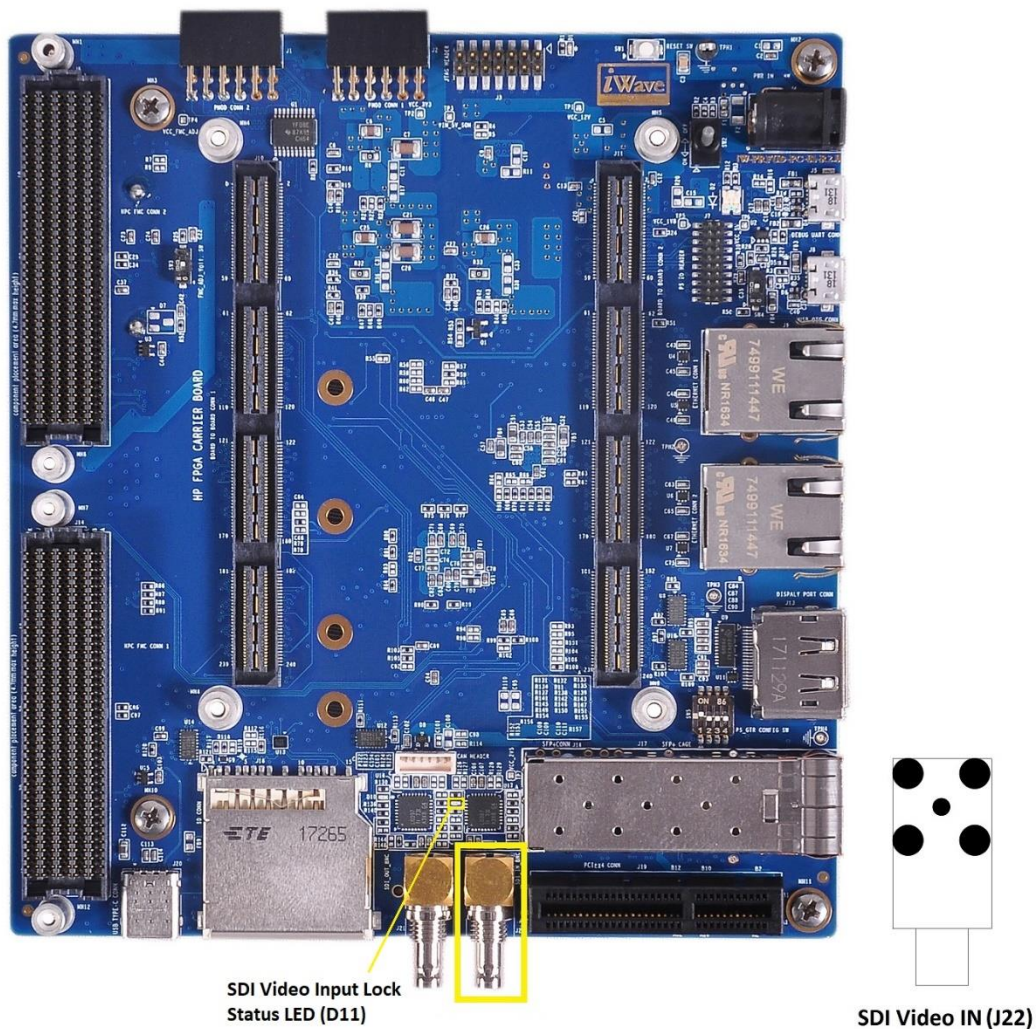


Figure 18: SDI Video IN HD BNC Connector

## 2.5.1.3 SDI Video OUT

The Zynq Ultrascale+ MPSoC Carrier board supports one 3G/12G SDI Video OUT interface through HD BNC connector (J21). Zynq Ultrascale+ MPSoC's PL Bank226 Channel3 GTH transmitter from Board to Board Connector2 is directly connected to Cable Driver chip and then connected to HD BNC Connector (J21) for Video out.

The Zynq Ultrascale+ MPSoC Carrier board supports Video Output Lock status LED (D10). This LED will glow when the video signal from MPSoC GTH transmitter is detected on Cable Driver chip. Also PS I2C0 is connected to Cable Driver chip for control and configuration with I2C address 0x30. SDI Video OUT HD BNC connector (J21) is physically located at the top of the board as shown below.

*Note: By default, 3G Cable Driver chip "LMH0397" is supported on the board. To support 12G Cable Driver chip "LMH1297", contact iWave.*

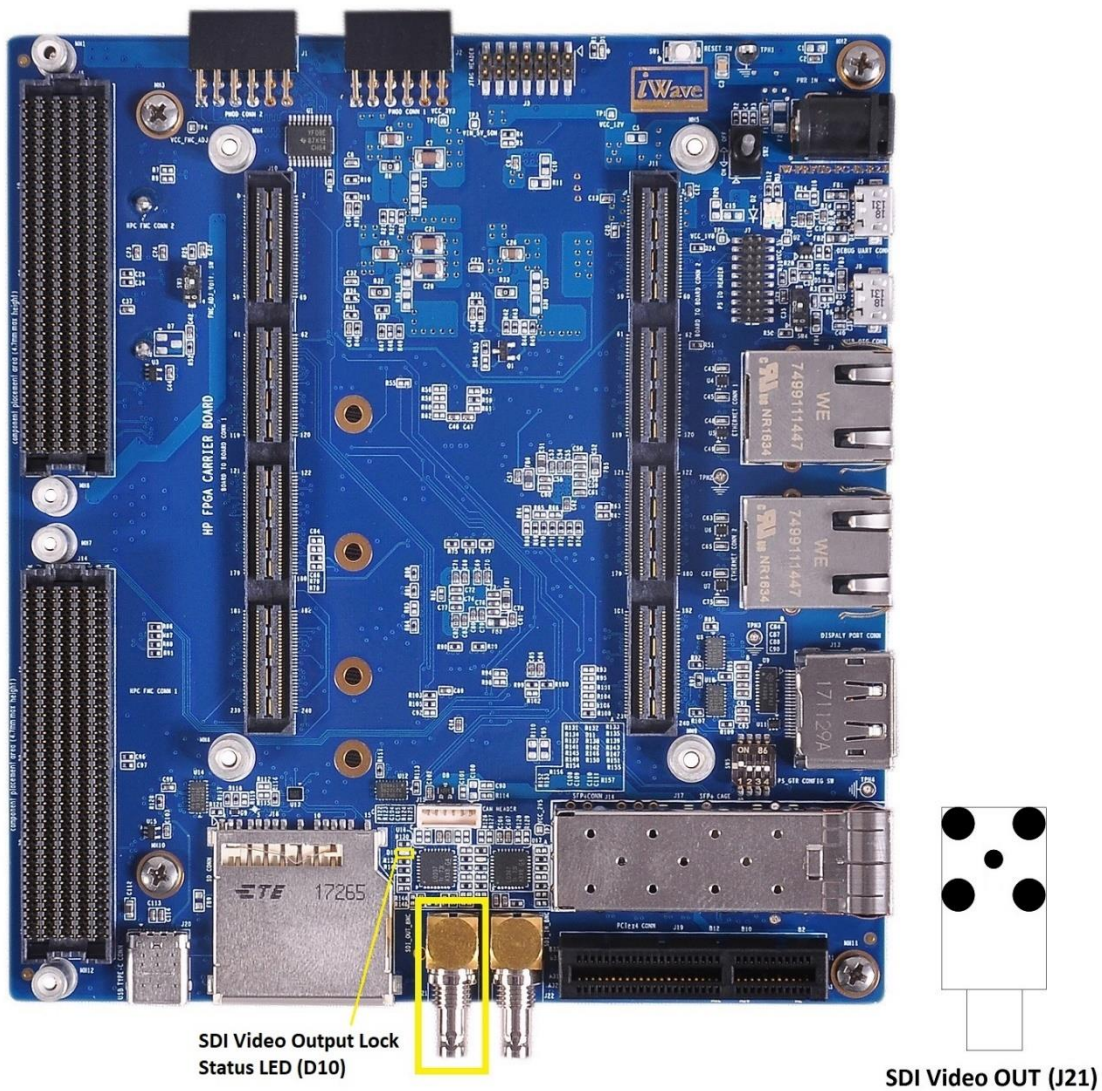


Figure 19: SDI Video OUT HD BNC Connector

## 2.5.2 FMC HPC Connector1

The Zynq Ultrascale+ MPSoC Carrier board supports two 400Pin Standard FMC HPC connectors to support standard ANSI/VITA 57.1 FMC modules. These FMC HPC connectors can accept two Single width FMC modules or one double width FMC module.

The FMC HPC Connector1 (J14) supports the below mentioned interface from Zynq Ultrascale+ MPSoC.

- 8 GTH High Speed Transceivers
- 2 GTH Reference Clock to SoC
- 20 LVDS IOs/40 Single ended (SE) IOs
- 20 Single ended (SE) IOs
- 4 Clock Input Capable LVDS/SE pins
- 2 Clock Output Capable LVDS/SE pins

This 400Pin FMC HPC Connector1 (J14) is physically located at the top of the board as shown below.

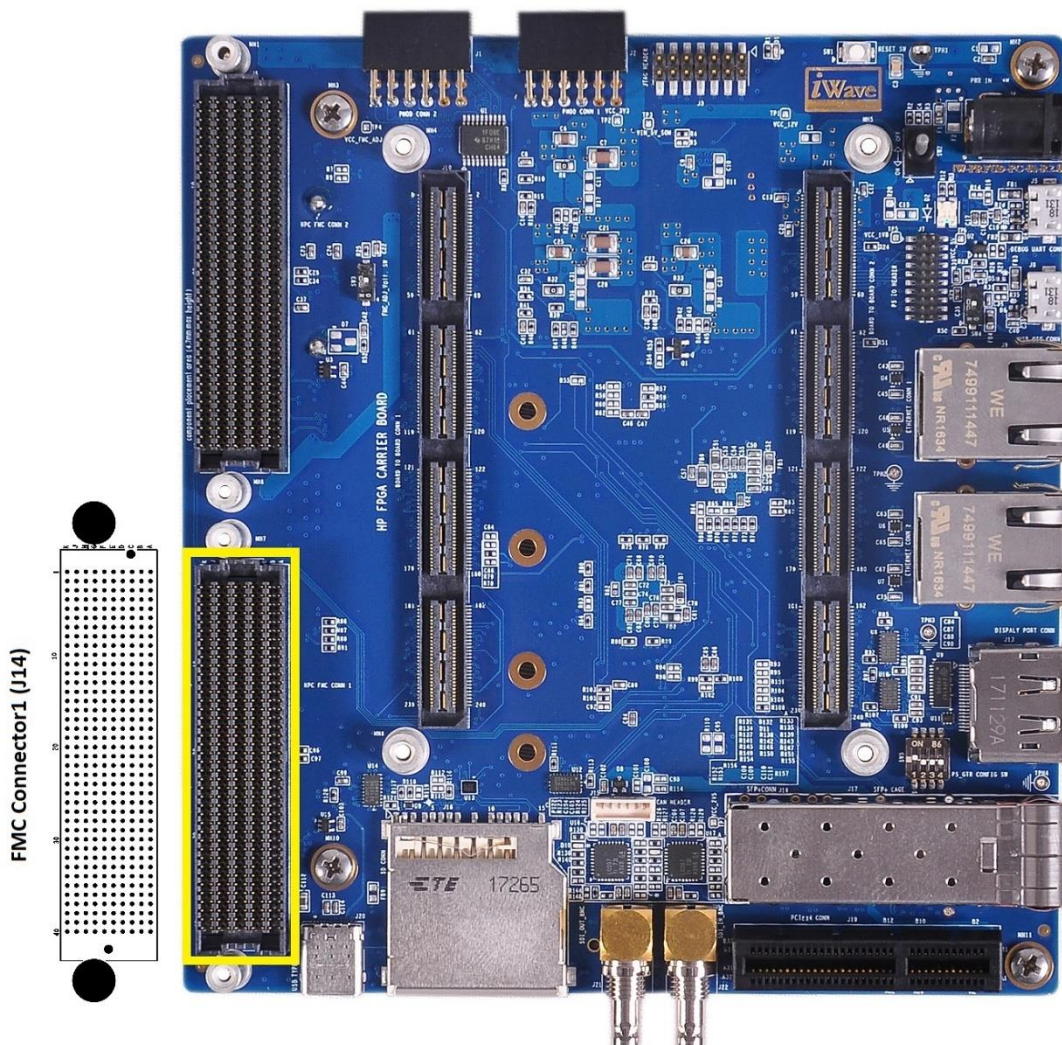


Figure 20: FMC Connector1



This 400Pin FMC HPC Connector1 (J14) pin mapping is shown below.

	K	J	H	G	F	E	D	C	B	A
1	NC	GND	NC	GND	PG_M2C	GND	PG_C2M	GND	NC	GND1
2	GND	CLK3_BIDIR_P	PRSNM2C_L	CLK1_M2C_P	GND	NC	GND	DP0_C2M_P	GND	DP1_M2C_P
3	GND	CLK3_BIDIR_N	GND	CLK1_M2C_N	GND	NC	GND	DP0_C2M_N	GND	DP1_M2C_N
4	NC	GND	NC	GND	HA00_P_CC	GND	GBTCLK0_M2C_P	GND	NC	GND
5	NC	GND	NC	GND	HA00_N_CC	GND	GBTCLK0_M2C_N	GND	NC	GND
6	GND	NC	GND	LA00_P_CC	GND	NC	GND	DP0_M2C_P	GND	DP2_M2C_P
7	NC	NC	LA02_P	LA00_N_CC	NC	NC	GND	DP0_M2C_N	GND	DP2_M2C_N
8	NC	GND	LA02_N	GND	NC	GND	LA01_P_CC	GND	NC	GND
9	GND	NC	GND	LA03_P	GND	NC	LA01_N_CC	GND	NC	GND
10	NC	NC	LA04_P	LA03_N	NC	NC	GND	LA06_P	GND	DP3_M2C_P
11	NC	GND	LA04_N	GND	NC	GND	LA05_P	LA06_N	GND	DP3_M2C_N
12	GND	NC	GND	LA08_P	GND	NC	LA05_N	GND	DP7_M2C_P	GND
13	NC	NC	LA07_P	LA08_N	NC	NC	GND	GND	DP7_M2C_N	GND
14	NC	GND	LA07_N	GND	NC	GND	LA09_P	LA10_P	GND	DP4_M2C_P
15	GND	NC	GND	LA12_P	GND	NC	LA09_N	LA10_N	GND	DP4_M2C_N
16	NC	NC	LA11_P	LA12_N	NC	NC	GND	GND	DP6_M2C_P	GND
17	NC	GND	LA11_N	GND	NC	GND	LA13_P	GND	DP6_M2C_N	GND
18	GND	NC	GND	LA16_P	GND	NC	LA13_N	LA14_P	GND	DP5_M2C_P
19	NC	NC	LA15_P	LA16_N	NC	NC	GND	LA14_N	GND	DP5_M2C_N
20	NC	GND	LA15_N	GND	NC	GND	LA17_P_CC	GND	GBTCLK1_M2C_P	GND
21	GND	NC	GND	LA20_P	GND	NC	LA17_N_CC	GND	GBTCLK1_M2C_N	GND
22	NC	NC	LA19_P	LA20_N	NC	NC	GND	LA18_P_CC	GND	DP1_C2M_P
23	NC	GND	LA19_N	GND	NC	GND	LA23_P	LA18_N_CC	GND	DP1_C2M_N
24	GND	NC	GND	LA22_P	GND	NC	LA23_N	GND	NC	GND
25	NC	NC	LA21_P	LA22_N	NC	NC	GND	GND	NC	GND
26	NC	GND	LA21_N	GND	NC	GND	LA26_P	LA27_P	GND	DP2_C2M_P
27	GND	NC	GND	LA25_P	GND	NC	LA26_N	LA27_N	GND	DP2_C2M_N
28	NC	NC	LA24_P	LA25_N	NC	NC	GND	GND	NC	GND
29	NC	GND	LA24_N	GND	NC	GND	TCK	GND	NC	GND
30	GND	NC	GND	LA29_P	GND	NC	TDI	SCL	GND	DP3_C2M_P
31	NC	NC	LA28_P	LA29_N	NC	NC	TDO	SDA	GND	DP3_C2M_N
32	NC	GND	LA28_N	GND	NC	GND	3P3VAUX	GND	DP7_C2M_P	GND
33	GND	NC	GND	LA31_P	GND	NC	TMS	GND	DP7_C2M_N	GND
34	NC	NC	LA30_P	LA31_N	NC	NC	TRST_L	GA0	GND	DP4_C2M_P
35	NC	GND	LA30_N	GND	NC	GND	GA1	12P0V	GND	DP4_C2M_N
36	GND	NC	GND	LA33_P	GND	NC	3P3V	GND	DP6_C2M_P	GND
37	NC	NC	LA32_P	LA33_N	NC	NC	GND	12P0V	DP6_C2M_N	GND
38	NC	GND	LA32_N	GND	NC	GND	3P3V	GND	GND	DP5_C2M_P
39	GND	NC	GND	VADJ	GND	VADJ	GND	3P3V	GND	DP5_C2M_N
40	NC	GND	VADJ	GND15	VADJ	GND	3P3V	GND	NC	GND

Figure 21: FMC HPC Connector1 Pin Out

Table 10: FMC HPC Connector1 Pin Assignment

SL No	FMC Connector VITA		Board to Board Connectors			Zynq Ultrascale+ MPSoC			Description
	FMC Connector1 Pin No	FMC Connector1 Pin Name	Board to Board Connector Number	Board to Board Connector Pin Number	Signal Name	MPSoC Bank	MPSoC Pin No	Signal Type/ Termination*	
1	A1	GND	NA	NA	GND	NA	NA	Power	Ground.
2	A2	DP1_M2C_P	Board to Board Connector 1	17	GTHRXP1_223	223	U4	I, DIFF	GTH Bank223 channel1 High speed differential receiver positive.
3	A3	DP1_M2C_N	Board to Board Connector 1	15	GTHRXN1_223	223	U3	I, DIFF	GTH Bank223 channel1 High speed differential receiver negative.
4	A4	GND	NA	NA	GND	NA	NA	Power	Ground.
5	A5	GND	NA	NA	GND	NA	NA	Power	Ground.
6	A6	DP2_M2C_P	Board to Board Connector 1	57	GTHRXP2_223	223	T2	I, DIFF	GTH Bank223 channel2 High speed differential receiver positive.
7	A7	DP2_M2C_N	Board to Board Connector 1	55	GTHRXN2_223	223	T1	I, DIFF	GTH Bank223 channel2 High speed differential receiver negative.
8	A8	GND	NA	NA	GND	NA	NA	Power	Ground.
9	A9	GND	NA	NA	GND	NA	NA	Power	Ground.
10	A10	DP3_M2C_P	Board to Board Connector 1	51	GTHRXP3_223	223	P2	I, DIFF	GTH Bank223 channel3 High speed differential receiver positive.
11	A11	DP3_M2C_N	Board to Board Connector 1	49	GTHRXN3_223	223	P1	I, DIFF	GTH Bank223 channel3 High speed differential receiver negative.
12	A12	GND	NA	NA	GND	NA	NA	Power	Ground.
12	A13	GND	NA	NA	GND	NA	NA	Power	Ground.
14	A14	DP4_M2C_P	Board to Board Connector 1	117	GTHRXP0_224	223	N4	I, DIFF	GTH Bank224 channel0 High speed differential receiver positive.
15	A15	DP4_M2C_N	Board to Board Connector 1	115	GTHRXN0_224	223	N3	I, DIFF	GTH Bank224 channel0 High speed differential receiver negative.
16	A16	GND	NA	NA	GND	NA	NA	Power	Ground.
17	A17	GND	NA	NA	GND	NA	NA	Power	Ground.
18	A18	DP5_M2C_P	Board to Board Connector 1	111	GTHRXP1_224	224	M2	I, DIFF	GTH Bank224 channel1 High speed differential receiver positive.
19	A19	DP5_M2C_N	Board to Board Connector 1	109	GTHRXN1_224	224	M1	I, DIFF	GTH Bank224 channel1 High speed differential receiver negative.
20	A20	GND	NA	NA	GND	NA	NA	Power	Ground.
21	A21	GND	NA	NA	GND	NA	NA	Power	Ground.
22	A22	DP1_C2M_P	Board to Board Connector 1	9	GTHTXP1_223	223	V6	O, DIFF	GTH Bank223 channel1 High speed differential transmitter positive.
23	A23	DP1_C2M_N	Board to Board Connector 1	11	GTHTXN1_223	223	V5	O, DIFF	GTH Bank223 channel1 High speed differential transmitter negative.
24	A24	GND	NA	NA	GND	NA	NA	Power	Ground.
25	A25	GND	NA	NA	GND	NA	NA	Power	Ground.

SL No	FMC Connector VITA		Board to Board Connectors			Zynq Ultrascale+ MPSoC			Description
	FMC Connector1 Pin No	FMC Connector1 Pin Name	Board to Board Connector Number	Board to Board Connector Pin Number	Signal Name	MPSoC Bank	MPSoC Pin No	Signal Type/ Termination*	
26	A26	DP2_C2M_P	Board to Board Connector 1	37	GTHTXP2_223	223	T6	O, DIFF	GTH Bank223 channel2 High speed differential transmitter positive.
27	A27	DP2_C2M_N	Board to Board Connector 1	39	GTHTXN2_223	223	T5	O, DIFF	GTH Bank223 channel2 High speed differential transmitter negative.
28	A28	GND	NA	NA	GND	NA	NA	Power	Ground.
29	A29	GND	NA	NA	GND	NA	NA	Power	Ground.
30	A30	DP3_C2M_P	Board to Board Connector 1	43	GTHTXP3_223	223	R4	O, DIFF	GTH Bank223 channel3 High speed differential transmitter positive.
31	A31	DP3_C2M_N	Board to Board Connector 1	45	GTHTXN3_223	223	R3	O, DIFF	GTH Bank223 channel3 High speed differential transmitter negative.
32	A32	GND	NA	NA	GND	NA	NA	Power	Ground.
33	A33	GND	NA	NA	GND	NA	NA	Power	Ground.
34	A34	DP4_C2M_P	Board to Board Connector 1	97	GTHTXP0_224	224	P6	O, DIFF	GTH Bank224 channel0 High speed differential transmitter positive.
35	A35	DP4_C2M_N	Board to Board Connector 1	99	GTHTXN0_224	224	P5	O, DIFF	GTH Bank224 channel0 High speed differential transmitter negative.
36	A36	GND	NA	NA	GND	NA	NA	Power	Ground.
37	A37	GND	NA	NA	GND	NA	NA	Power	Ground.
38	A38	DP5_C2M_P	Board to Board Connector 1	103	GTHTXP1_224	224	M6	O, DIFF	GTH Bank224 channel1 High speed differential transmitter positive.
39	A39	DP5_C2M_N	Board to Board Connector 1	105	GTHTXN1_224	224	M5	O, DIFF	GTH Bank224 channel1 High speed differential transmitter negative.
40	A40	GND	NA	NA	GND	NA	NA	Power	Ground.
41	B1	CLK_DIR	NA	NA	NA	NA	NA	NA	NC.
42	B2	GND	NA	NA	GND	NA	NA	Power	Ground.
43	B3	GND	NA	NA	GND	NA	NA	Power	Ground.
44	B4	DP9_M2C_P	NA	NA	NA	NA	NA	NA	NC.
45	B5	DP9_M2C_N	NA	NA	NA	NA	NA	NA	NC.
46	B6	GND	NA	NA	GND	NA	NA	Power	Ground.
47	B7	GND	NA	NA	GND	NA	NA	Power	Ground.
48	B8	DP8_M2C_P	NA	NA	NA	NA	NA	NA	NC.
49	B9	DP8_M2C_N	NA	NA	NA	NA	NA	NA	NC.
50	B10	GND	NA	NA	GND	NA	NA	Power	Ground.
51	B11	GND	NA	NA	GND	NA	NA	Power	Ground.
52	B12	DP7_M2C_P	Board to Board Connector 1	137	GTHRXP3_224	224	J4	I, DIFF	GTH Bank224 channel3 High speed differential receiver positive.
53	B13	DP7_M2C_N	Board to Board Connector 1	135	GTHRXN3_224	224	J3	I, DIFF	GTH Bank224 channel3 High speed differential receiver negative.
54	B14	GND	NA	NA	GND	NA	NA	Power	Ground.
55	B15	GND	NA	NA	GND	NA	NA	Power	Ground.

SL No	FMC Connector VITA		Board to Board Connectors			Zynq Ultrascale+ MPSoC			Description
	FMC Connector1 Pin No	FMC Connector1 Pin Name	Board to Board Connector Number	Board to Board Connector Pin Number	Signal Name	MPSoC Bank	MPSoC Pin No	Signal Type/Termination*	
56	B16	DP6_M2C_P	Board to Board Connector 1	143	GTHRXP2_224	224	K2	I, DIFF	GTH Bank224 channel2 High speed differential receiver positive.
57	B17	DP6_M2C_N	Board to Board Connector 1	141	GTHRXN2_224	224	K1	I, DIFF	GTH Bank224 channel2 High speed differential receiver negative.
58	B18	GND	NA	NA	GND	NA	NA	Power	Ground.
59	B19	GND	NA	NA	GND	NA	NA	Power	Ground.
60	B20	GBTCLK1_M2C_P	Board to Board Connector 1	98	GTREFCLKOP_224	224	L8	I, DIFF	GTH Bank224 differential reference clock0 positive.
61	B21	GBTCLK1_M2C_N	Board to Board Connector 1	100	GTREFCLKON_224	224	L7	I, DIFF	GTH Bank224 differential reference clock0 negative.
62	B22	GND	NA	NA	GND	NA	NA	Power	Ground.
63	B23	GND	NA	NA	GND	NA	NA	Power	Ground.
64	B24	DP9_C2M_P	NA	NA	NA	NA	NA	NA	NC.
65	B25	DP9_C2M_N	NA	NA	NA	NA	NA	NA	NC.
66	B26	GND	NA	NA	GND	NA	NA	Power	Ground.
67	B27	GND	NA	NA	GND	NA	NA	Power	Ground.
68	B28	DP8_C2M_P	NA	NA	NA	NA	NA	NA	NC.
69	B29	DP8_C2M_N	NA	NA	NA	NA	NA	NA	NC.
70	B30	GND	NA	NA	GND	NA	NA	Power	Ground.
71	B31	GND	NA	NA	GND	NA	NA	Power	Ground.
72	B32	DP7_C2M_P	Board to Board Connector 1	129	GTHTXP3_224	224	K6	O, DIFF	GTH Bank224 channel3 High speed differential transmitter positive.
73	B33	DP7_C2M_N	Board to Board Connector 1	131	GTHTXN3_224	224	K5	O, DIFF	GTH Bank224 channel3 High speed differential transmitter negative.
74	B34	GND	NA	NA	GND	NA	NA	Power	Ground.
75	B35	GND	NA	NA	GND	NA	NA	Power	Ground.
76	B36	DP6_C2M_P	Board to Board Connector 1	123	GTHTXP2_224	224	L4	O, DIFF	GTH Bank224 channel2 High speed differential transmitter positive.
77	B37	DP6_C2M_N	Board to Board Connector 1	125	GTHTXN2_224	224	L3	O, DIFF	GTH Bank224 channel2 High speed differential transmitter negative.
78	B38	GND	NA	NA	GND	NA	NA	Power	Ground.
79	B39	GND	NA	NA	GND	NA	NA	Power	Ground.
80	B40	RES0	NA	NA	NA	NA	NA	NA	NC.
81	C1	GND	NA	NA	GND	NA	NA	Power	Ground.
82	C2	DP0_C2M_P	Board to Board Connector 1	3	GTHTXP0_223	223	W4	O, DIFF	GTH Bank223 channel0 High speed differential transmitter positive.
83	C3	DP0_C2M_N	Board to Board Connector 1	5	GTHTXN0_223	223	W3	O, DIFF	GTH Bank223 channel0 High speed differential transmitter negative.
84	C4	GND	NA	NA	GND	NA	NA	Power	Ground.

SL No	FMC Connector VITA		Board to Board Connectors			Zynq Ultrascale+ MPSoC			Description
	FMC Connector1 Pin No	FMC Connector1 Pin Name	Board to Board Connector Number	Board to Board Connector Pin Number	Signal Name	MPSoC Bank	MPSoC Pin No	Signal Type/ Termination*	
85	C5	GND	NA	NA	GND	NA	NA	Power	Ground.
86	C6	DP0_M2C_P	Board to Board Connector 1	23	GTHRXPO_223	223	V2	I, DIFF	GTH Bank223 channel0 High speed differential receiver positive.
87	C7	DP0_M2C_N	Board to Board Connector 1	21	GTHRXNO_223	223	V1	I, DIFF	GTH Bank223 channel0 High speed differential receiver negative.
88	C8	GND	NA	NA	GND	NA	NA	Power	Ground.
89	C9	GND	NA	NA	GND	NA	NA	Power	Ground.
90	C10	LA06_P	Board to Board Connector 2	139	PL_AD5_LVDS66_L15 P	66	AD5	IO, 1.8V	PL HP Bank66 IO15 differential positive.
91	C11	LA06_N	Board to Board Connector 2	141	PL_AE5_LVDS66_L15 N	66	AE5	IO, 1.8V	PL HP Bank66 IO15 differential negative.
92	C12	GND	NA	NA	GND	NA	NA	Power	Ground.
93	C13	GND	NA	NA	GND	NA	NA	Power	Ground.
94	C14	LA10_P	Board to Board Connector 2	147	PL_AE18_LVDS64_L2 4P	64	AE18	IO, 1.8V	PL HP Bank64 IO24 differential positive.
95	C15	LA10_N	Board to Board Connector 2	149	PL_AF18_LVDS64_L2 4N	64	AF18	IO, 1.8V	PL HP Bank64 IO24 differential negative.
96	C16	GND	NA	NA	GND	NA	NA	Power	Ground.
97	C17	GND	NA	NA	GND	NA	NA	Power	Ground.
98	C18	LA14_P	Board to Board Connector 2	156	PL_AJ14_LVDS64_L9 P	64	AJ14	IO, 1.8V	PL HP Bank64 IO9 differential positive.
99	C19	LA14_N	Board to Board Connector 2	158	PL_AK14_LVDS64_L9 N	64	AK14	IO, 1.8V	PL HP Bank64 IO9 differential negative.
100	C20	GND	NA	NA	GND	NA	NA	Power	Ground.
101	C21	GND	NA	NA	GND	NA	NA	Power	Ground.
102	C22	LA18_P_CC	Board to Board Connector 1	84	PL_F16_LVDS45_L6P_HDGC	45	F16	IO, 1.8V	PL HD Bank45 IO6 differential positive.
103	C23	LA18_N_CC	Board to Board Connector 1	82	PL_F15_LVDS45_L6N_HDGC	45	F15	IO, 1.8V	PL HD Bank45 IO6 differential negative.
104	C24	GND	NA	NA	GND	NA	NA	Power	Ground.
105	C25	GND	NA	NA	GND	NA	NA	Power	Ground.
106	C26	LA27_P	Board to Board Connector 2	110	PL_AA8_LVDS66_L12 P_GC	66	AA8	IO, 1.8V	PL HP Bank66 IO12 differential positive.
107	C27	LA27_N	Board to Board Connector 2	112	PL_AB8_LVDS66_L12 N_GC	66	AB8	IO, 1.8V	PL HP Bank66 IO12 differential negative.
108	C28	GND	NA	NA	GND	NA	NA	Power	Ground.
109	C29	GND	NA	NA	GND	NA	NA	Power	Ground.
110	C30	SCL	Board to Board Connector 2	48	I2CO_SCL(PS_MIO10_500)	500	F18	O, 3.3V LVCMOS	I2CO Clock Signal.
111	C31	SDA	Board to Board Connector 2	46	I2CO_SDA(PS_MIO11_500)	500	G18	IO, 3.3V LVCMOS	I2CO Data Signal.

SL No	FMC Connector VITA		Board to Board Connectors			Zynq Ultrascale+ MPSoC			Description
	FMC Connector1 Pin No	FMC Connector1 Pin Name	Board to Board Connector Number	Board to Board Connector Pin Number	Signal Name	MPSoC Bank	MPSoC Pin No	Signal Type/ Termination*	
112	C32	GND	NA	NA	GND	NA	NA	Power	Ground.
113	C33	GND	NA	NA	GND	NA	NA	Power	Ground.
114	C34	GA0	NA	NA	GA0	NA	NA	1K, 3.3V PU	Geographical address 0
115	C35	12P0V	NA	NA	VCC_12V	NA	NA	O, 12V Power	12V Supply Voltage.
116	C36	GND	NA	NA	GND	NA	NA	Power	Ground.
117	C37	12P0V	NA	NA	VCC_12V	NA	NA	O, 12V Power	12V Supply Voltage.
118	C38	GND	NA	NA	GND	NA	NA	Power	Ground.
119	C39	3P3V	NA	NA	VCC_3V3	NA	NA	O, 3.3V Power	3.3V Supply Voltage.
120	C40	GND	NA	NA	GND	NA	NA	Power	Ground.
121	D1	PG_C2M	NA	NA	PG_C2M	NA	NA	I, 3.3V	Power Good Signal from Carrier to FMC Module.
122	D2	GND	NA	NA	GND	NA	NA	Power	Ground.
123	D3	GND	NA	NA	GND	NA	NA	Power	Ground.
124	D4	GBTCLKO_M2C_P	Board to Board Connector 1	4	GTREFCLKOP_223	223	R8	I, DIFF	GTH Bank223 differential reference clock0 positive.
125	D5	GBTCLKO_M2C_N	Board to Board Connector 1	6	GTREFCLKON_223	223	R7	I, DIFF	GTH Bank223 differential reference clock0 negative.
126	D6	GND	NA	NA	GND	NA	NA	Power	Ground.
127	D7	GND	NA	NA	GND	NA	NA	Power	Ground.
128	D8	LA01_P_CC	Board to Board Connector 2	176	PL_AG14_LVDS64_L1 1P_GC	64	AG14	IO, 1.8V	PL HP Bank64 IO11 differential positive.
129	D9	LA01_N_CC	Board to Board Connector 2	178	PL_AH14_LVDS64_L1 1N_GC	64	AH14	IO, 1.8V	PL HP Bank64 IO11 differential negative.
130	D10	GND	NA	NA	GND	NA	NA	Power	Ground.
131	D11	LA05_P	Board to Board Connector 2	145	PL_AC3_LVDS66_L21 P	66	AC3	IO, 1.8V	PL HP Bank66 IO21 differential positive.
132	D12	LA05_N	Board to Board Connector 2	143	PL_AC2_LVDS66_L21 N	66	AC2	IO, 1.8V	PL HP Bank66 IO21 differential negative.
133	D13	GND	NA	NA	GND	NA	NA	Power	Ground.
134	D14	LA09_P	Board to Board Connector 2	159	PL_AK17_LVDS64_L2 2P_DBC	64	AK17	IO, 1.8V	PL HP Bank64 IO22 differential positive.
135	D15	LA09_N	Board to Board Connector 2	161	PL_AK18_LVDS64_L2 2N_DBC	64	AK18	IO, 1.8V	PL HP Bank64 IO22 differential negative.
136	D16	GND	NA	NA	GND	NA	NA	Power	Ground.
137	D17	LA13_P	Board to Board Connector 2	155	PL_AJ16_LVDS64_L2 0P	64	AJ16	IO, 1.8V	PL HP Bank64 IO20 differential positive.
138	D18	LA13_N	Board to Board Connector 2	157	PL_AK16_LVDS64_L2 0N	64	AK16	IO, 1.8V	PL HP Bank64 IO20 differential negative.
139	D19	GND	NA	NA	GND	NA	NA	Power	Ground.
140	D20	LA17_P_CC	Board to Board Connector 1	58	PL_E17_LVDS45_L7P _HDGC	45	E17	IO, 1.8V	PL HD Bank45 IO7 differential positive.

SL No	FMC Connector VITA		Board to Board Connectors			Zynq Ultrascale+ MPSoC			Description
	FMC Connector1 Pin No	FMC Connector1 Pin Name	Board to Board Connector Number	Board to Board Connector Pin Number	Signal Name	MPSoC Bank	MPSoC Pin No	Signal Type/ Termination*	
141	D21	LA17_N_CC	Board to Board Connector 1	56	PL_D17_LVDS45_L7 N_HDGC	45	D17	IO, 1.8V	PL HD Bank45 IO7 differential negative.
142	D22	GND	NA	NA	GND	NA	NA	Power	Ground.
143	D23	LA23_P	Board to Board Connector 2	162	PL_AA15_LVDS64_L5 P	64	AA15	IO, 1.8V	PL HP Bank64 IO5 differential positive.
144	D24	LA23_N	Board to Board Connector 2	160	PL_AB15_LVDS64_L5 N	64	AB15	IO, 1.8V	PL HP Bank64 IO5 differential negative.
145	D25	GND	NA	NA	GND	NA	NA	Power	Ground.
146	D26	LA26_P	Board to Board Connector 1	91	PL_K13_LVDS46_L2P	46	K13	IO, 1.8V	PL HD Bank46 IO2 differential positive.
147	D27	LA26_N	Board to Board Connector 1	93	PL_J12_LVDS46_L2N	46	J12	IO, 1.8V	PL HD Bank46 IO2 differential negative.
148	D28	GND	NA	NA	GND	NA	NA	Power	Ground.
149	D29	TCK	Board to Board Connector 2	31	PS_JTAG_TCK	503	L19	I, 3.3V CMOS	JTAG Test Clock.
150	D30	TDI	Board to Board Connector 2	27	PS_JTAG_TDO	503	L20	I, 3.3V CMOS	JTAG Test Data Output.
151	D31	TDO	Board to Board Connector 2	33	PS_JTAG_TDI	503	M20	O, 3.3V CMOS	JTAG Test Data Input.
152	D32	3P3VAUX	NA	NA	3V3_AUX1	NA	NA	O, 3.3V Power	Auxiliary Supply Voltage.
153	D33	TMS	Board to Board Connector 2	29	PS_JTAG_TMS	503	L21	I, 3.3V CMOS	JTAG Test Mode Select.
154	D34	TRST_L	Board to Board Connector 2	25	PS_JTAG_TRST	NA	NA	I, 3.3V CMOS	JTAG Reset.
155	D35	GA1	NA	NA	GA1	NA	NA	1K, PD	Geographical address 1
156	D36	3P3V	NA	NA	VCC_3V3	NA	NA	O, 3.3V Power	3.3V Supply Voltage.
157	D37	GND	NA	NA	GND	NA	NA	Power	Ground.
158	D38	3P3V	NA	NA	VCC_3V3	NA	NA	O, 3.3V Power	3.3V Supply Voltage.
159	D39	GND	NA	NA	GND	NA	NA	Power	Ground.
160	D40	3P3V	NA	NA	VCC_3V3	NA	NA	O, 3.3V Power	3.3V Supply Voltage.
161	E1	GND	NA	NA	GND	NA	NA	Power	Ground.
162	E2	HA01_P_CC	NA	NA	NA	NA	NA	NA	NC.
163	E3	HA01_N_CC	NA	NA	NA	NA	NA	NA	NC.
164	E4	GND	NA	NA	GND	NA	NA	Power	Ground.
165	E5	GND	NA	NA	GND	NA	NA	Power	Ground.
166	E6	HA05_P	NA	NA	NA	NA	NA	NA	NC.
167	E7	HA05_N	NA	NA	NA	NA	NA	NA	NC.
168	E8	GND	NA	NA	GND	NA	NA	Power	Ground.
169	E9	HA09_P	NA	NA	NA	NA	NA	NA	NC.
170	E10	HA09_N	NA	NA	NA	NA	NA	NA	NC.
171	E11	GND	NA	NA	GND	NA	NA	Power	Ground.
172	E12	HA13_P	NA	NA	NA	NA	NA	NA	NC.
173	E13	HA13_N	NA	NA	NA	NA	NA	NA	NC.
174	E14	GND	NA	NA	GND	NA	NA	Power	Ground.
175	E15	HA16_P	NA	NA	NA	NA	NA	NA	NC.
176	E16	HA16_N	NA	NA	NA	NA	NA	NA	NC.
177	E17	GND	NA	NA	GND	NA	NA	Power	Ground.
178	E18	HA20_P	NA	NA	NA	NA	NA	NA	NC.

SL No	FMC Connector VITA		Board to Board Connectors			Zynq Ultrascale+ MPSoC			Description
	FMC Connector1 Pin No	FMC Connector1 Pin Name	Board to Board Connector Number	Board to Board Connector Pin Number	Signal Name	MPSoC Bank	MPSoC Pin No	Signal Type/ Termination*	
179	E19	HA20_N	NA	NA	NA	NA	NA	NA	NC.
180	E20	GND	NA	NA	GND	NA	NA	Power	Ground.
181	E21	HB03_P	NA	NA	NA	NA	NA	NA	NC.
182	E22	HB03_N	NA	NA	NA	NA	NA	NA	NC.
183	E23	GND	NA	NA	GND	NA	NA	Power	Ground.
184	E24	HB05_P	NA	NA	NA	NA	NA	NA	NC.
185	E25	HB05_N	NA	NA	NA	NA	NA	NA	NC.
186	E26	GND	NA	NA	GND	NA	NA	Power	Ground.
187	E27	HB09_P	NA	NA	NA	NA	NA	NA	NC.
188	E28	HB09_N	NA	NA	NA	NA	NA	NA	NC.
189	E29	GND	NA	NA	GND	NA	NA	Power	Ground.
190	E30	HB13_P	NA	NA	NA	NA	NA	NA	NC.
191	E31	HB13_N	NA	NA	NA	NA	NA	NA	NC.
192	E32	GND	NA	NA	GND	NA	NA	Power	Ground.
193	E33	HB19_P	NA	NA	NA	NA	NA	NA	NC.
194	E34	HB19_N	NA	NA	NA	NA	NA	NA	NC.
195	E35	GND	NA	NA	GND	NA	NA	Power	Ground.
196	E36	HB21_P	NA	NA	NA	NA	NA	NA	NC.
197	E37	HB21_N	NA	NA	NA	NA	NA	NA	NC.
198	E38	GND	NA	NA	GND	NA	NA	Power	Ground.
199	E39	VADJ	NA	NA	VCC_FMC_ADJ	NA	NA	O, 1.8V Power	1.8V Supply Voltage.
200	E40	GND	NA	NA	GND	NA	NA	Power	Ground.
201	F1	PG_M2C	NA	NA	IOEXP_P17_PG_M2C 1	NA	NA	O,3.3V/ 10K PU	Power Good Signal from FMC Module to Carrier.
202	F2	GND	NA	NA	GND	NA	NA	Power	Ground.
203	F3	GND	NA	NA	GND	NA	NA	Power	Ground.
204	F4	HA00_P_CC	Board to Board Connector 1	130	PL_E14_LVDS46_L7P_HDGC	46	E14	IO, 1.8V	PL HD Bank46 IO7 differential positive.
205	F5	HA00_N_CC	Board to Board Connector 1	132	PL_E13_LVDS46_L7N_HDGC	46	E13	IO, 1.8V	PL HD Bank46 IO7 differential negative.
206	F6	GND	NA	NA	GND	NA	NA	Power	Ground.
207	F7	HA04_P	NA	NA	NA	NA	NA	NA	NC.
208	F8	HA04_N	NA	NA	NA	NA	NA	NA	NC.
209	F9	GND	NA	NA	GND	NA	NA	Power	Ground.
210	F10	HA08_P	NA	NA	NA	NA	NA	NA	NC.
211	F11	HA08_N	NA	NA	NA	NA	NA	NA	NC.
212	F12	GND	NA	NA	GND	NA	NA	Power	Ground.
213	F13	HA12_P	NA	NA	NA	NA	NA	NA	NC.
214	F14	HA12_N	NA	NA	NA	NA	NA	NA	NC.
215	F15	GND	NA	NA	GND	NA	NA	Power	Ground.
216	F16	HA15_P	NA	NA	NA	NA	NA	NA	NC.



SL No	FMC Connector VITA		Board to Board Connectors			Zynq Ultrascale+ MPSoC			Description
	FMC Connector1 Pin No	FMC Connector1 Pin Name	Board to Board Connector Number	Board to Board Connector Pin Number	Signal Name	MPSoC Bank	MPSoC Pin No	Signal Type/Termination*	
217	F17	HA15_N	NA	NA	NA	NA	NA	NA	NC.
218	F18	GND	NA	NA	GND	NA	NA	Power	Ground.
219	F19	HA19_P	NA	NA	NA	NA	NA	NA	NC.
220	F20	HA19_N	NA	NA	NA	NA	NA	NA	NC.
221	F21	GND	NA	NA	GND	NA	NA	Power	Ground.
222	F22	HB02_P	NA	NA	NA	NA	NA	NA	NC.
223	F23	HB02_N	NA	NA	NA	NA	NA	NA	NC.
224	F24	GND	NA	NA	GND	NA	NA	Power	Ground.
225	F25	HB04_P	NA	NA	NA	NA	NA	NA	NC.
226	F26	HB04_N	NA	NA	NA	NA	NA	NA	NC.
227	F27	GND	NA	NA	GND	NA	NA	Power	Ground.
228	F28	HB08_P	NA	NA	NA	NA	NA	NA	NC.
229	F29	HB08_N	NA	NA	NA	NA	NA	NA	NC.
230	F30	GND	NA	NA	GND	NA	NA	Power	Ground.
231	F31	HB12_P	NA	NA	NA	NA	NA	NA	NC.
232	F32	HB12_N	NA	NA	NA	NA	NA	NA	NC.
233	F33	GND	NA	NA	GND	NA	NA	Power	Ground.
234	F34	HB16_P	NA	NA	NA	NA	NA	NA	NC.
235	F35	HB16_N	NA	NA	NA	NA	NA	NA	NC.
236	F36	GND	NA	NA	GND	NA	NA	Power	Ground.
237	F37	HB20_P	NA	NA	NA	NA	NA	NA	NC.
238	F38	HB20_N	NA	NA	NA	NA	NA	NA	NC.
239	F39	GND	NA	NA	GND	NA	NA	Power	Ground.
240	F40	VADJ	NA	NA	VCC_FMC_ADJ	NA	NA	O, 1.8V Power	1.8V Supply Voltage.
241	G1	GND	NA	NA	GND	NA	NA	Power	Ground.
242	G2	CLK1_M2C_P	Board to Board Connector 2	169	PL_AD17_LVDS64_L1 4P_GC	64	AD17	IO, 1.8V	PL HP Bank64 IO14 differential positive.
243	G3	CLK1_M2C_N	Board to Board Connector 2	171	PL_AE17_LVDS64_L1 4N_GC	64	AE17	IO, 1.8V	PL HP Bank64 IO14 differential negative.
244	G4	GND	NA	NA	GND	NA	NA	Power	Ground.
245	G5	GND	NA	NA	GND	NA	NA	Power	Ground.
246	G6	LA00_P_CC	Board to Board Connector 2	175	PL_AF15_LVDS64_L1 2P_GC	64	AF15	IO, 1.8V	PL HP Bank64 IO12 differential positive.
247	G7	LA00_N_CC	Board to Board Connector 2	177	PL_AG15_LVDS64_L1 2N_GC	64	AG15	IO, 1.8V	PL HP Bank64 IO12 differential negative.
248	G8	GND	NA	NA	GND	NA	NA	Power	Ground.
249	G9	LA03_P	Board to Board Connector 2	135	PL_AD19_LVDS64_L1 8P	64	AD19	IO, 1.8V	PL HP Bank64 IO18 differential positive.
250	G10	LA03_N	Board to Board Connector 2	137	PL_AE19_LVDS64_L1 8N	64	AE19	IO, 1.8V	PL HP Bank64 IO18 differential negative.
251	G11	GND	NA	NA	GND	NA	NA	Power	Ground.

SL No	FMC Connector VITA		Board to Board Connectors			Zynq Ultrascale+ MPSoC			Description
	FMC Connector1 Pin No	FMC Connector1 Pin Name	Board to Board Connector Number	Board to Board Connector Pin Number	Signal Name	MPSoC Bank	MPSoC Pin No	Signal Type/ Termination*	
252	G12	LA08_P	Board to Board Connector 2	140	PL_AE14_LVDS64_L2 P	64	AE14	IO, 1.8V	PL HP Bank64 IO2 differential positive.
253	G13	LA08_N	Board to Board Connector 2	142	PL_AE13_LVDS64_L2 N	64	AE13	IO, 1.8V	PL HP Bank64 IO2 differential negative.
254	G14	GND	NA	NA	GND	NA	NA	Power	Ground.
255	G15	LA12_P	Board to Board Connector 2	148	PL_AD15_LVDS64_L6 P	64	AD15	IO, 1.8V	PL HP Bank64 IO6 differential positive.
256	G16	LA12_N	Board to Board Connector 2	150	PL_AE15_LVDS64_L6 N	64	AE15	IO, 1.8V	PL HP Bank64 IO6 differential negative.
257	G17	GND	NA	NA	GND	NA	NA	Power	Ground.
258	G18	LA16_P	Board to Board Connector 2	164	PL_AJ15_LVDS64_L1 OP_QBC	64	AJ15	IO, 1.8V	PL HP Bank64 IO10 differential positive.
259	G19	LA16_N	Board to Board Connector 2	166	PL_AK15_LVDS64_L1 ON_QBC	64	AK15	IO, 1.8V	PL HP Bank64 IO10 differential negative.
260	G20	GND	NA	NA	GND	NA	NA	Power	Ground.
261	G21	LA20_P	Board to Board Connector 2	144	PL_AC14_LVDS64_L3 P	64	AC14	IO, 1.8V	PL HP Bank64 IO3 differential positive.
262	G22	LA20_N	Board to Board Connector 2	146	PL_AD14_LVDS64_L3 N	64	AD14	IO, 1.8V	PL HP Bank64 IO3 differential negative.
263	G23	GND	NA	NA	GND	NA	NA	Power	Ground.
264	G24	LA22_P	Board to Board Connector 2	183	PL_AG13_LVDS64_L7 P_QBC	64	AG13	IO, 1.8V	PL HP Bank64 IO7 differential positive.
265	G25	LA22_N	Board to Board Connector 2	181	PL_AH13_LVDS64_L7 N_QBC	64	AH13	IO, 1.8V	PL HP Bank64 IO7 differential negative.
266	G26	GND	NA	NA	GND	NA	NA	Power	Ground.
267	G27	LA25_P	Board to Board Connector 1	44	PL_J15_LVDS45_L3P	45	J15	IO, 1.8V	PL HD Bank45 IO3 differential positive.
268	G28	LA25_N	Board to Board Connector 1	42	PL_J14_LVDS45_L3N	45	J14	IO, 1.8V	PL HD Bank45 IO3 differential negative.
269	G29	GND	NA	NA	GND	NA	NA	Power	Ground.
270	G30	LA29_P	Board to Board Connector 1	32	PL_K15_LVDS45_L2P	45	K15	IO, 1.8V	PL HD Bank45 IO2 differential positive.
271	G31	LA29_N	Board to Board Connector 1	34	PL_K14_LVDS45_L2N	45	K14	IO, 1.8V	PL HD Bank45 IO2 differential negative.
272	G32	GND	NA	NA	GND	NA	NA	Power	Ground.
273	G33	LA31_P	Board to Board Connector 1	30	PL_L15_LVDS45_L1P	45	L15	IO, 1.8V	PL HD Bank45 IO1 differential positive.
274	G34	LA31_N	Board to Board Connector 1	28	PL_L14_LVDS45_L1N	45	L14	IO, 1.8V	PL HD Bank45 IO1 differential negative.
275	G35	GND	NA	NA	GND	NA	NA	Power	Ground.
276	G36	LA33_P	Board to Board Connector 1	12	PL_A17_LVDS45_L11 P	45	A17	IO, 1.8V	PL HD Bank45 IO11 differential positive.
277	G37	LA33_N	Board to Board Connector 1	14	PL_A16_LVDS45_L11 N	45	A16	IO, 1.8V	PL HD Bank45 IO11 differential negative.
278	G38	GND	NA	NA	GND	NA	NA	Power	Ground.
279	G39	VADJ	NA	NA	VCC_FMC_ADJ	NA	NA	O, 1.8V Power	1.8V Supply Voltage.
280	G40	GND	NA	NA	GND	NA	NA	Power	Ground.

SL No	FMC Connector VITA		Board to Board Connectors			Zynq Ultrascale+ MPSoC			Description
	FMC Connector1 Pin No	FMC Connector1 Pin Name	Board to Board Connector Number	Board to Board Connector Pin Number	Signal Name	MPSoC Bank	MPSoC Pin No	Signal Type/Termination*	
281	H1	VREF_A_M2C	NA	NA	NA	NA	NA	NA	NC
282	H2	PRSNT_M2C_L	NA	NA	IOEXP_P15_PR_M2C_L1	NA	NA	I, 3.3V	Module Present Signal.
283	H3	GND	NA	NA	GND	NA	NA	Power	Ground.
284	H4	CLK0_M2C_P	NA	NA	NA	NA	NA	NA	NC.
285	H5	CLK0_M2C_N	NA	NA	NA	NA	NA	NA	NC.
286	H6	GND	NA	NA	GND	NA	NA	Power	Ground.
287	H7	LA02_P	Board to Board Connector 2	132	PL_AG18_LVDS64_L2_3P	64	AG18	IO, 1.8V	PL HP Bank64 IO23 differential positive.
288	H8	LA02_N	Board to Board Connector 2	134	PL_AH18_LVDS64_L2_3N	64	AH18	IO, 1.8V	PL HP Bank64 IO23 differential negative.
289	H9	GND	NA	NA	GND	NA	NA	Power	Ground.
290	H10	LA04_P	Board to Board Connector 2	131	PL_AC17_LVDS64_L1_7P	64	AC17	IO, 1.8V	PL HP Bank64 IO17 differential positive.
291	H11	LA04_N	Board to Board Connector 2	133	PL_AC18_LVDS64_L1_7N	64	AC18	IO, 1.8V	PL HP Bank64 IO17 differential negative.
292	H12	GND	NA	NA	GND	NA	NA	Power	Ground.
293	H13	LA07_P	Board to Board Connector 2	151	PL_AH17_LVDS64_L2_1P	64	AH17	IO, 1.8V	PL HP Bank64 IO21 differential positive.
294	H14	LA07_N	Board to Board Connector 2	153	PL_AJ17_LVDS64_L2_1N	64	AJ17	IO, 1.8V	PL HP Bank64 IO21 differential negative.
295	H15	GND	NA	NA	GND	NA	NA	Power	Ground.
296	H16	LA11_P	Board to Board Connector 2	163	PL_AA13_LVDS64_L1_P_DBC	64	AA13	IO, 1.8V	PL HP Bank64 IO1 differential positive.
297	H17	LA11_N	Board to Board Connector 2	165	PL_AB13_LVDS64_L1_N_DBC	64	AB13	IO, 1.8V	PL HP Bank64 IO1 differential negative.
298	H18	GND	NA	NA	GND	NA	NA	Power	Ground.
299	H19	LA15_P	Board to Board Connector 2	136	PL_AG16_LVDS64_L1_9P_DBC	64	AG16	IO, 1.8V	PL HP Bank64 IO19 differential positive.
300	H20	LA15_N	Board to Board Connector 2	138	PL_AH16_LVDS64_L1_9N_DBC	64	AH16	IO, 1.8V	PL HP Bank64 IO19 differential negative.
301	H21	GND	NA	NA	GND	NA	NA	Power	Ground.
302	H22	LA19_P	Board to Board Connector 2	152	PL_AK13_LVDS64_L8_P	64	AK13	IO, 1.8V	PL HP Bank64 IO8 differential positive.
303	H23	LA19_N	Board to Board Connector 2	154	PL_AK12_LVDS64_L8_N	64	AK12	IO, 1.8V	PL HP Bank64 IO8 differential negative.
304	H24	GND	NA	NA	GND	NA	NA	Power	Ground.
305	H25	LA21_P	Board to Board Connector 2	182	PL_AA16_LVDS64_L1_6P_QBC	64	AA16	IO, 1.8V	PL HP Bank64 IO16 differential positive.
306	H26	LA21_N	Board to Board Connector 2	184	PL_AB16_LVDS64_L1_6N_QBC	64	AB16	IO, 1.8V	PL HP Bank64 IO16 differential negative.

SL No	FMC Connector VITA		Board to Board Connectors			Zynq Ultrascale+ MPSoC			Description
	FMC Connector1 Pin No	FMC Connector1 Pin Name	Board to Board Connector Number	Board to Board Connector Pin Number	Signal Name	MPSoC Bank	MPSoC Pin No	Signal Type/Termination*	
307	H27	GND	NA	NA	GND	NA	NA	Power	Ground.
308	H28	LA24_P	Board to Board Connector 1	38	PL_J16_LVDS45_L4P	45	J16	IO, 1.8V	PL HD Bank45 IO4 differential positive.
309	H29	LA24_N	Board to Board Connector 1	40	PL_H16_LVDS45_L4N	45	H16	IO, 1.8V	PL HD Bank45 IO4 differential negative.
310	H30	GND	NA	NA	GND	NA	NA	Power	Ground.
311	H31	LA28_P	Board to Board Connector 1	31	PL_D16_LVDS45_L9P	45	D16	IO, 1.8V	PL HD Bank45 IO9 differential positive.
312	H32	LA28_N	Board to Board Connector 1	33	PL_C16_LVDS45_L9N	45	C16	IO, 1.8V	PL HD Bank45 IO9 differential negative.
313	H33	GND	NA	NA	GND	NA	NA	Power	Ground.
314	H34	LA30_P	Board to Board Connector 1	27	PL_B15_LVDS45_L12P	45	B15	IO, 1.8V	PL HD Bank45 IO12 differential positive.
315	H35	LA30_N	Board to Board Connector 1	29	PL_A15_LVDS45_L12N	45	A15	IO, 1.8V	PL HD Bank45 IO12 differential negative.
316	H36	GND	NA	NA	GND	NA	NA	Power	Ground.
317	H37	LA32_P	Board to Board Connector 1	16	PL_C17_LVDS45_L10P	45	C17	IO, 1.8V	PL HD Bank45 IO10 differential positive.
318	H38	LA32_N	Board to Board Connector 1	18	PL_B16_LVDS45_L10N	45	B16	IO, 1.8V	PL HD Bank45 IO10 differential negative.
319	H39	GND	NA	NA	GND	NA	NA	Power	Ground.
320	H40	VADJ	NA	NA	VCC_FMC_ADJ	NA	NA	O, 1.8V Power	1.8V Supply Voltage.
321	J1	GND	NA	NA	GND	NA	NA	Power	Ground.
322	J2	CLK3_BIDIR_P	Board to Board Connector 2	170	PL_AF16_LVDS64_L13P_GC	64	AF16	IO, 1.8V	PL HP Bank64 IO13 differential positive.
323	J3	CLK3_BIDIR_N	Board to Board Connector 2	172	PL_AF17_LVDS64_L13N_GC	64	AF17	IO, 1.8V	PL HP Bank64 IO13 differential negative.
324	J4	GND	NA	NA	GND	NA	NA	Power	Ground.
325	J5	GND	NA	NA	GND	NA	NA	Power	Ground.
326	J6	HA03_P	NA	NA	NA	NA	NA	NA	NC.
327	J7	HA03_N	NA	NA	NA	NA	NA	NA	NC.
328	J8	GND	NA	NA	GND	NA	NA	Power	Ground.
329	J9	HA07_P	NA	NA	NA	NA	NA	NA	NC.
330	J10	HA07_N	NA	NA	NA	NA	NA	NA	NC.
331	J11	GND	NA	NA	GND	NA	NA	Power	Ground.
332	J12	HA11_P	NA	NA	NA	NA	NA	NA	NC.
333	J13	HA11_N	NA	NA	NA	NA	NA	NA	NC.
334	J14	GND	NA	NA	GND	NA	NA	Power	Ground.
335	J15	HA14_P	NA	NA	NA	NA	NA	NA	NC.
336	J16	HA14_N	NA	NA	NA	NA	NA	NA	NC.
337	J17	GND	NA	NA	GND	NA	NA	Power	Ground.
338	J18	HA18_P	NA	NA	NA	NA	NA	NA	NC.
339	J19	HA18_N	NA	NA	NA	NA	NA	NA	NC.
340	J20	GND	NA	NA	GND	NA	NA	Power	Ground.

SL No	FMC Connector VITA		Board to Board Connectors			Zynq Ultrascale+ MPSoC			Description
	FMC Connector1 Pin No	FMC Connector1 Pin Name	Board to Board Connector Number	Board to Board Connector Pin Number	Signal Name	MPSoC Bank	MPSoC Pin No	Signal Type/ Termination*	
341	J21	HA22_P	NA	NA	NA	NA	NA	NA	NC.
342	J22	HA22_N	NA	NA	NA	NA	NA	NA	NC.
343	J23	GND	NA	NA	GND	NA	NA	Power	Ground.
344	J24	HB01_P	NA	NA	NA	NA	NA	NA	NC.
345	J25	HB01_N	NA	NA	NA	NA	NA	NA	NC.
346	J26	GND	NA	NA	GND	NA	NA	Power	Ground.
347	J27	HB07_P	NA	NA	NA	NA	NA	NA	NC.
348	J28	HB07_N	NA	NA	NA	NA	NA	NA	NC.
349	J29	GND	NA	NA	GND	NA	NA	Power	Ground.
350	J30	HB11_P	NA	NA	NA	NA	NA	NA	NC.
351	J31	HB11_N	NA	NA	NA	NA	NA	NA	NC.
352	J32	GND	NA	NA	GND	NA	NA	Power	Ground.
353	J33	HB15_P	NA	NA	NA	NA	NA	NA	NC.
354	J34	HB15_N	NA	NA	NA	NA	NA	NA	NC.
355	J35	GND	NA	NA	GND	NA	NA	Power	Ground.
356	J36	HB18_P	NA	NA	NA	NA	NA	NA	NC.
357	J37	HB18_N	NA	NA	NA	NA	NA	NA	NC.
358	J38	GND	NA	NA	GND	NA	NA	Power	Ground.
359	J39	VIO_B_M2C	NA	NA	NA	NA	NA	NA	NC.
360	J40	GND	NA	NA	GND	NA	NA	Power	Ground.
361	K1	VREF_B_M2C	NA	NA	NA	NA	NA	NA	NC.
362	K2	GND	NA	NA	GND	NA	NA	Power	Ground.
363	K3	GND	NA	NA	GND	NA	NA	Power	Ground.
364	K4	CLK2_BIDIR_P	NA	NA	NA	NA	NA	NA	NC.
365	K5	CLK2_BIDIR_N	NA	NA	NA	NA	NA	NA	NC.
366	K6	GND	NA	NA	GND	NA	NA	Power	Ground.
367	K7	HA02_P	NA	NA	NA	NA	NA	NA	NC.
368	K8	HA02_N	NA	NA	NA	NA	NA	NA	NC.
369	K9	GND	NA	NA	GND	NA	NA	Power	Ground.
370	K10	HA06_P	NA	NA	NA	NA	NA	NA	NC.
371	K11	HA06_N	NA	NA	NA	NA	NA	NA	NC.
372	K12	GND	NA	NA	GND	NA	NA	Power	Ground.
373	K13	HA10_P	NA	NA	NA	NA	NA	NA	NC.
374	K14	HA10_N	NA	NA	NA	NA	NA	NA	NC.
375	K15	GND	NA	NA	GND	NA	NA	Power	Ground.
376	K16	HA17_P_CC	NA	NA	NA	NA	NA	NA	NC.
377	K17	HA17_N_CC	NA	NA	NA	NA	NA	NA	NC.
378	K18	GND	NA	NA	GND	NA	NA	Power	Ground.
379	K19	HA21_P	NA	NA	NA	NA	NA	NA	NC.
380	K20	HA21_N	NA	NA	NA	NA	NA	NA	NC.
381	K21	GND	NA	NA	GND	NA	NA	Power	Ground.

SL No	FMC Connector VITA		Board to Board Connectors			Zynq Ultrascale+ MPSoC			Description
	FMC Connector1 Pin No	FMC Connector1 Pin Name	Board to Board Connector Number	Board to Board Connector Pin Number	Signal Name	MPSoC Bank	MPSoC Pin No	Signal Type/Termination*	
382	K22	HA23_P	NA	NA	NA	NA	NA	NA	NC.
383	K23	HA23_N	NA	NA	NA	NA	NA	NA	NC.
384	K24	GND	NA	NA	GND	NA	NA	Power	Ground.
385	K25	HB00_P_CC	NA	NA	NA	NA	NA	NA	NC.
386	K26	HB00_N_CC	NA	NA	NA	NA	NA	NA	NC.
387	K27	GND	NA	NA	GND	NA	NA	Power	Ground.
388	K28	HB06_P_CC	NA	NA	NA	NA	NA	NA	NC.
389	K29	HB06_N_CC	NA	NA	NA	NA	NA	NA	NC.
390	K30	GND	NA	NA	GND	NA	NA	Power	Ground.
391	K31	HB10_P	NA	NA	NA	NA	NA	NA	NC.
392	K32	HB10_N	NA	NA	NA	NA	NA	NA	NC.
393	K33	GND	NA	NA	GND	NA	NA	Power	Ground.
394	K34	HB14_P	NA	NA	NA	NA	NA	NA	NC.
395	K35	HB14_N	NA	NA	NA	NA	NA	NA	NC.
396	K36	GND	NA	NA	GND	NA	NA	Power	Ground.
397	K37	HB17_P_CC	NA	NA	NA	NA	NA	NA	NC.
398	K38	HB17_N_CC	NA	NA	NA	NA	NA	NA	NC.
399	K39	GND	NA	NA	GND	NA	NA	Power	Ground.
400	K40	VIO_B_M2C	NA	NA	NA	NA	NA	NA	NC.

*\*IO Type of IOs originating from ZU7/5/4 MPSoC is configurable. Hence for exact IO type configuration options, refer Xilinx ZU7/5/4 MPSoC datasheet.*

## 2.5.3 FMC HPC Connector2

The Zynq Ultrascale+ MPSoC Carrier board supports two 400Pin Standard FMC HPC connectors to support standard ANSI/VITA 57.1 FMC modules. These FMC HPC connectors can accept two Single width FMC modules or one double width FMC module.

The FMC HPC Connector2 (J6) supports the below mentioned interface from Zynq Ultrascale+ MPSoC.

- 6 GTH High Speed Transceivers
- 2 GTH Reference Clock Capable
- 15 LVDS IOs/30 Single ended (SE) IOs
- 4 Single ended (SE) IOs
- 2 Clock Input Capable LVDS/SE pins
- 1 Clock Output Capable LVDS/SE pins

This 400Pin FMC HPC Connector2 (J6) is physically located at the top of the board as shown below.

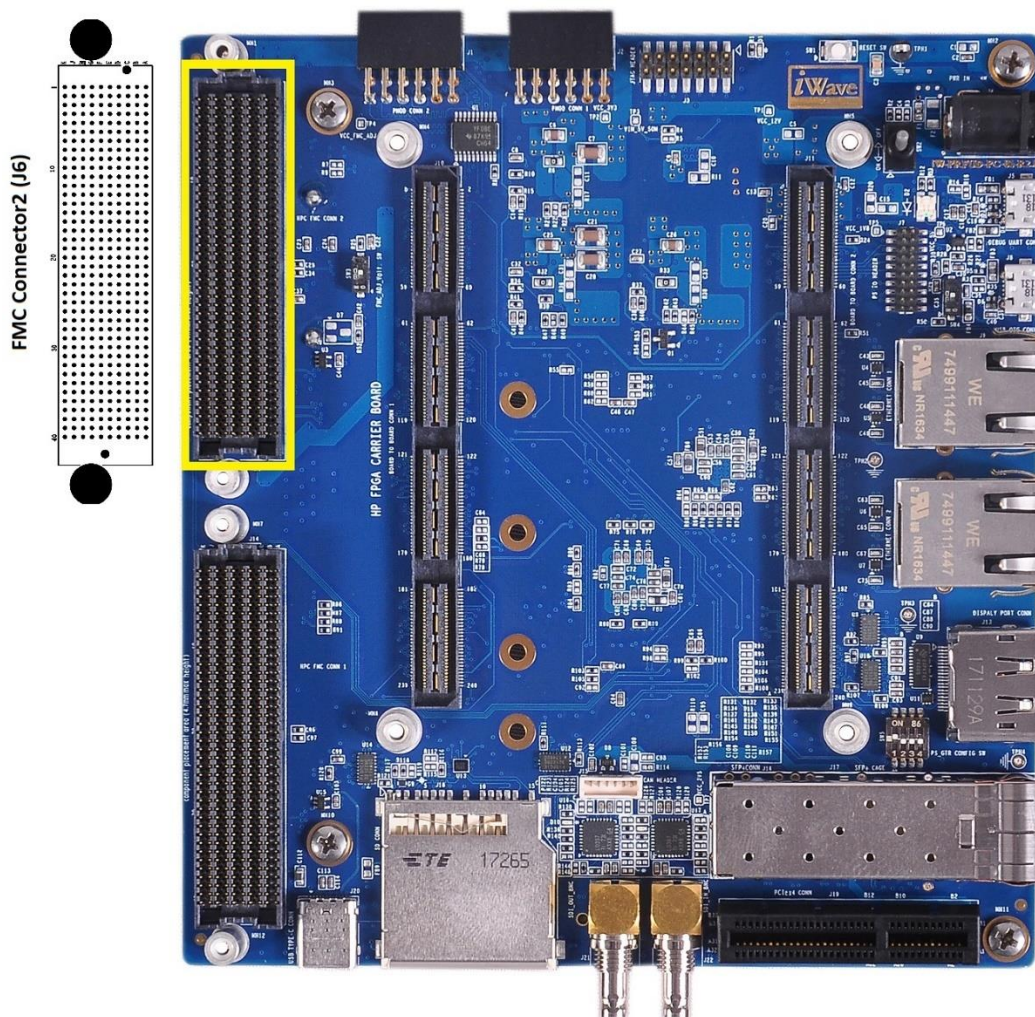


Figure 22: FMC Connector2

This 400Pin FMC HPC connector2 (J6) pin mapping is shown below.

	K	J	H	G	F	E	D	C	B	A
1	NC	GND	NC	GND	PG_M2C	GND	PG_C2M	GND	NC	GND
2	GND	NC	PRSNT_M2C_L	CLK1_M2C_P	GND	NC	GND	DP0_C2M_P	GND	DP1_M2C_P
3	GND	NC	GND	CLK1_M2C_N	GND	NC	GND	DP0_C2M_N	GND	DP1_M2C_N
4	NC	GND	NC	GND	NC	GND	GBTCLK0_M2C_P	GND	NC	GND
5	NC	GND	NC	GND	NC	GND	GBTCLK0_M2C_N	GND	NC	GND
6	GND	NC	GND	LA00_P_CC	GND	NC	GND	DP0_M2C_P	GND	DP2_M2C_P
7	NC	NC	LA02_P	LA00_N_CC	NC	NC	GND	DP0_M2C_N	GND	DP2_M2C_N
8	NC	GND	LA02_N	GND	NC	GND	LA01_P_CC	GND	NC	GND
9	GND	NC	GND	LA03_P	GND	NC	LA01_N_CC	GND	NC	GND
10	NC	NC	LA04_P	LA03_N	NC	NC	GND	LA06_P	GND	DP3_M2C_P
11	NC	GND	LA04_N	GND	NC	GND	LA05_P	LA06_N	GND	DP3_M2C_N
12	GND	NC	GND	LA08_P	GND	NC	LA05_N	GND	NC	GND
13	NC	NC	LA07_P	LA08_N	NC	NC	GND	GND	NC	GND
14	NC	GND	LA07_N	GND	NC	GND	LA09_P	LA10_P	GND	DP4_M2C_P
15	GND	NC	GND	LA12_P	GND	NC	LA09_N	LA10_N	GND	DP4_M2C_N
16	NC	NC	LA11_P	LA12_N	NC	NC	GND	GND	NC	GND
17	NC	GND	LA11_N	GND	NC	GND	LA13_P	GND	NC	GND
18	GND	NC	GND	LA16_P	GND	NC	LA13_N	LA14_P	GND	DP5_M2C_P
19	NC	NC	LA15_P	LA16_N	NC	NC	GND	LA14_N	GND	DP5_M2C_N
20	NC	GND	LA15_N	GND	NC	GND	LA17_P_CC	GND	GBTCLK1_M2C_P	GND
21	GND	NC	GND	NC	GND	NC	LA17_N_CC	GND	GBTCLK1_M2C_N	GND
22	NC	NC	NC	NC	NC	NC	GND	NC	GND	DP1_C2M_P
23	NC	GND	NC	GND	NC	GND	NC	NC	GND	DP1_C2M_N
24	GND	NC	GND	NC	GND	NC	NC	GND	NC	GND
25	NC	NC	NC	NC	NC	NC	GND	GND	NC	GND
26	NC	GND	NC	GND	NC	GND	NC	LA27_P	GND	DP2_C2M_P
27	GND	NC	GND	NC	GND	NC	NC	LA27_N	GND	DP2_C2M_N
28	NC	NC	NC	NC	NC	NC	GND	GND	NC	GND
29	NC	GND	NC	GND	NC	GND	TCK	GND	NC	GND
30	GND	NC	GND	NC	GND	NC	TDI	SCL	GND	DP3_C2M_P
31	NC	NC	NC	NC	NC	NC	TDO	SDA	GND	DP3_C2M_N
32	NC	GND	NC	GND	NC	GND	3P3VAUX	GND	NC	GND
33	GND	NC	GND	NC	GND	NC	TMS	GND	NC	GND
34	NC	NC	NC	NC	NC	NC	TRST_L	GA0	GND	DP4_C2M_P
35	NC	GND	NC	GND	NC	GND	GA1	12P0V	GND	DP4_C2M_N
36	GND	NC	GND	NC	GND	NC	3P3V	GND	NC	GND
37	NC	NC	NC	NC	NC	NC	GND	12P0V	NC	GND
38	NC	GND	NC	GND	NC	GND	3P3V	GND	GND	DP5_C2M_P
39	GND	NC	GND	VADJ	GND	VADJ	GND	3P3V	GND	DP5_C2M_N
40	NC	GND	VADJ	GND	VADJ	GND	3P3V	GND	NC	GND

Figure 23: FMC HPC Connector2 Pin Out



Table 11: FMC HPC Connector2 Pin Assignment

SL No	FMC Connector VITA		Board to Board Connectors			Zync Ultrascale+ MPSoC			Description
	FMC Connector2 Pin No	FMC Connector2 Pin Name	Board to Board Connector Number	Board to Board Connector Pin Number	Signal Name	MPSoC Bank	MPSoC Pin No	Signal Type/ Termination*	
1	A1	GND	NA	NA	GND	NA	NA	Power	Ground.
2	A2	DP1_M2C_P	Board to Board Connector 1	197	GTHRXP1_225	225	G4	I, DIFF	GTH Bank225 channel1 High speed differential receiver positive.
3	A3	DP1_M2C_N	Board to Board Connector 1	195	GTHRXN1_225	225	G3	I, DIFF	GTH Bank225 channel1 High speed differential receiver negative.
4	A4	GND	NA	NA	GND	NA	NA	Power	Ground.
5	A5	GND	NA	NA	GND	NA	NA	Power	Ground.
6	A6	DP2_M2C_P	Board to Board Connector 1	237	GTHRXP2_225	225	F2	I, DIFF	GTH Bank225 channel2 High speed differential receiver positive.
7	A7	DP2_M2C_N	Board to Board Connector 1	235	GTHRXN2_225	225	F1	I, DIFF	GTH Bank225 channel2 High speed differential receiver negative.
8	A8	GND	NA	NA	GND	NA	NA	Power	Ground.
9	A9	GND	NA	NA	GND	NA	NA	Power	Ground.
10	A10	DP3_M2C_P	Board to Board Connector 1	231	GTHRXP3_225	225	E4	I, DIFF	GTH Bank225 channel3 High speed differential receiver positive.
11	A11	DP3_M2C_N	Board to Board Connector 1	229	GTHRXN3_225	225	E3	I, DIFF	GTH Bank225 channel3 High speed differential receiver negative.
12	A12	GND	NA	NA	GND	NA	NA	Power	Ground.
12	A13	GND	NA	NA	GND	NA	NA	Power	Ground.
14	A14	DP4_M2C_P	Board to Board Connector 2	187	GTHRXP0_226	226	D2	I, DIFF	GTH Bank226 channel0 High speed differential receiver positive.
15	A15	DP4_M2C_N	Board to Board Connector 2	189	GTHRXN0_226	226	D1	I, DIFF	GTH Bank226 channel0 High speed differential receiver negative.
16	A16	GND	NA	NA	GND	NA	NA	Power	Ground.
17	A17	GND	NA	NA	GND	NA	NA	Power	Ground.
18	A18	DP5_M2C_P	Board to Board Connector 2	199	GTHRXP1_226	226	C4	I, DIFF	GTH Bank226 channel1 High speed differential receiver positive.
19	A19	DP5_M2C_N	Board to Board Connector 2	201	GTHRXN1_226	226	C3	I, DIFF	GTH Bank226 channel1 High speed differential receiver negative.
20	A20	GND	NA	NA	GND	NA	NA	Power	Ground.
21	A21	GND	NA	NA	GND	NA	NA	Power	Ground.
22	A22	DP1_C2M_P	Board to Board Connector 1	189	GTHTXP1_225	225	G8	O, DIFF	GTH Bank225 channel1 High speed differential transmitter positive.
23	A23	DP1_C2M_N	Board to Board Connector 1	191	GTHTXN1_225	225	G7	O, DIFF	GTH Bank225 channel1 High speed differential transmitter negative.
24	A24	GND	NA	NA	GND	NA	NA	Power	Ground.
25	A25	GND	NA	NA	GND	NA	NA	Power	Ground.
26	A26	DP2_C2M_P	Board to Board Connector 1	217	GTHTXP2_225	225	F6	O, DIFF	GTH Bank225 channel2 High speed differential transmitter positive.

SL No	FMC Connector VITA		Board to Board Connectors			Zync Ultrascale+ MPSoC			Description
	FMC Connector2 Pin No	FMC Connector2 Pin Name	Board to Board Connector Number	Board to Board Connector Pin Number	Signal Name	MPSoC Bank	MPSoC Pin No	Signal Type/ Termination*	
27	A27	DP2_C2M_N	Board to Board Connector 1	219	GTHTXN2_225	225	F5	O, DIFF	GTH Bank225 channel2 High speed differential transmitter negative.
28	A28	GND	NA	NA	GND	NA	NA	Power	Ground.
29	A29	GND	NA	NA	GND	NA	NA	Power	Ground.
30	A30	DP3_C2M_P	Board to Board Connector 1	223	GTHTXP3_225	225	E8	O, DIFF	GTH Bank225 channel3 High speed differential transmitter positive.
31	A31	DP3_C2M_N	Board to Board Connector 1	225	GTHTXN3_225	225	E7	O, DIFF	GTH Bank225 channel3 High speed differential transmitter negative.
32	A32	GND	NA	NA	GND	NA	NA	Power	Ground.
33	A33	GND	NA	NA	GND	NA	NA	Power	Ground.
34	A34	DP4_C2M_P	Board to Board Connector 2	193	GTHTXP0_226	226	D6	O, DIFF	GTH Bank226 channel0 High speed differential transmitter positive.
35	A35	DP4_C2M_N	Board to Board Connector 2	195	GTHTXN0_226	226	D5	O, DIFF	GTH Bank226 channel0 High speed differential transmitter negative.
36	A36	GND	NA	NA	GND	NA	NA	Power	Ground.
37	A37	GND	NA	NA	GND	NA	NA	Power	Ground.
38	A38	DP5_C2M_P	Board to Board Connector 2	205	GTHTXP1_226	226	C8	O, DIFF	GTH Bank226 channel1 High speed differential transmitter positive.
39	A39	DP5_C2M_N	Board to Board Connector 2	207	GTHTXN1_226	226	C7	O, DIFF	GTH Bank226 channel1 High speed differential transmitter negative.
40	A40	GND	NA	NA	GND	NA	NA	Power	Ground.
41	B1	CLK_DIR	NA	NA	NA	NA	NA	NA	NC.
42	B2	GND	NA	NA	GND	NA	NA	Power	Ground.
43	B3	GND	NA	NA	GND	NA	NA	Power	Ground.
44	B4	DP9_M2C_P	NA	NA	NA	NA	NA	NA	NC.
45	B5	DP9_M2C_N	NA	NA	NA	NA	NA	NA	NC.
46	B6	GND	NA	NA	GND	NA	NA	Power	Ground.
47	B7	GND	NA	NA	GND	NA	NA	Power	Ground.
48	B8	DP8_M2C_P	NA	NA	NA	NA	NA	NA	NC.
49	B9	DP8_M2C_N	NA	NA	NA	NA	NA	NA	NC.
50	B10	GND	NA	NA	GND	NA	NA	Power	Ground.
51	B11	GND	NA	NA	GND	NA	NA	Power	Ground.
52	B12	DP7_M2C_P	NA	NA	NA	NA	NA	NA	NC.
53	B13	DP7_M2C_N	NA	NA	NA	NA	NA	NA	NC.
54	B14	GND	NA	NA	GND	NA	NA	Power	Ground.
55	B15	GND	NA	NA	GND	NA	NA	Power	Ground.
56	B16	DP6_M2C_P	NA	NA	NA	NA	NA	NA	NC.
57	B17	DP6_M2C_N	NA	NA	NA	NA	NA	NA	NC.
58	B18	GND	NA	NA	GND	NA	NA	Power	Ground.
59	B19	GND	NA	NA	GND	NA	NA	Power	Ground.

SL No	FMC Connector VITA		Board to Board Connectors			Zync Ultrascale+ MPSoC			Description
	FMC Connector2 Pin No	FMC Connector2 Pin Name	Board to Board Connector Number	Board to Board Connector Pin Number	Signal Name	MPSoC Bank	MPSoC Pin No	Signal Type/ Termination*	
60	B20	GBTCLK1_M2C_P	Board to Board Connector 2	188	GTREFCLK0P_226	226	D10	I, DIFF	GTH Bank226 differential reference clock0 positive.
61	B21	GBTCLK1_M2C_N	Board to Board Connector 2	190	GTREFCLK0N_226	226	D9	I, DIFF	GTH Bank226 differential reference clock0 negative.
62	B22	GND	NA	NA	GND	NA	NA	Power	Ground.
63	B23	GND	NA	NA	GND	NA	NA	Power	Ground.
64	B24	DP9_C2M_P	NA	NA	NA	NA	NA	NA	NC.
65	B25	DP9_C2M_N	NA	NA	NA	NA	NA	NA	NC.
66	B26	GND	NA	NA	GND	NA	NA	Power	Ground.
67	B27	GND	NA	NA	GND	NA	NA	Power	Ground.
68	B28	DP8_C2M_P	NA	NA	NA	NA	NA	NA	NC.
69	B29	DP8_C2M_N	NA	NA	NA	NA	NA	NA	NC.
70	B30	GND	NA	NA	GND	NA	NA	Power	Ground.
71	B31	GND	NA	NA	GND	NA	NA	Power	Ground.
72	B32	DP7_C2M_P	NA	NA	NA	NA	NA	NA	NC.
73	B33	DP7_C2M_N	NA	NA	NA	NA	NA	NA	NC.
74	B34	GND	NA	NA	GND	NA	NA	Power	Ground.
75	B35	GND	NA	NA	GND	NA	NA	Power	Ground.
76	B36	DP6_C2M_P	NA	NA	NA	NA	NA	NA	NC.
77	B37	DP6_C2M_N	NA	NA	NA	NA	NA	NA	NC.
78	B38	GND	NA	NA	GND	NA	NA	Power	Ground.
79	B39	GND	NA	NA	GND	NA	NA	Power	Ground.
80	B40	RES0	NA	NA	NA	NA	NA	NA	NC.
81	C1	GND	NA	NA	GND	NA	NA	Power	Ground.
82	C2	DP0_C2M_P	Board to Board Connector 1	183	GTHTXP0_225	225	H6	O, DIFF	GTH Bank225 channel0 High speed differential transmitter positive.
83	C3	DP0_C2M_N	Board to Board Connector 1	185	GTHTXN0_225	225	H5	O, DIFF	GTH Bank225 channel0 High speed differential transmitter negative.
84	C4	GND	NA	NA	GND	NA	NA	Power	Ground.
85	C5	GND	NA	NA	GND	NA	NA	Power	Ground.
86	C6	DP0_M2C_P	Board to Board Connector 1	203	GTHRXP0_225	225	H2	I, DIFF	GTH Bank225 channel0 High speed differential receiver positive.
87	C7	DP0_M2C_N	Board to Board Connector 1	201	GTHRNX0_225	225	H1	I, DIFF	GTH Bank225 channel0 High speed differential receiver negative.
88	C8	GND	NA	NA	GND	NA	NA	Power	Ground.
89	C9	GND	NA	NA	GND	NA	NA	Power	Ground.
90	C10	LA06_P	Board to Board Connector 2	95	PL_AA12_LVDS66_L2P	66	AA12	IO, 1.8V	PL HP Bank66 IO2 differential positive.
91	C11	LA06_N	Board to Board Connector 2	97	PL_AA11_LVDS66_L2N	66	AA11	IO, 1.8V	PL HP Bank66 IO2 differential negative.
92	C12	GND	NA	NA	GND	NA	NA	Power	Ground.

SL No	FMC Connector VITA		Board to Board Connectors			Zynq Ultrascale+ MPSoC			Description
	FMC Connector2 Pin No	FMC Connector2 Pin Name	Board to Board Connector Number	Board to Board Connector Pin Number	Signal Name	MPSoC Bank	MPSoC Pin No	Signal Type/Termination*	
93	C13	GND	NA	NA	GND	NA	NA	Power	Ground.
94	C14	LA10_P	Board to Board Connector 2	99	PL_AB11_LVDS66_L3P	66	AB11	IO, 1.8V	PL HP Bank66 IO3 differential positive.
95	C15	LA10_N	Board to Board Connector 2	101	PL_AC11_LVDS66_L3N	66	AC11	IO, 1.8V	PL HP Bank66 IO3 differential negative.
96	C16	GND	NA	NA	GND	NA	NA	Power	Ground.
97	C17	GND	NA	NA	GND	NA	NA	Power	Ground.
98	C18	LA14_P	Board to Board Connector 1	87	PL_K12_LVDS46_L1P	46	K12	IO, 1.8V	PL HD Bank46 IO1 differential positive.
99	C19	LA14_N	Board to Board Connector 1	89	PL_K11_LVDS46_L1N	46	K11	IO, 1.8V	PL HD Bank46 IO1 differential negative.
100	C20	GND	NA	NA	GND	NA	NA	Power	Ground.
101	C21	GND	NA	NA	GND	NA	NA	Power	Ground.
102	C22	LA18_P_CC	NA	NA	NA	NA	NA	NA	NC.
103	C23	LA18_N_CC	NA	NA	NA	NA	NA	NA	NC.
104	C24	GND	NA	NA	GND	NA	NA	Power	Ground.
105	C25	GND	NA	NA	GND	NA	NA	Power	Ground.
106	C26	LA27_P	Board to Board Connector 1	24	PL_E15_LVDS45_L8P_HDGC	45	E15	I, 1.8V	PL HD Bank45 IO8 differential positive.
107	C27	LA27_N	Board to Board Connector 1	22	PL_D15_LVDS45_L8N_HDGC	45	D15	I, 1.8V	PL HD Bank45 IO8 differential negative.
108	C28	GND	NA	NA	GND	NA	NA	Power	Ground.
109	C29	GND	NA	NA	GND	NA	NA	Power	Ground.
110	C30	SCL	Board to Board Connector 2	48	I2C0_SCL(PS_MIO10_500)	500	F18	O, 3.3V LVCMOS	I2C0 Clock Signal.
111	C31	SDA	Board to Board Connector 2	46	I2C0_SDA(PS_MIO11_500)	500	G18	IO, 3.3V LVCMOS	I2C0 Data Signal.
112	C32	GND	NA	NA	GND	NA	NA	Power	Ground.
113	C33	GND	NA	NA	GND	NA	NA	Power	Ground.
114	C34	GA0	NA	NA	GA0_2	NA	NA	1K, PD	Geographical address 0
115	C35	12P0V	NA	NA	VCC_12V	NA	NA	O, 12V Power	12V Supply Voltage.
116	C36	GND	NA	NA	GND	NA	NA	Power	Ground.
117	C37	12P0V	NA	NA	VCC_12V	NA	NA	O, 12V Power	12V Supply Voltage.
118	C38	GND	NA	NA	GND	NA	NA	Power	Ground.
119	C39	3P3V	NA	NA	VCC_3V3	NA	NA	O, 3.3V Power	3.3V Supply Voltage.
120	C40	GND	NA	NA	GND	NA	NA	Power	Ground.
121	D1	PG_C2M	NA	NA	PG_C2M	NA	NA	O, 3.3V	Power Good Signal from Carrier to FMC Module.
122	D2	GND	NA	NA	GND	NA	NA	Power	Ground.
123	D3	GND	NA	NA	GND	NA	NA	Power	Ground.
124	D4	GBTCLK0_M2C_P	Board to Board Connector 1	184	GTREFCLK0P_225	225	H10	I, DIFF	GTH Bank225 differential reference clock0 positive.

SL No	FMC Connector VITA		Board to Board Connectors			Zynq Ultrascale+ MPSoC			Description
	FMC Connector2 Pin No	FMC Connector2 Pin Name	Board to Board Connector Number	Board to Board Connector Pin Number	Signal Name	MPSoC Bank	MPSoC Pin No	Signal Type/Termination*	
125	D5	GBTCLK0_M2C_N	Board to Board Connector 1	186	GTREFCLK0N_225	225	H9	I, DIFF	GTH Bank225 differential reference clock0 negative.
126	D6	GND	NA	NA	GND	NA	NA	Power	Ground.
127	D7	GND	NA	NA	GND	NA	NA	Power	Ground.
128	D8	LA01_P_CC	Board to Board Connector 2	116	PL_AC8_LVDS66_L11P_GC	66	AC8	IO, 1.8V	PL HP Bank66 IO11 differential positive.
129	D9	LA01_N_CC	Board to Board Connector 2	118	PL_AC7_LVDS66_L11N_GC	66	AC7	IO, 1.8V	PL HP Bank66 IO11 differential negative.
130	D10	GND	NA	NA	GND	NA	NA	Power	Ground.
131	D11	LA05_P	Board to Board Connector 2	98	PL_AC6_LVDS66_L8P	66	AC6	IO, 1.8V	PL HP Bank66 IO8 differential positive.
132	D12	LA05_N	Board to Board Connector 2	96	PL_AD6_LVDS66_L8N	66	AD6	IO, 1.8V	PL HP Bank66 IO8 differential negative.
133	D13	GND	NA	NA	GND	NA	NA	Power	Ground.
134	D14	LA09_P	Board to Board Connector 2	103	PL_AC12_LVDS66_L1P_DBC	66	AC12	IO, 1.8V	PL HP Bank66 IO1 differential positive.
135	D15	LA09_N	Board to Board Connector 2	105	PL_AD12_LVDS66_L1N_DBC	66	AD12	IO, 1.8V	PL HP Bank66 IO1 differential negative
136	D16	GND	NA	NA	GND	NA	NA	Power	Ground.
137	D17	LA13_P	Board to Board Connector 1	144	PL_D14_LVDS46_L8P_HDGC	46	D14	IO, 1.8V	PL HD Bank46 IO8 differential positive.
138	D18	LA13_N	Board to Board Connector 1	142	PL_C13_LVDS46_L8N_HDGC	46	C13	IO, 1.8V	PL HD Bank46 IO8 differential negative.
139	D19	GND	NA	NA	GND	NA	NA	Power	Ground.
140	D20	LA17_P_CC	Board to Board Connector 1	118	PL_G13_LVDS46_L5P_HDGC	46	G13	IO, 1.8V	PL HD Bank46 IO5 differential positive.
141	D21	LA17_N_CC	Board to Board Connector 1	116	PL_F13_LVDS46_L5N_HDGC	46	F13	IO, 1.8V	PL HD Bank46 IO5 differential negative.
142	D22	GND	NA	NA	GND	NA	NA	Power	Ground.
143	D23	LA23_P	NA	NA	NA	NA	NA	NA	NC.
144	D24	LA23_N	NA	NA	NA	NA	NA	NA	NC.
145	D25	GND	NA	NA	GND	NA	NA	Power	Ground.
146	D26	LA26_P	NA	NA	NA	NA	NA	NA	NC.
147	D27	LA26_N	NA	NA	NA	NA	NA	NA	NC.
148	D28	GND	NA	NA	GND	NA	NA	Power	Ground.
149	D29	TCK	NA	NA	PS_JTAG_TCK	NA	NA	I, 3.3V CMOS/49.9K PU	JTAG Test Clock.
150	D30	TDI	NA	NA	PS_JTAG_TDO	NA	NA	I, 3.3V CMOS	JTAG Test Data Output 1.
151	D31	TDO	NA	NA	PS_JTAG_TDO	NA	NA	O, 3.3V CMOS	JTAG Test Data Output 2.
152	D32	3P3VAUX	NA	NA	3V3_AUX1	NA	NA	O, 3.3V Power	Supply Voltage.

SL No	FMC Connector VITA		Board to Board Connectors			Zync Ultrascale+ MPSoC			Description
	FMC Connector2 Pin No	FMC Connector2 Pin Name	Board to Board Connector Number	Board to Board Connector Pin Number	Signal Name	MPSoC Bank	MPSoC Pin No	Signal Type/ Termination*	
153	D33	TMS	NA	NA	PS_JTAG_TMS	NA	NA	I, 3.3V CMOS/ 49.9K PU	JTAG Test Mode Select.
154	D34	TRST_L	NA	NA	JTAG_RST	NA	NA	I, 3.3V CMOS	JTAG Test Reset.
155	D35	GA1	NA	NA	GA1_2	NA	NA	1K, PU	Geographical address 1
156	D36	3P3V	NA	NA	VCC_3V3	NA	NA	O, 3.3V Power	3.3V Supply Voltage.
157	D37	GND	NA	NA	GND	NA	NA	Power	Ground.
158	D38	3P3V	NA	NA	VCC_3V3	NA	NA	O, 3.3V Power	3.3V Supply Voltage.
159	D39	GND	NA	NA	GND	NA	NA	Power	Ground.
160	D40	3P3V	NA	NA	VCC_3V3	NA	NA	O, 3.3V Power	3.3V Supply Voltage.
161	E1	GND	NA	NA	GND	NA	NA	Power	Ground.
162	E2	HA01_P_CC	NA	NA	NA	NA	NA	NA	NC.
163	E3	HA01_N_CC	NA	NA	NA	NA	NA	NA	NC.
164	E4	GND	NA	NA	GND	NA	NA	Power	Ground.
165	E5	GND	NA	NA	GND	NA	NA	Power	Ground.
166	E6	HA05_P	NA	NA	NA	NA	NA	NA	NC.
167	E7	HA05_N	NA	NA	NA	NA	NA	NA	NC.
168	E8	GND	NA	NA	GND	NA	NA	Power	Ground.
169	E9	HA09_P	NA	NA	NA	NA	NA	NA	NC.
170	E10	HA09_N	NA	NA	NA	NA	NA	NA	NC.
171	E11	GND	NA	NA	GND	NA	NA	Power	Ground.
172	E12	HA13_P	NA	NA	NA	NA	NA	NA	NC.
173	E13	HA13_N	NA	NA	NA	NA	NA	NA	NC.
174	E14	GND	NA	NA	GND	NA	NA	Power	Ground.
175	E15	HA16_P	NA	NA	NA	NA	NA	NA	NC.
176	E16	HA16_N	NA	NA	NA	NA	NA	NA	NC.
177	E17	GND	NA	NA	GND	NA	NA	Power	Ground.
178	E18	HA20_P	NA	NA	NA	NA	NA	NA	NC.
179	E19	HA20_N	NA	NA	NA	NA	NA	NA	NC.
180	E20	GND	NA	NA	GND	NA	NA	Power	Ground.
181	E21	HB03_P	NA	NA	NA	NA	NA	NA	NC.
182	E22	HB03_N	NA	NA	NA	NA	NA	NA	NC.
183	E23	GND	NA	NA	GND	NA	NA	Power	Ground.
184	E24	HB05_P	NA	NA	NA	NA	NA	NA	NC.
185	E25	HB05_N	NA	NA	NA	NA	NA	NA	NC.
186	E26	GND	NA	NA	GND	NA	NA	Power	Ground.
187	E27	HB09_P	NA	NA	NA	NA	NA	NA	NC.
188	E28	HB09_N	NA	NA	NA	NA	NA	NA	NC.
189	E29	GND	NA	NA	GND	NA	NA	Power	Ground.
190	E30	HB13_P	NA	NA	NA	NA	NA	NA	NC.
191	E31	HB13_N	NA	NA	NA	NA	NA	NA	NC.

SL No	FMC Connector VITA		Board to Board Connectors			Zynq Ultrascale+ MPSoC			Description
	FMC Connector2 Pin No	FMC Connector2 Pin Name	Board to Board Connector Number	Board to Board Connector Pin Number	Signal Name	MPSoC Bank	MPSoC Pin No	Signal Type/Termination*	
192	E32	GND	NA	NA	GND	NA	NA	Power	Ground.
193	E33	HB19_P	NA	NA	NA	NA	NA	NA	NC.
194	E34	HB19_N	NA	NA	NA	NA	NA	NA	NC.
195	E35	GND	NA	NA	GND	NA	NA	Power	Ground.
196	E36	HB21_P	NA	NA	NA	NA	NA	NA	NC.
197	E37	HB21_N	NA	NA	NA	NA	NA	NA	NC.
198	E38	GND	NA	NA	GND	NA	NA	Power	Ground.
199	E39	VADJ	NA	NA	VCC_FMC_ADJ	NA	NA	O, 1.8V Power	1.8V Supply Voltage.
200	E40	GND	NA	NA	GND	NA	NA	Power	Ground.
201	F1	PG_M2C	NA	NA	IOEXP_P06_PG_M2C2	NA	NA	I, 3.3V CMOS/ 10K PU	Power Good Signal from FMC Module to Carrier.
202	F2	GND	NA	NA	GND	NA	NA	Power	Ground.
203	F3	GND	NA	NA	GND	NA	NA	Power	Ground.
204	F4	HA00_P_CC	NA	NA	NA	NA	NA	NA	NC.
205	F5	HA00_N_CC	NA	NA	NA	NA	NA	NA	NC.
206	F6	GND	NA	NA	GND	NA	NA	Power	Ground.
207	F7	HA04_P	NA	NA	NA	NA	NA	NA	NC.
208	F8	HA04_N	NA	NA	NA	NA	NA	NA	NC.
209	F9	GND	NA	NA	GND	NA	NA	Power	Ground.
210	F10	HA08_P	NA	NA	NA	NA	NA	NA	NC.
211	F11	HA08_N	NA	NA	NA	NA	NA	NA	NC.
212	F12	GND	NA	NA	GND	NA	NA	Power	Ground.
213	F13	HA12_P	NA	NA	NA	NA	NA	NA	NC.
214	F14	HA12_N	NA	NA	NA	NA	NA	NA	NC.
215	F15	GND	NA	NA	GND	NA	NA	Power	Ground.
216	F16	HA15_P	NA	NA	NA	NA	NA	NA	NC.
217	F17	HA15_N	NA	NA	NA	NA	NA	NA	NC.
218	F18	GND	NA	NA	GND	NA	NA	Power	Ground.
219	F19	HA19_P	NA	NA	NA	NA	NA	NA	NC.
220	F20	HA19_N	NA	NA	NA	NA	NA	NA	NC.
221	F21	GND	NA	NA	GND	NA	NA	Power	Ground.
222	F22	HB02_P	NA	NA	NA	NA	NA	NA	NC.
223	F23	HB02_N	NA	NA	NA	NA	NA	NA	NC.
224	F24	GND	NA	NA	GND	NA	NA	Power	Ground.
225	F25	HB04_P	NA	NA	NA	NA	NA	NA	NC.
226	F26	HB04_N	NA	NA	NA	NA	NA	NA	NC.
227	F27	GND	NA	NA	GND	NA	NA	Power	Ground.
228	F28	HB08_P	NA	NA	NA	NA	NA	NA	NC.
229	F29	HB08_N	NA	NA	NA	NA	NA	NA	NC.
230	F30	GND	NA	NA	GND	NA	NA	Power	Ground.

SL No	FMC Connector VITA		Board to Board Connectors			Zynq Ultrascale+ MPSoC			Description
	FMC Connector2 Pin No	FMC Connector2 Pin Name	Board to Board Connector Number	Board to Board Connector Pin Number	Signal Name	MPSoC Bank	MPSoC Pin No	Signal Type/Termination*	
231	F31	HB12_P	NA	NA	NA	NA	NA	NA	NC.
232	F32	HB12_N	NA	NA	NA	NA	NA	NA	NC.
233	F33	GND	NA	NA	GND	NA	NA	Power	Ground.
234	F34	HB16_P	NA	NA	NA	NA	NA	NA	NC.
235	F35	HB16_N	NA	NA	NA	NA	NA	NA	NC.
236	F36	GND	NA	NA	GND	NA	NA	Power	Ground.
237	F37	HB20_P	NA	NA	NA	NA	NA	NA	NC.
238	F38	HB20_N	NA	NA	NA	NA	NA	NA	NC.
239	F39	GND	NA	NA	GND	NA	NA	Power	Ground.
240	F40	VADJ	NA	NA	VCC_FMC_ADJ	NA	NA	O, 1.8V Power	1.8V Supply Voltage.
241	G1	GND	NA	NA	GND	NA	NA	Power	Ground.
242	G2	CLK1_M2C_P	Board to Board Connector 2	109	PL_AB6_LVDS66_L14P_GC	66	Ab6	IO, 1.8V	PL HP Bank66 IO14 differential positive.
243	G3	CLK1_M2C_N	Board to Board Connector 2	111	PL_AB5_LVDS66_L14N_GC	66	Ab5	IO, 1.8V	PL HP Bank66 IO14 differential negative.
244	G4	GND	NA	NA	GND	NA	NA	Power	Ground.
245	G5	GND	NA	NA	GND	NA	NA	Power	Ground.
246	G6	LA00_P_CC	Board to Board Connector 2	115	PL_AD7_LVDS66_L13P_GC	66	AD7	IO, 1.8V	PL HP Bank66 IO13 differential positive.
247	G7	LA00_N_CC	Board to Board Connector 2	117	PL_AE7_LVDS66_L13N_GC	66	AE7	IO, 1.8V	PL HP Bank66 IO13 differential negative.
248	G8	GND	NA	NA	GND	NA	NA	Power	Ground.
249	G9	LA03_P	Board to Board Connector 2	100	PL_AC9_LVDS66_L7P_QBC	66	AC9	IO, 1.8V	PL HP Bank66 IO7 differential positive.
250	G10	LA03_N	Board to Board Connector 2	102	PL_AD9_LVDS66_L7N_QBC	66	AD9	IO, 1.8V	PL HP Bank66 IO7 differential negative.
251	G11	GND	NA	NA	GND	NA	NA	Power	Ground.
252	G12	LA08_P	Board to Board Connector 2	104	PL_AD11_LVDS66_L4P_DBC	66	AD11	IO, 1.8V	PL HP Bank66 IO4 differential positive.
253	G13	LA08_N	Board to Board Connector 2	106	PL_AD10_LVDS66_L4N_DBC	66	AD10	IO, 1.8V	PL HP Bank66 IO4 differential negative.
254	G14	GND	NA	NA	GND	NA	NA	Power	Ground.
255	G15	LA12_P	Board to Board Connector 2	126	PL_AA14_LVDS64_L4P_DBC	64	AA14	IO, 1.8V	PL HP Bank64 IO4 differential positive.
256	G16	LA12_N	Board to Board Connector 2	128	PL_AB14_LVDS64_L4N_DBC	64	AB14	IO, 1.8V	PL HP Bank64 IO4 differential negative.
257	G17	GND	NA	NA	GND	NA	NA	Power	Ground.
258	G18	LA16_P	Board to Board Connector 1	50	PL_B12_LVDS46_L12P	46	B12	IO, 1.8V	PL HD Bank46 IO12 differential positive.
259	G19	LA16_N	Board to Board Connector 1	52	PL_A12_LVDS46_L12N	46	A12	IO, 1.8V	PL HD Bank46 IO12 differential negative.



SL No	FMC Connector VITA		Board to Board Connectors			Zync Ultrascale+ MPSoC			Description
	FMC Connector2 Pin No	FMC Connector2 Pin Name	Board to Board Connector Number	Board to Board Connector Pin Number	Signal Name	MPSoC Bank	MPSoC Pin No	Signal Type/Termination*	
260	G20	GND	NA	NA	GND	NA	NA	Power	Ground.
261	G21	LA20_P	NA	NA	NA	NA	NA	NA	NC.
262	G22	LA20_N	NA	NA	NA	NA	NA	NA	NC.
263	G23	GND	NA	NA	GND	NA	NA	Power	Ground.
264	G24	LA22_P	NA	NA	NA	NA	NA	NA	NC.
265	G25	LA22_N	NA	NA	NA	NA	NA	NA	NC.
266	G26	GND	NA	NA	GND	NA	NA	Power	Ground.
267	G27	LA25_P	NA	NA	NA	NA	NA	NA	NC.
268	G28	LA25_N	NA	NA	NA	NA	NA	NA	NC.
269	G29	GND	NA	NA	GND	NA	NA	Power	Ground.
270	G30	LA29_P	NA	NA	NA	NA	NA	NA	NC.
271	G31	LA29_N	NA	NA	NA	NA	NA	NA	NC.
272	G32	GND	NA	NA	GND	NA	NA	Power	Ground.
273	G33	LA31_P	NA	NA	NA	NA	NA	NA	NC.
274	G34	LA31_N	NA	NA	NA	NA	NA	NA	NC.
275	G35	GND	NA	NA	GND	NA	NA	Power	Ground.
276	G36	LA33_P	NA	NA	NA	NA	NA	NA	NC.
277	G37	LA33_N	NA	NA	NA	NA	NA	NA	NC.
278	G38	GND	NA	NA	GND	NA	NA	Power	Ground.
279	G39	VADJ	NA	NA	VCC_FMC_ADJ	NA	NA	O, 1.8V Power	1.8V Supply Voltage.
280	G40	GND	NA	NA	GND	NA	NA	Power	Ground.
281	H1	VREF_A_M2C	NA	NA	NA	NA	NA	NA	NC.
282	H2	PRSNT_M2C_L	NA	NA	IOEXP_P06_PG_M2C2	NA	NA	I,3.3V CMOS/ 10K PU	Module Preset Signal.
283	H3	GND	NA	NA	GND	NA	NA	Power	Ground.
284	H4	CLK0_M2C_P	NA	NA	NA	NA	NA	NA	NC.
285	H5	CLK0_M2C_N	NA	NA	NA	NA	NA	NA	NC.
286	H6	GND	NA	NA	GND	NA	NA	Power	Ground.
287	H7	LA02_P	Board to Board Connector 2	92	PL_Y7_LVDS66_L10P_QBC	66	Y7	IO, 1.8V	PL HP Bank66 IO10 differential positive.
288	H8	LA02_N	Board to Board Connector 2	94	PL_AA7_LVDS66_L10N_QBC	66	AA7	IO, 1.8V	PL HP Bank66 IO10 differential negative.
289	H9	GND	NA	NA	GND	NA	NA	Power	Ground.
290	H10	LA04_P	Board to Board Connector 2	127	PL_AD4_LVDS66_L16P_QBC	66	AD4	IO, 1.8V	PL HP Bank66 IO16 differential positive.
291	H11	LA04_N	Board to Board Connector 2	125	PL_AE4_LVDS66_L16N_QBC	66	AE4	IO, 1.8V	PL HP Bank66 IO16 differential negative.
292	H12	GND	NA	NA	GND	NA	NA	Power	Ground.
293	H13	LA07_P	Board to Board Connector 2	123	PL_AB4_LVDS66_L17P	66	AB4	IO, 1.8V	PL HP Bank66 IO17 differential positive.

SL No	FMC Connector VITA		Board to Board Connectors			Zync Ultrascale+ MPSoC			Description
	FMC Connector2 Pin No	FMC Connector2 Pin Name	Board to Board Connector Number	Board to Board Connector Pin Number	Signal Name	MPSoC Bank	MPSoC Pin No	Signal Type/ Termination*	
294	H14	LA07_N	Board to Board Connector 2	121	PL_AC4_LVDS66_L17N	66	AC4	IO, 1.8V	PL HP Bank66 IO17 differential negative.
295	H15	GND	NA	NA	GND	NA	NA	Power	Ground.
296	H16	LA11_P	Board to Board Connector 2	122	PL_AC16_LVDS64_L15P	64	AC16	IO, 1.8V	PL HP Bank64 IO15 differential positive.
297	H17	LA11_N	Board to Board Connector 2	124	PL_AD16_LVDS64_L15N	64	AD16	IO, 1.8V	PL HP Bank64 IO15 differential negative.
298	H18	GND	NA	NA	GND	NA	NA	Power	Ground.
299	H19	LA15_P	Board to Board Connector 1	46	PL_A14_LVDS46_L11P	46	A14	IO, 1.8V	PL HD Bank46 IO11 differential positive.
300	H20	LA15_N	Board to Board Connector 1	48	PL_A13_LVDS46_L11N	46	A13	IO, 1.8V	PL HD Bank46 IO11 differential negative.
301	H21	GND	NA	NA	GND	NA	NA	Power	Ground.
302	H22	LA19_P	NA	NA	NA	NA	NA	NA	NC.
303	H23	LA19_N	NA	NA	NA	NA	NA	NA	NC.
304	H24	GND	NA	NA	GND	NA	NA	Power	Ground.
305	H25	LA21_P	NA	NA	NA	NA	NA	NA	NC.
306	H26	LA21_N	NA	NA	NA	NA	NA	NA	NC.
307	H27	GND	NA	NA	GND	NA	NA	Power	Ground.
308	H28	LA24_P	NA	NA	NA	NA	NA	NA	NC.
309	H29	LA24_N	NA	NA	NA	NA	NA	NA	NC.
310	H30	GND	NA	NA	GND	NA	NA	Power	Ground.
311	H31	LA28_P	NA	NA	NA	NA	NA	NA	NC.
312	H32	LA28_N	NA	NA	NA	NA	NA	NA	NC.
313	H33	GND	NA	NA	GND	NA	NA	Power	Ground.
314	H34	LA30_P	NA	NA	NA	NA	NA	NA	NC.
315	H35	LA30_N	NA	NA	NA	NA	NA	NA	NC.
316	H36	GND	NA	NA	GND	NA	NA	Power	Ground.
317	H37	LA32_P	NA	NA	NA	NA	NA	NA	NC.
318	H38	LA32_N	NA	NA	NA	NA	NA	NA	NC.
319	H39	GND	NA	NA	GND	NA	NA	Power	Ground.
320	H40	VADJ	NA	NA	VCC_FMC_ADJ	NA	NA	O, 1.8V Power	1.8V Supply Voltage.
321	J1	GND	NA	NA	GND	NA	NA	Power	Ground.
322	J2	CLK3_BIDIR_P	NA	NA	NA	NA	NA	NA	NC.
323	J3	CLK3_BIDIR_N	NA	NA	NA	NA	NA	NA	NC.
324	J4	GND	NA	NA	GND	NA	NA	Power	Ground.
325	J5	GND	NA	NA	GND	NA	NA	Power	Ground.
326	J6	HA03_P	NA	NA	NA	NA	NA	NA	NC.
327	J7	HA03_N	NA	NA	NA	NA	NA	NA	NC.
328	J8	GND	NA	NA	GND	NA	NA	Power	Ground.
329	J9	HA07_P	NA	NA	NA	NA	NA	NA	NC.

SL No	FMC Connector VITA		Board to Board Connectors			Zynq Ultrascale+ MPSoC			Description
	FMC Connector2 Pin No	FMC Connector2 Pin Name	Board to Board Connector Number	Board to Board Connector Pin Number	Signal Name	MPSoC Bank	MPSoC Pin No	Signal Type/Termination*	
330	J10	HA07_N	NA	NA	NA	NA	NA	NA	NC.
331	J11	GND	NA	NA	GND	NA	NA	Power	Ground.
332	J12	HA11_P	NA	NA	NA	NA	NA	NA	NC.
333	J13	HA11_N	NA	NA	NA	NA	NA	NA	NC.
334	J14	GND	NA	NA	GND	NA	NA	Power	Ground.
335	J15	HA14_P	NA	NA	NA	NA	NA	NA	NC.
336	J16	HA14_N	NA	NA	NA	NA	NA	NA	NC.
337	J17	GND	NA	NA	GND	NA	NA	Power	Ground.
338	J18	HA18_P	NA	NA	NA	NA	NA	NA	NC.
339	J19	HA18_N	NA	NA	NA	NA	NA	NA	NC.
340	J20	GND	NA	NA	GND	NA	NA	Power	Ground.
341	J21	HA22_P	NA	NA	NA	NA	NA	NA	NC.
342	J22	HA22_N	NA	NA	NA	NA	NA	NA	NC.
343	J23	GND	NA	NA	GND	NA	NA	Power	Ground.
344	J24	HB01_P	NA	NA	NA	NA	NA	NA	NC.
345	J25	HB01_N	NA	NA	NA	NA	NA	NA	NC.
346	J26	GND	NA	NA	GND	NA	NA	Power	Ground.
347	J27	HB07_P	NA	NA	NA	NA	NA	NA	NC.
348	J28	HB07_N	NA	NA	NA	NA	NA	NA	NC.
349	J29	GND	NA	NA	GND	NA	NA	Power	Ground.
350	J30	HB11_P	NA	NA	NA	NA	NA	NA	NC.
351	J31	HB11_N	NA	NA	NA	NA	NA	NA	NC.
352	J32	GND	NA	NA	GND	NA	NA	Power	Ground.
353	J33	HB15_P	NA	NA	NA	NA	NA	NA	NC.
354	J34	HB15_N	NA	NA	NA	NA	NA	NA	NC.
355	J35	GND	NA	NA	GND	NA	NA	Power	Ground.
356	J36	HB18_P	NA	NA	NA	NA	NA	NA	NC.
357	J37	HB18_N	NA	NA	NA	NA	NA	NA	NC.
358	J38	GND	NA	NA	GND	NA	NA	Power	Ground.
359	J39	VIO_B_M2C	NA	NA	NA	NA	NA	NA	NC.
360	J40	GND	NA	NA	GND	NA	NA	Power	Ground.
361	K1	VREF_B_M2C	NA	NA	NA	NA	NA	NA	NC.
362	K2	GND	NA	NA	GND	NA	NA	Power	Ground.
363	K3	GND	NA	NA	GND	NA	NA	Power	Ground.
364	K4	CLK2_BIDIR_P	NA	NA	NA	NA	NA	NA	NC.
365	K5	CLK2_BIDIR_N	NA	NA	NA	NA	NA	NA	NC.
366	K6	GND	NA	NA	GND	NA	NA	Power	Ground.
367	K7	HA02_P	NA	NA	NA	NA	NA	NA	NC.
368	K8	HA02_N	NA	NA	NA	NA	NA	NA	NC.
369	K9	GND	NA	NA	GND	NA	NA	Power	Ground.

SL No	FMC Connector VITA		Board to Board Connectors			Zync Ultrascale+ MPSoC			Description
	FMC Connector2 Pin No	FMC Connector2 Pin Name	Board to Board Connector Number	Board to Board Connector Pin Number	Signal Name	MPSoC Bank	MPSoC Pin No	Signal Type/ Termination*	
370	K10	HA06_P	NA	NA	NA	NA	NA	NA	NC.
371	K11	HA06_N	NA	NA	NA	NA	NA	NA	NC.
372	K12	GND	NA	NA	GND	NA	NA	Power	Ground.
373	K13	HA10_P	NA	NA	NA	NA	NA	NA	NC.
374	K14	HA10_N	NA	NA	NA	NA	NA	NA	NC.
375	K15	GND	NA	NA	GND	NA	NA	Power	Ground.
376	K16	HA17_P_CC	NA	NA	NA	NA	NA	NA	NC.
377	K17	HA17_N_CC	NA	NA	NA	NA	NA	NA	NC.
378	K18	GND	NA	NA	GND	NA	NA	Power	Ground.
379	K19	HA21_P	NA	NA	NA	NA	NA	NA	NC.
380	K20	HA21_N	NA	NA	NA	NA	NA	NA	NC.
381	K21	GND	NA	NA	GND	NA	NA	Power	Ground.
382	K22	HA23_P	NA	NA	NA	NA	NA	NA	NC.
383	K23	HA23_N	NA	NA	NA	NA	NA	NA	NC.
384	K24	GND	NA	NA	GND	NA	NA	Power	Ground.
385	K25	HB00_P_CC	NA	NA	NA	NA	NA	NA	NC.
386	K26	HB00_N_CC	NA	NA	NA	NA	NA	NA	NC.
387	K27	GND	NA	NA	GND	NA	NA	Power	Ground.
388	K28	HB06_P_CC	NA	NA	NA	NA	NA	NA	NC.
389	K29	HB06_N_CC	NA	NA	NA	NA	NA	NA	NC.
390	K30	GND	NA	NA	GND	NA	NA	Power	Ground.
391	K31	HB10_P	NA	NA	NA	NA	NA	NA	NC.
392	K32	HB10_N	NA	NA	NA	NA	NA	NA	NC.
393	K33	GND	NA	NA	GND	NA	NA	Power	Ground.
394	K34	HB14_P	NA	NA	NA	NA	NA	NA	NC.
395	K35	HB14_N	NA	NA	NA	NA	NA	NA	NC.
396	K36	GND	NA	NA	GND	NA	NA	Power	Ground.
397	K37	HB17_P_CC	NA	NA	NA	NA	NA	NA	NC.
398	K38	HB17_N_CC	NA	NA	NA	NA	NA	NA	NC.
399	K39	GND	NA	NA	GND	NA	NA	Power	Ground.
400	K40	VIO_B_M2C	NA	NA	NA	NA	NA	NA	NC.

\*IO Type of IOs originating from ZU7/5/4 MPSoC is configurable. Hence for exact IO type configuration options, refer Xilinx ZU7/5/4 MPSoC datasheet.

## 2.5.4 Pmod Host Port Connectors

Pmod interface or Peripheral Module interface is a standard defined by Digilent Inc. The Pmod interface is used to connect low frequency, low I/O pin count peripheral modules to host controller boards. There are twelve-pin of the interface defined, encompassing SPI, I<sup>2</sup>C, UART, I2S and GPIO protocols.

The Zynq Ultrascale+ MPSoC Carrier board supports two 12pin Pmod host port connector for plugging Pmod modules. Since the Pmod interface specification requires 3.3V IO level, the signals from Board to Board connector is connected to Pmod Connectors through Voltage Level Translator. Pmod Host Port Connector1 (J2) and Connector2 (J1) are physically located at the top of the board as shown below.

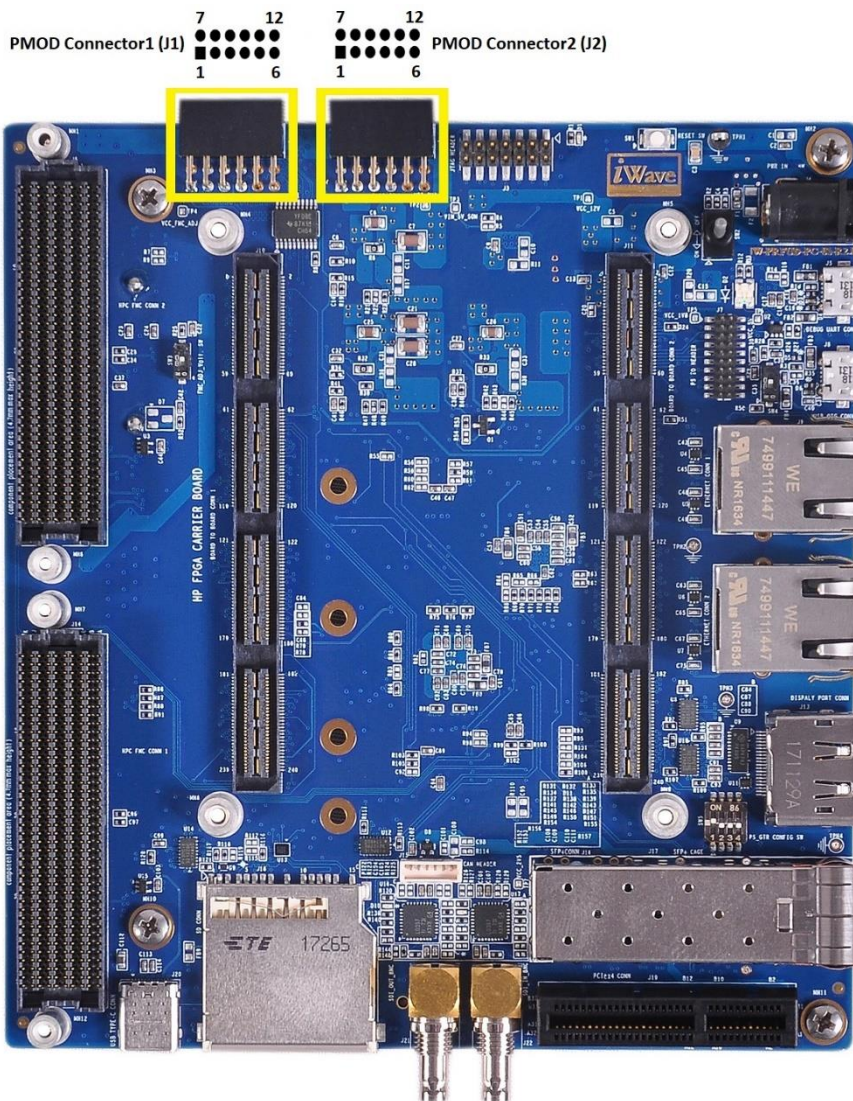


Figure 24: Pmod Host Port Connectors

**Table 12: Pmod Connector1 Pin Assignment**

Pin No	Signal Name	Signal Type/ Termination	Description
1	PL_AD1_LVDS66_L20P	IO, 3V3 LVCMOS	General purpose Input Output.
2	PL_AE1_LVDS66_L20N	IO, 3V3 LVCMOS	General purpose Input Output.
3	PL_AA6_LVDS66_L18P	IO, 3V3 LVCMOS	General purpose Input Output.
4	PL_AA5_LVDS66_L18N	IO, 3V3 LVCMOS	General purpose Input Output.
5	GND	Power	Ground.
6	VCC_3V3	O, 3.3V Power	3V3 Supply Voltage.
7	PL_AA2_LVDS66_L24P	IO, 3V3 LVCMOS	General purpose Input Output.
8	PL_AA1_LVDS66_L24N	IO, 3V3 LVCMOS	General purpose Input Output.
9	PL_AB1_LVDS66_L23P	IO, 3V3 LVCMOS	General purpose Input Output.
10	PL_AC1_LVDS66_L23N	IO, 3V3 LVCMOS	General purpose Input Output.
11	GND	Power	Ground.
12	VCC_3V3	O, 3.3V Power	3V3 Supply Voltage.

**Table 13: Pmod Connector2 Pin Assignment**

Pin No	Signal Name	Signal Type/ Termination	Description
1	PL_AB9_LVDS66_L5N	IO, 3V3 LVCMOS	General purpose Input Output.
2	PL_AB10_LVDS66_L5P	IO, 3V3 LVCMOS	General purpose Input Output.
3	PL_AA3_LVDS66_L22P_DBC	IO, 3V3 LVCMOS	General purpose Input Output.
4	PL_AB3_LVDS66_L22N_DBC	IO, 3V3 LVCMOS	General purpose Input Output.
5	GND	Power	Ground.
6	VCC_3V3	O, 3.3V Power	3V3 Supply Voltage.
7	PL_AE2_LVDS66_L19N_DBC	IO, 3V3 LVCMOS	General purpose Input Output.
8	PL_AD2_LVDS66_L19P_DBC	IO, 3V3 LVCMOS	General purpose Input Output.
9	PL_Y8_LVDS66_L9N	IO, 3V3 LVCMOS	General purpose Input Output.
10	PL_W8_LVDS66_L9P	IO, 3V3 LVCMOS	General purpose Input Output.
11	GND	Power	Ground.
12	VCC_3V3	O, 3.3V Power	3V3 Supply Voltage.

## 2.6 Additional Features

### 2.6.1 Clock Synthesizer/Generator

The Zynq Ultrascale+ MPSoC Carrier board supports one 10-output Clock Synthesizer “SI5341B-D-GM” for on board clock distribution. This Clock Generator outputs are connected to PL-GTH & PS-GTR Transceiver Banks Reference Clock on Board to Board Connectors through 0.01uF AC coupling capacitors. An external 48MHz crystal is connected to this Clock Synthesizer for reference. This Clock Synthesizer supports from 100 Hz to 1028 Mhz clock output and configurable through PS I2C0.

**Table 14: Clock Synthesizer Output Clocks**

Pin No	Pin Name	Signal Name	Programmed Frequency	Connected To
23	OUT0b	PS_MGTREFCLK3N_505	125MHz	B2B-2 220 <sup>th</sup> pin.
24	OUT0	PS_MGTREFCLK3P_505		B2B-2 218 <sup>th</sup> pin.
30	OUT2b	PS_MGTREFCLK1N_505	27MHz	B21-2 169 <sup>th</sup> pin.
31	OUT2	PS_MGTREFCLK1P_505		B2B-1 171 <sup>th</sup> pin.
34	OUT3b	PS_MGTREFCLK2N_505	52MHz	B2B-2 232 <sup>th</sup> pin.
35	OUT3	PS_MGTREFCLK2P_505		B2B-2 230 <sup>th</sup> pin.
37	OUT4b	PCIe_REFCLKP	100MHz	PCIe x4 connector A14 <sup>th</sup> pin.
38	OUT4	PCIe_REFCLKP		PCIe x4 connector A13 <sup>th</sup> pin.
41	OUT5b	PS_MGTREFCLK0N_505	100MHz	B2B-1 75 <sup>th</sup> pin.
42	OUT5	PS_MGTREFCLK0P_505		B2B-1 77 <sup>th</sup> pin.
44	OUT6b	GTREFCLK1N_223	125MHz	B2B-1 66 <sup>th</sup> pin.
45	OUT6	GTREFCLK1P_223		B2B-1 64 <sup>th</sup> pin.
50	OUT7b	GTREFCLK1N_224	125MHz	B2B-1 160 <sup>th</sup> pin.
51	OUT7	GTREFCLK1P_224		B2B-1 158 <sup>th</sup> pin.
53	OUT8b	GTREFCLK1N_225	156.25MHz	B2B-1 220 <sup>th</sup> pin.
54	OUT8	GTREFCLK1P_225		B2B-1 218 <sup>th</sup> pin.
58	OUT9b	GTREFCLK1N_226	148.5MHz	B2B-2 225 <sup>th</sup> pin.
59	OUT9	GTREFCLK1P_226		B2B-2 223 <sup>th</sup> pin.

*Note: In Zynq Ultrascale+ MPSoC Development board, PL GTH Primary clocks are connected from the dedicated clocks on FMC HPC Connectors.*

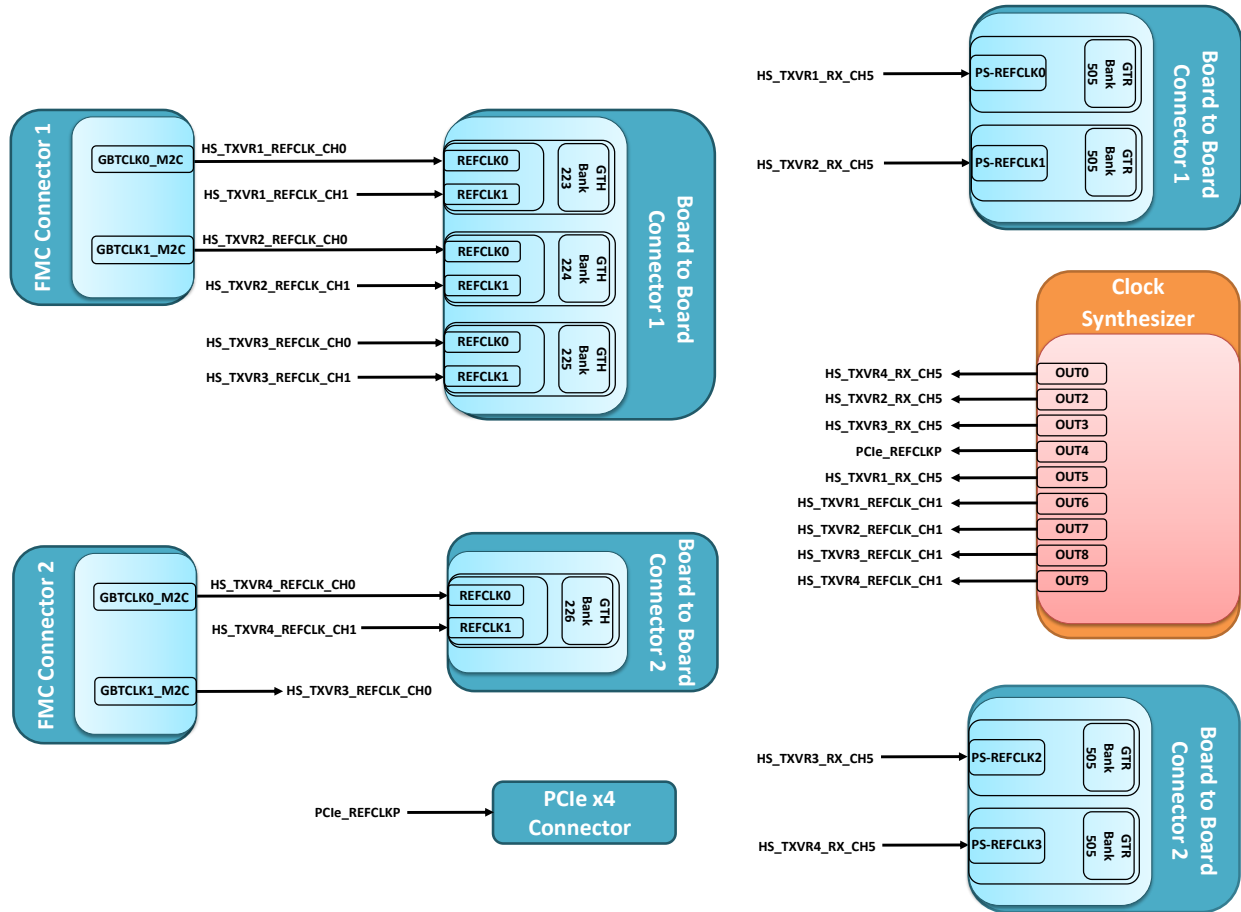


Figure 25: Clock Tree



## 2.6.2 IO Expander

The Zynq Ultrascale+ MPSoC Carrier board supports one “TCA6416A” GPIO 16-Bit port Expander. This GPIO 16-Bit port Expander controls the enable pin of USB type-C Switch, SFP+ Control signals and FMC Control Signals. This GPIO 16-Bit port Expander is connected to PS I2C0 through level translator. The GPIO 16-Bit port Expander I2C address is 0X72. The pinout details for IO Expander are given as below.

**Table 15: IO Expander pinout details**

Pin No	Pin Name	Signal Name	Signal Type/ Termination	Description
4	P00	IOEXP_P00_SFP_TFAULT	I, 3.3V CMOS/ 4.7K PU	Connected to SFP+ Connector
5	P01	IOEXP_P01_SFP_RX_LOS	I, 3.3V CMOS/ 4.7K PU	Connected to SFP+ Connector
6	P02	IOEXP_P02_SFP_MOD_ABS	I, 3.3V CMOS/ 4.7K PU	Connected to SFP+ Connector
7	P03	IOEXP_P03_SFP_RS1	I, 3.3V CMOS/ 4.7K PU	Connected to SFP+ Connector
8	P04	IOEXP_P04_SFP_RS0	O, 3.3V CMOS/ 4.7K PU	Connected to SFP+ Connector
9	P05	IOEXP_P05_SFP_TDIS	O, 3.3V CMOS/ 4.7K PD	Connected to SFP+ Connector
10	P06	IOEXP_P06_PG_M2C2	O, 3.3V CMOS	Connected to F1 pin of FMC Connector 2 (J6).
11	P07	IOEXP_P07_SDI_IN_CD_INT	I, 3.3V CMOS	Connected to 27 <sup>th</sup> pin of SDI Video IN Equalizer.
13	P10	IOEXP_P10_SDI_CD_INT	I, 3.3V CMOS	Connected to 27 <sup>th</sup> pin of SDI Video OUT Driver.
14	P11	IOEXP_P11_MUX_SEL1	O, 3.3V CMOS	Connected to MUX Selection Switch 1
15	P12	IOEXP_P12_MUX_SEL2	O, 3.3V CMOS	Connected to MUX Selection Switch 2
16	P13	IOEXP_P13_MUX_SEL3	O, 3.3V CMOS	Connected to MUX Selection Switch 3
17	P14	IOEXP_P14_MUX_SEL4	O, 3.3V CMOS/ 4.7K PU	Connected to MUX Selection Switch 4
18	P15	IOEXP_P15_PR_M2C_L1	O, 3.3V CMOS/10K PU	Connected to H2 pin of FMC Connector 1 (J14).
19	P16	IOEXP_P16_PR_M2C_L2	O, 3.3V CMOS/10K PU	Connected to H2 pin of FMC Connector 2 (J6).
20	P17	IOEXP_P17_PG_M2C1	O, 3.3V CMOS/10K PU	Connected to F1 pin of FMC Connector 1 (J14).

## 2.6.3 JTAG Connector

A Standard Xilinx 14-pin JTAG Header is available in Zynq Ultrascale+ MPSoC Carrier board for debug purpose. JTAG signals from Board to Board connector2 is directly connected to JTAG Header (J3) and same JTAG signals are also connected to FMC connector. JTAG-HS2/JTAG-HS3 programming cable can be plugged to this JTAG Header for programming and debugging purpose. This JTAG Header (J3) is physically located at the top of the board as shown below.

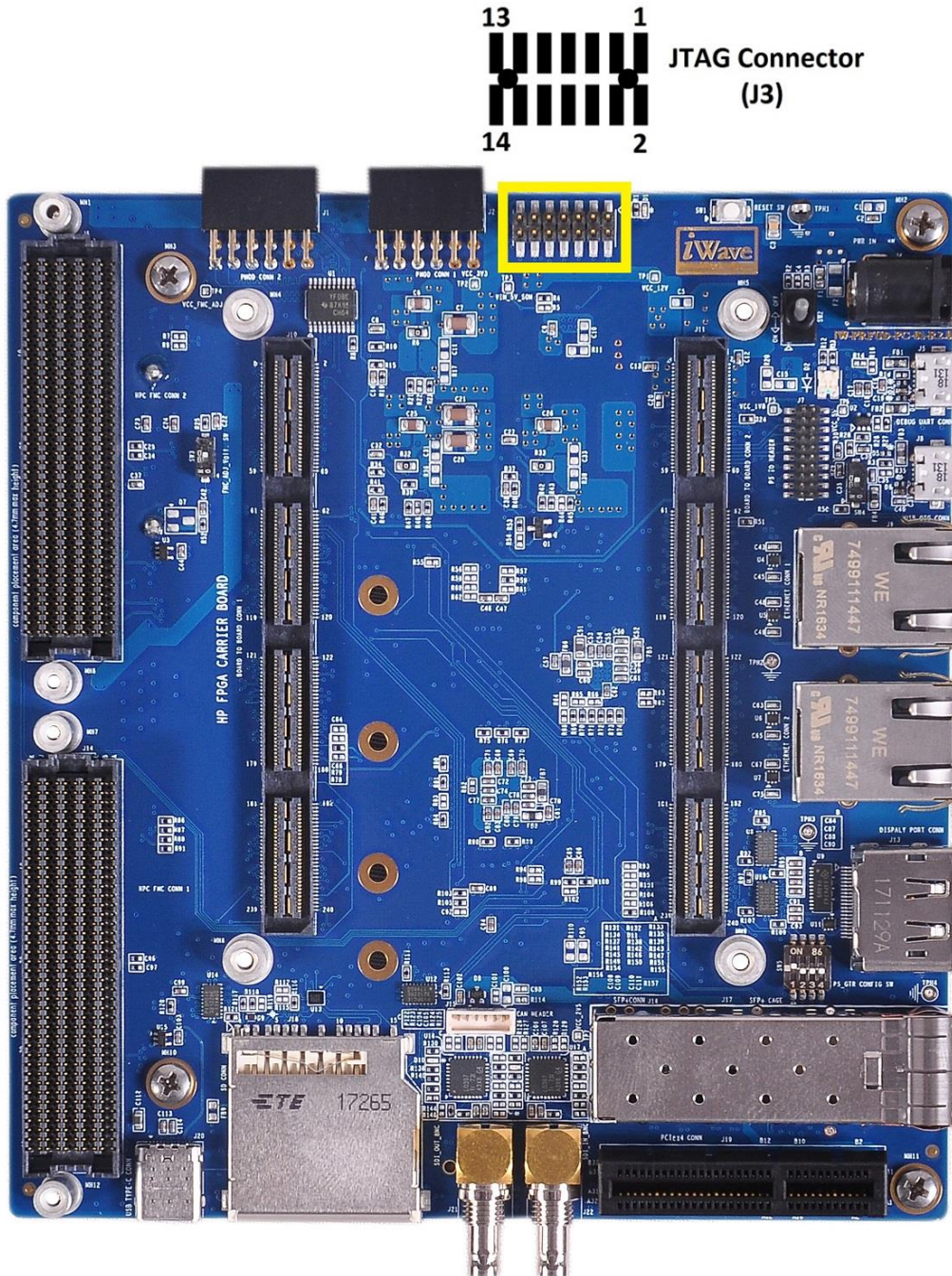


Figure 26: JTAG Connector

**Table 16: JTAG Header Pin Assignment**

Pin No	Signal Name	Signal Type/ Termination	Description
1	NC	-	Not Connected
2	VCC_3V3	O, 3.3V Power	3V3 Supply Voltage.
3	GND	Power	Ground
4	JTAG_TMS	I, 3V3 LVCMOS/ 49.9K PU	JTAG test mode select.
5	GND	Power	Ground
6	JTAG_TCK	I, 3V3 LVCMOS/ 49.9K PU	JTAG test Clock
7	GND	Power	Ground
8	JTAG_TDO	O,3V3 LVCMOS/ 49.9K PU	JTAG test data output.
9	GND	Power	Ground
10	JTAG_TDI	I, 3V3 LVCMOS	JTAG test data input
11	GND	Power	Ground
12	NC	-	Not Connected
13	GND	Power	Ground
14	JTAG_TRSTB	-	Not Connected

## 2.6.4 GPIO Header

The Zynq Ultrascale+ MPSoC Carrier board supports GPIO Header (J7) for General Purpose. This Header signals are directly connected from Board to Board connectors. This header supports I2C0, UART1, SPI0, CAN1 and PS GPIOs. This GPIO Header (J7) is physically located at the top of the board as shown below.

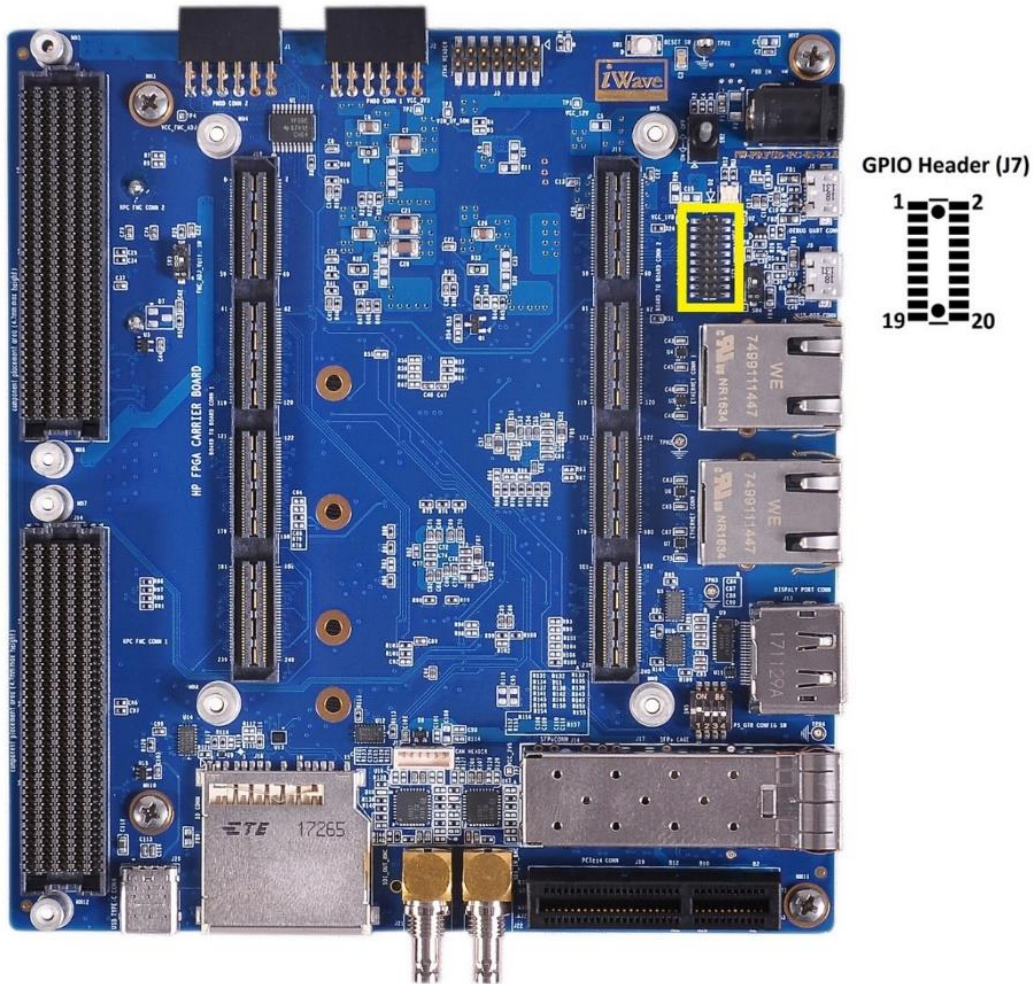


Figure 27: GPIO Header

Table 17: GPIO Header Pin Assignment

Pin No	Signal Name	Signal Type/ Termination	Description
1	VCC_1V8	O, 1.8V Power	1V8 Supply Voltage.
2	VCC_5V	O, 5V Power	5V Supply Voltage.
3	CAN1_RX(PS_MIO41_501)	I, 1.8V LVCMOS	CAN1 Receive data. Same pin can be configured as General Purpose Input/Output if required. This Pin is connected to 211 <sup>th</sup> pin of Board to Board Connector1 (J10).
4	PS_I2C0_SDA	IO, 1.8V OD/ 4.7K PU	I2C0 data. This Pin is connected to 46 <sup>th</sup> pin of Board to Board Connector2 (J11).

Pin No	Signal Name	Signal Type/ Termination	Description
5	CAN1_TX(PS_MIO40_501)	O, 1.8V LVCMOS	CAN1 Transmit data. Same pin can be configured as General Purpose Input/Output if required. This Pin is connected to 213 <sup>rd</sup> pin of Board to Board Connector1 (J10).
6	PS_I2C0_SCL	IO, 1.8V OD/ 4.7K PU	I2C0 Clock. This Pin is connected to 48 <sup>th</sup> pin of Board to Board Connector2 (J11).
7	SPIO_SS2(PS_MIO1_500)	O, 1.8V LVCMOS	SPI Chip select 2. Same pin can be configured as General Purpose Input/Output if required. This Pin is connected to 178 <sup>rd</sup> pin of Board to Board Connector1 (J10).
8	PS_UART1_TX	O, 1.8V LVCMOS	UART1 Transmit data line. Same pin can be configured as General Purpose Input/Output if required. This Pin is connected to 50 <sup>th</sup> pin of Board to Board Connector2 (J11).
9	NC	NA	NC.
10	PS_UART1_RX	I, 1.8V LVCMOS	UART1 Receive data line. Same pin can be configured as General Purpose Input/Output if required. This Pin is connected to 52 <sup>nd</sup> pin of Board to Board Connector2 (J11).
11	GND	Power	Ground
12	GND	Power	Ground
13	PS_SPIO_CLK	O, 1.8V LVCMOS	SPI Clock output. Same pin can be configured as General Purpose Input/Output if required. This Pin is connected to 61 <sup>st</sup> pin of Board to Board Connector2 (J11).
14	NC	NA	NC.
15	PS_SPIO_SS0	O, 1.8V LVCMOS	SPI Chip select 0. This Pin is connected to 63 <sup>rd</sup> pin of Board to Board Connector2 (J11).
16	NC	NA	NC.
17	PS_SPIO_MOSI	IO, 1.8V LVCMOS	SPI Master output Slave input. Same pin can be configured as General Purpose Input/Output if required. This Pin is connected to 65 <sup>th</sup> pin of Board to Board Connector2 (J11).
18	PS_SPIO_MISO	IO, 1.8V LVCMOS	SPI Master input Slave output. Same pin can be configured as General Purpose Input/Output if required. This Pin is connected to 67 <sup>th</sup> pin of Board to Board Connector2 (J11).
19	GND	Power	Ground
20	GND	Power	Ground

## 2.6.5 I2C Tree

The Zynq Ultrascale+ MPSoC Carrier board supports I2C through the Zynq Ultrascale+ SoC SOM via the Board to Board Connectors. The Carrier Board I2C tree is shown below.

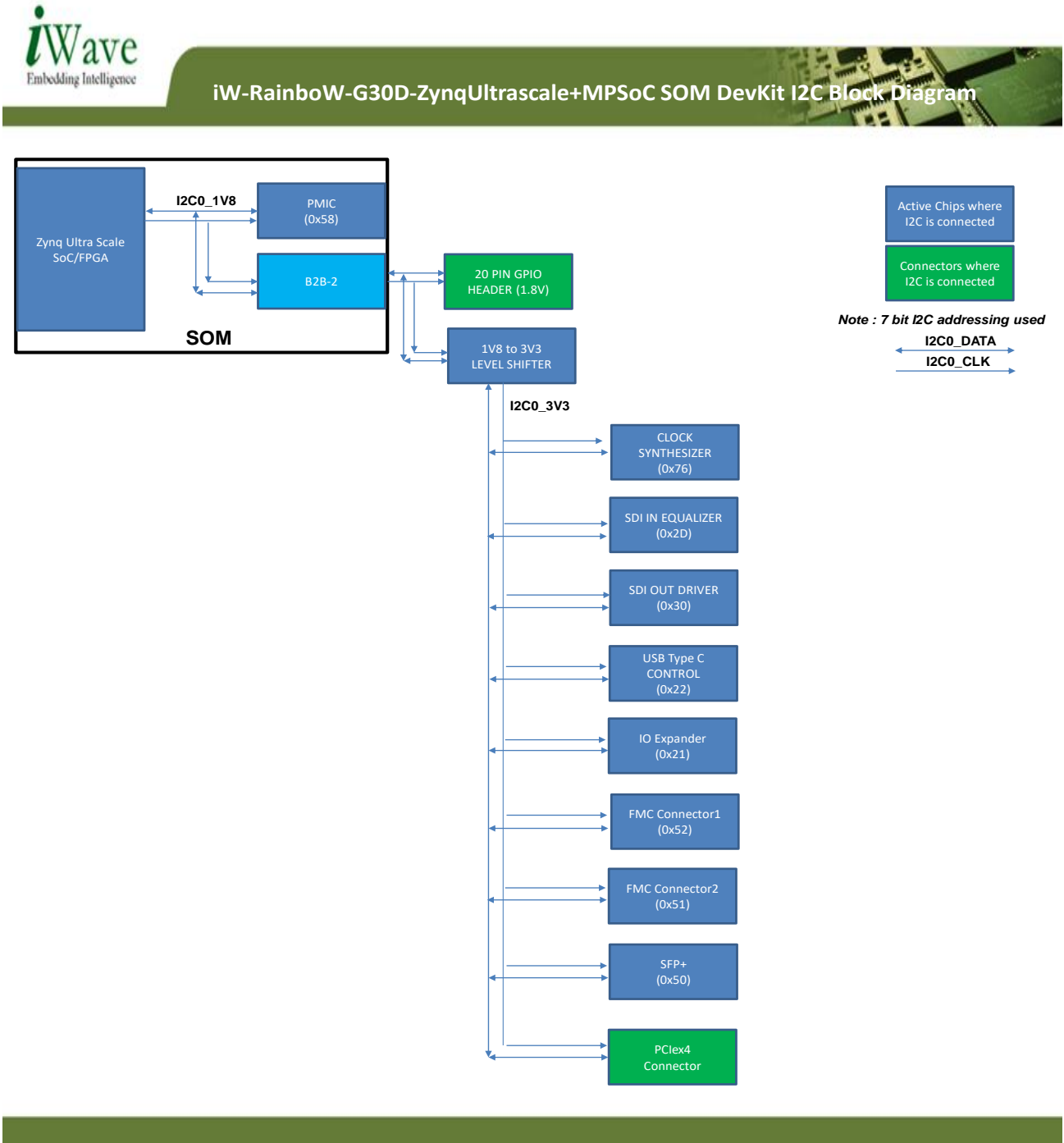


Figure 28: I2C Tree

## 2.6.6 Power ON/OFF Switch

The Zynq Ultrascale+ MPSoC Carrier Board has power ON/OFF switch (SW2) to control the Main power Input ON/OFF functionality. This power ON/OFF switch is physically located at the top of the board as shown below.

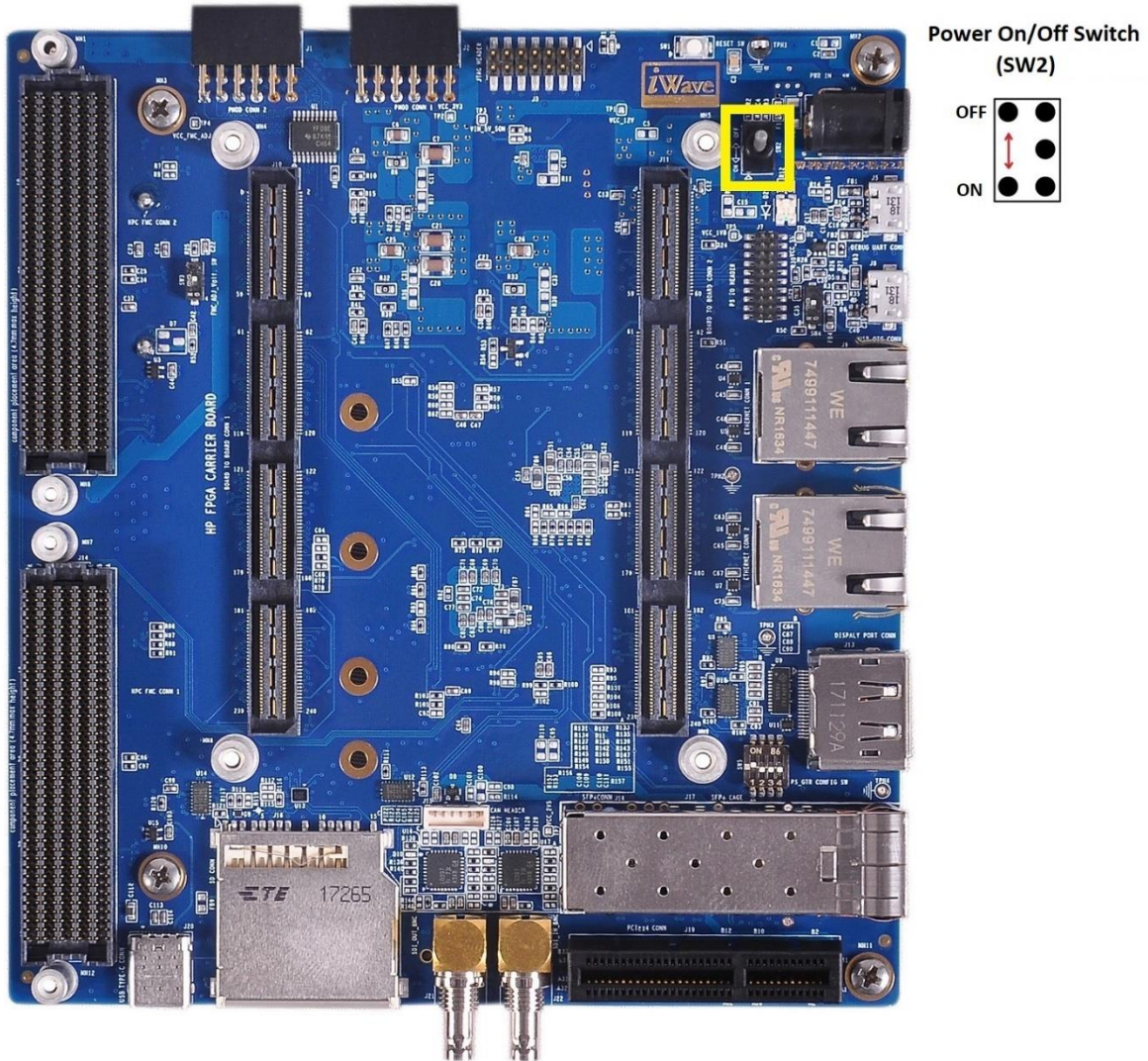


Figure 29: Power On/Off Switch

## 2.6.7 Reset Switch

The Zynq Ultrascale+ MPSoC Carrier board supports Push button switch (SW1) to reset the Zynq Ultrascale+ MPSoC CPU. Reset signal from Pin 35 of Board to Board connector2 is directly connected from Reset Push Button switch. This Reset Push button switch (SW1) is physically located at the top of the board as shown below.

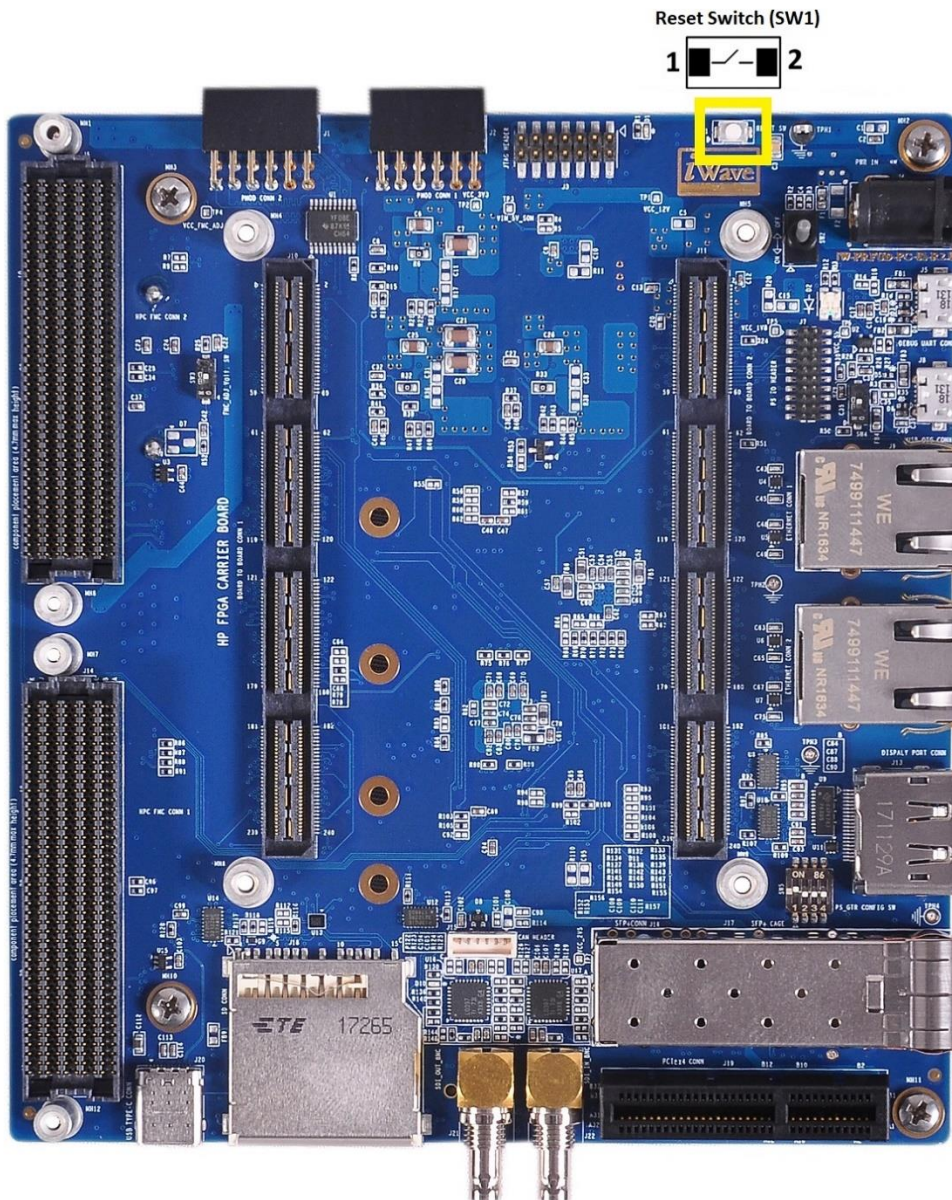


Figure 30: Reset Switch



## 2.6.8 RTC Coin Cell Holder

The Zynq Ultrascale+ MPSoC Carrier board supports Coin Cell Holder to connect “2032” series 3V coin cell. This coin cell voltage is connected to Zynq Ultrascale+ MPSoC SOM for RTC back up voltage when VCC main power is off. This Coin Cell Holder (J23) is physically located at the bottom of the board as shown below.

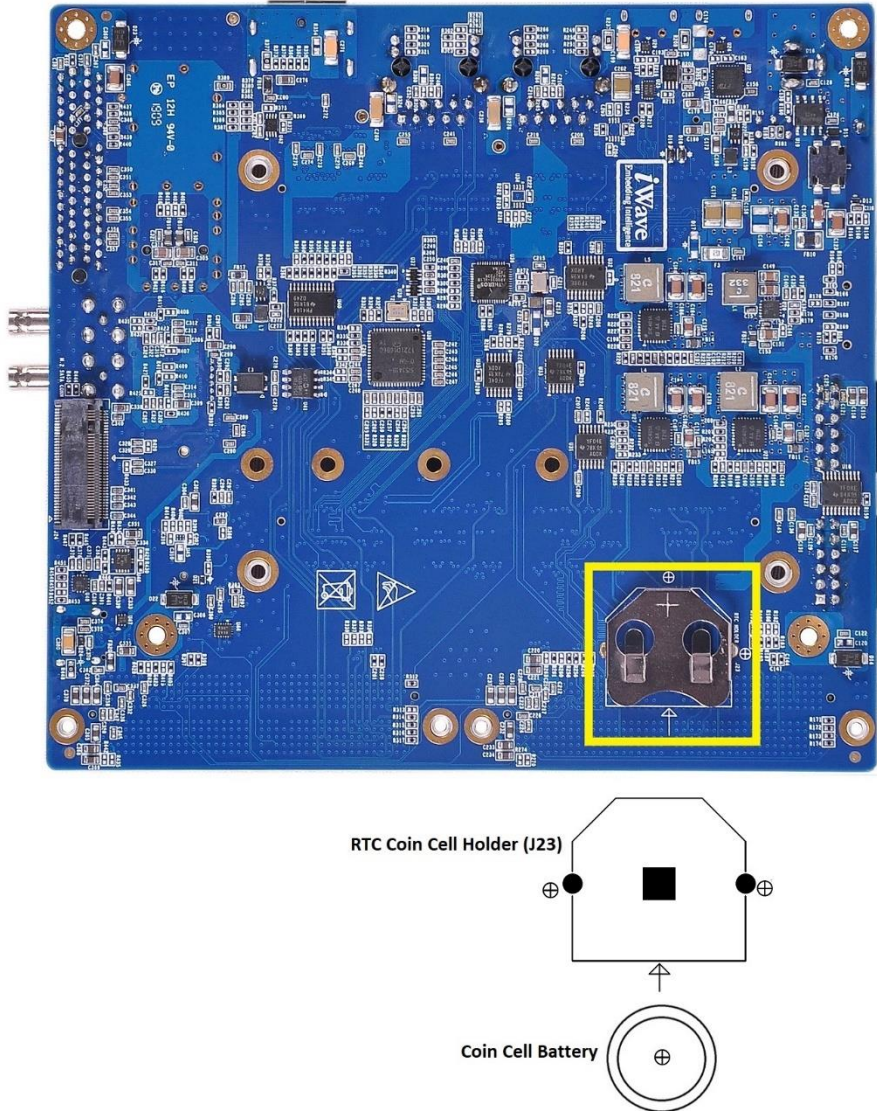


Figure 31: RTC Coin Cell Holder

## 3. TECHNICAL SPECIFICATION

This section provides detailed information about the Zynq Ultrascale+ MPSoC Carrier Board technical specification with Electrical, Environmental and Mechanical characteristics.

### 3.1 Power Input Requirement

The Zynq Ultrascale+ MPSoC Carrier Board is designed to work with 12V external power and uses on board voltage regulators for internal power management. 12V power input from an external power supply is connected to the Zynq Ultrascale+ MPSoC Carrier Board through Power Jack (J4). This 2.5mm x 6.5mm barrel connector Jack should fit standard DC Plugs with an inner dimension of 2.5mm and an outer dimension of 5.5mm. This Power Input connector (J4) is physically located at the top of the board as shown below.

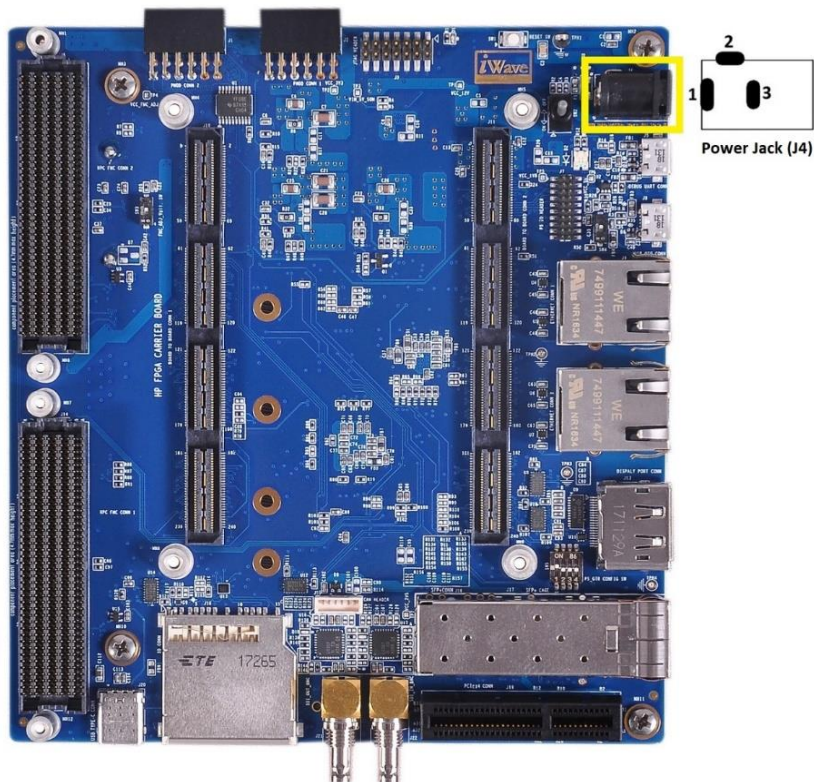


Figure 32: Power Jack

The below table provides the Power Input Requirement Zynq Ultrascale+ MPSoC Carrier Board.

Table 18: Power Input Requirement

Sl. No.	Power Rail	Min (V)	Typical (V)	Max(V)	Max Input Ripple
1	VCC_12V	11.75V	12V	12.25V	±50mV
2	VRTC_3V0 <sup>1</sup>	0V	3V	3.15V	±20mV

<sup>1</sup> The Zynq Ultrascale+ MPSoC DevKit uses this voltage as backup power source to On-SOM PMIC RTC controller when VCC is off.

## 3.2 Power Output Specification

The Zynq Ultrascale+ MPSoC Carrier Board has dedicated power regulator to provide +5V power to SOM for VCC power supply. Also +3V RTC power from Coin Cell holder is provided for Real Time Clock support.

The Zynq Ultrascale+ MPSoC Carrier Board also shares different on-board power to FMC connectors, Pmod connectors and GPIO Header for its Add-On Module power.

**Table 19: Power Output Specification**

Sl. No.	Power Rail	Min (V)	Typical (V)	Max(V)	Max Output Current
<b>To Board to Board Connector2 (for Zynq Ultrascale+ MPSoC SOM)</b>					
1	VCC_5V	4.85V	5V	5.15V	15A
2	VRTC_3V0	2.8V	3V	3.3V	-
<b>To FMC Connector1</b>					
1	VCC_FMC_ADJ	1.75	1.8	1.85	4A
2	VCC_3V3	3.15	3.3	3.45	3A
3	3P3VAUX	3.15	3.3	3.45	100mA
4	VCC_12V	11.75V	12V	12.25V	1A
<b>To FMC Connector2</b>					
1	VCC_FMC_ADJ	1.75	1.8	1.85	4A
2	VCC_3V3	3.15	3.3	3.45	3A
3	3P3VAUX	3.15	3.3	3.45	100mA
4	VCC_12V	11.75V	12V	12.25V	1A
<b>To Pmod Connector1</b>					
1	VCC_3V3	3.15	3.3	3.45	500mA
<b>To Pmod Connector2</b>					
1	VCC_3V3	3.15	3.3	3.45	500mA
<b>To GPIO Header</b>					
1	VCC_5V	3.15	3.3	3.45	500mA
2	VCC_1V8	1.75	1.8	1.85	200mA

## 3.3 Environmental Characteristics

### 3.3.1 Environmental Specification

The below table provides the Environment specification of Zynq Ultrascale+ MPSoC Development platform.

**Table 20: Environmental Specification**

Parameters	Min	Max
Operating temperature range <sup>1</sup>	0°C	70°C

<sup>1</sup> iWave only guarantees the component selection for the given operating temperature.

### 3.3.2 RoHS Compliance

iWave's Zynq Ultrascale+ MPSoC Development platform is designed by using RoHS compliant components and manufactured on lead free production process.

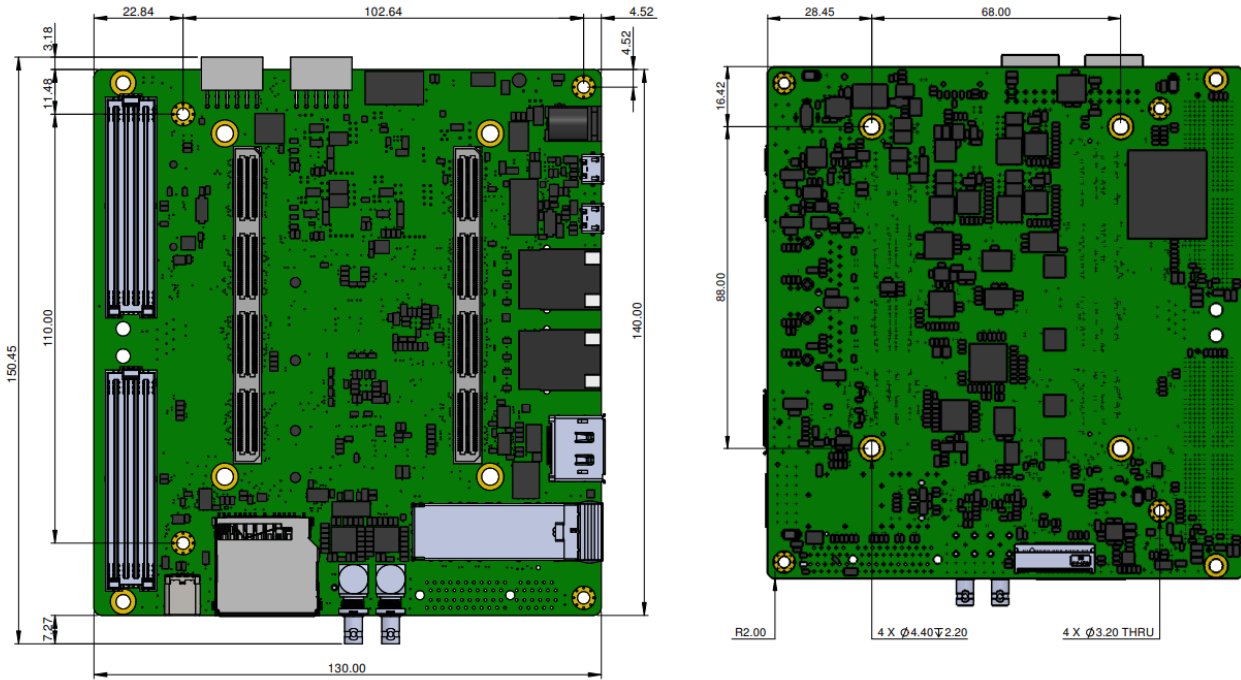
### 3.3.3 Electrostatic Discharge

iWave's Zynq Ultrascale+ MPSoC Development platform is sensitive to electro static discharge and so high voltages caused by static electricity could damage some of the devices on board. It is packed with necessary protection while shipping. Do not open or use board except at an electrostatic free workstation.

## 3.4 Mechanical Characteristics

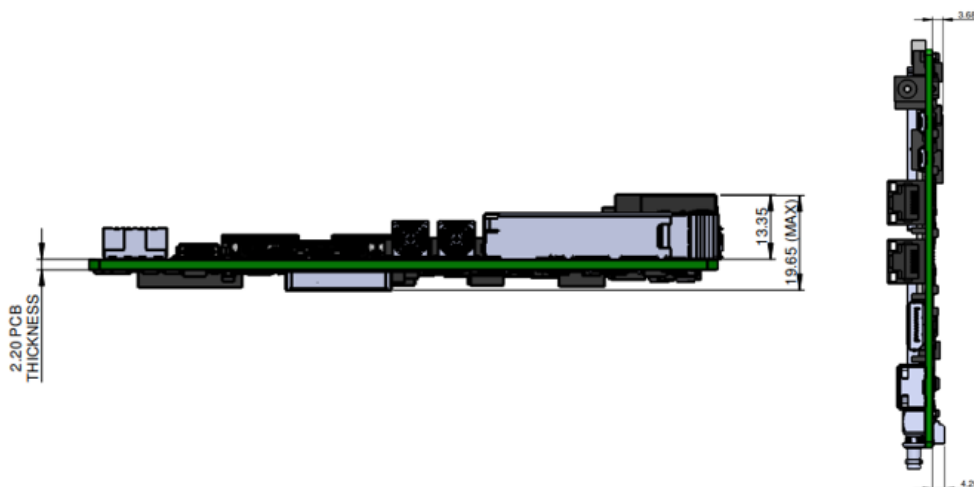
### 3.4.1 Carrier Board Mechanical Dimensions

The High-Performance Carrier Board PCB form factor is 130mmx140mm. The Board mechanical dimensions are shown below.



**Figure 33: Carrier Board Mechanical dimension – Top and Bottom Views**

The High-Performance carrier board PCB thickness is 1.55mm±0.1mm, top side maximum height component is Ethernet Connector (15.27mm) and bottom side maximum height component is M.2 SATA Connector (4.20mm). Please refer the below figure for height details of the Zynq Ultrascale+ MPSoC Carrier board.



**Figure 34: Carrier board Mechanical dimension – Side Views**

## 3.4.2 Guidelines to insert and remove the Zynq Ultrascale+ SoC SOM with Carrier Board

The following section gives the details on inserting and removing of the Zynq Ultrascale+ SoC SOM into the Carrier Board.

- Before inserting the SOM, make sure that the power is not provided to the Carrier Board.
- Insert the Zynq Ultrascale+ SoC SOM to the Board to Board Connectors (B2B) as shown below in the first photo.
- Confirm whether the positions of B2B1 and B2B2 of Zynq Ultrascale+ SOM is matching with the Carrier Board B2B Connectors while inserting.
- Press the SOM in to B2B Connectors from the edges as shown below in the first photo such that the SOM is fixed firmly into the B2B Connectors.
- To remove the SOM from the Carrier Board, lift the SOM following the procedure as shown in the second photo.

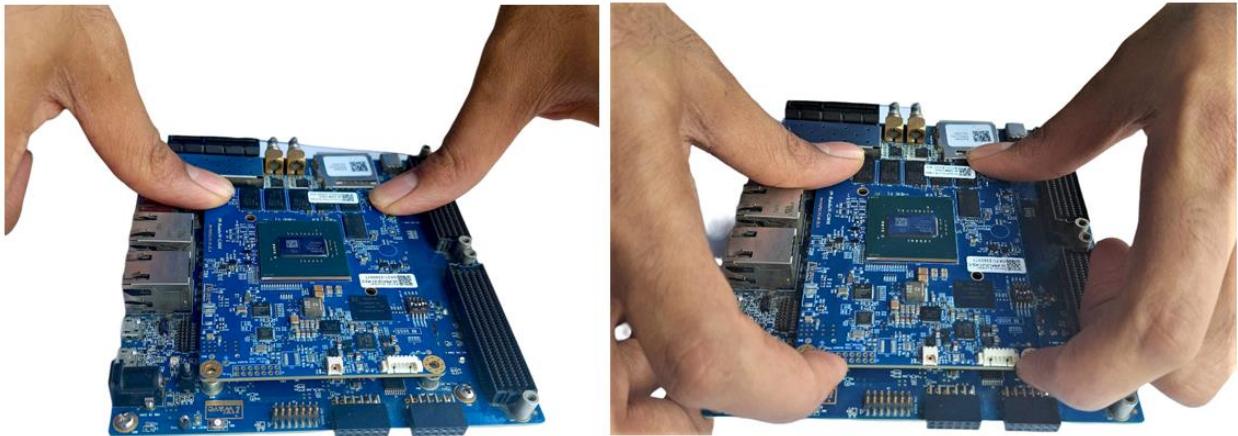
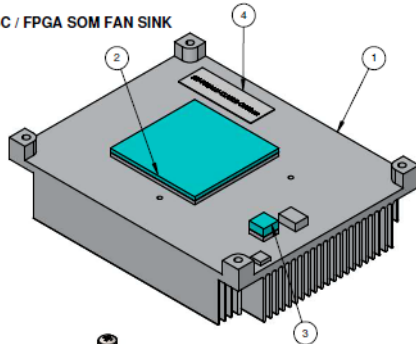


Figure 35: Zynq Ultrascale+ SoC SOM Insert and Removal Procedure

## 3.4.3 Fan Sink Fixing procedure on SOM with Carrier Board

The Fan Sink fixing procedure for the Zynq Ultrascale+ SOM with Carrier board is as shown in the image below.

iW-RainboW-G30M  
ZU7/5/4 Zynq UltraScale+ MPSoC / FPGA SOM FAN SINK  
ASSEMBLY INSTRUCTIONS

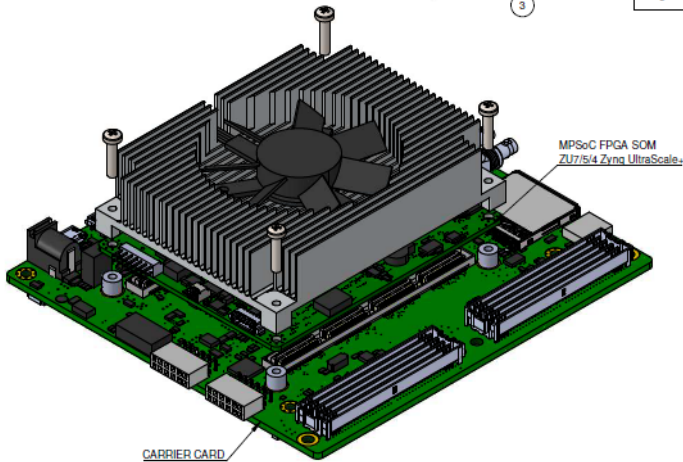


NOTE 1.1:

CAUTION-

- ASSEMBLY MUST BE DONE VERY CAREFULLY SINCE PUTTING THE FAN SINK IN A WRONG WAY AND OVER TIGHTENING OF SCREWS WILL DAMAGE THE SOM MODULE OR PREVENT THE SYSTEM FROM WORKING PROPERLY.
- FOLLOW THE ASSEMBLY INSTRUCTIONS (NOTE 1.2) CAREFULLY TO ENSURE THAT THE MODULE DOES NOT GET DAMAGED.
- NECESSARY PRECAUTIONS SHOULD BE TAKEN CARE TO AVOID THE ELECTROSTATIC CHARGES.

ITEM NO	PART NUMBER	DESCRIPTION	MATERIAL	QTY
1	iW-FSKALU-CLASLR-CU02	FAN SINK FOR MPSoC FPGA SOM	ALUMINIUM 6063	1
2	TG-A1250-35-35-1.5	1.5mm THICK THERMAL PAD	SILICONE RUBBER(SIR)	1
3	TG-A1250-6-6-3	3mm THICK THERMAL PAD	SILICONE RUBBER(SIR)	1
4	LABEL	LABEL FOR PRODUCTION PART NUMBER	STICKER	1
5	M3X16 PAN PHILLIPS DIN 7985	M3X16 PAN PHILLIPS SCREWS	SS 304	4



PEEL OFF THERMAL PAD LINER

NOTE 1.2:

FAN SINK ASSEMBLY INSTRUCTIONS:-

- CHECK IF THE THERMAL PAD PRESENT ON THE FSK, PEEL OFF THE LINER PRESENT ON IT.
- CLEAN THE PROCESSOR AND PMIC SURFACES WHERE THERMAL PAD WILL BE IN CONTACT.
- GENTLY PLACE THE FAN SINK ON SOM MODULE.
- MAKE SURE THAT SOM MODULE AND FAN SINK MOUNTING HOLES ARE ALIGNED.
- MOUNT THE ASSEMBLED FAN SINK AND SOM ON THE CARRIER CARD SPACERS.
- AFTER ASSEMBLING MAKE SURE ALL THE SOM MOUNTING HOLES ARE ALIGNED WITH CARRIER CARD SPACERS.
- PUT THE SCREWS FROM TOP OF THE FAN SINK AND TIGHTEN THEM TO HAND TIGHT(REFER Fig1.1).

Figure 36: Zynq Ultrascale+ SOM with Fan Sink fixing procedure

## 4. ORDERING INFORMATION

The below table provides the standard orderable part numbers for Zynq Ultrascale+ MPSoC Development platform which includes Zynq Ultrascale+ MPSoC SOM and Carrier Board.

**Table 21: Orderable Product Part Numbers**

Product Part Number	Description	Temperature
<b>ZU7 MPSoC based SOM Development Platform</b>		
iW-G30D-C7CG-4E004G-E008G-LCA	ZU7CG (-1) MPSoC SOM Linux Development Platform with 4GB PS DDR4 with ECC, 1GB FPGA DDR4, 8GB EMMC	Commercial
iW-G30D-C7EG-4E004G-E008G-LCA	ZU7EG (-1) MPSoC SOM Linux Development Platform with 4GB PS DDR4 with ECC, 1GB FPGA DDR4, 8GB EMMC	Commercial
iW-G30D-C7EV-4E004G-E008G-LCA	ZU7EV (-1) MPSoC SOM Linux Development Platform with 4GB PS DDR4 with ECC, 1GB FPGA DDR4, 8GB EMMC	Commercial
<b>ZU5 MPSoC based SOM Development Platform</b>		
iW-G30D-C5CG-4E002G-E008G-LCA	ZU5CG (-1) MPSoC SOM Linux Development Platform with 2GB PS DDR4 with ECC, 1GB FPGA DDR4, 8GB EMMC	Commercial
iW-G30D-C5EG-4E002G-E008G-LCA	ZU5EG (-1) MPSoC SOM Linux Development Platform with 2GB PS DDR4 with ECC, 1GB FPGA DDR4, 8GB EMMC	Commercial
iW-G30D-C5EV-4E002G-E008G-LCA	ZU5EV (-1) MPSoC SOM Linux Development Platform with 2GB PS DDR4 with ECC, 1GB FPGA DDR4, 8GB EMMC	Commercial
<b>ZU4 MPSoC based SOM Development Platform</b>		
iW-G30D-C4CG-4E002G-E008G-LCA	ZU4CG (-1) MPSoC SOM Linux Development Platform with 2GB PS DDR4 with ECC, 1GB FPGA DDR4, 8GB EMMC	Commercial
iW-G30D-C4EG-4E002G-E008G-LCA	ZU4EG (-1) MPSoC SOM Linux Development Platform with 2GB PS DDR4 with ECC, 1GB FPGA DDR4, 8GB EMMC	Commercial
iW-G30D-C4EV-4E002G-E008G-LCA	ZU4EV (-1) MPSoC SOM Linux Development Platform with 2GB PS DDR4 with ECC, 1GB FPGA DDR4, 8GB EMMC	Commercial

*Note: For Development platform identification purpose, Product part number is pasted as Label with Barcode readable format.*



