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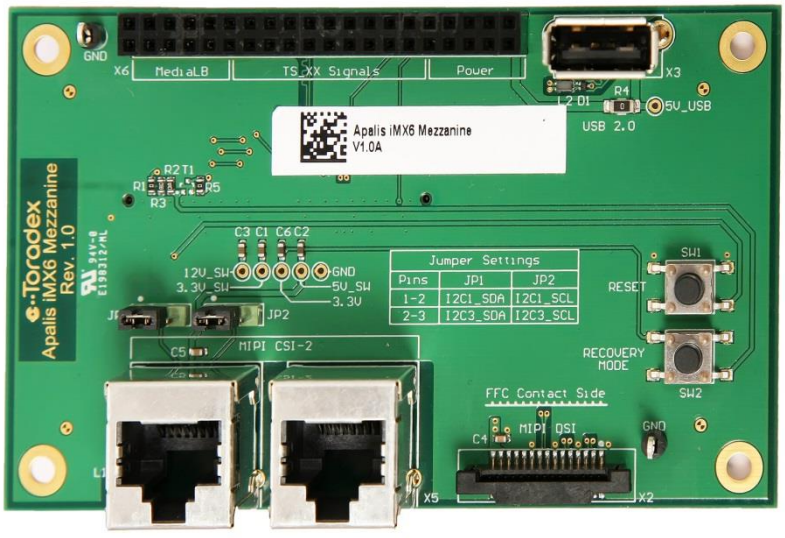
Apalis iMX6 Mezzanine

Datasheet



Revision History

Date	Doc. Rev.	Board Version	Changes
15-April-15	Rev. 1.0	V1.0	- Initial Release: Preliminary Version
07-May-15	Rev. 1.1	V1.0	- Section 3, Assembly: Assembly instruction has been added - Section 4, Product Compliance : Minor Corrections
01-Feb-17	Rev. 1.2	V1.0	- Section 1.1, Reference Documents: Updated web-links

Contents

1. Introduction

Apalis iMX6 Mezzanine is an add-on board for the Apalis Evaluation Board which provides access to the type specific interfaces available on the Apalis iMX6 module. It allows the user to test and evaluate the type specific features available on the Apalis iMX6 module.

Since type specific features are dependent on the Apalis module. Specific types of mezzanine boards will be available for each Apalis module. Customers are free to develop their own type specific mezzanine board for prototyping and development purposes. Please refer to the datasheets for the individual Apalis module for more information.

1.1. Reference Documents

For detailed technical information about suitable computer modules, please refer to the documents listed below.

1.1.1 Apalis Computer Modules

An overview of the Apalis product family:

https://www.toradex.com/computer-on-modules/apalis-arm-family

An overview of the Apalis iMX6 module:

https://www.toradex.com/computer-on-modules/apalis-arm-family/nxp-freescale-imx-6

http://developer.toradex.com/products/apalis-imx6

1.1.2 Toradex Developer Website - Apalis Evaluation Board

http://developer.toradex.com/products/apalis-evaluation-board

1.1.3 Toradex Developer Website - Carrier Board Design

http://developer.toradex.com/carrier-board-design

1.2. Features

1.2.1 Overview

The Apalis iMX6 Board provides the following features and interfaces:

- 1x MIPI CSI-2 connector
- 1x MIPI DSI interface connector
- 1x USB 2.0 connector
- 1x Recovery mode switch
- 1x Reset switch
- 1x Generic header
  - Media Local Bus (MediaLB) interface
  - Power Pins
  - Rest of the type specific (TS_XX) signals

1.2.2 Block Diagram

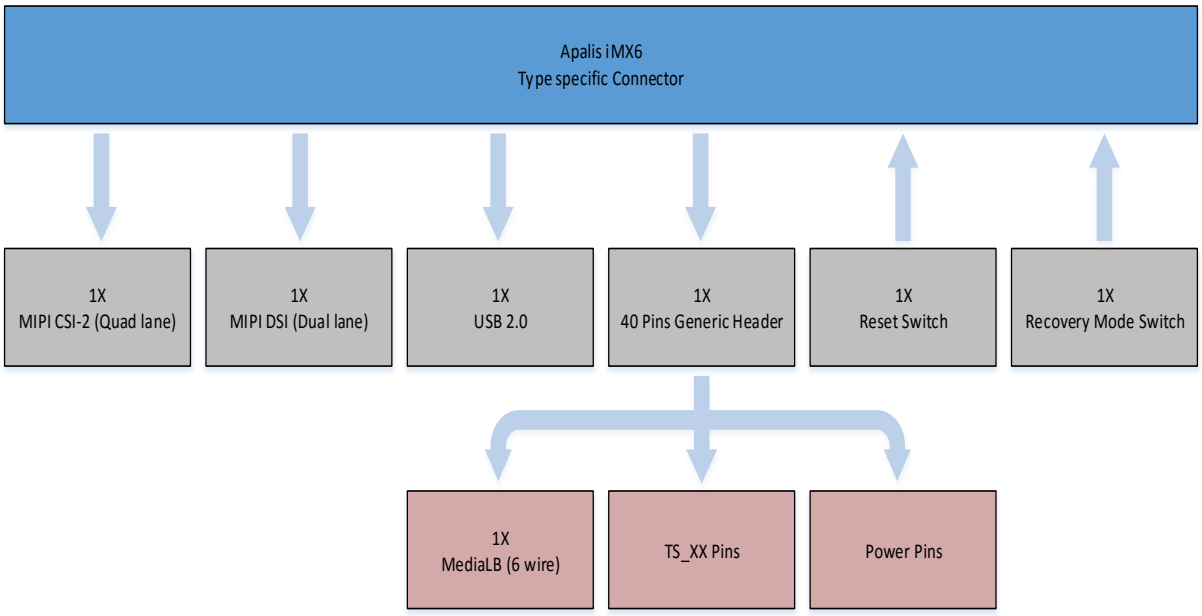


Fig.1 Apalis iMX6 Mezzanine Board Hardware Architecture

1.3. Connector Locations

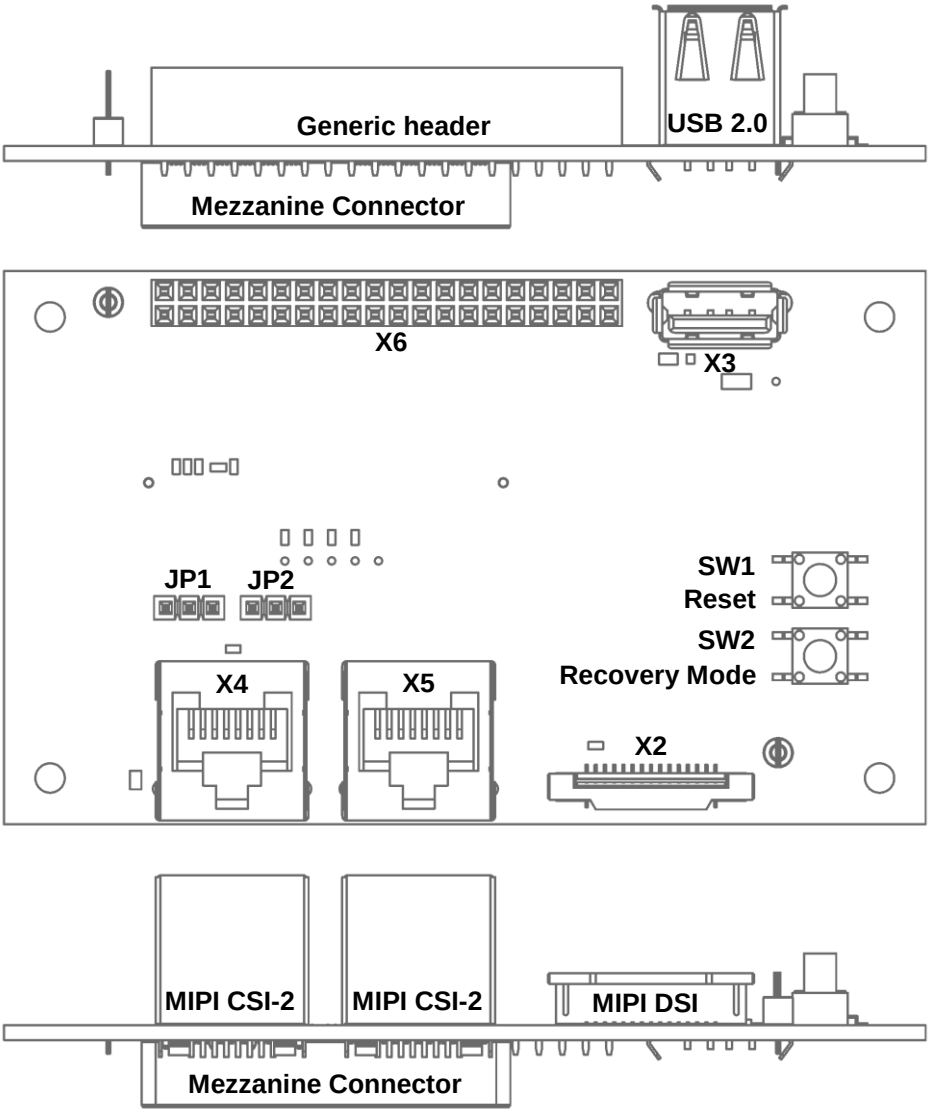


Fig.2 Apalis iMX6 Mezzanine Board Connectors – Top Side

Ref	Description	Remarks
X2	MIPI DSI connector	
X3	USB connector	
X4, X5	MIPI CSI-2 connector	
X6	Generic header	
SW1	Reset switch	
SW2	Recovery mode switch	

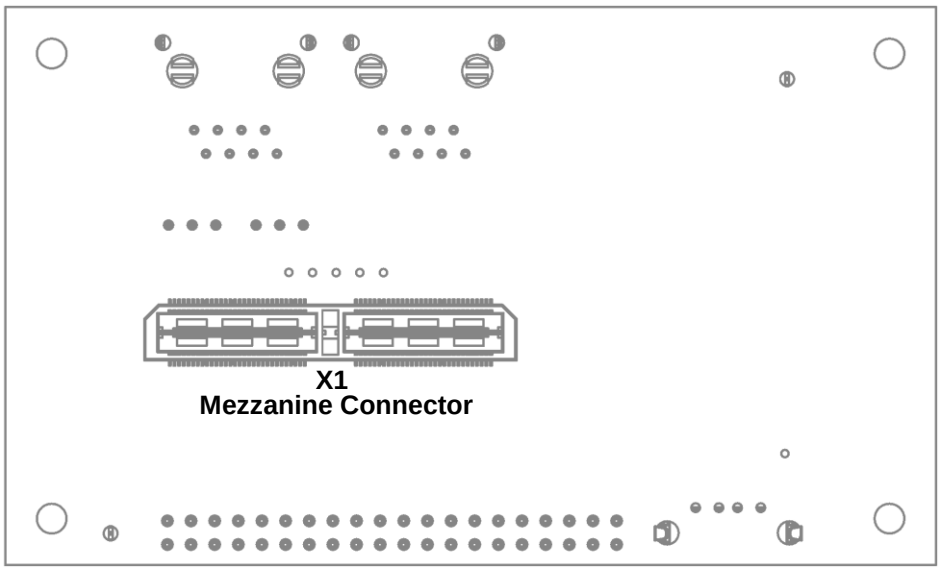


Fig.3 Apalis iMX6 Mezzanine Board Connectors – Bottom Side

Ref	Description	Remarks
X1	Mezzanine Connector	

1.4. Mechanical Drawing

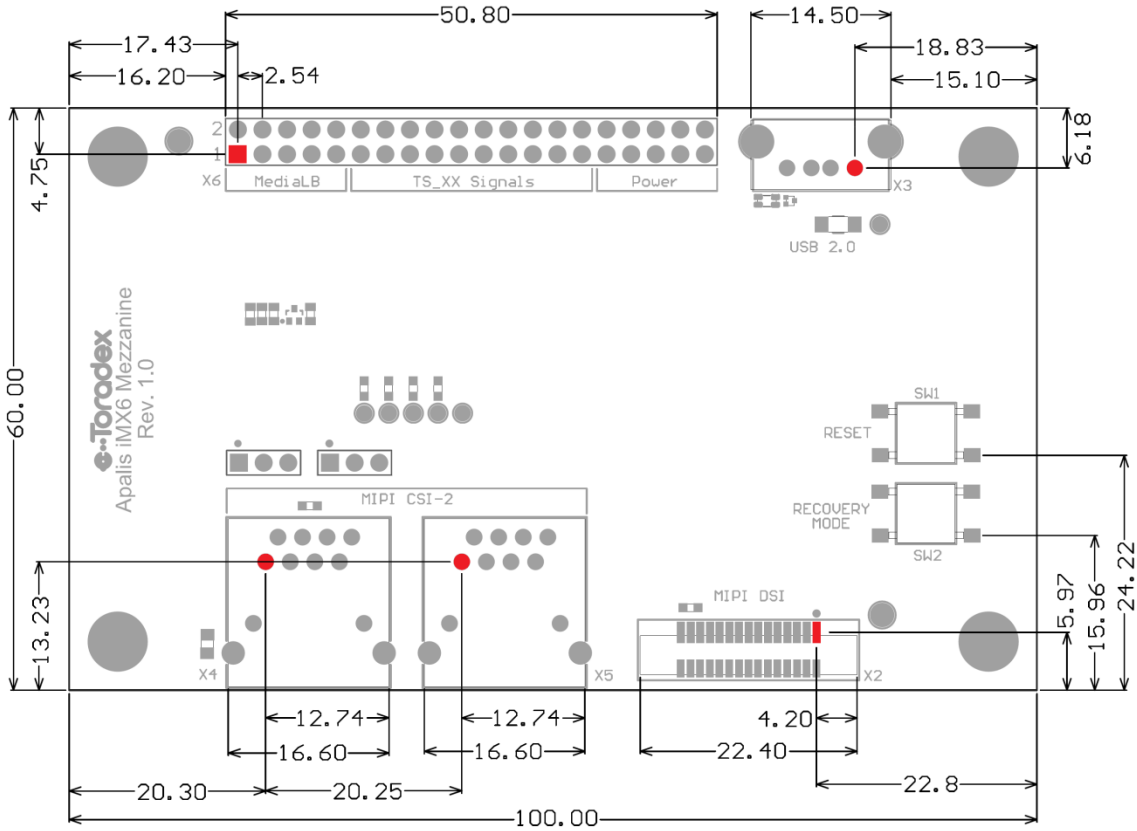


Fig.4 Apalis iMX6 Mezzanine Board Mechanical Drawing – Top Side
All dimensions in millimetres (mm)

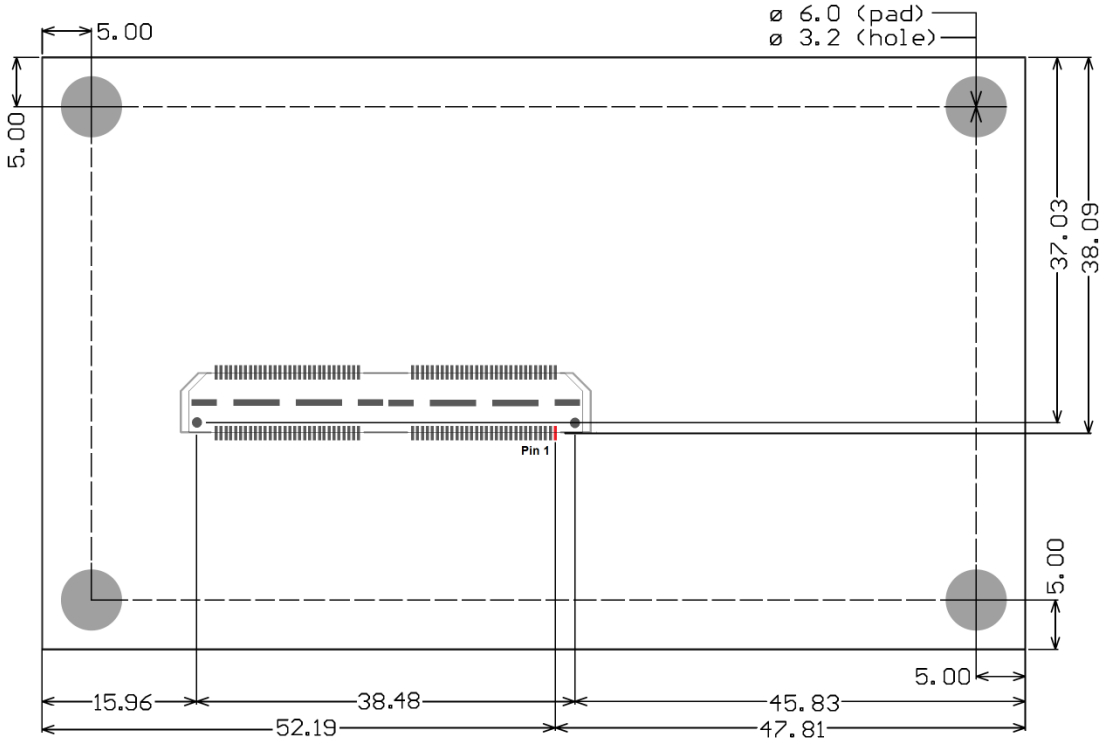


Fig.5 Apalis iMX6 Mezzanine Board Mechanical Drawing – Bottom Side
All dimensions in millimetres (mm)

2. Apalis iMX6 Mezzanine Connectors

2.1. Mezzanine Connector (X1)

Manufacturer: Samtec, QTH-060-02-L-D-A

Pin No.	Signal Name	MXM Number	IO Type	Voltage	Pullup/Pulldown
1	GND		PWR		
2	NC				
3	CSI_CLK0_P	163	I		
4	GND		PWR		
5	CSI_CLK0_N	161	I		
6	NC				
7	EIM_WAIT	159	I/O		
8	NC				
9	CSI_DATA0_P	157	I		
10	NC				
11	CSI_DATA0_N	155	I		
12	NC				
13	GND		PWR		
14	NC				
15	CSI_DATA1_P	151	I		
16	NC				
17	CSI_DATA1_N	149	I		
18	NC				
19	GND		PWR		
20	NC				
21	CSI_DATA2_P	145	I		
22	GND		PWR		
23	CSI_DATA2_N	143	I		
24	NC				
25	GND		PWR		
26	NC				
27	CSI_DATA3_P	139	I		
28	NC				
29	CSI_DATA3_N	137	I		
30	NC				
31	GND		PWR		
32	GND		PWR		
33	EIM_DATA29	135	I/O		
34	NC				
35	CLK2_P	133			
36	GND		PWR		
37	CLK2_N	131			
38	I2C3_SCL	203	O		

Pin No.	Signal Name	MXM Number	IO Type	Voltage	Pullup/Pulldown
39	GND		PWR		
40	GND		PWR		
41	DSI_CLK0_P	127	O		
42	I2C3_SDA	201	I/O		
43	DSI_CLK0_N	125	O		
44	5V_SW		PWR	+5V	
45	GND		PWR		
46	5V_SW		PWR	+5V	
47	SD4_DATA3	123	I/O		
48	5V_SW		PWR	+5V	
49	DSI_DATA0_P	121	O		
50	5V_SW		PWR	+5V	
51	DSI_DATA0_N	119	O		
52	5V_SW		PWR	+5V	
53	GND		PWR		
54	NC				
55	DSI_DATA1_P	115	O		
56	NC				
57	DSI_DATA1_N	113	O		
58	NC				
59	GND		PWR		
60	NC				
61	USBDN4_D_P	109	I/O		
62	3.3V		PWR	+3.3V	
63	USBDN4_D_N	107	I/O		
64	3.3V		PWR	+3.3V	
65	GND		PWR		
66	3.3V		PWR	+3.3V	
67	TAMPER	103	I		
68	3.3V		PWR	+3.3V	
69	NC				
70	NC				
71	GND		PWR		
72	3.3V_SW		PWR	+3.3V	
73	SD4_CMD	99	I/O		
74	3.3V_SW		PWR	+3.3V	
75	NC				
76	3.3V_SW		PWR	+3.3V	
77	SD4_DATA0	95	I/O		
78	3.3V_SW		PWR	+3.3V	
79	GND		PWR		
80	NC				
81	NAND_ALE	91	I/O		

Pin No.	Signal Name	MXM Number	IO Type	Voltage	Pullup/Pulldown
82	12V_SW_UNREG_F		PWR	+12V	
83	NAND_CS3_B	89	I/O		
84	12V_SW_UNREG_F		PWR	+12V	
85	GND		PWR		
86	12V_SW_UNREG_F		PWR	+12V	
87	BOOT_MODE1	87	I		
88	GND		PWR		
89	SD4_CLK	85	I/O		
90	I2C1_SCL	211	O		
91	NAND_CLE	83	I/O		
92	I2C1_SDA	209	I/O		
93	GND		PWR		
94	NC				
95	NAND_CS0_B	79	I/O		
96	NC				
97	CSI0_DATA_EN	77	I/O		
98	NC				
99	GND		PWR		
100	NC				
101	MLB_SIG_P	73			
102	NC				
103	MLB_SIG_N	71			
104	RESET_MICO#	28	I		
105	GND		PWR		
106	NC				
107	MLB_DATA_P	67			
108	NC				
109	MLB_DATA_N	65			
110	NC				
111	GND		PWR		
112	NC				
113	BOOT_MODE0	63	I		
114	NC				
115	MLB_CLK_P	61			
116	NC				
117	MLB_CLK_N	59			
118	NC				
119	GND		PWR		
120	NC				
121	GND		PWR		

2.2. MIPI DSI Connector (X2)

Manufacturer: Tyco, 1-1734248-5

Pin No.	Signal Name	MXM Number	IO Type	Voltage	Pullup/Pulldown
1	GND		PWR		
2	DSI_DATA1_N	113	O		
3	DSI_DATA1_P	115	O		
4	GND		PWR		
5	DSI_CLK0_N	125	O		
6	DSI_CLK0_P	127	O		
7	GND		PWR		
8	DSI_DATA0_N	119	O		
9	DSI_DATA0_P	121	O		
10	GND		PWR		
11	NC				
12	NC				
13	GND		PWR		
14	3.3V_SW		PWR	+3.3V	
15	3.3V_SW		PWR	+3.3V	

2.3. USB Connector (X3)

Manufacturer: Amphenol, UE27AE54100

Pin No.	Signal Name	MXM Number	IO Type	Voltage	Pullup/Pulldown
1	5V_USB		PWR	+5V	
2	USB_N	107	I/O		
3	USB_P	109	I/O		
4	GND		PWR		

Please note that on Apalis iMX6 Mezzanine, USB power circuit is not over current protected. Special attention need to be paid while testing the USB available on the Apalis iMX6 Mezzanine. Please refer Apalis iMX6 Mezzanine schematics for more details.

2.4. MIPI CSI-2 Connectors (X4, X5)

2.4.1 MIPI CSI-2 Connectors (X4)

Manufacturer: Molex, 85508-5001

Pin No.	Signal Name	MXM Number	IO Type	Voltage	Pullup/Pulldown
1	CSI_CLK0_P	163			
2	CSI_CLK0_N	161			
3	I2C_CSI_SDA				
4	5V_SW		PWR	+5V	
5	GND		PWR		
6	I2C_CSI_SCL				
7	CSI_DATA0_N	155			
8	CSI_DATA0_P	157			
S1,S2	SHIELD		PWR		

2.4.2 MIPI CSI-2 Connectors (X5)

Manufacturer: Molex, 85508-5001

Pin No.	Signal Name	MXM Number	IO Type	Voltage	Pullup/Pulldown
1	CSI_DATA1_N	149			
2	CSI_DATA1_P	151			
3	GND		PWR		
4	CSI_DATA2_P	145			
5	CSI_DATA2_N	143			
6	GND		PWR		
7	CSI_DATA3_N	137			
8	CSI_DATA3_P	139			
S1,S2	SHIELD		PWR		

For MIPI CSI-2 interface, I2C channel can be selected using jumpers JP1 and JP2. Jumper JP1 is used for the selection of the I2C data signal, whereas jumper JP2 is used for the selection of the I2C clock signal.

Jumper (JP1)

Connected Pins	Signal Name I2C_CSI_SDA
1-2	I2C_SDA1
2-3	I2C_SDA3

Jumper (JP2)

Connected Pins	Signal Name I2C_CSI_SCL
1-2	I2C_SCL1
2-3	I2C_SCL3

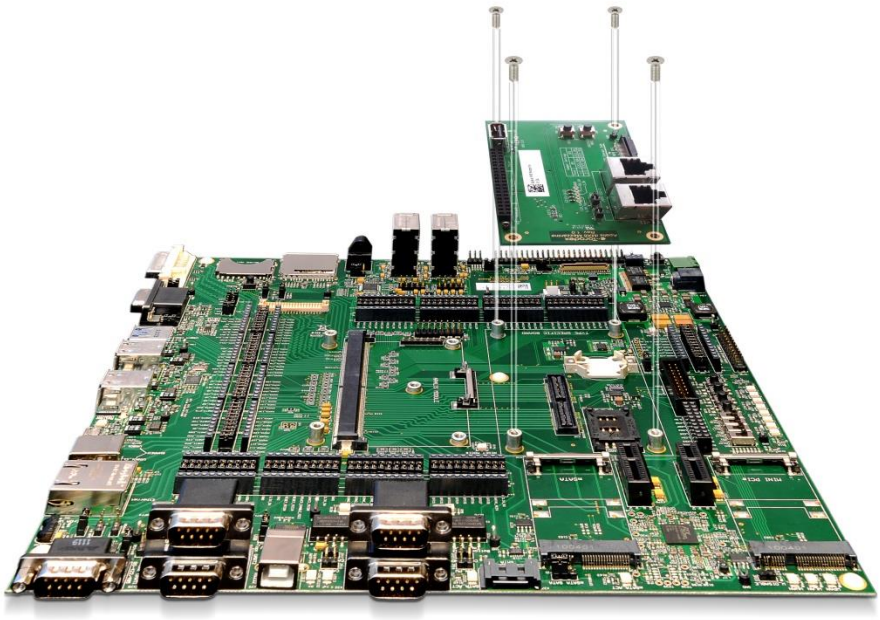
2.5. Generic Header Pins (X6)

Manufacturer: Sullins Connector, SFH11-PBPC-D20-ST-BK, Female Type, 2.54mm Pitch

Pin No.	Signal Name	MXM Number	IO Type	Voltage	Pullup/Pulldown
1	MLB_CLK_N	59			
2	MLB_CLK_P	61			
3	GND		PWR		
4	GND		PWR		
5	MLB_DATA_N	65			
6	MLB_DATA_P	67			
7	GND		PWR		
8	GND		PWR		
9	MLB_SIG_N	71			
10	MLB_SIG_P	73			
11	GND		PWR		
12	GND		PWR		
13	CSI0_DATA_EN	77	I/O		
14	NAND_CS0_B	79	I/O		
15	GND		PWR		
16	GND		PWR		
17	CLK2_N	131			
18	CLK2_P	133			
19	GND		PWR		
20	GND		PWR		
21	SD4_CLK	85	I/O		
22	SD4_DATA0	95	I/O		
23	SD4_CMD	99	I/O		
24	SD4_DATA3	123	I/O		
25	NAND_CLE	83	I/O		
26	NAND_ALE	91	I/O		
27	EIM_DATA29	135	I/O		
28	EIM_WAIT	159	I/O		
29	TAMPER	103	I		
30	NAND_CS3_B	89	I/O		
31	3.3V_SW		PWR	+3.3V	
32	3.3V_SW		PWR	+3.3V	
33	GND		PWR		
34	GND		PWR		
35	12V_SW_UNREG_F		PWR	+12V	
36	12V_SW_UNREG_F		PWR	+12V	
37	GND		PWR		
38	GND		PWR		
49	5V_SW		PWR	+5V	
40	5V_SW		PWR	+5V	

3. Assembly

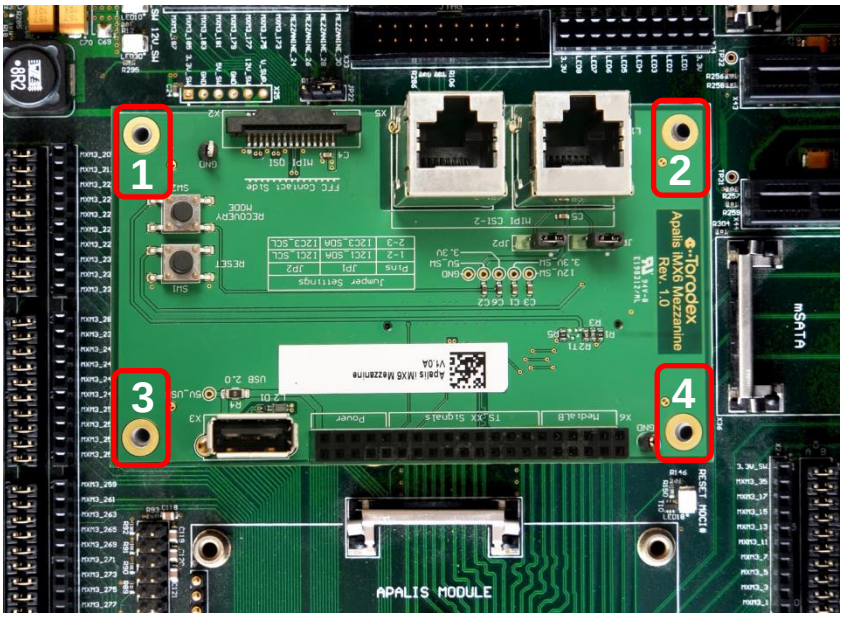
The illustration shown below represents how to attach the Apalis iMX6 Mezzanine to the Apalis Carrier Board.



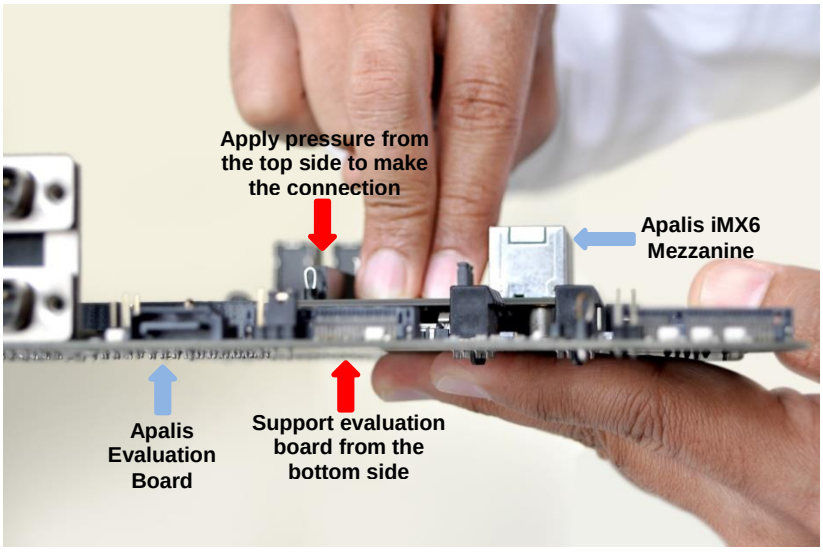
3.1. Assembly Procedure

The following procedure demonstrates how to attach the Apalis iMX6 Mezzanine to the Apalis Evaluation Board. Please read the instructions carefully to ensure that the connectors or circuit board does not get damaged. Necessary precautions should be taken to avoid the electrostatic charge.

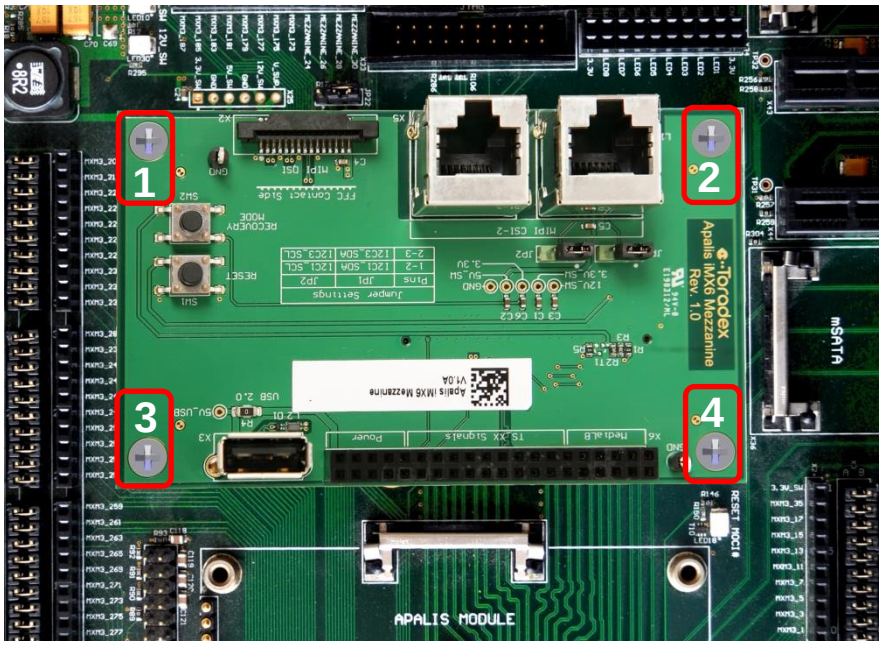
1. Carefully align the mounting holes {1}, {2}, {3}, and {4} on the mezzanine to be in-line with the fasteners available on the Apalis Evaluation board. Place the mezzanine on the Apalis Evaluation Board.



2. As shown in the image below, support the Apalis Evaluation Board from the bottom side, place the fingers just beneath the Apalis Mezzanine mating connector. Apply pressure on the Apalis iMX6 Mezzanine from the top to make the proper connection. This procedure ensures that the Apalis Evaluation Board CPB does not flex or bent while connecting the Apalis iMX6 Mezzanine.



3. Optional: Use 4 units of M3 screws to affix the mezzanine together with the Apalis Evaluation Board.



4. Done. The Apalis iMX6 Mezzanine is now firmly connected to the Apalis Evaluation Board.

4. PCB Revision

Revision history of the Apalis iMX6 Mezzanine is as follows:

- Apalis iMX6 Mezzanine V1.0 : Initial Design

5. Product Compliance

Up-to-date information about product compliance such as RoHS, CE, UL-94, Conflict Materials, REACH etc. can be found on our website at: http://www.toradex.com/support/product-compliance

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