

TB-FMCH-VBY1-AD

Hardware User Manual

Rev.1.00

Revision History

Version	Date	Description	Publisher
Rev.1.00	2014/11/12	Release version	Yoshioka

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Introduction

Thank you for purchasing the **TB-FMCH-VBY1-AD** board. Before using the product, be sure to carefully read this user manual and fully understand how to correctly use the product. First read through this manual and then always keep it handy.




SAFETY PRECAUTIONS

Be sure to observe these precautions




Observe the precautions listed below to prevent injuries to you or other personnel or damage to property.

- Before using the product, read these safety precautions carefully to assure correct use.
- These precautions contain serious safety instructions that must be observed.
- After reading through this manual, be sure to always keep it handy.

The following conventions are used to indicate the possibility of injury/damage and classify precautions if the product is handled incorrectly.

 Danger	Indicates the high possibility of serious injury or death if the product is handled incorrectly.
 Warning	Indicates the possibility of serious injury or death if the product is handled incorrectly.
 Caution	Indicates the possibility of injury or physical damage in connection with houses or household goods if the product is handled incorrectly.

The following graphical symbols are used to indicate and classify precautions in this manual.
(Examples)

	Turn off the power switch.
	Do not disassemble the product.
	Do not attempt this.



Warning

	<p>In the event of a failure, disconnect the power supply. If the product is used as is, a fire or electric shock may occur. Disconnect the power supply immediately and contact our sales personnel for repair.</p>
	<p>If an unpleasant smell or smoking occurs, disconnect the power supply. If the product is used as is, a fire or electric shock may occur. Disconnect the power supply immediately. After verifying that no smoking is observed, contact our sales personnel for repair.</p>
	<p>Do not disassemble, repair or modify the product. Otherwise, a fire or electric shock may occur due to a short circuit or heat generation. For inspection, modification or repair, contact our sales personnel.</p>
	<p>Do not touch a cooling fan. As a cooling fan rotates in high speed, do not put your hand close to it. Otherwise, it may cause injury to persons. Never touch a rotating cooling fan.</p>
	<p>Do not place the product on unstable locations. Otherwise, it may drop or fall, resulting in injury to persons or failure.</p>
	<p>If the product is dropped or damaged, do not use it as is. Otherwise, a fire or electric shock may occur.</p>
	<p>Do not touch the product with a metallic object. Otherwise, a fire or electric shock may occur.</p>
	<p>Do not place the product in dusty or humid locations or where water may splash. Otherwise, a fire or electric shock may occur.</p>
	<p>Do not get the product wet or touch it with a wet hand. Otherwise, the product may break down or it may cause a fire, smoking or electric shock.</p>
	<p>Do not touch a connector on the product (gold-plated portion). Otherwise, the surface of a connector may be contaminated with sweat or skin oil, resulting in contact failure of a connector or it may cause a malfunction, fire or electric shock due to static electricity.</p>

**Caution****Do not use or place the product in the following locations.**

- Humid and dusty locations
- Airless locations such as closet or bookshelf
- Locations which receive oily smoke or steam
- Locations exposed to direct sunlight
- Locations close to heating equipment
- Closed inside of a car where the temperature becomes high
- Sticky locations
- Locations close to water or chemicals

Otherwise, a fire, electric shock, accident or deformation may occur due to a short circuit or heat generation.

**Do not place heavy things on the product.**

Otherwise, the product may be damaged.

Disclaimer

This product is a Samtec FMC connector to JAE FI-R Series connector conversion board. Tokyo Electron Device Limited assumes no responsibility for any damages resulting from the use of this product for purposes other than those stated.

Even if the product is used properly, Tokyo Electron Device Limited assumes no responsibility for any damages caused by:

- (1) Earthquake, thunder, natural disaster or fire resulting from the use beyond our responsibility, acts by a third party or other accidents, the customer's willful or accidental misuse or use under other abnormal conditions.
- (2) Secondary impact arising from use of this product or its unusable state (business interruption or others)
- (3) Use of this product against the instructions given in this manual.
- (4) Malfunctions due to connection to other devices.

Tokyo Electron Device Limited assumes no responsibility or liability for:

- (1) Erasure or corruption of data arising from use of this product.
- (2) Any consequences or other abnormalities arising from use of this product, or
- (3) Damage of this product not due to our responsibility or failure due to modification

This product has been developed by assuming its use for research, testing or evaluation. It is not authorized for use in any system or application that requires high reliability.

Repair of this product is carried out by replacing it on a chargeable basis, not repairing the faulty devices. However, non-chargeable replacement is offered for initial failure if such notification is received within two weeks after delivery of the product.

The specification of this product is subject to change without prior notice.

The product is subject to discontinuation without prior notice.

1. Related Documents and Accessories

Related documents:

All documents relating to this board can be downloaded from our website. Please see attached paper on the products.

Board Accessories:

Dedicated cables

- V-by-One HS x 2, LVDS x 1

FMC Spacer set

- Spacer x 2, Screws x 4

Jumper short-circuit socket

- Short-circuit socket x 10

2. Overview

This product is a Samtec FMC connector (High-Pin Count) to JAE FI-R Series connector conversion board. It supports Thine Electronics' V-by-One HS high speed data interface.

For 16 lane configuration, it is required 41 pin connector (FI-RE41S-VF). Please refer to section 7.2 and contact to us.

The Board is specifically designed for connection with a platform board equipped with High-Pin Count connectors.

3. Feature

- FMC Connector: Samtec FMC Connector (High-Pin Count)
- SerDes/LVDS Connector: JAE FI-R Series Connector
- Clock Supply: Clock can be supplied from IDT ICS849N2021 to Xilinx FPGA transceiver
- Power Supply Switchover: Power supply switchover is enabled by an onboard jumper switch

	K	J	H	G	F	E	D	C	B	A
1	VREF_B_M2C	GND	VREF_A_M2C	GND	PG_M2C	GND	PG_C2M	GND	RES1	GND
2	GND	CLK3_M2C_P	PRSNT_M2C_L	CLK1_M2C_P	GND	HA01_P_CC	GND	DP0_C2M_P	GND	DP1_M2C_P
3	GND	CLK3_M2C_N	GND	CLK1_M2C_N	GND	HA01_N_CC	GND	DP0_C2M_N	GND	DP1_M2C_N
4	CLK2_M2C_P	GND	CLK0_M2C_P	GND	HA00_P_CC	GND	GBTCLK0_M2C_P	GND	DP9_M2C_P	GND
5	CLK2_M2C_N	GND	CLK0_M2C_N	GND	HA00_N_CC	GND	GBTCLK0_M2C_N	GND	DP9_M2C_N	GND
6	GND	HA03_P	GND	LA00_P_CC	GND	HA05_P	GND	DP0_M2C_P	GND	DP2_M2C_P
7	HA02_P	HA03_N	LA02_P	LA00_N_CC	HA04_P	HA05_N	GND	DP0_M2C_N	GND	DP2_M2C_N
8	HA02_N	GND	LA02_N	GND	HA04_N	GND	LA01_P_CC	GND	DP8_M2C_P	GND
9	GND	HA07_P	GND	LA03_P	GND	HA09_P	LA01_N_CC	GND	DP8_M2C_N	GND
10	HA06_P	HA07_N	LA04_P	LA03_N	HA08_P	HA09_N	GND	LA06_P	GND	DP3_M2C_P
11	HA06_N	GND	LA04_N	GND	HA08_N	GND	LA05_P	LA06_N	GND	DP3_M2C_N
12	GND	HA11_P	GND	LA08_P	GND	HA13_P	LA05_N	GND	DP7_M2C_P	GND
13	HA10_P	HA11_N	LA07_P	LA08_N	HA12_P	HA13_N	GND	GND	DP7_M2C_N	GND
14	HA10_N	GND	LA07_N	GND	HA12_N	GND	LA09_P	LA10_P	GND	DP4_M2C_P
15	GND	HA14_P	GND	LA12_P	GND	HA16_P	LA09_N	LA10_N	GND	DP4_M2C_N
16	HA17_P_CC	HA14_N	LA11_P	LA12_N	HA15_P	HA16_N	GND	GND	DP8_M2C_P	GND
17	HA17_N_CC	GND	LA11_N	GND	HA15_N	GND	LA13_P	GND	DP6_M2C_N	GND
18	GND	HA18_P	GND	LA16_P	GND	HA20_P	LA13_N	LA14_P	GND	DP5_M2C_P
19	HA21_P	HA18_N	LA15_P	LA16_N	HA19_P	HA20_N	GND	LA14_N	GND	DP5_M2C_N
20	HA21_N	GND	LA15_N	GND	HA19_N	GND	LA17_P_CC	GND	GBTCLK1_M2C_P	GND
21	GND	HA22_P	GND	LA20_P	GND	HB03_P	LA17_N_CC	GND	GBTCLK1_M2C_N	GND
22	HA23_P	HA22_N	LA19_P	LA20_N	HB02_P	HB03_N	GND	LA18_P_CC	GND	DP1_C2M_P
23	HA23_N	GND	LA19_N	GND	HB02_N	GND	LA23_P	LA18_N_CC	GND	DP1_C2M_N
24	GND	HB01_P	GND	LA22_P	GND	HB05_P	LA23_N	GND	DP9_C2M_P	GND
25	HB00_P_CC	HB01_N	LA21_P	LA22_N	HB04_P	HB05_N	GND	GND	DP9_C2M_N	GND
26	HB00_N_CC	GND	LA21_N	GND	HB04_N	GND	LA26_P	LA27_P	GND	DP2_C2M_P
27	GND	HB07_P	GND	LA25_P	GND	HB09_P	LA26_N	LA27_N	GND	DP2_C2M_N
28	HB06_P_CC	HB07_N	LA24_P	LA25_N	HB08_P	HB09_N	GND	GND	DP8_C2M_P	GND
29	HB06_N_CC	GND	LA24_N	GND	HB08_N	GND	TCK	GND	DP8_C2M_N	GND
30	GND	HB11_P	GND	LA29_P	GND	HB13_P	TDI	SCL	GND	DP3_C2M_P
31	HB10_P	HB11_N	LA28_P	LA29_N	HB12_P	HB13_N	TDO	SDA	GND	DP3_C2M_N
32	HB10_N	GND	LA28_N	GND	HB12_N	GND	3P3VAUX	GND	DP7_C2M_P	GND
33	GND	HB15_P	GND	LA31_P	GND	HB19_P	TMS	GND	DP7_C2M_N	GND
34	HB14_P	HB15_N	LA30_P	LA31_N	HB16_P	HB19_N	TRST_L	GA0	GND	DP4_C2M_P
35	HB14_N	GND	LA30_N	GND	HB16_N	GND	GA1	12P0V	GND	DP4_C2M_N
36	GND	HB18_P	GND	LA33_P	GND	HB21_P	3P3V	GND	DP6_C2M_P	GND
37	HB17_P_CC	HB18_N	LA32_P	LA33_N	HB20_P	HB21_N	GND	12P0V	DP6_C2M_N	GND
38	HB17_N_CC	GND	LA32_N	GND	HB20_N	GND	3P3V	GND	GND	DP5_C2M_P
39	GND	VIO_B_M2C	GND	VADJ	GND	VADJ	GND	3P3V	GND	DP5_C2M_N
40	VIO_B_M2C	GND	VADJ	GND	VADJ	GND	3P3V	GND	RES0	GND

Figure 3-1 FMC Connector Pin Layout

4. Block Diagram

Figure 4-1 shows a block diagram of the TB-FMCH-VBY1-AD board. The FMC connector is mounted on the reverse side of the board.

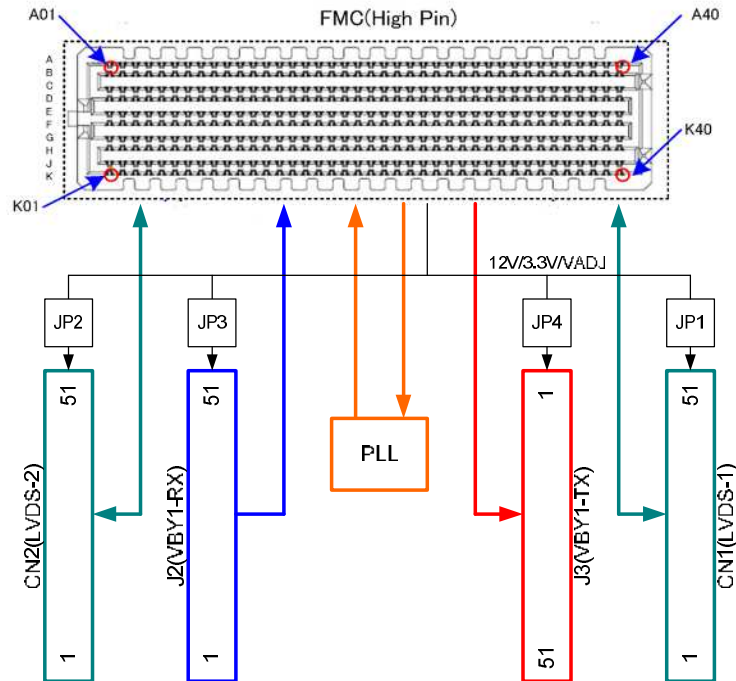


Figure 4-1 Block Diagram

Major functions:

- 8 pairs SerDes connection for each FMC connector to SerDes connector (J2/J3) circuit
- 12 pairs LVDS connection for each FMC connector to LVDS connector (CN1/CN2) circuit
- Power supply to the SerDes/LVDS connector
- Reference clock to Xilinx FPGA transceiver
- Probe points

5. External View of the Board

Figures 5-1 and 5-2 show the external view of the board.

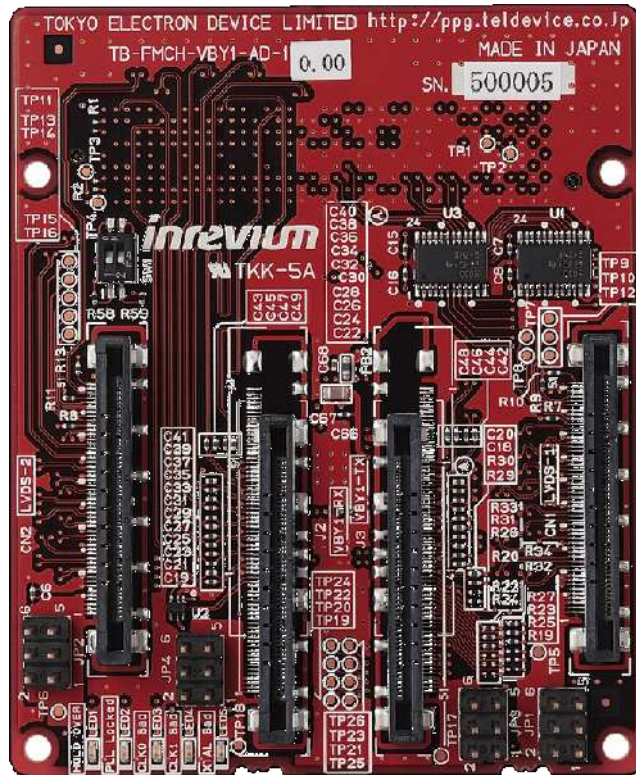


Figure 5-1 Component Side

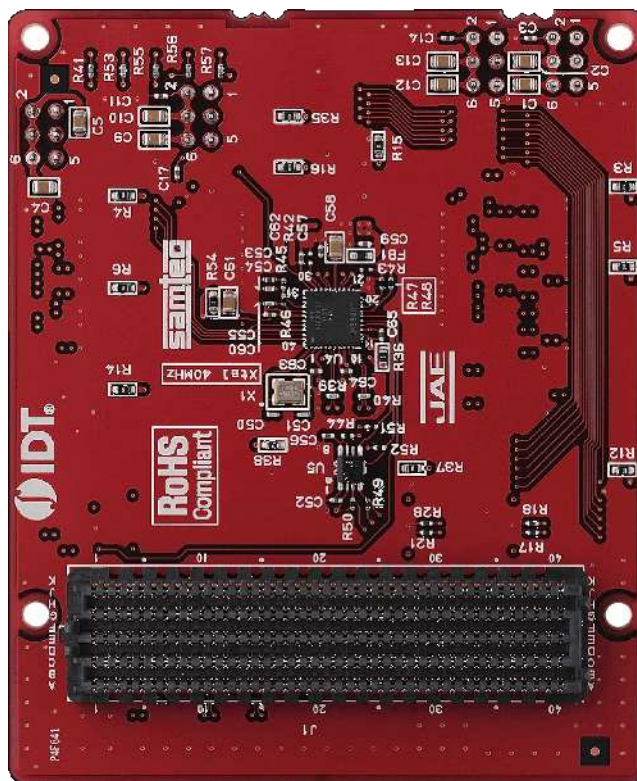


Figure 5-2 Solder Side

6. Board Specifications

The board specifications are as follows:

External dimensions:	W:84 mm x H:69 mm
Number of layers:	10 Layers
Board thickness:	1.6 mm
Material:	FR-4
FMC connector:	Samtec' ASP-134488-01
SerDes connector:	JAE' FI-RE51S-VF
LVDS connector:	JAE' FI-RE51S-VF

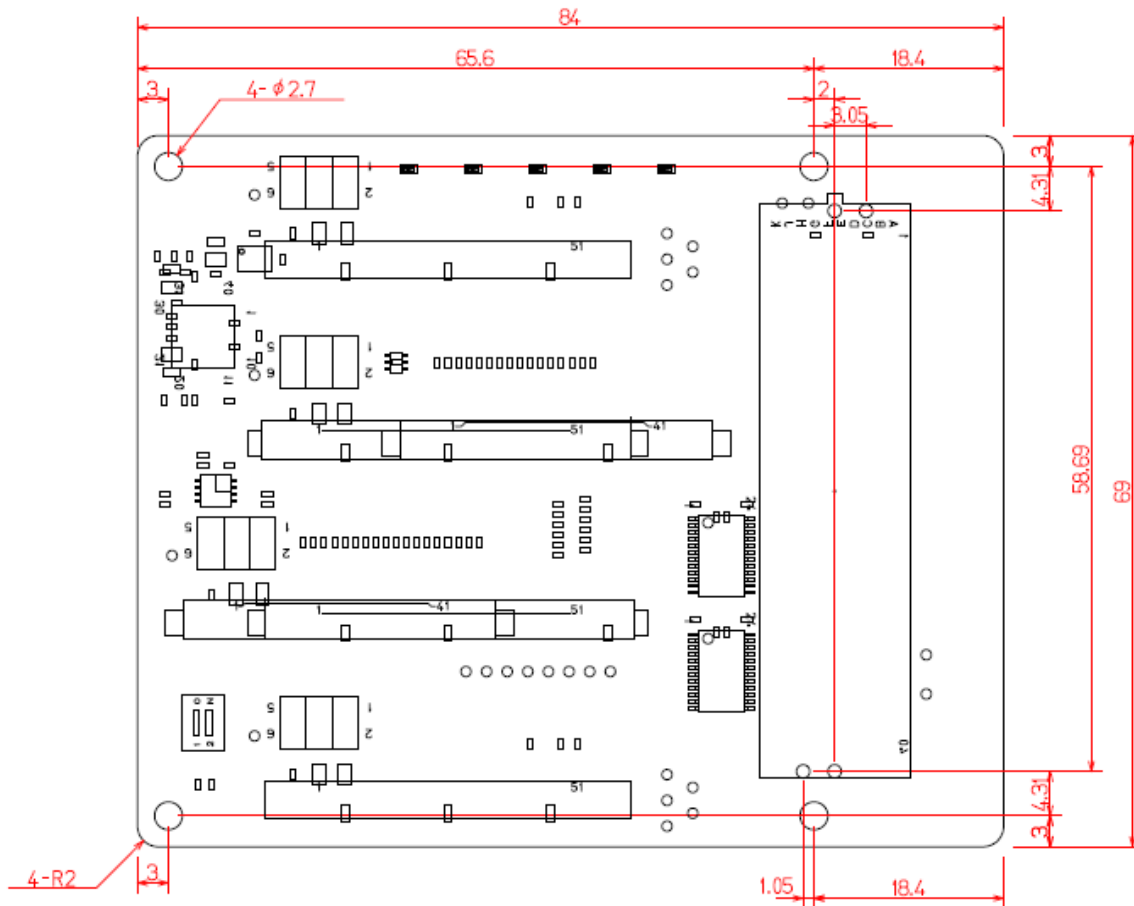


Figure 6-1 Board Dimensions

7. Description of Components

7.1. Signal connections between SerDes/LVDS and FMC connectors

Figure 7-1 shows a cable and Table 7-1 shows pin assignment of SerDes/LVDS via FMC connector. The SerDes side of the connector provides two circuits, RX1 (Receive) and TX1 (Send). The LVDS side of the connector can be used for either Receive or Send circuit.

Two dedicated cables, one for V-by-One HS and the other for LVDS, are supplied with your board. The former cable is labeled as “VBY1-51” and the latter is labeled as “LVDS”.

Be sure to use the corresponding cable for each connector.



Figure 7-1 Supplied Cables

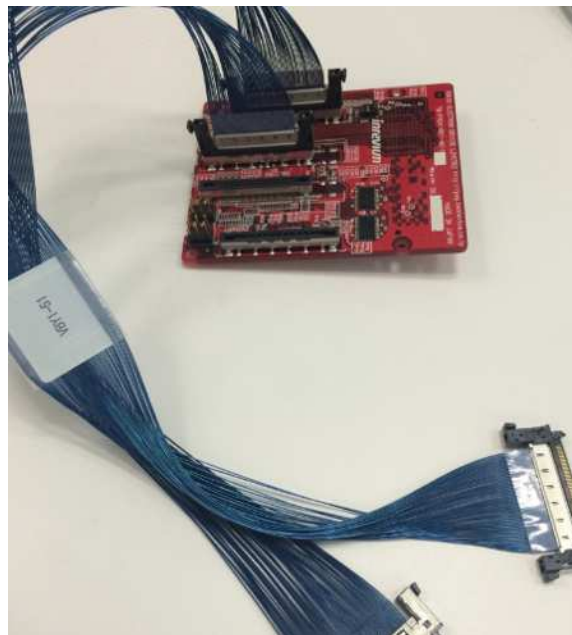


Figure 7-2 Cable Connections

Table 7-1 VBY1-RX (J2) Signal Connection

SerDes Side Pin No.	Signal Name	FMC Side	
		Pin No.	FMC Pin Name
1,2,3,4	*1 VCC	-	-
27,30,33,36,39,42,45 48,51	GND	-	GND
25	*2 VX1_RX_HTPDN	G9	LA03_P
26	*2 VX1_RX_LOCKN	G10	LA03_N
28	VX1_RX0N	C7	DP0_M2C_N
29	VX1_RX0P	C6	DP0_M2C_P
31	VX1_RX1N	A3	DP1_M2C_N
32	VX1_RX1P	A2	DP1_M2C_P
34	VX1_RX2N	A7	DP2_M2C_N
35	VX1_RX2P	A6	DP2_M2C_P
37	VX1_RX3N	A11	DP3_M2C_N
38	VX1_RX3P	A10	DP3_M2C_P
40	VX1_RX4N	A15	DP4_M2C_N
41	VX1_RX4P	A14	DP4_M2C_P
43	VX1_RX5N	A19	DP5_M2C_N
44	VX1_RX5P	A18	DP5_M2C_P
46	VX1_RX6N	B17	DP6_M2C_N
47	VX1_RX6P	B16	DP6_M2C_P
49	VX1_RX7N	B13	DP7_M2C_N
50	VX1_RX7P	B12	DP7_M2C_P

- *1: Either 12V, 3.3V or VADJ that is supplied from the FMC connector can be selected using JP4. For more information, refer to section 7.3, Power supply to the connector.
- *2: A tri-state buffer is inserted between the FMC connector and the VBY1-RX(J2) connector. For more information, refer to section 7.4, Option pin configuration of the VBY1-RX (J2) connector.

Table 7-2 VBY1-TX (J3) Signal Connection

SerDes Side Pin No.	Signal Name	FMC Side	
		Pin No.	FMC Pin Name
48,49,50,51	*1 VCC	-	-
1,4,7,10,13,16,19,22 25	GND	-	GND
27	VX1_TX_HTPDN	G12	LA08_P
26	VX1_TX_LOCKN	G13	LA08_N
24	TX1_0_N	C3	DP0_C2M_N
23	TX1_0_P	C2	DP0_C2M_P
21	TX1_1_N	A23	DP1_C2M_N
20	TX1_1_P	A22	DP1_C2M_P
18	TX1_2_N	A27	DP2_C2M_N
17	TX1_2_P	A26	DP2_C2M_P
15	TX1_3_N	A31	DP3_C2M_N
14	TX1_3_P	A30	DP3_C2M_P
12	TX1_4_N	A35	DP4_C2M_N
11	TX1_4_P	A34	DP4_C2M_P
9	TX1_5_N	A39	DP5_C2M_N
8	TX1_5_P	A38	DP5_C2M_P
6	TX1_6_N	B37	DP6_C2M_N
5	TX1_6_P	B36	DP6_C2M_P
3	TX1_7_N	B33	DP7_C2M_N
2	TX1_7_P	B32	DP7_C2M_P
39	*2 OPT11	G31	LA29_N
38	*2 OPT10	G30	LA29_P
37	*2 OPT9	G28	LA25_N
36	*2 OPT8	G27	LA25_P
35	*2 OPT7	G22	LA20_N
34	*2 OPT6	G21	LA20_P
33	*2 OPT5	G31	LA29_N
32	*2 OPT4	G30	LA29_P
31	*2 OPT3	G28	LA25_N
30	*2 OPT2	G27	LA25_P
29	*2 OPT1	G22	LA20_N
28	*2 OPT0	G21	LA20_P

*1: Either 12V, 3.3V or VADJ that is supplied from the FMC connector can be selected using JP3. For more information, refer to section 7.3, Power supply to the connector.

*2: The connection destination can be changed by swapping an associated resistor. For more information, refer to section 7.5, Option pin configuration of the VBY1-TX (J3) connector.

Table 7-3 LVDS-1 (CN1) Signal Connection

LVDS Side Pin No.	Signal Name	FMC Side	
		Pin No.	FMC Pin Name
1,2,3,4,5	*VCC	-	-
7,8,9,16,19,24,31,34, 39,42,48,51	GND	-	GND
10	A_TLA0_N	H8	LA02_N
11	A_TLA0_P	H7	LA02_P
12	A_TLB0_N	H11	LA04_N
13	A_TLB0_P	H10	LA04_P
14	A_TLC0_N	H14	LA07_N
15	A_TLC0_P	H13	LA07_P
17	A_TLCLK0_N	H5	CLK0_M2C_N
18	A_TLCLK0_P	H4	CLK0_M2C_P
20	A_TLD0_N	H17	LA11_N
21	A_TLD0_P	H16	LA11_P
22	A_TLE0_N	H20	LA15_N
23	A_TLE0_P	H19	LA15_P
25	A_TLA1_N	H23	LA19_N
26	A_TLA1_P	H22	LA19_P
27	A_TLB1_N	H26	LA21_N
28	A_TLB1_P	H25	LA21_P
29	A_TLC1_N	H28	LA24_N
30	A_TLC1_P	H29	LA24_P
32	A_TLCLK1_N	H32	LA28_N
33	A_TLCLK1_P	H31	LA28_P
35	A_TLD1_N	H35	LA30_N
36	A_TLD1_P	H34	LA30_P
37	A_TLE1_N	H38	LA32_N
38	A_TLE1_P	H37	LA32_P
40	A_TLF_N0	G34	LA31_N
41	A_TLF_P0	G33	LA31_P
49	A_TLF_N1	G37	LA33_N
50	A_TLF_P1	G36	LA33_P

*1: Either 12V, 3.3V or VADJ that is supplied from the FMC connector can be selected using JP1.
For more information, refer to section 7.3, Power supply to the connector.

Table 7-4 LVDS-2 (CN2) Signal Connection

LVDS Side Pin No.	Signal Name	FMC Side	
		Pin No.	FMC Pin Name
1,2,3,4,5	*VCC	-	-
7,8,9,16,19,24,31,34, 39,42,48,51	GND	-	GND
10	B_TLA0_N	D9	LA01_N_CC
11	B_TLA0_P	D8	LA01_P_CC
12	B_TLB0_N	C11	LA06_N
13	B_TLB0_P	C10	LA06_P
14	B_TLC0_N	D12	LA05_N
15	B_TLC0_P	D11	LA05_P
17	B_TLCLK0_N	G3	CLK1_M2C_N
18	B_TLCLK0_P	G2	CLK1_M2C_P
20	B_TLD0_N	G7	LA00_N_CC
21	B_TLD0_P	G6	LA00_P_CC
22	B_TLE0_N	D15	LA09_N
23	B_TLE0_P	D14	LA09_P
25	B_TLA1_N	C15	LA10_N
26	B_TLA1_P	C14	LA10_P
27	B_TLB1_N	D18	LA13_N
28	B_TLB1_P	D17	LA13_P
29	B_TLC1_N	C19	LA14_N
30	B_TLC1_P	C18	LA14_P
32	B_TLCLK1_N	D21	LA17_N_CC
33	B_TLCLK1_P	D20	LA17_P_CC
35	B_TLD1_N	C23	LA18_N_CC
36	B_TLD1_P	C22	LA18_P_CC
37	B_TLE1_N	D24	LA23_N
38	B_TLE1_P	D23	LA23_P
40	B_TLF_N0	D27	LA26_N
41	B_TLF_P0	D26	LA26_P
49	B_TLF_N1	C27	LA27_N
50	B_TLF_P1	C26	LA27_P

*1: Either 12V, 3.3V or VADJ that is supplied from the FMC connector can be selected using JP2.
For more information, refer to section 7.3, Power supply to the connector.

7.2. Customization of the SerDes connector

The board is equipped with the JAE FI-RE51S-VF. If the user wants to realize a V-by-one HS 16LANE structure, it is possible to provide a customized version of the board with the FI-RE41S-VF in accordance with the configuration of the equipment to be connected.

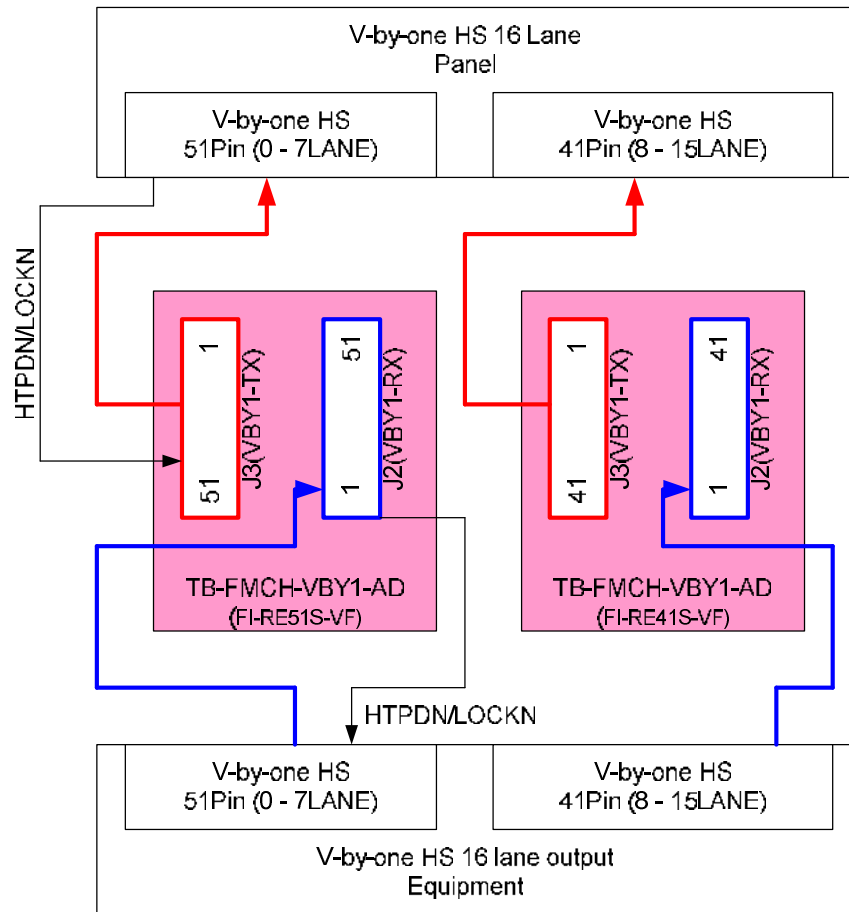


Figure 7-3 An example of the V-by-one HS 16LANE structure

If the FI-RE41S-VF is used, the HTPDN/LOCKN signal cannot be supported in V-by-oneHS protocol. Therefore, if the user wants to realize the V-by-one HS 16LANE environment, it is required to use our standard board with the FI-RE51S-VF together.

In addition, the power supply to the connector and the use of optional signals are also disabled.

For more information, please contact to us.



Figure 7-4 Overview image of the FI-RE41S-VF board

Table 7-5 VBY1-RX(J2) with FI-RE41S-VF Signal Connection

SerDes Side	Signal Name	FMC Side	
Pin No.		Pin No.	FMC Pin Name
1,4,7,10,13,16,19, 22,25	GND	-	GND
2	VX1_RX0N	C7	DP0_M2C_N
3	VX1_RX0P	C6	DP0_M2C_P
5	VX1_RX1N	A3	DP1_M2C_N
6	VX1_RX1P	A2	DP1_M2C_P
8	VX1_RX2N	A7	DP2_M2C_N
9	VX1_RX2P	A6	DP2_M2C_P
11	VX1_RX3N	A11	DP3_M2C_N
12	VX1_RX3P	A10	DP3_M2C_P
14	VX1_RX4N	A15	DP4_M2C_N
15	VX1_RX4P	A14	DP4_M2C_P
17	VX1_RX5N	A19	DP5_M2C_N
18	VX1_RX5P	A18	DP5_M2C_P
20	VX1_RX6N	B17	DP6_M2C_N
21	VX1_RX6P	B16	DP6_M2C_P
23	VX1_RX7N	B13	DP7_M2C_N
24	VX1_RX7P	B12	DP7_M2C_P

Table 7-6 VBY1-TX(J3) with FI-RE41S-VF Signal Connection

SerDes Side	Signal Name	FMC Side	
Pin No.		Pin No.	FMC Pin Name
17,20,23,26,29,32,35, 38,41	GND	-	GND
40	TX1_0_N	C3	DP0_C2M_N
39	TX1_0_P	C2	DP0_C2M_P
37	TX1_1_N	A23	DP1_C2M_N
36	TX1_1_P	A22	DP1_C2M_P
34	TX1_2_N	A27	DP2_C2M_N
33	TX1_2_P	A26	DP2_C2M_P
31	TX1_3_N	A31	DP3_C2M_N
30	TX1_3_P	A30	DP3_C2M_P
28	TX1_4_N	A35	DP4_C2M_N
27	TX1_4_P	A34	DP4_C2M_P
25	TX1_5_N	A39	DP5_C2M_N
24	TX1_5_P	A38	DP5_C2M_P
22	TX1_6_N	B37	DP6_C2M_N
21	TX1_6_P	B36	DP6_C2M_P
19	TX1_7_N	B33	DP7_C2M_N
18	TX1_7_P	B32	DP7_C2M_P

7.3. Power supply to the connector

Power supply from the FMC connector to each connector can be switched using the onboard jumper pins. Figure 7-5 shows the structure of power supply.

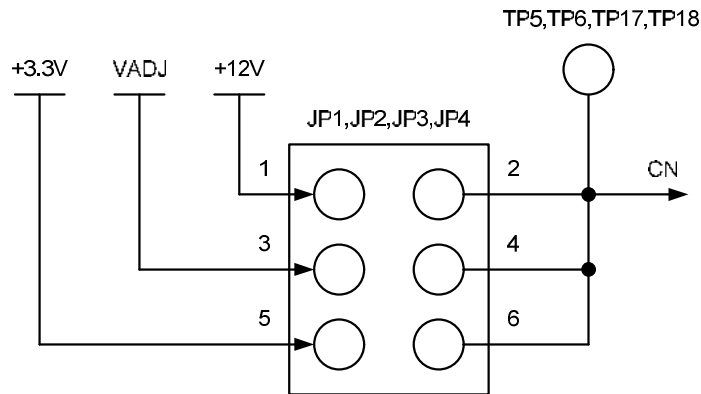


Figure 7-5 SerDes/LVDS CN Power Supply

Table 7-7 Power Supply Switching

CN Name	Pin No.	Connect(JP1.2.3.4)			
		1-2	3-4	5-6	Test Point
CN1(LVDS-1)	1,2,3,4,5	12V	VADJ	3.3V	TP5
CN2(LVDS-2)	1,2,3,4,5	12V	VADJ	3.3V	TP6
J2(VB1-TX)	48,49,50,51	12V	VADJ	3.3V	TP17
J3(VB1-RX)	1,2,3,4,5	12V	VADJ	3.3V	TP18

7.4. Option pin configuration of the VBY1-RX (J2) connector

A tri-state buffer is inserted in the signal connection between the VBY1-RX(J2) connector and the FMC connector for the VX1_RX_HTPDN and VX1_RX_LOCKN pins.

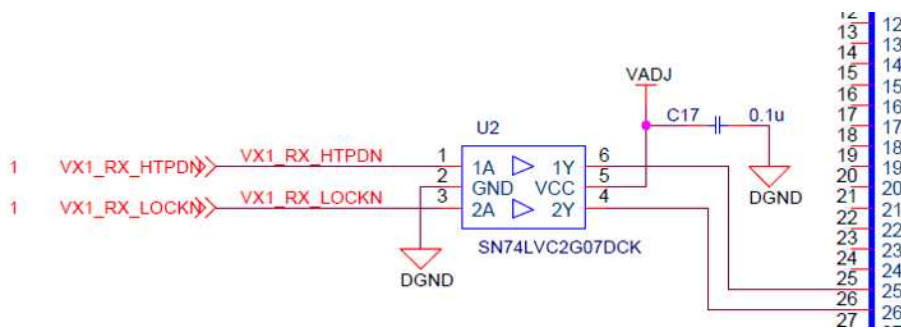


Figure 7-6 A Tri-State Buffer Structure

Normally the tri-state output is performed from the FPGA in V-by-One HS protocol. However, if the board is used, perform the drive output.

7.5. Option pin configuration of the VBY1-TX (J3) connector

In the connection structure shown in Figure 7-7, 12 option pins are provided for signal connections between the FMC connector and the VBY1-TX (J3) connector via the level conversion IC (VADJ => 3.3V conversion). 6 signals are connected via zero ohm resistors in default setting.

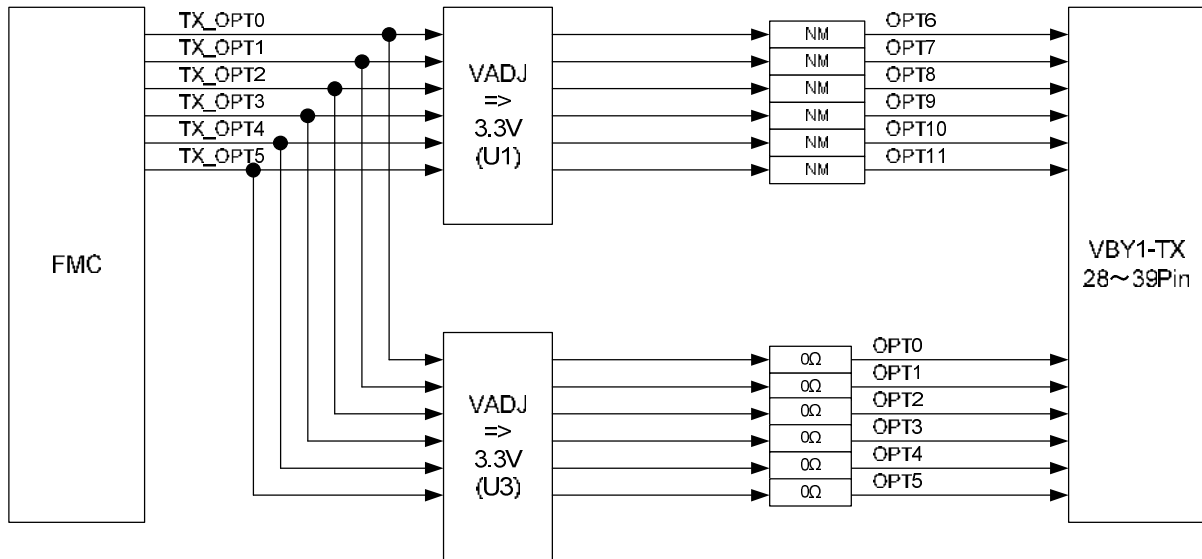


Figure 7-7 VBY1-TX(J3) Option Pin Connections

7.6. Option pin configuration of connectors

The VBY1-TX (J3)/LVDS-1(CN1)/LVDS-2(CN2) connectors have several test points.

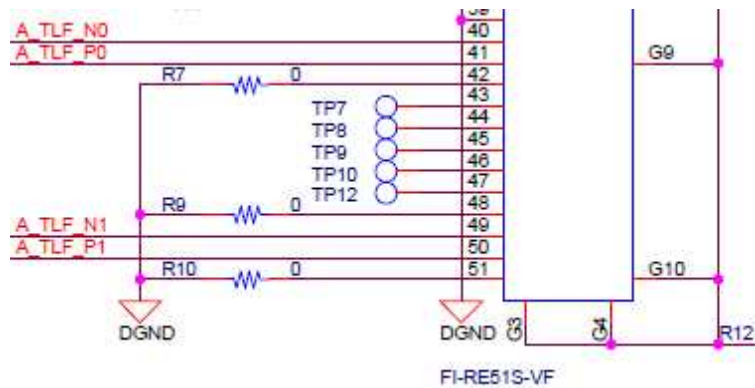


Figure 7-8 LVDS-1(CN1) Test Points

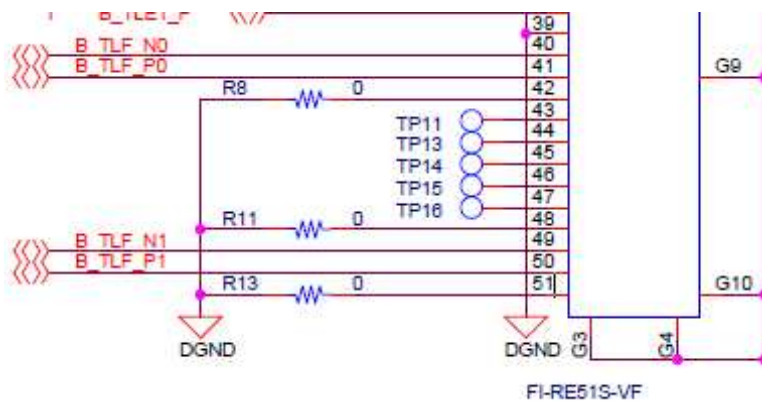


Figure 7-9 LVDS-1(CN2) Test Points

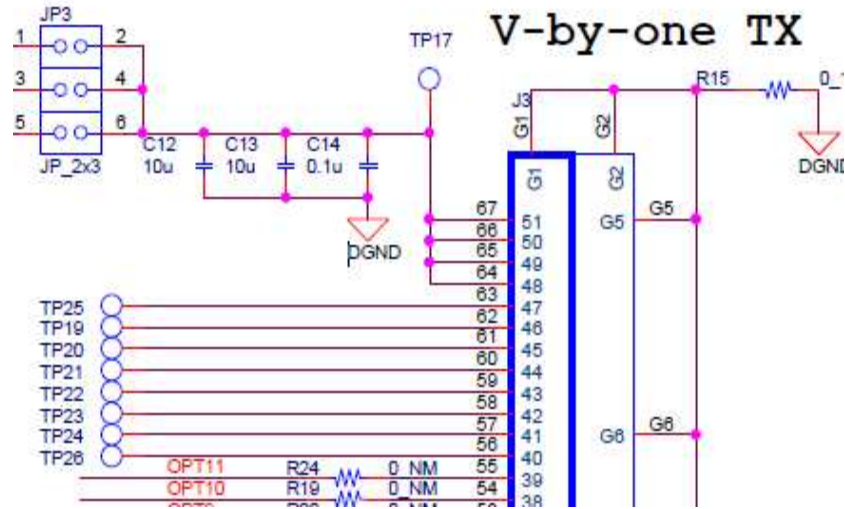


Figure 7-10 VBY1-TX(J3) Test Points

7.7. Reference Clock

The Board is equipped with IDT’s PLL ICS849N202I and can provide a reference clock to the transceiver of the FPGA to be connected.

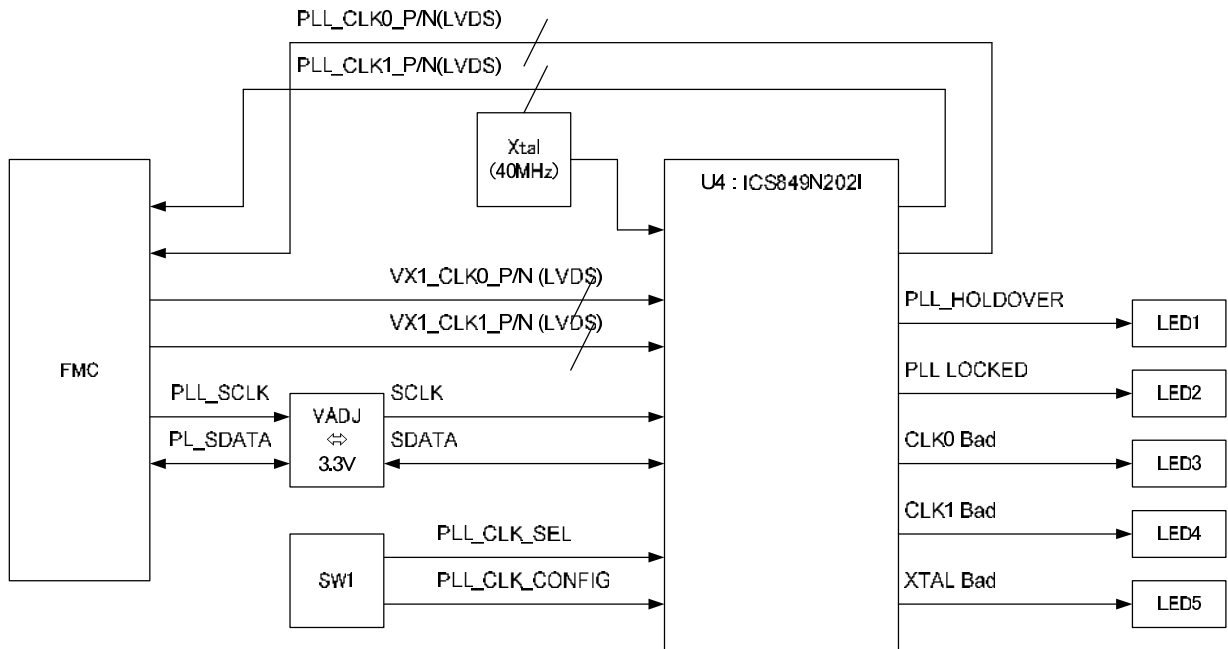


Figure 7-11 PLL Connection Diagram

7.7.1. Output frequency setting

The onboard switch (SW1-1) allows selection of the desired output frequency by turning it to the ON or OFF position.

OFF => 148.5MHz output ON => 74.25MHz output

This PLL has 2 different clock sources but it generates the same frequency irrespective of the setting.

If it receives a supplied clock (74.25MHz LVDS) from the connected device, it generates a clock in synchronization with it. It allows selection of 2 different clock sources by setting the onboard switch (SW1-2).

OFF => VX1_CLK0_P/N ON => VX1_CLK1_P/N

7.7.2. Changing I2C setting

This PLL allows I2C access to the PLL registers from the FPGA via the level convertor.

We have performed an operation check of the ## I2C but do not provide the FPGA design.

For more information, please contact us.

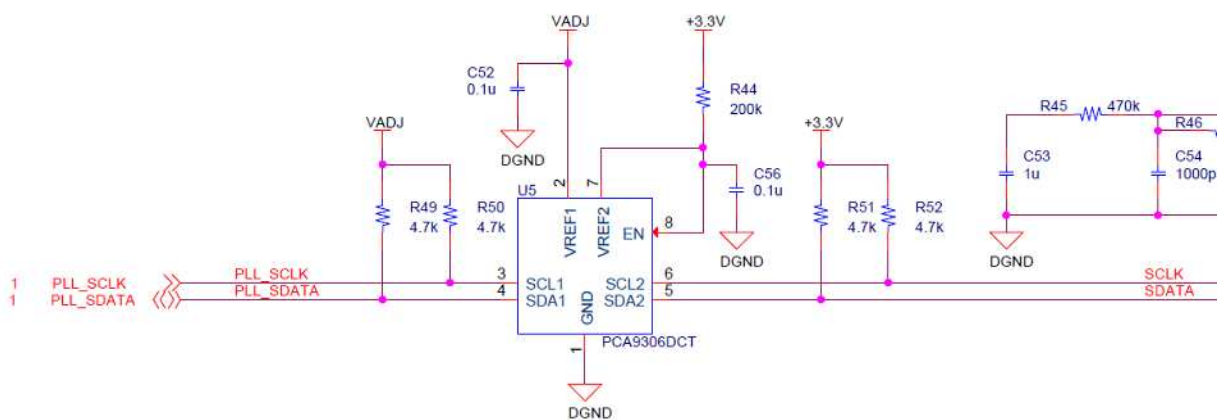


Figure 7-12 PLL I2C Connection Diagram

7.7.3. FMC to PLL Connection

Following Table provides the information relating to the FMC to PLL connection.

Table 7-8: FMC to PLL Signal Connection

PLL Side		FMC Side	
Pin No.	Signal Name	Pin No.	FMC Pin Name
5	VX1_CLK0_P	G15	LA12_P
6	VX1_CLK0_N	G16	LA12_N
9	VX1_CLK1_P	G18	LA016_P
10	VX1_CLK1_N	G19	LA016_N
14	PLL_SDATA	G25	LA22_N
15	PLL_SCLK	G24	LA22_P
27	PLL_CLK0_P	D4	GBTCLK0_M2C_P
26	PLL_CLK0_N	D5	GBTCLK0_M2C_N
24	PLL_CLK1_P	B20	GBTCLK1_M2C_P
23	PLL_CLK1_N	B21	GBTCLK1_M2C_N

7.7.4. PLL STATUS Output

Following Table provides the information relating to those LEDs that are connected to the STATUS signal from the PLL.

Table 7-9 PLL LED STATUS

LED No.	PLL Pin Name	STATUS
LED1	HOLDOVER	Lights when the PLL gets unlocked.
LED2	CONFIG	Lights when the PLL gets locked.
LED3	CLK0BAD	Lights when the VX1_CLK0_P/N is not input.
LED4	CLK1BAD	Lights when the VX1_CLK1_P/N is not input.
LED5	XTALBAD	Lights when the Xtal(40MHz) is failed.

8. Default Switch Settings

Following Table shows the default switch settings.

Table8-1 Default Settings

No.	Silk No.	Initial Setting	Function
1	JP1	Open	Power supply selection (12V/3.3V/VADJ)
2	JP2	Open	Power supply selection (12V/3.3V/VADJ)
3	JP3	Open	Power supply selection (12V/3.3V/VADJ)
4	JP4	Open	Power supply selection (12V/3.3V/VADJ)
5	SW1-1	OFF	PLL output frequency selection
6	SW1-2	OFF	PLL input clock selection

The short-circuit socket comes with the Board.



TOKYO ELECTRON DEVICE

PLD Solution Dept. PLD Division
URL: <http://solutions.inrevium.com/>
E-mail: psd-support@teldevice.co.jp

HEAD Quarter: Yokohama East Square, 1-4 Kinko-cho, Kanagawa-ku, Yokohama City,
Kanagawa, Japan 221-0056
TEL: +81-45-443-4016 FAX: +81-45-443-4058