



FPGA Mezzanine Card (FMC) to High Speed Mezzanine Card (HSMC) adapter board

(KY-FMC2HSMC)

**Data Book
2013**

International Distributors

sky blue
microsystems

Sky Blue Microsystems GmbH
Geisenhausenerstr. 18
81379 Munich, Germany
+49 89 780 2970, info@skyblue.de
www.skyblue.de

ZERIF
TECHNOLOGIES LTD.
A SKY BLUE COMPANY, FOUNDED 1999

In Great Britain:
Zerif Technologies Ltd.
Winnington House, 2 Woodberry Grove
Finchley, London N12 0DR
+44 115 855 7883, info@zerif.co.uk
www.zerif.co.uk

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Revision History

Version	Date	Notes
0.1	13/5/2013	Initial Release
0.2	23/08/2017	Minor changes

2.1 Safety Precautions

With your *FPGA Mezzanine Card (FMC) to High Speed Mezzanine Card (HSMC) adapter board* in hand, please take a minute to read carefully the precautions listed below in order to prevent unnecessary injuries to you or other personnel or cause 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 act upon it to prevent misuse of product.**



Caution

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.
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.
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.
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.
Do not place the product on unstable locations. Otherwise, it may drop or fall, resulting in injury to persons or failure.
If the product is dropped or damaged, do not use it as is. Otherwise, a fire or electric shock may occur.
Do not touch the product with a metallic object. Otherwise, a fire or electric shock may occur.
Do not place the product in dusty or humid locations or where water may splash. Otherwise, a fire or electric shock may occur.
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.
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.
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 close to heating equipment
- Closed inside of a car where the temperature becomes high
- Static electricity replete 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.

2.2 Disclaimer

This product should be used for FMC to HSMC module adaption, according to signal connection described in Table 3 found in this document. KAYA Instruments 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, KAYA Instruments assumes no responsibility for any damages caused by the following:

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

KAYA Instruments assumes no responsibility or liability for:

- Erasure or corruption of data arising from use of this product.
- Any consequences or other abnormalities arising from use of this product, or damage of this product not due to our responsibility or failure due to modification.

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.

3.1 Overview

KY-FMC2HSMC is an adapter board designed to enable connection of industry standard Altera HSMC cards to FPGA boards with FMC interface. This adapter board is designed to support full duplex high speed serial signals (SerDes), as well as LVDS or single ended signals. **KY-FMC2HSMC** uses a standard HPC connector as an interface to the host board and standard HSMC connector as an interface to mezzanine card.

3.2 Features

- Enables connection of standard Altera HSMC cards to FMC enabled FPGA boards
- Interfaces:
 - Up to 8 full duplex high speed serial channels with HPC
 - Up to 1 full duplex high speed serial channels with LPC
 - Up to 34 LVDS channels or 68 single ended LVTTTL signals connected to FMC connector
- On Board, user programmable, low jitter clock generator used to provide clock reference as required for high speed links. The clock frequency can be selected from the following:
 - 100 MHz, supporting PCIe gen 1
 - 125 MHz, supporting PCIe gen 1, GigE, Aurora and SRIO 1.25 and 2.5 Gbps
 - 150 MHz, supporting SATA
 - 156.25 MHz, supporting XAUI, SRIO and Aurora 3.125 Gbps
 - 250 MHz, supporting PCIe gen 2
 - 312.5 MHz, supporting Aurora 5 and 6.25 Gbps
- Altera HSMC compliant
- FMC (VITA 57.1) compliant
- Support HPC and LPC FMC connectors
- -40°C to 85°C operating environment temperature (industrial grade)

3.3 Product Applications

- ✓ Analog to digital conversion
- ✓ Digital to analog conversion
- ✓ Interface peripherals (HD/SD/SDI/SFP/PCIe/SMA etc.)
- ✓ Serial connectivity (LVDS/Serdes etc.)
- ✓ Image processing (HDMI/DVI/DP/LVDS etc.)
- ✓ Machine vision (CameraLink/CXP etc.)

- ✓ Industrial interfaces

3.4 Related documents and accessories

Documents:

- AT24C01B datasheet
- American National Standard for FPGA Mezzanine Card (FMC) Standard (ANSI/VITA 57.1-2008)
- High Speed Mezzanine Card (HSMC) Specification
- CDCM61002 datasheet

Accessories:

- Board Standoffs set

4.1 Block Diagram

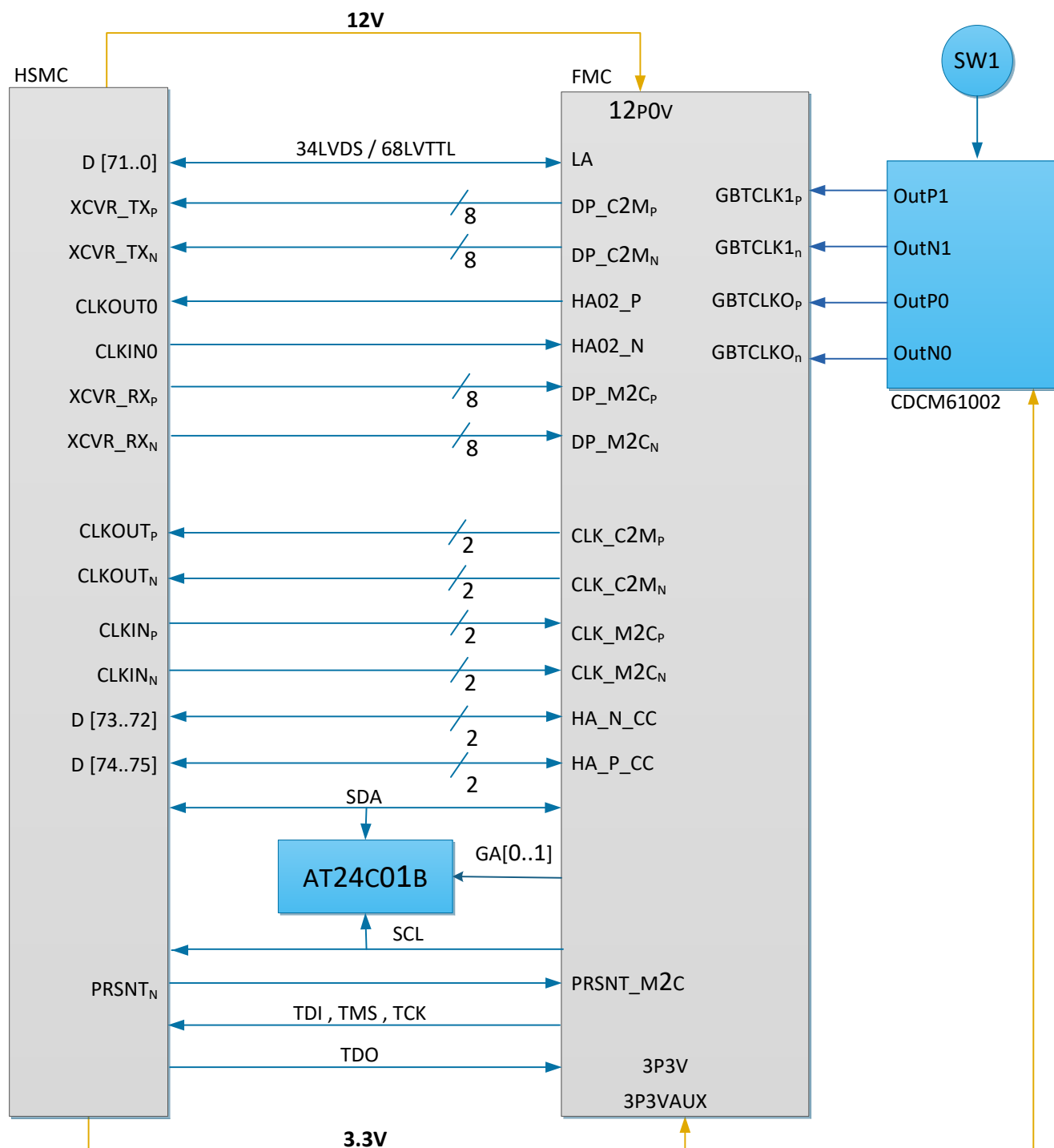


Figure 1 : KY-FMC2HSMC block diagram

4.2 External View of the Board

Figure 2 and Figure 3 shows the **KY-FMC2HSMC** board specification.

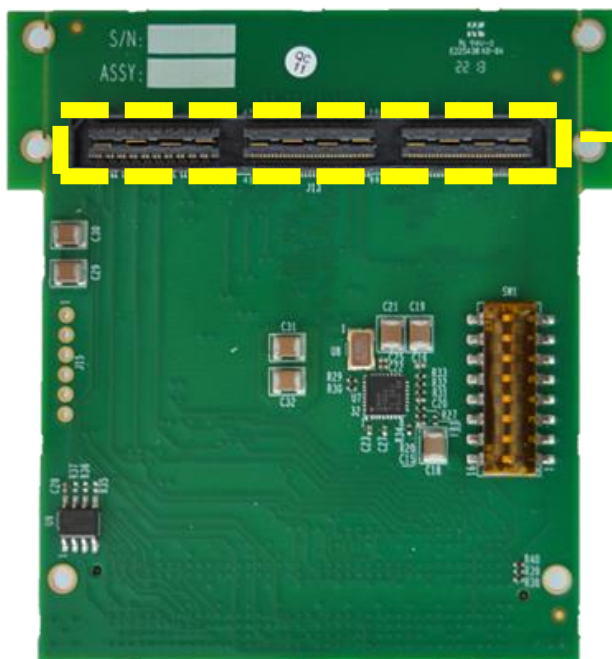
External Dimensions: Width: 78mm x Height: 840mm

Board Thickness: 1.6mm



FMC (HPC) connector

Figure 2 : KY-FMC2HSMC front external view



HSMC connector

Figure 3 : KY-FMC2HSMC back external view

5.1 FMC connector standard pin assignments

	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	CLK1_C2M_P	PRSNT_M2C_L	CLK0_C2M_P	GND	HA01_P_CC	GND	DP0_C2M_P	GND	DP1_M2C_P
3	GND	CLK1_C2M_N	GND	CLK0_C2M_N	GND	HA01_N_CC	GND	DP0_C2M_N	GND	DP1_M2C_N
4	CLK1_M2C_P	GND	CLK0_M2C_P	GND	HA00_P_CC	GND	GBTCLK0_M2C_P	GND	DP9_M2C_P	GND
5	CLK1_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	DP6_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	12POV	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	12POV	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
			LPC Connector	LPC Connector			LPC Connector	LPC Connector		

Table 1 : FMC connector standard pin assignments

5.2 HSMC pin assignments

Pin	Signal	Direction	Pin	Signal	Direction
1	XCVR_TXp7	Input	2	XCVR_RXp7	Output
3	XCVR_TXn7	Input	4	XCVR_RXn7	Output
5	XCVR_TXp6	Input	6	XCVR_RXp6	Output
7	XCVR_TXn6	Input	8	XCVR_RXn6	Output
9	XCVR_TXp5	Input	10	XCVR_RXp5	Output
11	XCVR_TXn5	Input	12	XCVR_RXn5	Output
13	XCVR_TXp4	Input	14	XCVR_RXp4	Output
15	XCVR_TXn4	Input	16	XCVR_RXn4	Output
17	XCVR_TXp3	Input	18	XCVR_RXp3	Output
19	XCVR_TXn3	Input	20	XCVR_RXn3	Output
21	XCVR_TXp2	Input	22	XCVR_RXp2	Output
23	XCVR_TXn2	Input	24	XCVR_RXn2	Output
25	XCVR_TXp1	Input	26	XCVR_RXp1	Output
27	XCVR_TXn1	Input	28	XCVR_RXn1	Output
29	XCVR_TXp0	Input	30	XCVR_RXp0	Output
31	XCVR_TXn0	Input	32	XCVR_RXn0	Output
33	SDA	Bidir	34	SCL	Input
35	JTAG_TCK	Input	36	JTAG_TMS	Input
37	JTAG_TDO	Output	38	JTAG_TDI	Input
39	CLKOUT0	Input	40	CLKIN0	Bidir
41	D0	Bidir	42	D1	Bidir
43	D2	Bidir	44	D3	Bidir
45	3.3V	Power	46	12V	Power
47	LVDS_TXp0/D4	Bidir	48	LVDS_RXp0/D5	Bidir
49	LVDS_TXn0/D6	Bidir	50	LVDS_RXn0/D7	Bidir
51	3.3V	Power	52	12V	Power
53	LVDS_TXp1/D8	Bidir	54	LVDS_RXp1/D9	Bidir
55	LVDS_TXn1/D10	Bidir	56	LVDS_RXn1/D11	Bidir
57	3.3V	Power	58	12V	Power
59	LVDS_TXp2/D12	Bidir	60	LVDS_RXp2/D13	Bidir
61	LVDS_TXn2/D14	Bidir	62	LVDS_RXn2/D15	Bidir
63	3.3V	Power	64	12V	Power
65	LVDS_TXp3/D16	Bidir	66	LVDS_RXp3/D17	Bidir
67	LVDS_TXn3/D18	Bidir	68	LVDS_RXn3/D19	Bidir
69	3.3V	Power	70	12V	Power
71	LVDS_TXp4/D20	Bidir	72	LVDS_RXp4/D21	Bidir
73	LVDS_TXn4/D22	Bidir	74	LVDS_RXn4/D23	Bidir
75	3.3V	Power	76	12V	Power
77	LVDS_TXp5/D24	Bidir	78	LVDS_RXp5/D25	Bidir
79	LVDS_TXn5/D26	Bidir	80	LVDS_RXn5/D27	Bidir
81	3.3V	Power	82	12V	Power
83	LVDS_TXp6/D28	Bidir	84	LVDS_RXp6/D29	Bidir
85	LVDS_TXn6/D30	Bidir	86	LVDS_RXn6/D31	Bidir
87	3.3V	Power	88	12V	Power
89	LVDS_TXp7/D32	Bidir	90	LVDS_RXp7/D33	Bidir
91	LVDS_TXn7/D34	Bidir	92	LVDS_RXn7/D35	Bidir
93	3.3V	Power	94	12V	Power
95	CLKOUT1p/D36	Bidir	96	CLKIN1p/D37	Bidir
97	CLKOUT1n/D38	Bidir	98	CLKIN1n/D39	Bidir
99	3.3V	Power	100	12V	Power
101	LVDS_TXp8/D40	Bidir	102	LVDS_RXp8/D41	Bidir
103	LVDS_TXn8/D42	Bidir	104	LVDS_RXn8/D43	Bidir
105	3.3V	Power	106	12V	Power
107	LVDS_TXn9/D44	Bidir	108	LVDS_RXp9/D45	Bidir

109	LVDS_TXn9/D46	Bidir	110	LVDS_RXn9/D47	Bidir
111	3.3V	Power	112	12V	Power
113	LVDS_TXn10/D48	Bidir	114	LVDS_RXp10/D49	Bidir
115	LVDS_TXn10/D50	Bidir	116	LVDS_RXn10/D51	Bidir
117	3.3V	Power	118	12V	Power
119	LVDS_TXp11/D52	Bidir	120	LVDS_RXp11/D53	Bidir
121	LVDS_TXn11/D54	Bidir	122	LVDS_RXn11/D55	Bidir
123	3.3V	Power	124	12V	Power
125	LVDS_TXp12/D56	Bidir	126	LVDS_RXp12/D57	Bidir
127	LVDS_TXn12/D58	Bidir	128	LVDS_RXn12/D59	Bidir
129	3.3V	Power	130	12V	Power
131	LVDS_TXp13/D60	Bidir	132	LVDS_RXp13/D61	Bidir
133	LVDS_TXn13/D62	Bidir	134	LVDS_RXn13/D63	Bidir
135	3.3V	Power	136	12V	Power
137	LVDS_TXn14/D64	Bidir	138	LVDS_RXp14/D65	Bidir
139	LVDS_TXn14/D66	Bidir	140	LVDS_RXn14/D67	Bidir
141	3.3V	Power	142	12V	Power
143	LVDS_TXn15/D68	Bidir	144	LVDS_RXp15/D69	Bidir
145	LVDS_TXn15/D70	Bidir	146	LVDS_RXn15/D71	Bidir
147	3.3V	Power	148	12V	Power
149	LVDS_TXn16/D72	Bidir	150	LVDS_RXp16/D73	Bidir
151	LVDS_TXn16/D74	Bidir	152	LVDS_RXn16/D75	Bidir
153	3.3V	Power	154	12V	Power
155	CLKOUT2p/D76	Bidir	156	CLKIN2p/D77	Bidir
157	CLKOUT2n/D78	Bidir	158	CLKIN2n/D79	Bidir
159	3.3V	Power	160	PRSENTn	Output

Table 2 : HSMC connector pin assignment

5.3 Signal connection

Pin on HSMC	Signal on HSMC	Pin on FMC	Signal on FMC	Pin on HSMC	Signal on HSMC	Pin on FMC	Signal on FMC
1	XCVR_TXp7	B32	DP7_C2M_P	2	XCVR_RXp7	B12	DP7_M2C_P
3	XCVR_TXn7	B33	DP7_C2M_N	4	XCVR_RXn7	B13	DP7_M2C_N
5	XCVR_TXp6	B36	DP6_C2M_P	6	XCVR_RXp6	B16	DP6_M2C_P
7	XCVR_TXn6	B37	DP6_C2M_N	8	XCVR_RXn6	B17	DP6_M2C_N
9	XCVR_TXp5	A38	DP5_C2M_P	10	XCVR_RXp5	A18	DP5_M2C_P
11	XCVR_TXn5	A39	DP5_C2M_N	12	XCVR_RXn5	A19	DP5_M2C_N
13	XCVR_TXp4	A34	DP4_C2M_P	14	XCVR_RXp4	A14	DP4_M2C_P
15	XCVR_TXn4	A35	DP4_C2M_N	16	XCVR_RXn4	A15	DP4_M2C_N
17	XCVR_TXp3	A30	DP3_C2M_P	18	XCVR_RXp3	A10	DP3_M2C_P
19	XCVR_TXn3	A31	DP3_C2M_N	20	XCVR_RXn3	A11	DP3_M2C_N
21	XCVR_TXp2	A26	DP2_C2M_P	22	XCVR_RXp2	A6	DP2_M2C_P
23	XCVR_TXn2	A27	DP2_C2M_N	24	XCVR_RXn2	A7	DP2_M2C_N
25	XCVR_TXp1	A22	DP1_C2M_P	26	XCVR_RXp1	A2	DP1_M2C_P
27	XCVR_TXn1	A23	DP1_C2M_N	28	XCVR_RXn1	A3	DP1_M2C_N
29	XCVR_TXp0	C2	DP0_C2M_P	30	XCVR_RXp0	C6	DP0_M2C_P
31	XCVR_TXn0	C3	DP0_C2M_N	32	XCVR_RXn0	C7	DP0_M2C_N
33	SDA	C31	SDA	34	SCL	C30	SCL
35	JTAG_TCK	D29	TCK	36	JTAG_TMS	D33	TMS
37	JTAG_TDO	D31	TDO	38	JTAG_TDI	D30	TDI
39	CLKOUT0	K7	HA02_P	40	CLKIN0	K8	HA02_N
41	D0	D8	LA01_P_CC	42	D1	G6	LA00_P_CC
43	D2	D9	LA01_N_CC	44	D3	G7	LA00_N_CC
47	LVDS_TXp0/D4	G9	LA03_P	48	LVDS_RXp0/D5	H7	LA02_P
49	LVDS_TXn0/D6	G10	LA03_N	50	LVDS_RXn0/D7	H8	LA02_N

53	LVDS_TXp1/D8	D11	LA05_P	54	LVDS_RXp1/D9	H10	LA04_P
55	LVDS_TXn1/D10	D12	LA05_N	56	LVDS_RXn1/D11	H11	LA04_N
59	LVDS_TXp2/D12	H13	LA07_P	60	LVDS_RXp2/D13	C10	LA06_P
61	LVDS_TXn2/D14	H14	LA07_N	62	LVDS_RXn2/D15	C11	LA06_N
65	LVDS_TXp3/D16	D14	LA09_P	66	LVDS_RXp3/D17	G12	LA08_P
67	LVDS_TXn3/D18	D15	LA09_N	68	LVDS_RXn3/D19	G13	LA08_N
71	LVDS_TXp4/D20	H16	LA11_P	72	LVDS_RXp4/D21	C14	LA10_P
73	LVDS_TXn4/D22	H17	LA11_N	74	LVDS_RXn4/D23	C15	LA10_N
77	LVDS_TXp5/D24	D17	LA13_P	78	LVDS_RXp5/D25	G15	LA12_P
79	LVDS_TXn5/D26	D18	LA13_N	80	LVDS_RXn5/D27	G16	LA12_N
83	LVDS_TXp6/D28	H19	LA15_P	84	LVDS_RXp6/D29	C18	LA14_P
85	LVDS_TXn6/D30	H20	LA15_N	86	LVDS_RXn6/D31	C19	LA14_N
89	LVDS_TXp7/D32	D20	LA17_P_CC	90	LVDS_RXp7/D33	G18	LA16_P
91	LVDS_TXn7/D34	D21	LA17_N_CC	92	LVDS_RXn7/D35	G19	LA16_N
95	CLKOUT1p/D36	G2	CLK0_C2M_P	96	CLKIN1p/D37	H4	CLK0_M2C_P
97	CLKOUT1n/D38	G3	CLK0_C2M_N	98	CLKIN1n/D39	H5	CLK0_M2C_N
101	LVDS_TXp8/D40	H22	LA19_P	102	LVDS_RXp8/D41	C22	LA18_P_CC
103	LVDS_TXn8/D42	H23	LA19_N	104	LVDS_RXn8/D43	C23	LA18_N_CC
107	LVDS_TXp9/D44	H25	LA21_P	108	LVDS_RXp9/D45	G21	LA20_P
109	LVDS_TXn9/D46	H26	LA21_N	110	LVDS_RXn9/D47	G22	LA20_N
113	LVDS_TXp10/D48	D23	LA23_P	114	LVDS_RXp10/D49	G24	LA22_P
115	LVDS_TXn10/D50	D24	LA23_N	116	LVDS_RXn10/D51	G25	LA22_N
119	LVDS_TXp11/D52	G27	LA25_P	120	LVDS_RXp11/D53	H28	LA24_P
121	LVDS_TXn11/D54	G28	LA25_N	122	LVDS_RXn11/D55	H29	LA24_N
125	LVDS_TXp12/D56	C26	LA27_P	126	LVDS_RXp12/D57	D26	LA26_P
127	LVDS_TXn12/D58	C27	LA27_N	128	LVDS_RXn12/D59	D27	LA26_N
131	LVDS_TXp13/D60	G30	LA29_P	132	LVDS_RXp13/D61	H31	LA28_P
133	LVDS_TXn13/D62	G31	LA29_N	134	LVDS_RXn13/D63	H32	LA28_N
137	LVDS_TXp14/D64	G33	LA31_P	138	LVDS_RXp14/D65	H34	LA30_P
139	LVDS_TXn14/D66	G34	LA31_N	140	LVDS_RXn14/D67	H35	LA30_N
143	LVDS_TXp15/D68	G36	LA33_P	144	LVDS_RXp15/D69	H37	LA32_P
145	LVDS_TXn15/D70	G37	LA33_N	146	LVDS_RXn15/D71	H38	LA32_N
149	LVDS_TXp16/D72	E3	HA01_N_CC	150	LVDS_RXp16/D73	F5	HA00_N_CC
151	LVDS_TXn16/D74	E2	HA01_P_CC	152	LVDS_RXn16/D75	F4	HA00_P_CC
155	CLKOUT2p/D76	J2	CLK1_C2M_P	156	CLKIN2p/D77	K4	CLK1_M2C_P
157	CLKOUT2n/D78	J3	CLK1_C2M_N	158	CLKIN2n/D79	K5	CLK1_M2C_N
				160	PRSNTn	H2	PRSNT_M2C_L

Table 3 : Signal connection

5.4 I²C

The adaptor enables identification and control of the HSMC board using I²C. The I²C SCL and SDA lines are connected directly to the HSMC board. User must take care that there are no address violations between different I²C devices connected to the FMC carrier, as the HSMC boards does not support I²C address selection. In addition an I²C EEPROM is assembled on the adaptor itself, the EEPROM uses a standard FMC addressing.

6.1 Power supplies

The adaptor sources all the voltages from the HSMC connector. The following voltages are connected to FMC card.

Voltage on FMC	Connected to
3P3V	HSMC Connector 3.3V
12P0V	HSMC Connector 12V
3P3VAUX	HSMC Connector 3.3V
VIO_B_M2C	HSMC Connector 3.3V

Table 4 : Power supplies

6.2 Absolute maximum ratings*

Specification	Values
3.3V power supply	-1.0V to +7.0V
12V power supply	-0.3 to 20
Storage Temperature	-55°C to 150°C
Operating Temperature	-40°C to 85°C
Voltage on I ² C signals	-1.0V to +7.0V

Table 5 : Absolute maximum ratings

* Does not apply to connected HSMC mezzanine or FMC carrier

6.3 Operating conditions

Parameter	Minimum	Typical	Maximum
3.3V power input	3.14V	3.3V	3.46V
12V power input	11.4V	12V	12.6V
I ² C VIL Input Low Level ⁽¹⁾	-0.6V		1V
I ² C VIH Input High Level ⁽¹⁾	2.31V		3.8V
I ² C Clock frequency ⁽¹⁾			400KHz

Table 6 : Operating conditions

(1) Please refer to Atmel AT24C01B datasheet for more information about I²C operating conditions

7.1 Transceiver reference clocks

On Board, user programmable, low jitter clock generator used to provide clock reference as required for high speed links. The clock frequency can be selected from the following:

- 100 MHz, supporting PCIe gen 1
- 125 MHz, supporting PCIe gen 1, GigE, Aurora and SRIO 1.25 and 2.5 Gbps
- 150 MHz, supporting SATA
- 156.25 MHz, supporting XAUI, SRIO and Aurora 3.125 Gbps
- 250 MHz, supporting PCIe gen 2
- 312.5 MHz, supporting Aurora 5 and 6.25 Gbps

The selection of the desired frequency is configurable using the onboard switch SW1 according to Table 7:

SW1 (on / off)						Frequency
sw3 (PR0)	sw4 (PR1)	sw5 (OD0)	sw6 (OD1)	sw7 (OD2)	sw8 (CE)	
On	On	Off	On	Off	Off	100 MHz
Off	Off	Off	Off	On	Off	125 MHz
On	On	Off	Off	On	Off	150 MHz
On	Off	Off	Off	On	Off	156.25 MHz
Off	Off	Off	On	On	Off	250 MHz
On	Off	Off	On	On	Off	312.5 MHz

Table 7 : frequency configuration table

The reference clock type is configurable using the onboard switch SW1 according to Table 8:

SW1 (on / off)		Clock type
sw1 (OS0)	Sw2 (OS1)	
On	On	Do not use
Off	On	LVDS
On	Off	LVPECL
Off	Off	LVPECL

Table 8 : Output type configuration table

8.1 Installation instructions

1. Before installing, turn off the power to the board.
2. Firmly press the HSMC mezzanine card connector to the adaptor board.
3. Use spacers if the HSMC is not aligned correctly with the adapter board.
4. Firmly press the adaptor card FMC connector to the carrier board.

International Distributors



Sky Blue Microsystems GmbH
Geisenhausenerstr. 18
81379 Munich, Germany
+49 89 780 2970, info@skyblue.de
www.skyblue.de



In Great Britain:
Zerif Technologies Ltd.
Winnington House, 2 Woodberry Grove
Finchley, London N12 0DR
+44 115 855 7883, info@zerif.co.uk
www.zerif.co.uk