Product Name: **ZX181-HPC FMC Vita 57.1 breakout adapter – passive FPGA Mezzanine Card HPC**

Product Description: FPGA Mezzanine card , FMC , passive test module meeting VITA 57.1 , Vita 57.4 standard bus interface. Includes 10 rows x 40 pins, totaling **400** pins, High Pin Count , HPC, housing only SEAM connector, mating with host system (CC). Fully compatible with Low Pin Count, LPC connector interface.

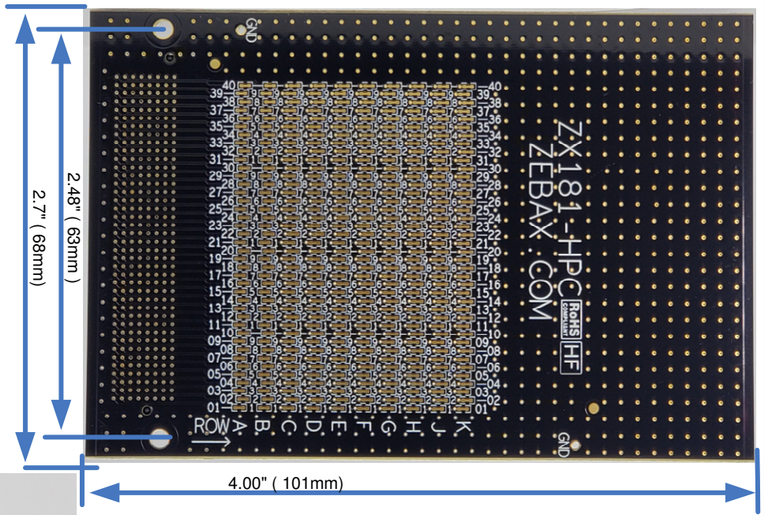
Provides prototype area as well as onboard SMD 0402 footprint shunts for accessing any of the 400 signals. Ideal breakout mezzanine card for any design utilizing SEAM (10x40) connector series as well as Vita 57.1, and Vita 57.4 standards.

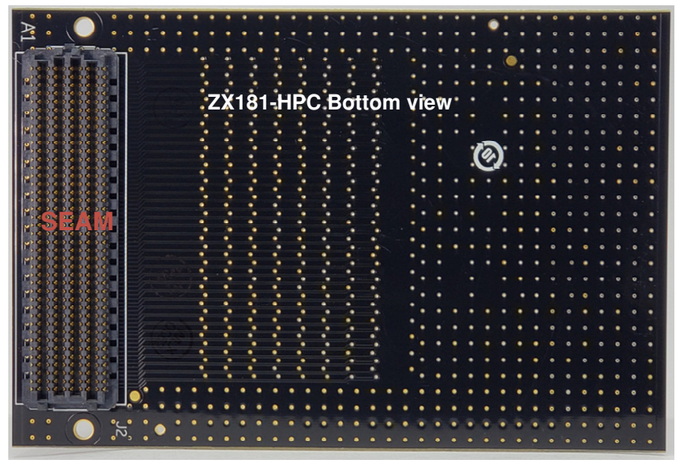
Fully compatible with **Vita 57.1 (FMC) ,** and **Vita 57.4 (FMC+)** standard by providing full access to all Vita 57.1 HPC signals via onboard 0402 SMD footprint shunts.
Fully compatible with Vita 57.4 FMC+, with exception of no access to signals on Columns L , M , Z , Y.

Please refer to **Page 2** for full list of accessible signals as listed by Vita 57.1 Vita 57.4 standards.
The GND access point is offered by 2 onboard GND test points interfacing with test equipment, host and target. The GND test points are connected to inner GND planes as well as top/bottom layers fill.

1- Mates with any Samtec Molex HI-SPEED HI-DENSITY SEARRAY design connectors.
2- **Fully** compatible with 10 rows x 40 pins per row single ended or differential pairs design configuration
3- Designed in **8** layers PCB stackup
4- **All** signals are accessible via onboard standard 0402 SMD footprint shunts.
5- All signals (via 0402 SMD package) are extended to the onboard 0402 SMD package shunts foo
6- Improved signal integrity and crosstalk
7- Multiple GND test points connecting directly to inner layers GND planes.
8- Includes only HPC MC (SEAM) connector.
9- Matching connector **50Ω** trace impedance on all signals – Reference plane impedance 50Ω for DC
10- Easy interface with single or differential scope probe, see **page 3** for details.

See Page 2,3 for more details

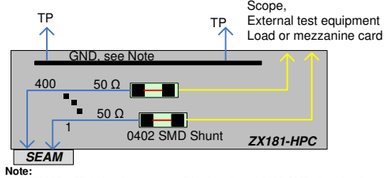




Electrical:
Insertion loss > -2dB @8GHz
Trace impedance: 50 Ω
PCB Material : FR4, 8 layers
Plating: Gold = 30 µ" (0.76 µm) over 50 µ" (1.27 µm) Ni, all signal layers
Operating Temperature: -55℃ to +125℃
Connector:
Onboard Connector type: SEAM 10x40 BGA
Connector contact : Copper Alloy
Connector housing: LCP UL 94 V0, COLOR: BLACK
Connector contacts: COPPER ALLOY / LEAD FREE SOLDER
Connector plating: = 30 µ" (0.76 µm) Au over 50 µ" (1.27 µm) Ni
Mates with: Any height SEAM and SEAF 10x40 BGA connectors
Pitch: 0.05" (1.27mm) pin to pin pitch
Shunt:
Package: 0402 SMD standard footprint
Plating: Gold = 30 µ" (0.76 µm) over 50 µ" (1.27 µm) Ni

Application: FMC VITA 57.1 , Vita 57.4 FMC+ , daughter card Bringup, testing, characterization, qualification , manufacturing loopback test.
Emulation, Xilinx Intel custom FPGA system development solutions.
Interface testing of daughter board to host, modular design evaluations.

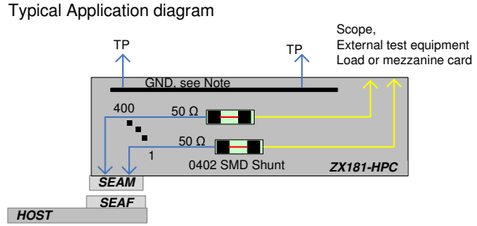
Simplified Block diagram



Note:
1- All 400 Vita 57.1 signals are accessible via onboard 0402 SMD shunt landing pads.
2- The GND test points are connected to inner GND planes as well as top/bottom fill.
3- Onboard SEAM connector mates with Host's onboard SEAF connector.
4- Prototype, Evaluation board, daughter card, Mezzanine card can be wired to ZX181-HPC.

Typical signal connection:
0402 SMD shunt

Typical Application diagram



Note:
1- All 400 signals - Vita 57.1 signals are accessible via onboard 0402 SMD shunt landing pads.
2- The GND test points are connected to inner GND planes as well as top/bottom layers fill.

Compliance:

ISO2001 certified
RoHs - Lead Free
EU RoHS2
UL E111594 document
ELV- Vehicle Directive (Directive 2000/EC)
European Union Directive (203/11/EC)
Halogen Free per IEC-61249-2.21 : 2003
RoHs Directive 2011/65/EU
WEEE Directive (2012/12/EU)

Certificate of Compliance for Radioactive substances
Certificate of Compliance for Asbestos
Certificate of Compliance for Ozone Depleting Substances, ODS
Certificate REACH SVHC
Certificate of Compliance RoHS_EN_CoC

ZX181-HPC package includes:

Part number	Quantity	Description
ZX181-HPC	1	FMC Vita 57.1 breakout adapter
ZX00BC2PH30	0	30AWG Bare Copper wire to pin header wire assembly
ZX0002SRF4	0	High Frequency semi-rigid SMA to bare wire coax cable assembly

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ROHS COMPLIANT

ASSEMBLY DRAWING

ITEM: ZX181-HPC

DESCRIPTION: **FMC VITA 57.1 breakout adapter – passive FPGA mezzanine card HPC**

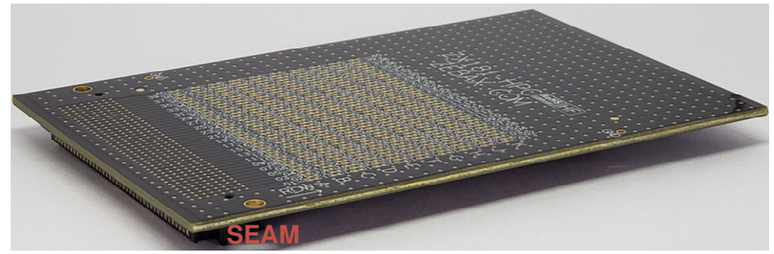
CHECKED: M. MARINA
DRAWN: SONYA
REVISSION: 1.0
SHEET: 1 OF 3

Product Name: **Cont's ZX181-HPC FMC Vita 57.1 breakout adapter – passive FPGA Mezzanine Card HPC**

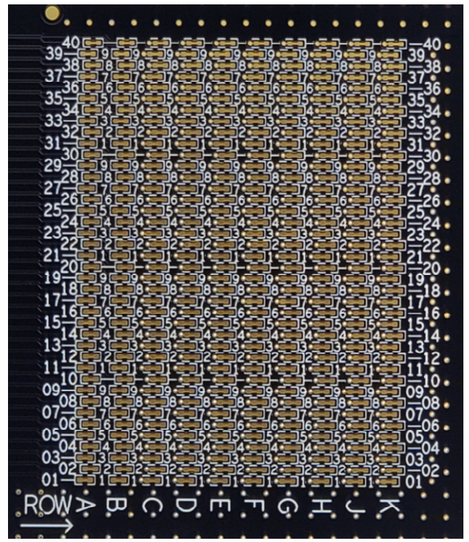
Mates with : Xilinx FPGA development systems Virtex 6 Virtex 7 connecting daughter board to Host
Any and all FMC VITA 57.1 compliant design.
SEAM SADL SEAMP SEAR SEAMI SEAC FMC HPC
SEAF-040-08.0-L-10-2-A SEAF-040-08-L-10-2-A
SEAFP-40 SEAMP-040 SEAMI-040 SEAR-040-10-10- SEAM-040
All listed Samtec Molex FMC connectors listed, table below:

ZX181 HPC FMC breakout adapter mates with the following Samtec Molex SEARAY™ VITA 57 Connectors

Molex P N	Samtec PN	VITA PN	Description
45971-4307	ASP-127796-01	CC-LPC-10L	female
45971-4317	ASP-134485-01	CC-HPC-10L	female
45971-4315	ASP-134486-01	CC-HPC-10	female
45971-4305	ASP-134603-01	CC-LPC-10	female



ZX181-HPC 0402 SMD shunt footprints grid matrix



Ground: The GND access points are offered by 2 onboard GND test points interfacing with test equipment, host and target. It is connected to the module inner GND planes and top & bottom GND fills.

Access signals: ZX181-HPC provides access to all Vita 57.1 signals as well as Vita 57.4 (with exception of no access to signals on Columns L , M , Z , Y) via onboard 0402 SMD footprint package. Table below lists the Vita 57.1 signals , to be used as reference accessing ZX181-HPC FMC Vita 57.1 FMC test module breakout adapter.

Pin	Vita 57.1 - HPC									
	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	CLK_DIR	GND
2	GND	CLK3_BIDIR_P	PRSNT_M2C_L	CLK1_M2C_P	GND	HA01_P_CC	GND	DP0_C2M_P	GND	DP1_M2C_P
3	GND	CLK3_BIDIR_N	GND	CLK1_M2C_N	GND	HA01_N_CC	GND	DP0_C2M_N	GND	DP1_M2C_N
4	CLK2_BIDIR_P	GND	CLK0_M2C_P	GND	HA00_P_CC	GND	GBTCLK0_M2C_P	GND	DP9_M2C_P	GND
5	CLK2_BIDIR_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	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

Notice

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ASSEMBLY DRAWING

ITEM: ZX181-HPC

DESCRIPTION: FMC VITA 57.1 breakout adapter – passive FPGA mezzanine card HPC

CHECKED: M. MARINA

DRAWN: SONYA

REVISSION: 1.0

Product Name: **Cont's ZX181-HPC FMC Vita 57.1 breakout adapter – passive FPGA Mezzanine Card HPC**

Access: ZX181-HPC offers all 400 signals accessible via onboard standard 0402 SMD footprint shunts. The followings are few recommendations for interfacing ZX181-HPC with test & measurement equipment , scope, function generator, Network Analyzer, power supply, electronics load and more.

1- Using 32AWG solid copper wire with pin header, ZX00BC2PH30 or similar to interface to any scope probe / test equipment
2- Using high frequency semi-rigid coax cable assembly , ZX0002SRF4 , to solder on any signal on ZX181-HPC. The SMA connector part of the cable assembly may be interfaced with any test equipment for purpose of signal injection or interface with test equipment.

Loopback test: ZX181-HPC may be configured for manufacturing , development , or qualification loopback test configuration. Using any 32AWG solid copper wire to inner connect any connection combination. The ZX181-HPC enables any design loopback test requirement, ensuring solid test & measurement method for pre-bringup, bringup, qualification and manufacturing phase of any design.

Typical Application: ZX181-HPC is designed for purpose of test and debugging at full connector's bandwidth. It provides new approach in usage of breakout adapters by :

1- Utilizing single or differential scope probe for purpose of test & measurements
2- Enabling design changes, by re-assignment of any signal by means of cut and solder, where any signal may be cut and assigned to new location by jumper wires.
3- Loopback test & measurement , enabling software development & testing.

Scope Probe wire Installation:

1- It is recommended to keep the probe wire length at 0.5" (1.2cm) long.
2- In order to avoid ground loop problems, please use the shortest Ground probe wire interfacing to the nearest GND reference. The ZX181-HPC provides two GND test points for reference.
3- Both Keysight as well as Tektronix offer variety of single ended as well as differential probes along with their accessories, below are few probes from each vendor:

a) Keysight differential probe or similar N2795A, N2796A, 1168V, 1134B along with E2677B differential Solder-in probe, N5426A ZIF Tip, N2884A Fine Wire ZIF Tip and more – See the figure "probe head accessories".
b) Tektronix offers several single-ended as well as differential probes such as : P6245, P6248, P6247, P6246 or any of TDP7000 series and more

4- Please follow your vendor's guideline in installation of probe wires & accessories.

Signal Access & re-route:

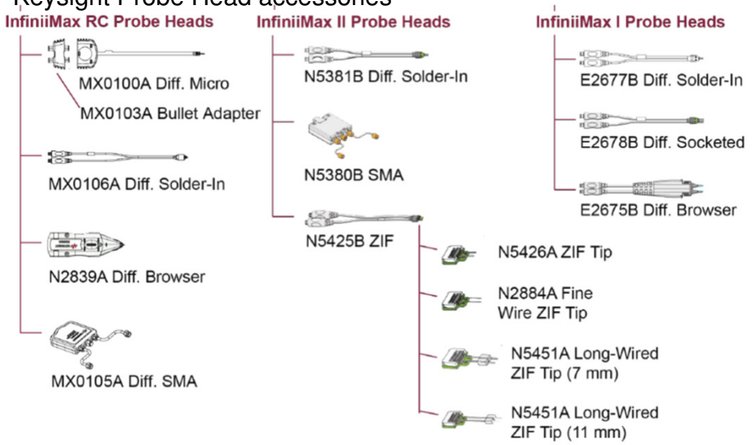
Re-routing any signal on ZX181-HPC may be implemented by cutting the designated 0402 SMD shunt and re-routing to new location.

Accessories: The following accessories compliment ZX181-HPC for testing purpose.

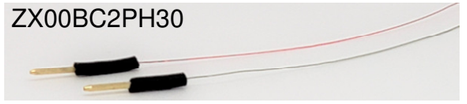
ZX00BC2PH30 30AWG Bare Copper wire to pin header wire assembly – It can be easily soldered to any pads on the ZX181-HPC for scope probe interface.

ZX0002SRF4 High Frequency SMA to bare wire semi-rigid coax cable assembly – It is **semi-rigid** coax cable assembly where case of the cable assembly is exposed copper. It can easily soldered to any pads on ZX181-HPC. With Insertion loss of >-0.5dB, ZX0002SRF4 is excellent for characterization and performance test qualification.

Keysight Probe Head accessories



Tektronix P6243 scope probe



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ASSEMBLY DRAWING

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DESCRIPTION: FMC VITA 57.1 breakout adapter – passive FPGA mezzanine card HPC

CHECKED: M. MARINA
DRAWN: SONYA
REVISSION: 1.0
SHEET 3 OF 3