

Product Name: ZX180-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 both SEAM and SEAF connectors. 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 / SEAF (10x40) connector series as well as Vita 57.1, and Vita 57.4 standards.

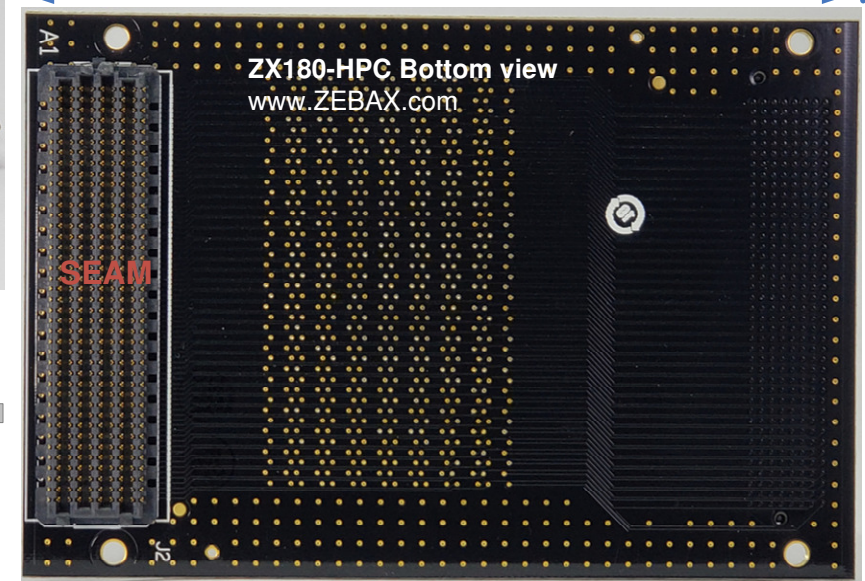
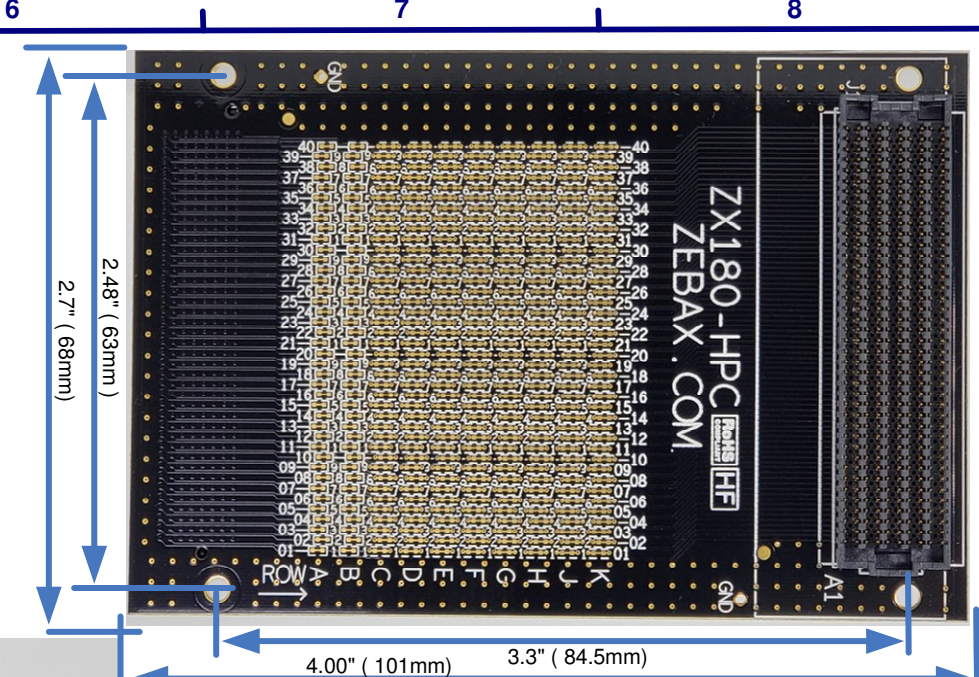
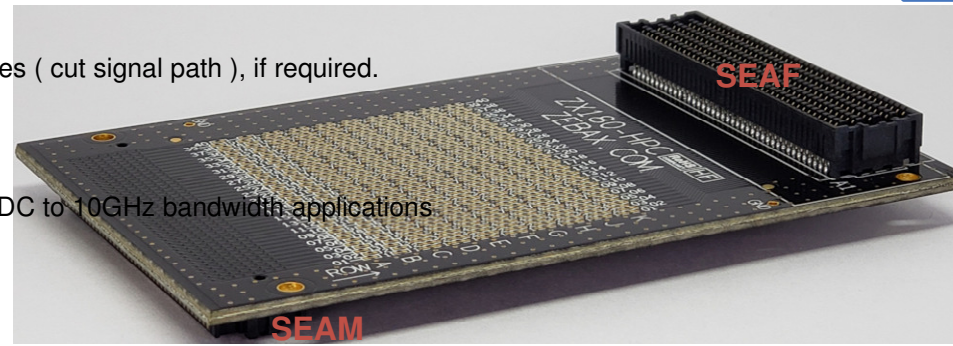
Fully compatible with **Vita 57.1 (FMC)** , and **Vita 57.4 (FMC+)** standard by providing full access to all Vita 57.1 HPC signals via onboard 0402 SMD footprint shunts. Fully compatible with Vita 57.4 FMC+, with exception of no access to signals on Columns L , M , Z , Y.

Please refer to **Page 2** for full list of accessible signals as listed by Vita 57.1 Vita 57.4 standards.

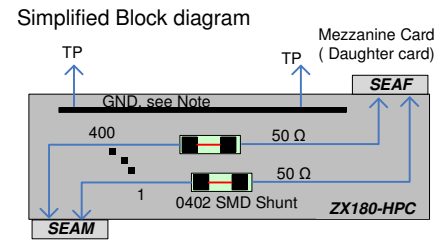
The GND access point is offered by 2 onboard GND test points interfacing with test equipment, host and target. The GND test points are connected to inner GND planes as well as top/bottom layers fill.

- 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 pass through, enabling user to implement design changes (cut signal path), if required.
- 6- Improved signal integrity and crosstalk
- 7- Multiple GND test points connecting directly to inner layers GND planes.
- 8- Includes both HPC MC (SEAM) and CC (SEAF) connectors
- 9- Matching connector's **50Ω** trace impedance on all signals – Reference plane impedance 50Ω for DC to 10GHz bandwidth applications
- 10- Easy interface with single or differential scope probe, see **page 3** for details.

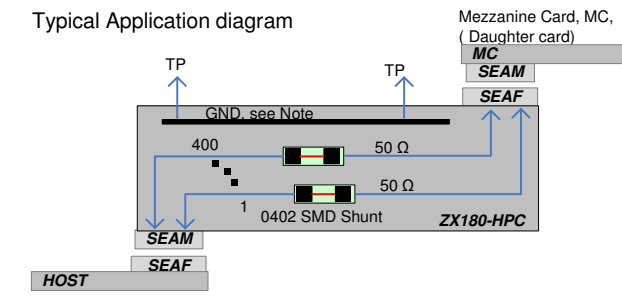
See Page 2,3 for more details



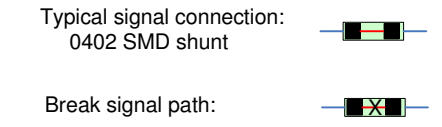
Electrical: Insertion loss > -2dB @8GHz
 Trace impedance: 50 Ω
 PCB Material : FR4, 8 layers
 Plating: Gold = 30 μ" (0.76 μm) over 50 μ" (1.27 μm) Ni, all signal layers
 Operating Temperature: -55°C to +125°C
Connector:
 Onboard Connector type: SEAM 10x40 BGA
 SEAF 10x40 BGA
 Connector contact : Copper 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



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- Onboard SEAF connector mates with Mezzanine Card's onboard SEAM connector.



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.



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.

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

ZX180-HPC package includes:

Part number	Quantity	Description
ZX180-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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DESCRIPTION: FMC VITA 57.1 breakout adapter – passive FPGA mezzanine card HPC		
CHECKED: M. MARINA	DRAWN: SONYA	REVISION: 1.0
		SHEET: 1 OF 3

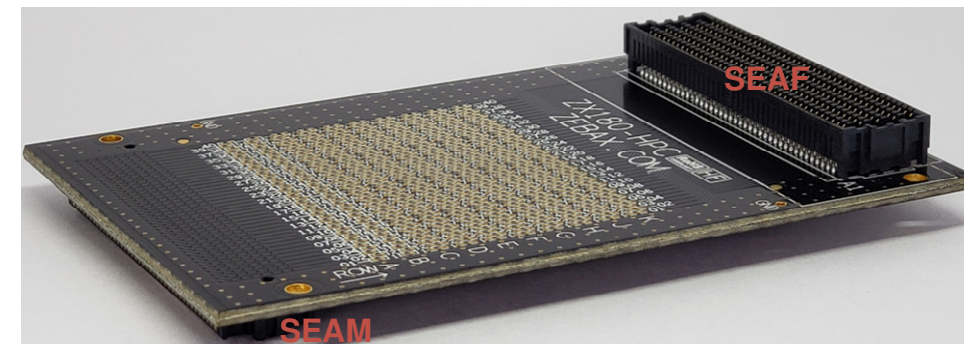
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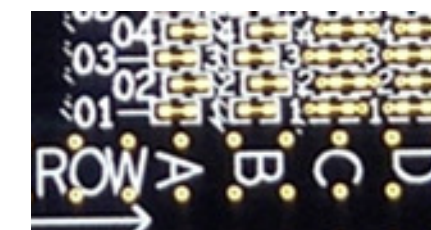
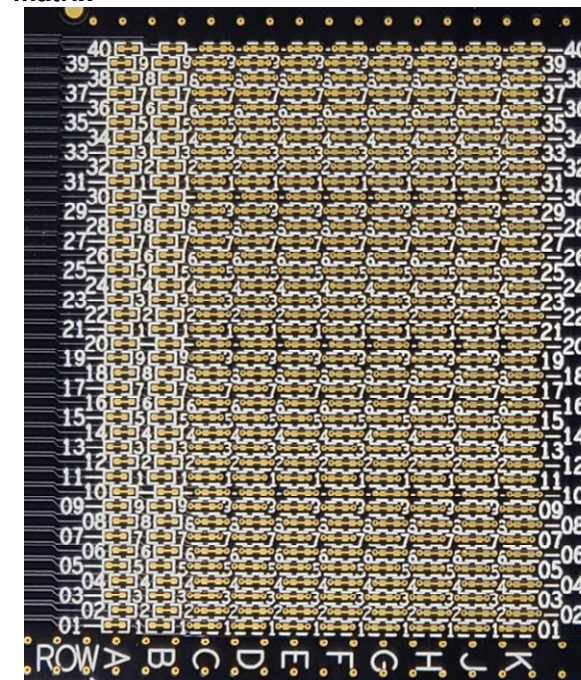
Mates with : Xilinx FPGA development systems Virtex 6 Virtex 7 connecting daughter board to Host Any and all FMC VITA 57.1 compliant design.
 SEAM SADL SEAMP SEAR SEAMI SEAC FMC HPC LPC
 SEAF-040-08.0-L-10-2-A SEAF-040-08-L-10-2-A
 SEAFP-40 SEAMP-040 SEAMI-040 SEAR-040-10-10- SEAM-040
 All listed Samtec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

ZX180 HPC FMC breakout adapter mates with the following Samtec Molex SEARAY™ VITA 57 Connectors

Molex PN	Samtec PN	VITA PN	Description	Mated Stack Height
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	
45970-4117	ASP-134601-01	MC-HPC-8.5L	male	8.5 mm
45970-4115	ASP-134602-01	MC-HPC-8.5	male	8.5 mm
45970-4107	ASP-134605-01	MC-LPC-8.5L	male	8.5 mm
45970-4105	ASP-134606-01	MC-LPC-8.5	male	8.5 mm
45970-4307	ASP-127797-01	MC-LPC-10L	male	10 mm
45970-4317	ASP-134487-01	MC-HPC-10L	male	10 mm
45970-4315	ASP-134488-01	MC-HPC-10	male	10 mm
45970-4305	ASP-134604-01	MC-LPC-10	male	10 mm



ZX180-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: ZX180-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 ZX180-HPC FMC Vita 57.1 FMC test module breakout adapter.

Pin	Vita 57.4													
	Vita 57.1													
	M	L	K	J	H	G	F	E	D	C	B	A	Z	Y
	Signal	Signal	Signal	Signal	Signal	Signal	Signal	Signal	Signal	Signal	Signal	Signal	Signal	Signal
1	GND	GND	VREF_B M2C	GND	VREF_A M2C	GND	PG M2C	GND	PG C2M	GND	CLK DIR	GND	HBPC_PRSNT M2C L	GND
2	DP23 M2C P	GND	GND	CLK3 BIDIR P	GND	CLK1 M2C P	GND	HA01 P CC	GND	DP0 C2M P	GND	DP1 M2C P	GND	DP23 C2M P
3	DP23 M2C N	GBTCLK4 M2C P	GND	CLK3 BIDIR N	GND	CLK1 M2C N	GND	HA01 N CC	GND	DP0 C2M N	GND	DP1 M2C N	GND	DP23 C2M N
4	GND	GBTCLK4 M2C N	CLK2 BIDIR P	GND	CLK0 M2C P	GND	HA00 P CC	GND	GBTCLK0 M2C P	GND	DP9 M2C P	GND	DP22 C2M P	GND
5	GND	GND	CLK2 BIDIR N	GND	CLK0 M2C N	GND	HA00 N CC	GND	GBTCLK0 M2C N	GND	DP9 M2C N	GND	DP22 C2M N	GND
6	DP22 M2C P	GND	GND	HA03 P	GND	LA00 P CC	GND	HA05 P	GND	DP0 M2C P	GND	DP2 M2C P	GND	DP21 C2M P
7	DP22 M2C N	GBTCLK3 M2C P	HA02 P	HA03 N	LA02 P	LA00 N CC	HA04 P	HA05 N	GND	DP0 M2C N	GND	DP2 M2C N	GND	DP21 C2M N
8	GND	GBTCLK3 M2C N	HA02 N	GND	LA02 N	GND	HA04 N	GND	LA01 P CC	GND	DP8 M2C P	GND	DP20 C2M P	GND
9	GND	GND	GND	HA07 P	GND	LA03 P	GND	HA09 P	GND	DP8 M2C N	GND	DP20 C2M N	GND	GND
10	DP21 M2C P	GND	HA06 P	HA07 N	LA04 P	LA03 N	HA08 P	HA09 N	GND	LA06 P	GND	DP3 M2C P	GND	DP10 M2C P
11	DP21 M2C N	GBTCLK2 M2C P	HA06 N	HA07 P	LA04 N	GND	HA08 N	HA09 P	GND	LA06 N	GND	DP3 M2C N	GND	DP10 M2C N
12	GND	GBTCLK2 M2C N	GND	HA11 P	GND	LA05 P	GND	HA13 P	GND	LA05 N	GND	DP7 M2C P	GND	DP11 M2C P
13	GND	GND	HA10 P	HA11 N	LA07 P	LA08 N	HA12 P	HA13 N	GND	LA06 N	GND	DP7 M2C N	GND	DP11 M2C N
14	DP20 M2C P	GND	HA10 N	GND	LA07 N	GND	HA12 N	GND	LA09 P	LA10 P	GND	DP4 M2C P	GND	DP12 M2C P
15	DP20 M2C N	SYNC C2M P	GND	HA14 P	GND	LA12 P	GND	HA16 P	GND	LA10 N	GND	DP4 M2C N	GND	DP12 M2C N
16	GND	SYNC C2M N	HA17-P-CC	HA14 N	LA11 P	LA12 N	HA15 P	HA16 N	GND	LA09 N	GND	DP6 M2C P	GND	DP13 M2C P
17	GND	GND	HA17-N-CC	GND	LA11 N	GND	HA15 N	GND	LA13 P	GND	DP6 M2C N	GND	DP13 M2C N	GND
18	DP14 C2M P	GND	GND	HA18 P	GND	LA16 P	GND	HA20 P	GND	LA13 N	GND	DP5 M2C P	GND	DP14 M2C P
19	DP14 C2M N	REFCLK C2M P	HA21 P	HA18 N	LA15 P	LA16 N	HA19 P	HA20 N	GND	LA14 N	GND	DP5 M2C N	GND	DP14 M2C N
20	GND	REFCLK C2M N	HA21 N	GND	LA15 N	GND	HA19 N	GND	LA17 P CC	GND	GBTCLK1 M2C P	GND	GBTCLK5 M2C P	GND
21	GND	GND	GND	HA22 P	GND	LA20 P	GND	HB03 P	GND	LA17 N CC	GND	GBTCLK1 M2C N	GND	GBTCLK5 M2C N
22	DP15 C2M P	GND	HA23 P	HA22 N	LA19 P	LA20 N	HB02 P	HB03 N	GND	LA18 P CC	GND	DP1 C2M P	GND	DP15 M2C P
23	DP15 C2M N	REFCLK M2C P	HA23 N	GND	LA19 N	GND	HB02 N	GND	LA23 P	GND	DP1 C2M N	GND	DP15 M2C N	GND
24	GND	REFCLK M2C N	GND	HB01 P	GND	LA22 P	GND	HB05 P	GND	LA18 N CC	GND	DP9 C2M P	GND	DP10 C2M P
25	GND	GND	HB00-P-CC	HB01 N	LA21 P	LA22 N	HB04 P	HB05 N	GND	LA23 N	GND	DP9 C2M N	GND	DP10 C2M N
26	DP16 C2M P	GND	HB00-N-CC	GND	LA21 N	GND	HB04 N	GND	LA26 P	LA27 P	GND	DP2 C2M P	GND	DP11 C2M P
27	DP16 C2M N	SYNC M2C P	GND	HB07 P	GND	LA25 P	GND	HB09 P	GND	LA26 N	LA27 N	DP2 C2M N	GND	DP11 C2M N
28	GND	SYNC M2C N	HB06-P-CC	HB07 N	LA24 P	LA25 N	HB08 P	HB09 N	GND	LA27 N	GND	DP2 C2M P	GND	DP11 C2M P
29	GND	GND	HB06-N-CC	GND	LA24 N	GND	HB08 N	GND	TCK	GND	DP8 C2M N	GND	DP12 C2M N	GND
30	DP17 C2M P	GND	GND	HB11 P	GND	LA29 P	GND	HB13 P	GND	DP8 C2M P	GND	DP3 C2M P	GND	DP13 C2M P
31	DP17 C2M N	RES2	HB10-P	HB11 N	LA28 P	LA29 N	HB12 P	HB13 N	GND	DP8 C2M N	GND	DP3 C2M N	GND	DP13 C2M N
32	GND	RES3	HB10-N	GND	LA28 N	GND	HB12 N	GND	3P3VAUX	GND	DP7 C2M P	GND	DP16 M2C P	GND
33	GND	GND	GND	HB15 P	GND	LA31 P	GND	HB19 P	GND	TMS	GND	DP7 C2M N	GND	DP16 M2C N
34	DP18 C2M P	GND	HB14-P	HB15 N	LA30 P	LA31 N	HB16 P	HB19 N	TRST L	GA0	GND	DP4 C2M P	GND	DP17 M2C P
35	DP18 C2M N	12P0V	HB14-N	GND	LA30 N	GND	HB16 N	GND	GA1	12P0V	GND	DP4 C2M N	GND	DP17 M2C N
36	GND	12P0V	GND	HB18 P	GND	LA33 P	GND	HB21 P	GND	3P3V	GND	DP6 C2M P	GND	DP18 M2C P
37	GND	GND	HB17-P-CC	HB18 N	LA32 P	LA33 N	HB20 P	HB21 N	GND	3P3V	GND	DP6 C2M N	GND	DP18 M2C N
38	DP19 C2M P	GND	HB17-N-CC	GND	LA32 N	GND	HB20 N	GND	3P3V	GND	DP5 C2M P	GND	DP19 M2C P	GND
39	DP19 C2M N	GND	GND	VIO_B M2C	VADJ	VADJ	GND	VADJ	GND	3P3V	GND	DP5 C2M N	GND	DP19 M2C N
40	GND	12P0V	VIO_B M2C	GND	VADJ	VADJ	GND	VADJ	GND	3P3V	GND	RES0	GND	3P3V

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DESCRIPTION: FMC VITA 57.1 breakout adapter – passive FPGA mezzanine card HPC		
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		SHEET: 2 OF 3

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Access: ZX180-HPC offers all 400 signals accessible via onboard standard 0402 SMD footprint shunts. The followings are few recommendations for interfacing ZX180-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 ZX180-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: ZX180-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 ZX180-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: ZX180-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 ZX180-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:

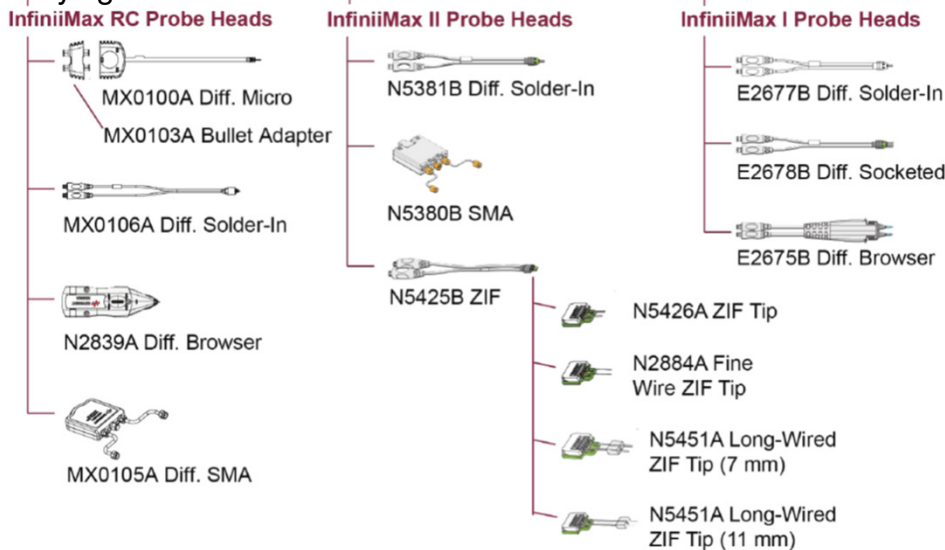
Re-routing any signal on ZX180-HPC may be implemented by cutting the designated 0402 SMD shunt and re-routing to new location.

Accessories: The following accessories compliment ZX180-HPC for testing purpose.

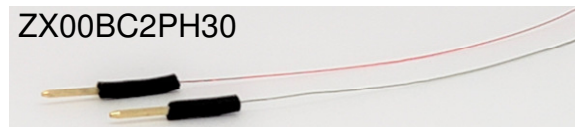
ZX00BC2PH30 30AWG Bare Copper wire to pin header wire assembly – It can be easily soldered to any pads on the ZX180-HPC for scope probe interface.

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 ZX180-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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