

Product Name: ZX118LSHM-DS10 Samtec Breakout Adapter Rugged Hermaphroditic Razor Beam – Page 1 OF 3

Product Description: ZX118LSHM-DS10 is Samtec LSHM connector breakout adapter. ZX118LSHM-DS10 is designed for real-time electrical test & measurements, signal integrity , characterization, manufacturing loopback test applications.

ZX118LSHM-DS10 is breakout adapter, supporting Samtec LSHM Rugged Hermaphroditic Razor Beam 0.5mm ( 0.02" ) pitch connectors, providing full access to all LSHM connector signals from both sides of the PCB for purpose of test & measurement. ZX118LSHM-DS10 designed configured where J1 pin 1 is connected to J2 pins. The ZX118LSHM-DS10 would be transparent when mated with Host & Target due to its design by swapping the J1 to J2 pin. Please see figures 2.1 and 2.2 on **page 2** for detailed pin to pin configuration.

- 1- Provides access to all Samtec LSHM signals via onboard Shunts. The Shunt are accessible on both sides of PCB for easy probe access.
- 2- Passthrough design where J1 pin 1 is connected to pin 2 of J2.
- 3- The shunts are standard 0402 SMD footprint package size.
- 4- Listed number adjacent to each Shunt would be in reference to the Host system's Samtec LSHM connector pin numbering.
- 5- All traces are 50 Ohms impedance controlled.
- 6- Four, 4, layers PCB design, inner layers are GND planes.
- 7- Accessible GND test point, The test point is connected to inner GND planes as well as the connector's shield.
- 8- Ease of interface with single channel and differential scope probes.
- 9- Reassign any signal by cutting the shunts' inner connecting trace and rewire.
- 10- The module is shipped with 12pc of probing wires – See package includes, ZX00BC2PH1

Electrical: Insertion loss > -3dB @6GHz  
Trace impedance: 50 Ω  
Operating Temperature: -55°C to +125°C  
Samtec Connector:  
Onboard Connector: LSHM-DH Shielded - 2 rows per 10 pins/row  
Mates with: Any Samtec LSHM -DV -DH -RH formfactor Hermaphroditic connector  
Pitch: 0.020" ( 0.50mm ) pin to pin pitch  
Plating: 10μ" ( 0.25μm )  
Shunt: Package: Standard 0402 SMD package  
ZX00BC2PH1 : 36AWG Bare copper wire to pin header

Application: Manufacturing test measurement & re-use, bringup, testing , debugging

Mates with : Samtec Rugged Hermaphroditic Razor Beam LSHM  
Mates with any height & formfactor LSHM connector / cable assembly such as DV ( Straight ) DH ( Right Angle ) or RH ( Reverse Right Angle ).  
LSHM-110-01-F-DV-A-S LSHM-110-01-L-DV-A-S  
LSHM-110-01-F-DH-A-S LSHM-110-01-L-DH-A-S  
LSHM-110-01-F-RH-A-S LSHM-110-01-L-RH-A-S

Access:  
For signal measurements:  
1- Recommendation: Use 36AWG solid copper wire with pin header,ZX00BC2PH1 or similar

For signal relocation:  
1- Cut the inner connecting trace within any Shunt and reassign to new location.  
2- Using 36AWG solid copper wire, make the required connections. See Signal Access & re-route, **Page 3**

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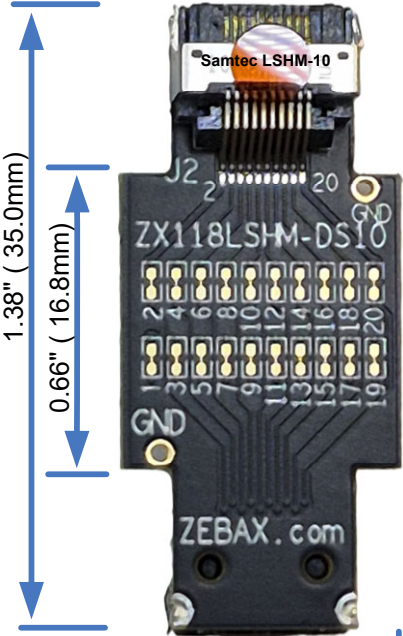
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Compliance:  
ISO2001 certified  
RoHs - Lead Free  
EU RoHS2  
UL E111594 document  
ELV- Vehicle Directive ( Directive 2000/EC)  
European Union Directive ( 203/11/EC )  
Halogen Free per IEC-61249-2.21 : 2003  
RoHs Directive 2011/65/EU  
WEEE Directive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

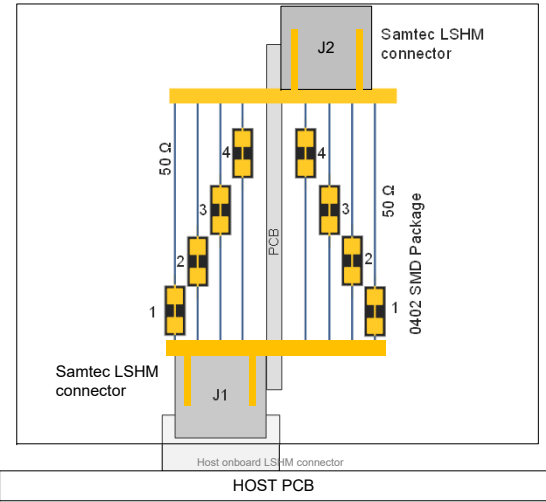
ZX118LSHM-DS10 package includes:		
Part number	Quantity	Description
ZX118LSHM-DS10	1	Breakout Adapter module
ZX00BC2PH1	1	36AWG Bare Copper wire to pin header wire assembly

Note  
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SPECIFIED DIMENSIONS ARE INCHES (MM). ROHS COMPLIANT		ASSEMBLY DRAWING
		ITEM: ZX118LSHM-DS10
DESCRIPTION:		Samtec rugged LSHM Hermaphroditic Razor Beam Breakout Adapter
CHECKED:	DRAWN:	REVISION: 1.0
M. MAHIN	KADIJEH	SHEET: 1 OF 3

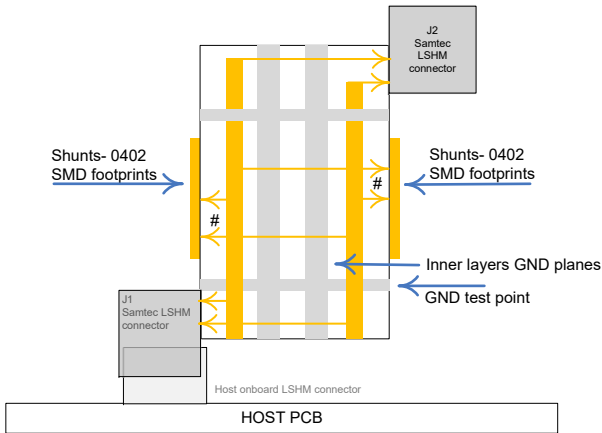


ZX118LSHM-DS10 simplified circuit diagram



Note: 1- Shunts are standard 0402 SMD package size  
2- Shunts are available on both sides of ZX118LSHM-DS10 module, making ALL Samtec connector signals accessible on sides of the module.

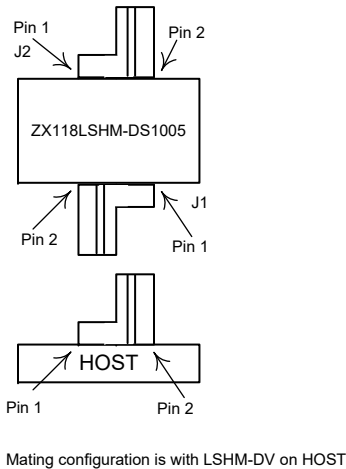
ZX118LSHM-DS10 simplified cross section diagram



Note:  
Ground layers, Please note – The GND test point is connector to:  
1- Top/Bottom GND fill  
2- The inner layers ground planes  
  
Shunts & signal routing  
1- Shunts are standard 0402 SMD package size  
2- Shunts are available on both sides of ZX118LSHM-DS10 module, making ALL Samtec connector signals accessible on both sides of the module.  
  
# LSHM signals path to Shunts and to/from ERF5.

**LSHM Hermaphroditic connector mating configuration:** LSHM connector is Hermaphroditic, self mating connector series, therefore ZX118LSHM-DS10 module would be transparent to any design using LSHM -DV or -DH connector series. Please see figure 2.1 exhibiting “Mated pin configuration details”. ZX118LSHM-DS10 utilizes LSHM-DH connector series where the J1 LSHM connector pin 1 is connected to the J2 LSHM connector pin 2. When the ZX118LSHM-DS10 is mated with Host & Target ( Host & Target using -DV or -DH connector series ), it would be transparent since the ZX118LSHM-DS10 does pin swapping between the onboard LSHM connectors. If using LSHM-RH connector series, please use figure 2.2 as reference identifying pin numbering on your host & target.

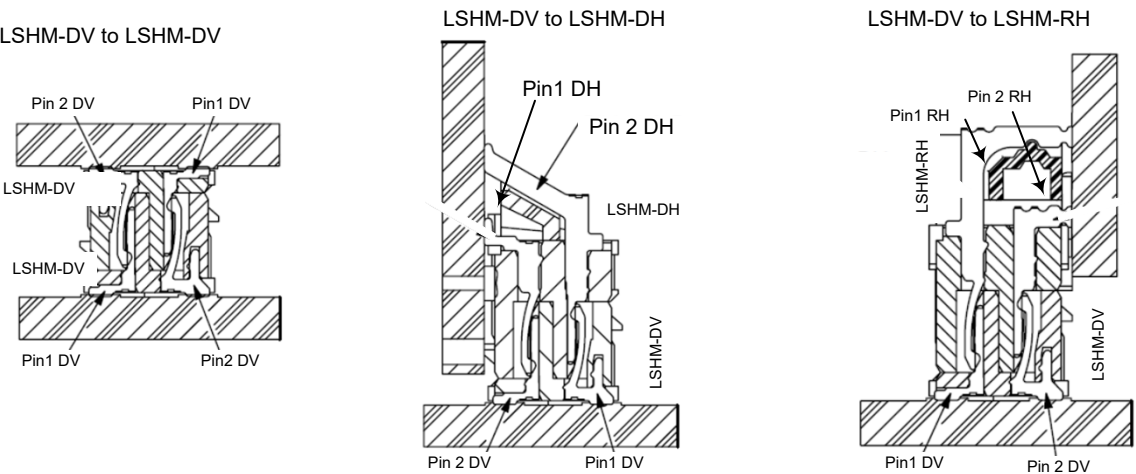
Figure 2.1: ZX118LSHM-DS10 mated pin configuration details



**ZX118LSHM-DS10 Pin numbering:** The listed Shunts pin numbering are listed as reference to the host LSHM connector. Since the ZX118LSHM-DS10 would be transparent to user ( see “**LSHM Hermaphroditic connector mating configuration**” section above ) the LSHM connector’s pin numbers would be identical to the host LSHM connector pin numbers as seen from ZX118LSHM-DS10’s J2 connector. Special care must be given if special rework required between the J1 & J2 LSHM connectors pins as the pin 1 , 3, 5, 7, 9, .. of J1 LSHM connector are connected to pin 2, 4, 6, 8, 10, .. of the J2 LSHM connector.

**Mated Pin Details:** Figure 2.2 exhibits LSHM connector family mated pin interface. -DV connectors are Straight , -DH connector series are Right Angle and the -RH are Reverse Right Angle connectors. All LSHM connector series mate with each other. However; attention must be paid to pin to pin interface ensuring expected design interface configuration. Below diagrams are provided as standard pin to pin interface configuration using LSHM Hermaphroditic connector series.

Figure 2.2 – LSHM Mated Pin Details – LSHM connector formactors are: -DV Straight , -DH : Right Angle , -RH : Reverse Right Angle



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<b>DESCRIPTION: Samtec rugged LSHM Hermaphroditic Razor Beam Breakout Adapter</b>		
<b>CHECKED:</b> <b>M. MAHIN</b>	<b>DRAWN:</b> <b>KADIJEH</b>	<b>REVISION: 1.0</b> <b>SHEET: 2 OF 3</b>

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Signal Access & re-route: Re-routing any signal on ZX118LSHM-DS10 is implemented by cutting inner-connecting Shunt's trace and redirect to the new signal or test equipment.

Ground : ZX118LSHM-DS10 is 4 layers PCB design where the inner layers are Ground layers. They are connected to the GND test point as well as top & bottom GND fills. For improved signal integrity, please connect the GND test point to system GND reference point. See Cross Section diagram for details.

ZX118LSHM-DS10 part numbers : ZX118LSHM-DS10 is offered in 6 different models, supporting Samtec LSHM connectors. Below are each part number with associated mechanical diagram.

Typical Application: ZX118LSHM-DS10 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.
- 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.

Scope Probe wire Installation:

- 1- It is recommended to keep the probe wire length at 0.5" ( 1.2cm ) long.
- 2- Zebax provided ZX00BC2PH1 , ( 36AWG Bare Copper wire to pin header wire assembly ) is an ideal probing wire solution where the header fits into any single ended or differential probe.



- 2- In order to avoid ground loop problems, please use the shortest Ground probe wire interfacing to the nearest GND reference point. ZX118LSHM-DS10 provides GND test point to be utilized as GND reference interface with host.

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