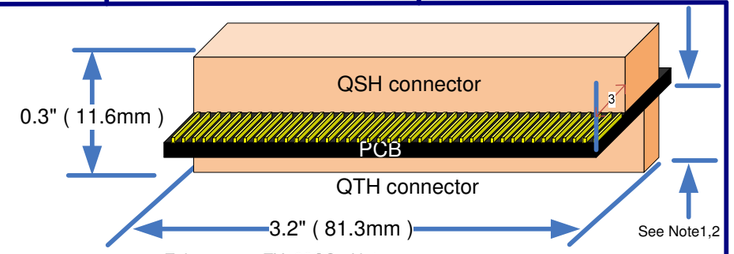
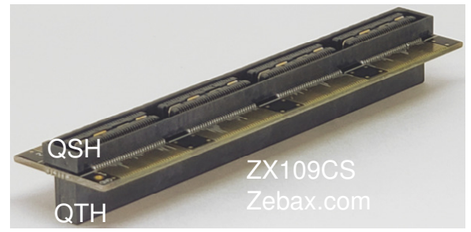
Product Name: **ZX109CS Samtec Connector Saver - Breakout Adapter QSH – QTH 120 – Page 1 of 2**

Product Description: 120pins x 2 rows, 240 pins Samtec Connector Saver - breakout adapter. Offering **both** QSH and QTH Q Strip High Speed Ground Plane connectors on connector saver module with debug access point, providing full feature breakout adapter for purpose of test and measurement.

1- Each QSH signal is routed to associated QTH connector through board to board via. Pin 1 of QTH is connected to pin 1 of QSH connector.
2- All signals have 0.20" (5mm) trace access on both top and bottom layers of the PCB.
3- All traces have 10mils (0.26mm) width, enabling soldering of any probe wires (36AWG solid copper – See package includes)
4- All traces are 50 Ohms impedance controlled.
5- Four layers PCB design, inner layers are GND planes.
6- Two accessible GND test points, The test points are connected to module GND planes and direct interface to the connectors GND blades.
7- Offering Extended height QTH connector (0.286" – 7.26mm) , providing interface clearance from host components.
8- Mated QSH-QTH (Host with ZX109CS) height 0.315" (8.00mm)
9- Ease of interface with single channel and differential scope probes, utilizing Solder-in probe, Fine Wire ZIF Tip or similar.
10- User may relocate any QSH / QTH connector signal by cutting trace before the via and solder to new location or external test equipment.
11- Fully compatible with Single Ended , -D, and Differential Pair, -DP, Samtec connector QSH QTH series as well as cable assemblies; HQCD , HQDP
12- Mates with any height and form factor QSH QTH connector series such as -D -DP, -RA, -EM configurations.
13- The module is shipped with 12pc of probing wires – See ordering information, see ZX00BC2PH1



Zebax.com - ZX109CS - Notes:
1- QTH height 0.286" (7.26mm)
2- Mated QTH – QSH height 0.315" (8.00mm)
3- PCB Extends 0.2" (5mm) from the QSH connector



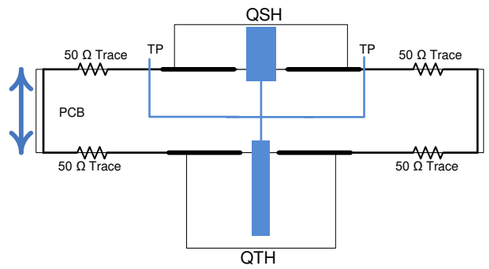
Electrical:
Insertion loss > -2dB @8GHz
Trace impedance: 50 Ω
Operating Temperature: -55℃ to +125℃
Trace width: 10mils (0.254mm)
Trace to Trace Spacing: 10mils (0.254mm)
Trace Length: 0.2" (5mm)
Trace to Trace via: 30mils (0.8mm) from end of PCB trace
PCB Clearance : 8.0mm from Host PCB (QSH on host)
36AWG Bare copper wire : 0.042mm diameter - See package includes for details - ZX00BC2PH1

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

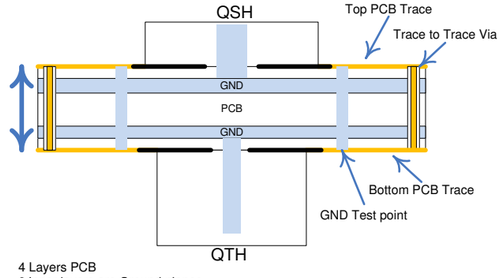
Mates with : Samtec QTH120 QSH120 QSH080(DP) QTH080(DP) Also mates with HQCD, HQDP cable assemblies.
Compatible with – differential Pair (DP), unused signal can be left unconnected or Grounded for improved noise immunity.

Pitch: 0.50mm (0.0197") High Speed connector

ZX109CS – Simplified Circuit Diagram



All traces are controlled 50 Ω impedance
TP – The GND Test Points , have direct connection to QSH QTH ground power blades , PCB inner layers , the TOP & Bottom GND Fills as well as the GND stitching vias



4 Layers PCB
2 inner layers are Ground planes
GND Test Points , TP, provide direct connection to QSH QTH Integral metal plane Blades.

Access:

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

For signal relocation:
1- Cut the trace to the connecting via (60 mils [0.8mm] before end of trace)
2- Using 36AWG solid copper wire, make the required connections. See Signal Access & re-route, **Page 2** (figure "ZX109CS – portion of Top View ").

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

ZX109CS package includes:

Part number	Quantity	Description
ZX109CS	1	Connector Saver Breakout Adapter module
ZX00BC2PH1	12	36AWG Bare Copper wire to pin header wire assembly

Note : ALL ZEBAX products are **RoHS** compliant and **Lead Free** unless otherwise indicated.

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SPECIFIED DIMENSIONS ARE INCHES (MM).
ROHS COMPLIANT

ASSEMBLY DRAWING

ITEM: ZX109CS

DESCRIPTION: **Samtec Connector Saver - breakout adapter QSH QTH 120**

CHECKED: M. MARINA
DRAWN: MATTHEW
REVISSION: 1.0
SHEET: 1 OF 2

Product Name: **ZX109CS Samtec Connector Saver - Breakout Adapter QSH – QTH 120 – Page 2 of 2**

Typical Application: ZX109CS is designed for purpose of test and measurement at full connector's bandwidth. It provides breakout adapters in real-time test and measurements by offering: 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- In order to avoid ground loop problems, please use the shortest Ground probe wire interfacing to the nearest GND reference. ZX109CS provides two GND test points to be utilized as GND reference interface with host.
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:

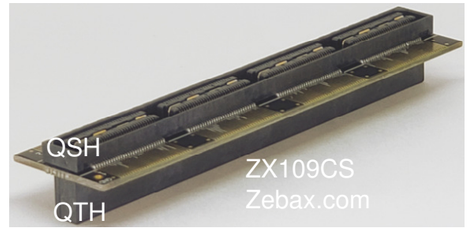
Re-routing any signal on ZX109CS may be implemented by cutting the trace min. of 30 mils (0.8mm) before end of the trace on top or bottom side of the PCB. The Via (inner connecting via) at end of the trace connects the top layer's signal (trace) to bottom layer's signal (trace).The inner connecting via may not be visible on most of Zebax designs. The via has clearance of 30mils from end of the trace.

ZX109CS module is 4 layers PCB where the inner layers are Ground layers. They are connected to the GND test points as well as the connector's GND blades. For improved signal integrity, please connect the GND test points to system GND reference point. See Cross Section View figure on Page 1 for details.

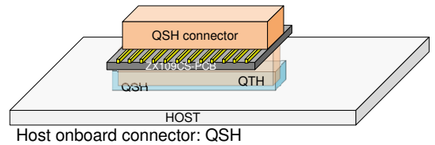
Mating and Un-mating:

Uneven or off—angle forces during mating and un-mating of ZX109CS from host or daughter card may cause overstress and damage to the contacts, housing or solder joints. Severe side-to-side rocking motions should be prohibited.
Un-mating ZX109CS by lifting one end of the connector (peeling) is permitted. However, this should only be done to initiate separation of the mated contacts at one end of the interfaced connector. The separation angle should be kept as low as possible as the contacts continue to un-mate, thereby spreading out the un-mating forces over the length of the interface connectors. The connectors should not be "peeled" beyond a 20° angle. See Figure below.

ZX109CS Top View

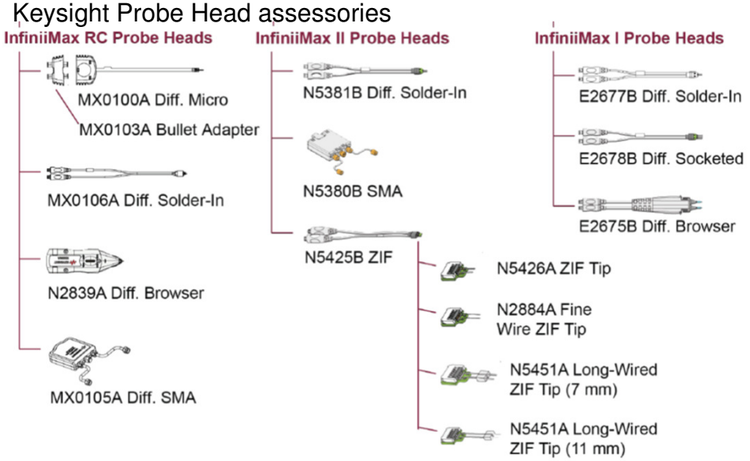


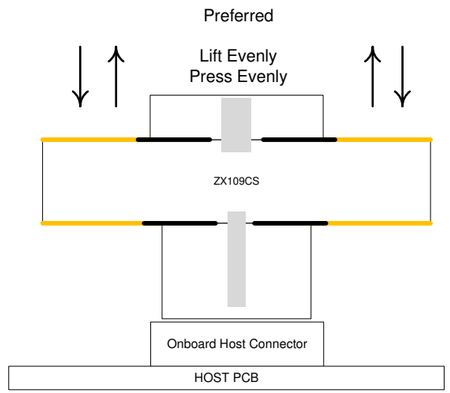
Typical ZX109CS interface with host



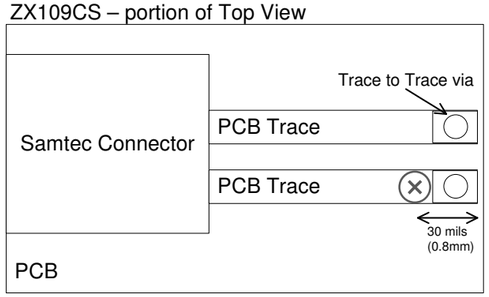
Host onboard connector: QSH

Keysight Probe Head assessories





ZX109CS – portion of Top View



Note: The hole for the Via may not be visible on Zebax Connector Saver breakout adapter designs. The via is located 30 mils (0.8mm) from end of the trace as marked

⊗ Ideal location to cut the trace

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