

**Product Name:** ZX145CS Samtec Connector Saver - Breakout Adapter QSE – QTE 020 ( DP -014 ) - Page 1/3  
 TE Mictor SB 0.8mm ( 0.032" ) centerline 40 Breakout Adapter

**Product Description:** 20pins x 2 rows, 40 pins Samtec Connector Saver - breakout adapter, supporting both Samtec and TE Mictor SB connector series :  
 1- Samtec's HI-SPEED Header / Socket QTE QSE Q-Strip Blade & Beam Design connectors.  
 2- Tyco Electronics, TE, Mictor SB 0.80mm centerline ( pitch ) 40 positions Mictor-Strip connectors. Please refer to **Page 3** for TE compatibility list  
 Offering **both** QSE and QTE connectors on connector saver module with debug access point providing full feature breakout adapter for purpose of test and measurements.

QSE is Samtec Socket connector - TE Mictor SB 0.8mm centerline ( pitch ) counterpart is commonly referred to Receptacle  
 QTE is Samtec Header connector - TE Mictor - SB 0.8mm centerline ( pitch ) counterpart is commonly referred to Plug.  
 For simplicity, this document uses QSE / QTE in reference to the Samtec: Socket / Header ( TE: Receptacle / Plug ) naming convention.

- 1- Each QSE signal is routed to associated QTE connector through board to board via. Pin 1 of QTE is connected to pin 1 of QSE connector.
- 2- All signals have 0.3" ( 7.6mm ) trace length 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 designed 50 Ohms impedance controlled.
- 5- Four, 4, layers PCB design, inner layers are GND planes with direct connection to QSE-QTE ground blades.
- 6- Two accessible GND test points, The test points are connected to module GND planes.
- 7- Offering Extended height QTE connector ( 0.286" – 7.26mm ) , providing interface clearance from host components.
- 8- Mated QSE-QTE ( Host with ZX145CS ) height 0.315" ( 8.00mm )
- 9- Ease of interface with single ended and differential scope probes.
- 10- User may relocate any QTE signal by cutting trace before the via and solder to new location or external test equipment.
- 11- Fully compatible with Single Ended , SE, and Differential Pair, DP, Samtec connector QSE QTE series as well as cable assemblies; SQCD .
- 12- Mates with any height and formfactor QSE QTE connector series such as -DP, -RA, -EM, -DP-RA configurations.
- 13 – Accessible GND test point with direct interface to the integral metal plane ( GND blade )
- 14- The module is shipped with 12pc of probing wires – See ordering information, see [ZX00BC2PH1](#)

**Electrical:** Insertion loss -2dB @8GHz  
 Trace impedance: 50 Ω  
 Operating Temperature: -55°C to +125°C  
 Trace width: 10mils ( 0.26mm )  
 Trace to Trace Spacing: 22mils ( 0.558mm )  
 Trace Length: 0.3" ( 7.6mm )  
 Trace to Trace via: 30mils (0.8mm) from end of PCB trace  
 PCB Clearance : 8mm from Host PCB ( QSE on host )  
 36AWG Bare copper wire : 0.014mm diameter - See package includes for details - [ZX00BC2PH1](#)

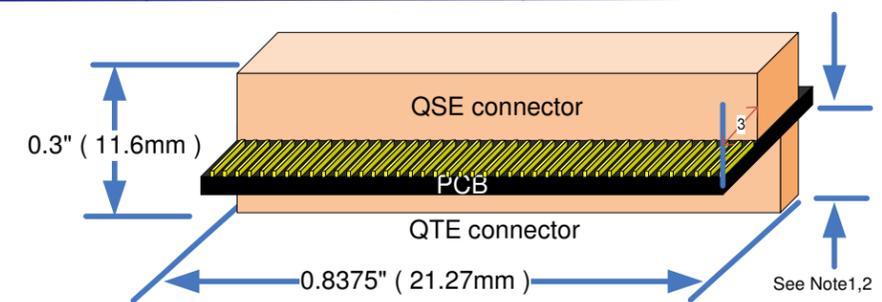
**Application:** Manufacturing test and re-use, bringup, testing , debugging

**Mates with :** Any height and formfactor of Samtec QTE020 QSE020 QSE014(DP) QTE014(DP), SQCD cable assembly. Compatible with – differential Pair (DP), unused signal can be left unconnected or Grounded for improved noise immunity. *Samtec QTE-020-L-D QSE-020-L-D QTE-014-01-DP QSE-014-01-DP connectors EQCD EQSD EQDP EQRF cable assembly and any 1 banks of QTE-040 QSE-040 ( -028 Differential pair, -DP), QTE-060 QSE-060 (-042), QTE-080 QSE-080 (-056) connectors.*  
 TE Mictor SB 0.8mm ( 0.032" ) centerline 40 positions ( 2 rows, 20 positions / row ) Plug and Receptacles. Table 1 lists 40 positions - 2 Rows x 20 Pins/Row TE Mictor SB 0.8mm ( 0.032" ) Pitch Connectors Part numbers – See Page 3  
**ZX145CS mates with all listed Plug and Receptacles** of TE Mictor SB 0.80mm ( 0.032" ) centerline 40 positions connectors. Table 2 lists cross matrix compatibility between Samtec and TE Mictor SB 0.8mm ( 0.032 ) 40 positions connector.

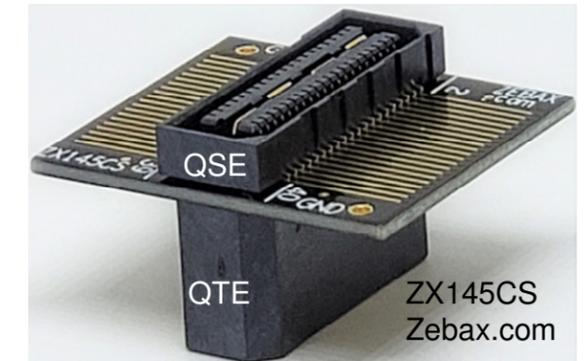
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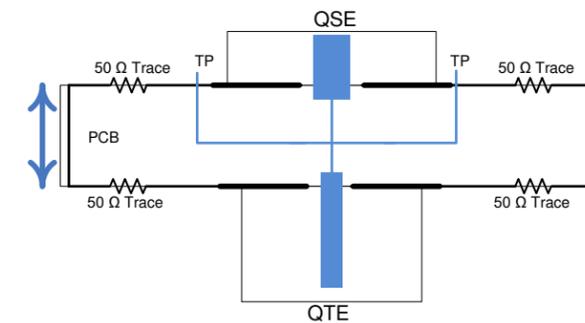
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- Notes:**
- 1- QTE height 0.286" ( 7.26mm )
  - 2- Mated QTE – QSE height 0.315" ( 8.00mm )
  - 3- PCB Extends 0.3" ( 7.6mm ) from the QSE connector

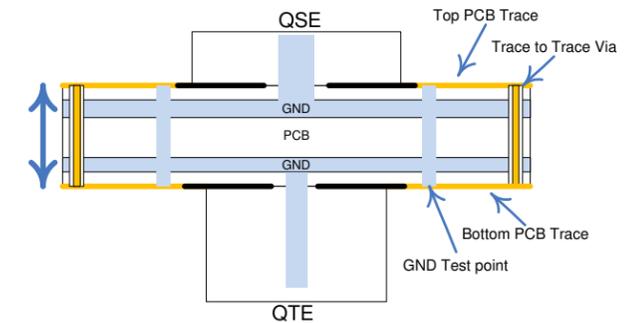


ZX145CS - Simplified Circuit Diagram



All traces are controlled 50 Ω impedance  
 The GND Test Point , has direct connection to QSE QTE ground power blades

ZX145CS Cross section view



4 Layers PCB- where 2 inner layers are Ground planes  
 GND Test Point provides direct connection to QSE QTE Blades.

**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

**ZX145CS package includes:**

Part number	Quantity	Description
ZX145CS	1	Connector Saver Breakout Adapter module
ZX00BC2PH1	12	36AWG Bare Copper wire to pin header wire assembly

**Note**

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SPECIFIED DIMENSIONS ARE INCHES (MM). ROHS COMPLIANT	<b>ASSEMBLY DRAWING</b> <b>ITEM: ZX145CS</b>	
<b>DESCRIPTION:</b> Samtec Connector Saver - breakout adapter QSE QTE 020 - TE Mictor SB 0.80mm 40		
<b>CHECKED:</b> M. MARINA	<b>DRAWN:</b> MATTHEW	<b>REVISION: 1.0</b> <b>SHEET: 1 OF 3</b>

**Product Name:** ZX145CS Samtec Connector Saver - Breakout Adapter QSE – QTE 020 ( DP -014 ) - Page 2/3  
TE Mictor SB 0.8mm ( 0.032" ) centerline 40 Breakout Adapter

**Pitch:** Samtec QSE QTE connector 0.6350mm (0.0315") Q-Strip Blade & Beam High Speed connector  
TE Mictor SB 0.8mm ( 0.032" ) centerline

**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 ( 30 mils [ 0.8mm ] before end of trace )  
2- Using 36AWG solid copper wire, make the required connections. See figure below

**Typical Application:** ZX145CS 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- In order to avoid ground loop problems, please use the shortest Ground probe wire interfacing to the nearest GND reference. ZX145CS 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:

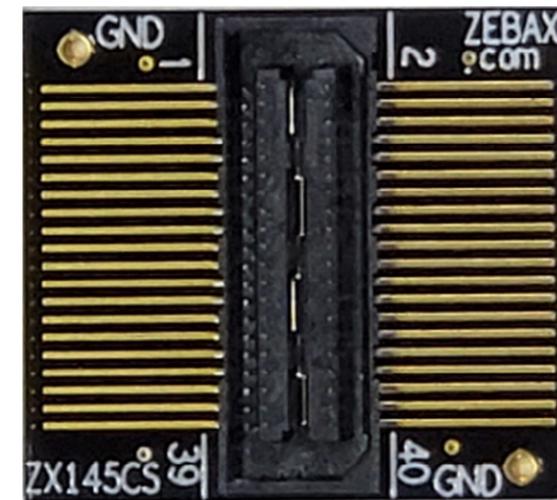
- a) Keysight differential probe or similar N2795A, N2796A, 1168V, 1134B along with E2677B differential Solder-in probe, N5426A ZIF Tip, N2884A Fine Wire ZIF Tip and more – See the figure "probe head accessories".
- b) Tektronix offers several single-ended as well as differential probes such as : P6245,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

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

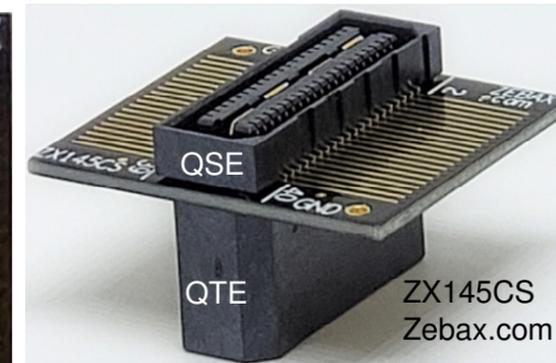
**Signal Access & re-route:**

Any signal re-routing on ZX145CS 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 our design. The via has clearance of 30mils from end of the trace.

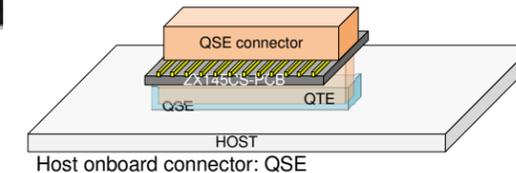
ZX145CS module has 4 layer PCB where the inner layers are Ground layers. They are connected to connector ground power blade. Please see Cross Section View figure on Page 1 for details.



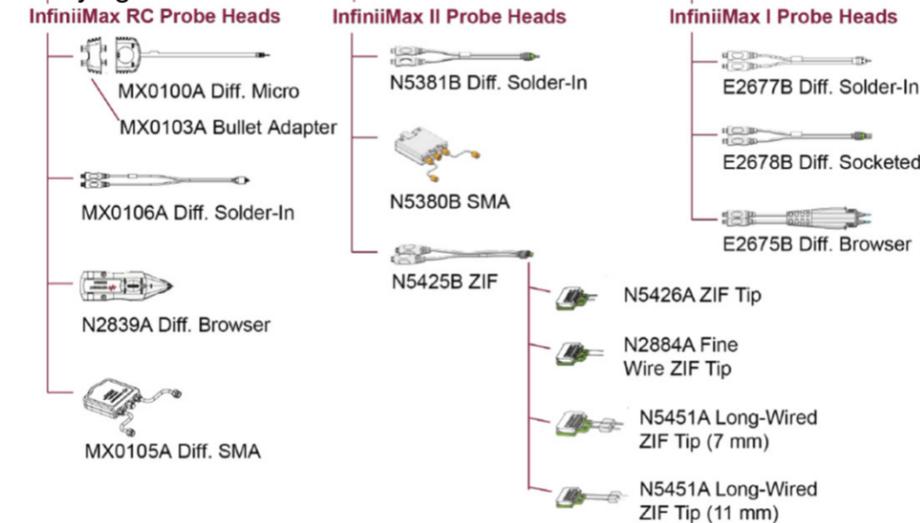
ZX145CS Top View



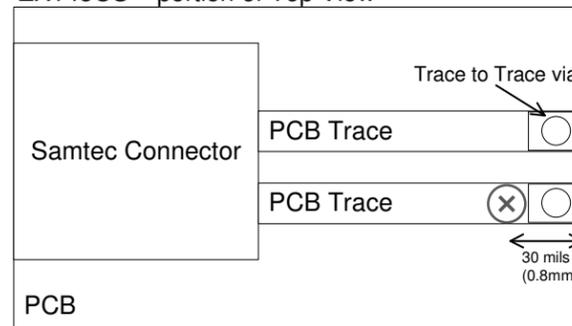
Typical ZX145CS interface with host



**Keysight Probe Head accessories**



ZX145CS – 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

(X) Ideal location to cut the trace

**Note**

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**Product Name:** ZX145CS Samtec Connector Saver - Breakout Adapter QSE – QTE 020 ( DP -014 ) - Page 3/3  
 TE Mictor SB 0.8mm ( 0.032" ) centerline 40 Breakout Adapter

**Cross compatible:** Table 1 and Table 2 provides cross compatibility part numbers list between Samtec QSE QTE connector series and TE Mictor SB 0.80mm centerline ( pitch ) .  
 Samtec's HI-SPEED Header / Socket QTE QSE Q-Strip Blade & Beam Design connectors  
 Tyco Electronics, TE, Mictor SB 0.80mm centerline ( pitch ) 40 positions Mictor-Strip connectors.

Table 1 – TE Mictor SB 0.8mm ( 0.032" ) Pitch connectors

40 positions - 2 Rows x 20 Pins/Row TE Mictor SB 0.8mm ( 0.032" ) Pitch Connectors Part numbers		
TE Mictor SD 0.8mm ( 0.032" )	Description	Mated Stack Height
1658043-1 2-1658043-1 1658012-1 2-1658012-1 1658462-1 2-1658462-1 4-1658043-1 6-1658043-1 4-1658012-1 6-1658012-1 4-1658462-1 6-1658462-1	Receptacle	
1658044-1 2-1658044-1 1658013-1 2-1658013-1 1658463-1 2-1658463-1 4-1658044-1 6-1658044-1 4-1658013-1 6-1658013-1 4-1658463-1 6-1658463-1 1658045-1 2-1658045-1 1658014-1 2-1658014-1 1658464-1 2-1658464-1 1658046-1 2-1658046-1 1658015-1 2-1658015-1 1658465-1 2-1658465-1 1658046-1 2-1658046-1 1658015-1 2-1658015-1 1658465-1 2-1658465-1 4-1658046-1 6-1658046-1 4-1658015-1 6-1658015-1 4-1658465-1 6-1658465-1 1658437-1 2-1658437-1 1658438-1 2-1658438-1 1658439-1 2-1658439-1 4-1658437-1 6-1658437-1 4-1658438-1 6-1658438-1 4-1658439-1 6-1658439-1 1658047-1 2-1658047-1 1658016-1 2-1658016-1 1658466-1 2-1658466-1 4-1658047-1 6-1658047-1 4-1658016-1 6-1658016-1 4-1658466-1 6-1658466-1 1658048-1 2-1658048-1 1658017-1 2-1658017-1 1658467-1 2-1658467-1 1658049-1 2-1658049-1 1658018-1 2-1658018-1 1658468-1 2-1658468-1	Plug	5mm ( 0.197" )
		8mm ( 0.315" )
		11mm ( 0.433" )
		14mm ( 0.551" )
		16mm ( 0.63" )
		19mm ( 0.748" )
		22mm ( 0.866" )
		25mm ( 0.984" )
		30mm ( 1.181" )
1658050-1 — 1658019-1 — 1658469-1 1658051-1 — 1658020-1 — 1658470-1		

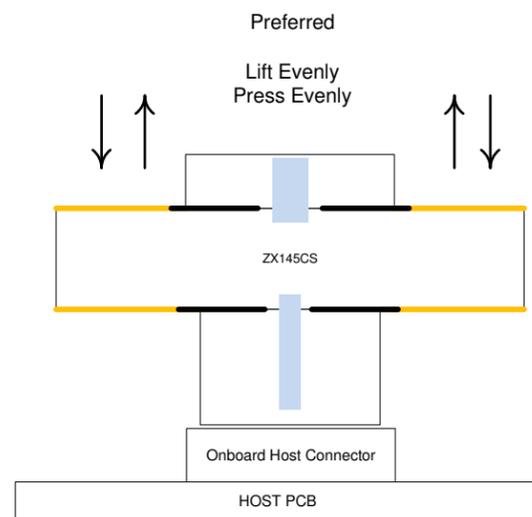
All above listed TE Mictor SB 0.80mm ( 0.032" ) centerline ( pitch ) are compatible with Samtec QStrip QTE QSE connectors

Table 2

ZX145 Samtec Qstrip QTE QSE cross matrix compatibility with TE Mictor SB 0.8mm ( 0.032" ) Pitch Connectors							
TE Mictor SD 0.8mm ( 0.032" )			Samtec QStrip QTE QSE			Description	Mated Stack Height
Gold Flashing	10 μ" Gold Plating	30 μ" Gold Plating	Gold Flashing	10 μ" Gold Plating	30 μ" Gold Plating		
1658043-1	1658012-1	1658462-1	QSE-020-01-F-D-A	QSE-020-01-L-D-A	QSE-020-01-C-D-A	Receptacle	
1658044-1	1658013-1	1658463-1	QTE-020-01-F-D-A	QTE-020-01-L-D-A	QTE-020-01-C-D-A	Plug	5mm ( 0.197" )
1658045-1	1658014-1	1658464-1	QTE-020-02-F-D-A	QTE-020-02-L-D-A	QTE-020-02-C-D-A		8mm ( 0.315" )
1658046-1	1658015-1	1658465-1	QTE-020-03-F-D-A	QTE-020-03-L-D-A	QTE-020-03-C-D-A		11mm ( 0.433" )
1658437-1	1658438-1	1658439-1	QTE-020-09-F-D-A	QTE-020-09-L-D-A	QTE-020-09-C-D-A		14mm ( 0.551" )
1658047-1	1658016-1	1658466-1	QTE-020-04-F-D-A	QTE-020-04-L-D-A	QTE-020-04-C-D-A		16mm ( 0.63" )
1658048-1	1658017-1	1658467-1	QTE-020-05-F-D-A	QTE-020-05-L-D-A	QTE-020-05-C-D-A		19mm ( 0.748" )
1658049-1	1658018-1	1658468-1					22mm ( 0.866" )
1658050-1	1658019-1	1658469-1	QTE-020-07-F-D-A	QTE-020-07-L-D-A	QTE-020-07-C-D-A		25mm ( 0.984" )
1658050-1	1658019-1	1658469-1					30mm ( 1.181" )

Note:  
 1- Stack Height : Receptacle with the listed Plug  
 2- **Any** listed Samtec QTE Plug is compatible with **Any** TE Mictor SD 0.8mm ( 0.032" ) pitch Receptacle connector.  
 3- **Any** Listed TE Mictor SD 0.8mm ( 0.032" ) pitch Plug is compatible with **Any** Samtec QStrip QSE connector.

**Mating and Un-mating:** Uneven or off—angle forces during mating and un-mating of ZX145CS 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 ZX145CS 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.



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