An Overview of Mictor connector Technology
Mictor breakout adapter

ZX104x, ZX105, ZX110x

Mictor Connectors was initially introduced by AMP with wide industry acceptance in high speed board to board interconnect solutions. Through corporate transactions, Tyco Electronics, TE, is the owner and sole manufacturer of Mictor connectors. Zebax offers best in class Mictor breakout adaptor tailored for testing, debug pre-bringup, bringup, software development and emulation and applications. This document outlines general features of Mictor connector technology and outlines benefits of Zebax Mictor breakout adapter series ZX104x ZX105 ZX110x in today's GHz applications.

This document identifies:

1. Mictor connector Technology
2. Industry acceptance of Mictor connectors
3. Application of ZX104x, ZX105 ZX110x Mictor breakout adapters

Revision History

Version	Date	Description
v01	Jan 14, 2017	updated

1 Mictor Connector Technology

The Mictor connector product line is based on microstrip concept of two rows of signal contacts divided by a **center power ground** plane. The **center power ground** is a solid copper plate with multiple pins extending to Printed Circuit Board, PCB. Figure 1 is cross section of the Mictor connector assemblies where both Plug (Header or Male) and Receptacle (Socket, Female) connectors. The center power ground plates that hold pins extending to PCBoard as the main connector's GND interface to system ground. The center power ground pins plays vital role in Mictor connector microstrip concept where each active signal is exposed and guarded to system ground. Figure 2 exhibits typical application of Mictor connector where the Receptacle is used on the Host PCB. Figure 3 explores the connection of the ground bus as it runs as a contagious ground bus for each bank. Each bank's ground bus may be used for different system ground per design requirements: AGND DGND, GND, CPGND. The Mictor connectors are **0.64" (0.025mm)** centerline contact spacing (Pitch) offered in several connector heights and pin counts meeting multiple design requirements, figure 4. Any Mictor connector height does mate with counter part with any height.

The Mictor connectors are designed for DC to GHz bandwidth with characteristic impedance of contacts at 50 Ω and isolation resistance of 10,000 MΩ. Good design can achieve DC to 8GHz bandwidth or higher when properly designed both at circuit and meeting industry standard guidelines in PCB layout design. Although typical application of today design is limited to 0.8Volts to 3.3Volts, however Mictor connectors are rated at 30Vac with current rating of 1.0Amps (11.5A with ground rated). Operating temperature of Mictor connectors is rated at -55°C to +150°C.

The most common Mictor connector is 38 pins (1 Bank) that is configured in 19 pins per 2 rows totaling 38 pins. Mictor connectors are offered in 38 (19pins x 2 rows - 1 Bank), 76 (19pins x 2 rows 2 Banks) 114 (3 Banks) 152 190 228 and 256 pins. Unlike Samtec Q-Strip® HI-SPEED connectors, Mictor is not offered in differential pair, see figure 5. Differential pair design can be achieved with Mictor, by allocating the pin between each differential pair to system ground.

The center power ground plate of Mictor connector constitutes 5 pins per bank enforcing solid connector ground connection to system ground., figure 6 and 7 outlines the 3D outline of the center power ground pins for 38 pin and 76 pin Mictor receptacles respectively.

Figure 1 – Mictor connector interconnect cross-section
Plug – Receptacle

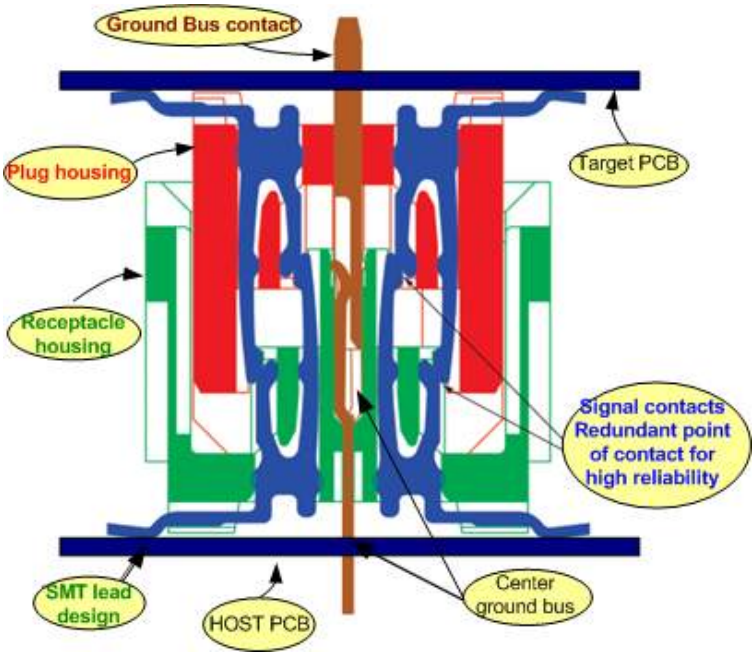


Figure 2 – typical application of Mictor connector

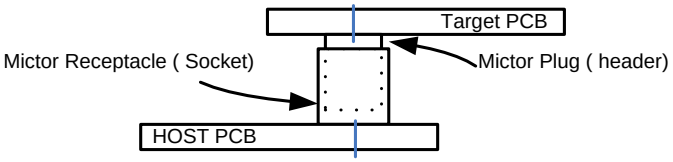


Figure 3 – Outlining Mictor's central ground bus as it is solid ground bus contact that runs throughout each bank

Red marked region is the contagious ground bus for each bank

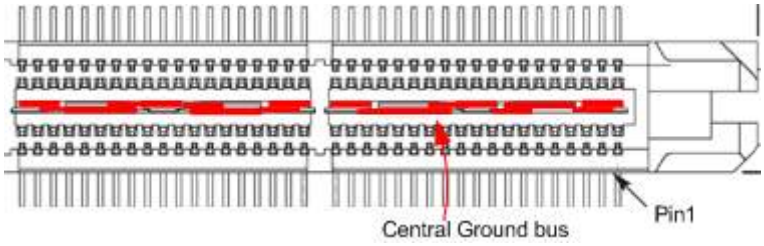


Figure 4- Mictor connector offering in Plug and Receptacle height - 0.26" (6.6mm) is commonly used

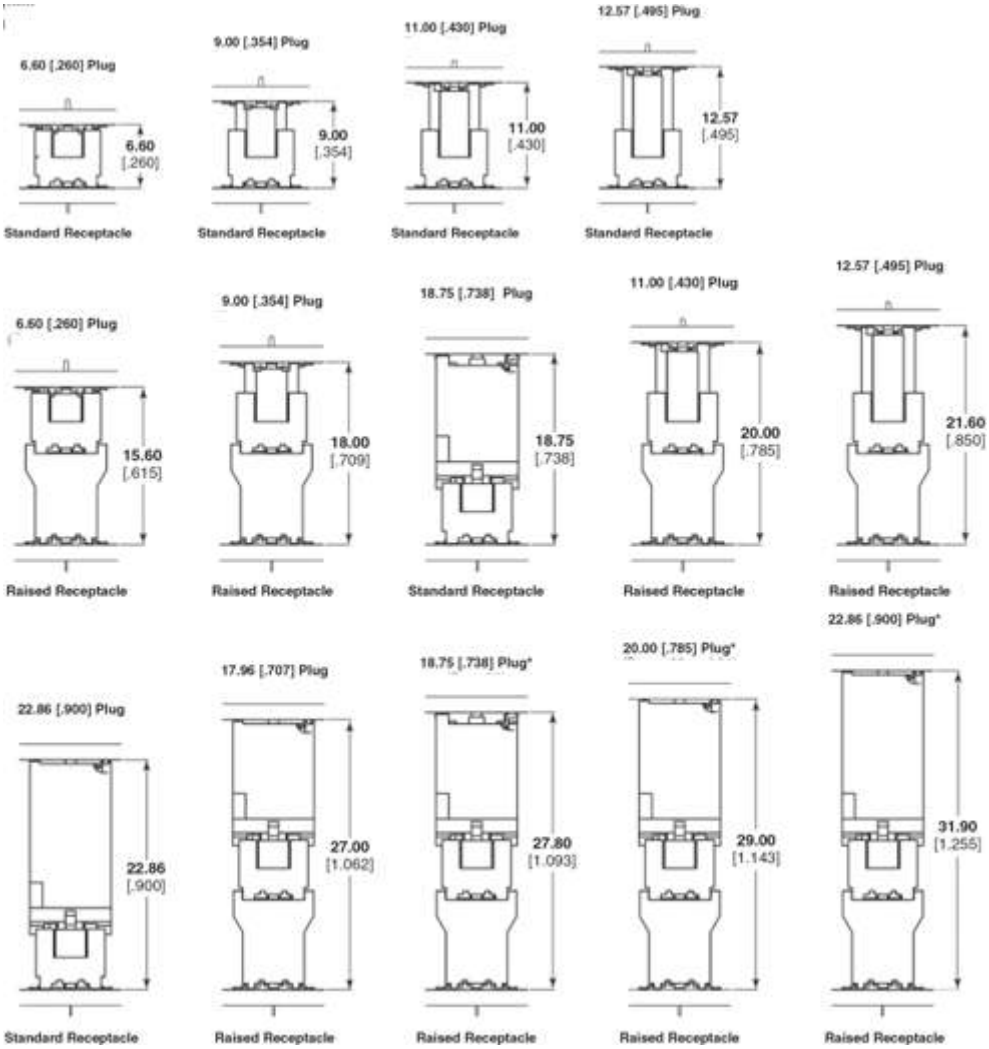


Figure 5 – Mictor Connector Plug mechanical outline- bank segment

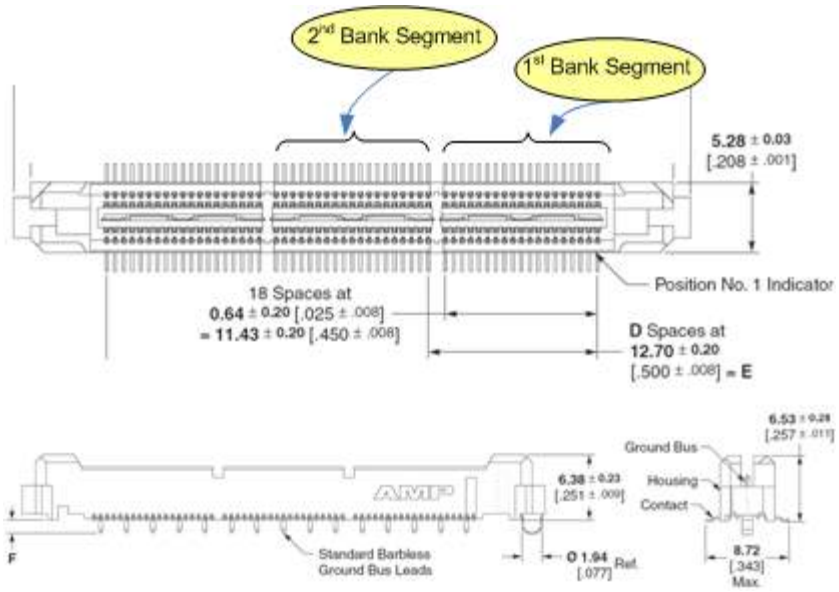
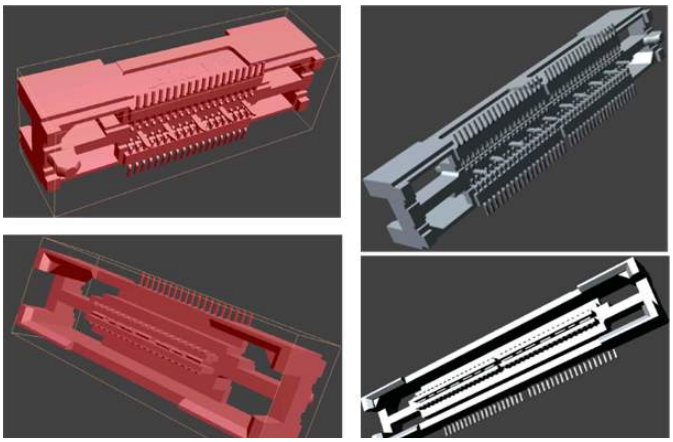


Figure 6 – 38 and 76 pins Mictor Receptacle 3D view of center power ground (top) and pins connecting ground to PCB



2 Industry acceptance of Mictor connectors

Adaptation of Mictor connectors in electronic industry is wide spread. Typical application is not limited to analog or digital, it is widely used for characterization of memory interface, pre-bringup, bringup and validation of design in emulation and development. In addition Mictor connectors are used as observation bus interface, testing points, and general Board to Board interconnect solution.

Keysight (Agilent) and Tektronix logic analyzers have employed Mictor or Samtec connector at probe assemblies enabling ease of interface for signal capture and analysis. 38 pin Mictor connector is used in Keysight E5339A, E5334A, E5331A to name the few. Zebax Mictor breakout adapters are designed enabling debugging of today's high density mixed-signal designs. Zebax Mictor breakout adapter enable ease of interface with logic analyzer and scope by providing accessible headers with dedicated ground **test point** for external ground shielding to an external ground for improved signal integrity and performance.

Zebax Mictor breakout adapters provide full interface enabling Host to Target solutions. Host Boards are defined as the main board and the Target is referred to daughter or secondary board that is connected to the Host board via Mictor Board-to-Board connector assemblies. Zebax ZX104x ZX105 ZX110x Mictor breakout adapters are designed in 4 layers PCB with 50 Ω trace impedance with improved signal integrity, meeting both analog as well as digital worlds requirements. Two Internal PCB Layers of Zebax Mictor breakout adapter are GND planes, for reduced crosstalk and improved signal integrity. All Zebax Mictor breakout adapter offer GND test point, enabling direct interface to the Mictor GND center blade. All Zebax Mictor breakout adapter modules embed GND stitching vias for improved signal integrity and maximizing design's bandwidth performance.

3 Application of ZX104x, ZX105 ZX110x Breakout Adapters

Zebax Mictor breakout adapter provides full interface enabling Host to Target solutions. Host Boards are defined as the main board and the Target is referred to daughter or secondary board that is interfaced with the Host board via Mictor Board-to-Board connector assemblies. Zebax ZX104x ZX105 ZX110x Mictor breakout adapters are designed in 4 layers PCB with 50 Ω trace impedance meeting both analog as well as digital worlds requirements. All Zebax Mictor breakout adapter utilize internal layers (typically 2 internal layers) as GND plane with GND stitching vias. Zebax Mictor breakout adapter are best in class test and measurement tool, offering full Mictor connector's signal bandwidth performance. All Zebax Mictor breakout adapters include test point for external ground interface.

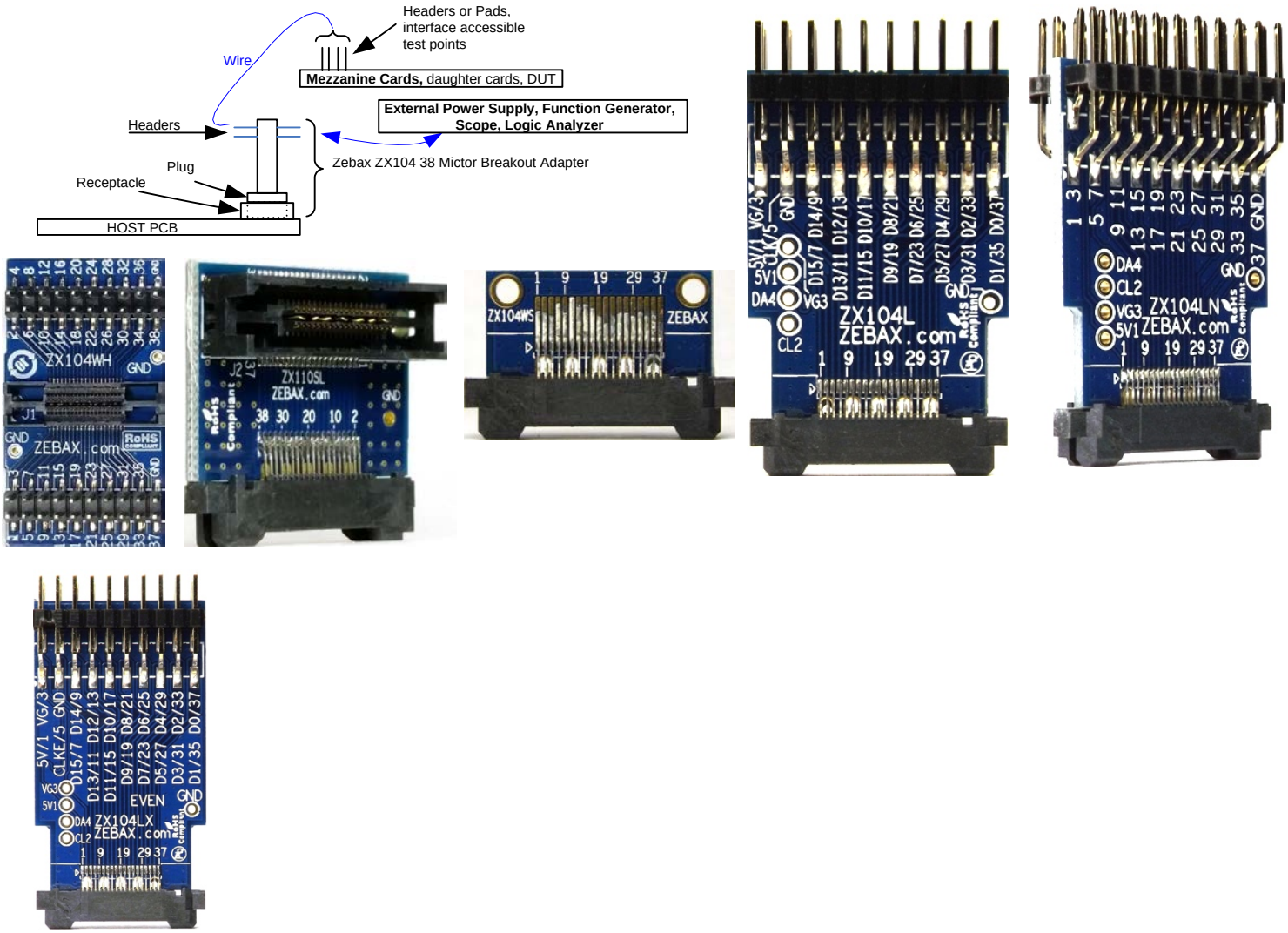
ZX104x Mictor breakout adapter is offered in several versions. The variations of the ZX104x are primarily catering different designs and applications. ZX104x is offered as ZX104WS ZX104WH ZX104LN ZX104LNR ZX104L ZX104LX ZX014D12 ZX104D13

ZX104D12 and ZX104D13 Mictor breakout adapter offer differential pair signal assignment configuration.

All Zebax Mictor breakout adapters may be used in variety of applications, including board to board, board to logic analyzer, board to scope and board to evaluation board or any board to board stitching needs in emulation environment, see figure 7. Zebax Mictor breakout adapter provide debugging and interface solution for pre-bringup , bringup, validation and testing of any prototype or evaluation board.
figure 7.

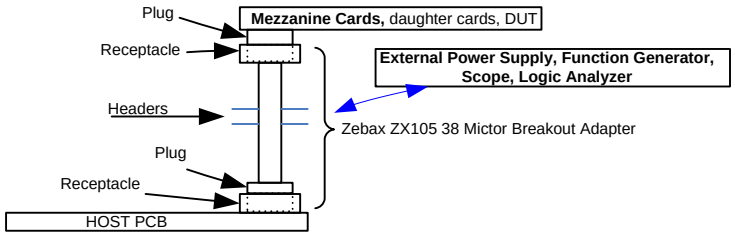
All Zebax Mictor breakout adapter modules include test point for external ground shielding. TP1 , TP2 ground test points may be connected to external ground for improved signal integrity along with shielding requirements. Traditionally the Tp1 or Tp2 ground test points are used for proper Scope or logic analyzer ground interface.

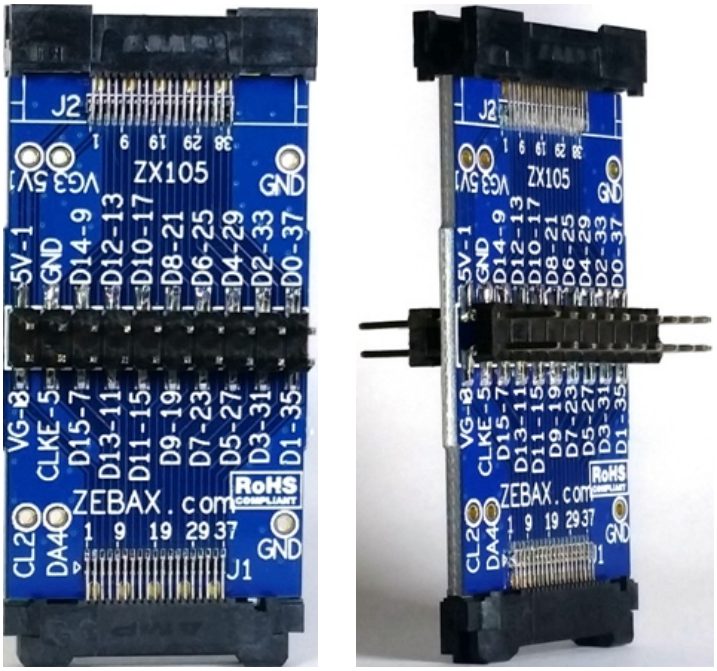
Figure 7 – Zebax ZX104x 38 Mictor Breakout adapter using Mictor Plug - typical applications



Zebax Mictor breakout adapter ZX105 38 pin Mictor breakout adapter is offered with both Plug and Receptacle connectors facilitates interface of any prototype, evaluation board, or daughter cards to HOST by providing accessible headers for debugging via scope or logic Analyzer, Keysight (Agilent) or Tektronix, figure 8.

Figure 8 – Zebax ZX105 38 Mictor Breakout adapter using Mictor Plug and Receptacle -typical applications





Zebax Mictor breakout adapter ZX110 38 pin is offered in 3 forms as listed below:

ZX110 Mictor breakout adapter is offered with both Plug and Receptacle connectors. It is designed to meet Keysight (Agilent) logic analyzer probe pin out assignment. E5339A, E5334A, E5351AB. The ZX110 can certainly be used for any debugging, and testing due to its accessible headers, figures 9,10.

Figure 9 – Zebax ZX110 38 Mictor Breakout adapter typical application

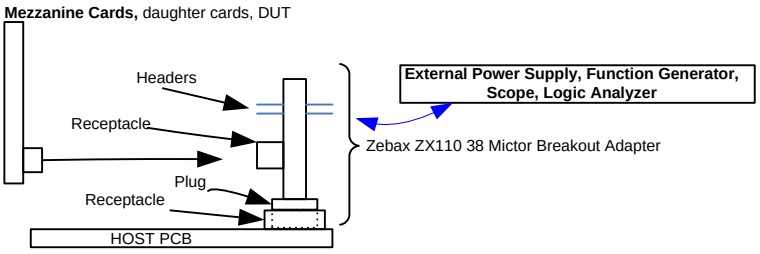
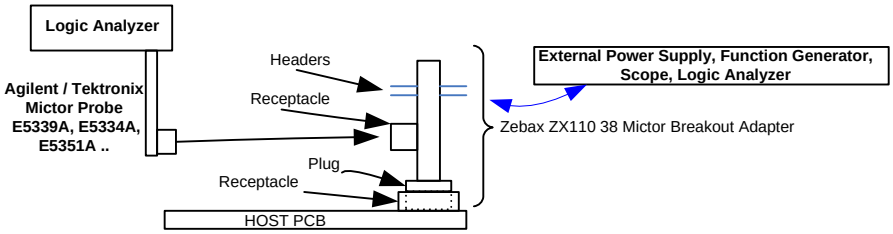
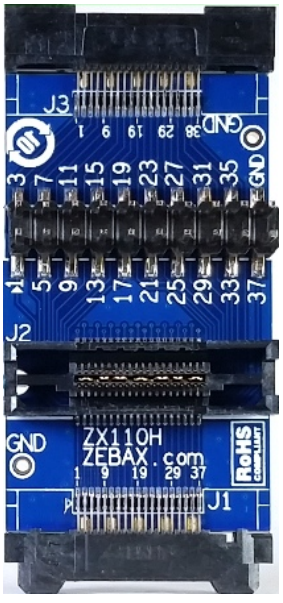


Figure 10 – Zebax ZX110 38 Mictor Breakout adapter typical application



ZX110H Mictor breakout adapter is offered with both Plug and Receptacle connectors as well as headers. It interfaces to both scope and Logic Analyzer. It is designed to meet Keysight (Agilent) Logic Analyzer probe pin out assignment. E5339A, E5334A, E5351AB.



ZX110X4 Mictor breakout adapter is offered with one Plug and three Receptacle connectors. It is ideal extender test module for board to board as well as board to Logic Analyzer. It interfaces with any Logic Analyzer probe supporting Mictor connector, E5339A, E5334A, E5351AB.

Zebax offers best in class Samtec Mictor FMC VITA 57.1 AHSMC PCISIG M.2 PCIe/104 PCI/104-Express and more breakout test modules extension boards. ZX100 products are widely used in test, debug, validation and characterization of engineering efforts in R&D as well as automation test environment and manufacturing test areas.

Zebax is dedicated in providing best in class solutions supporting engineering and technical communities in test and measurements disciplines.

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