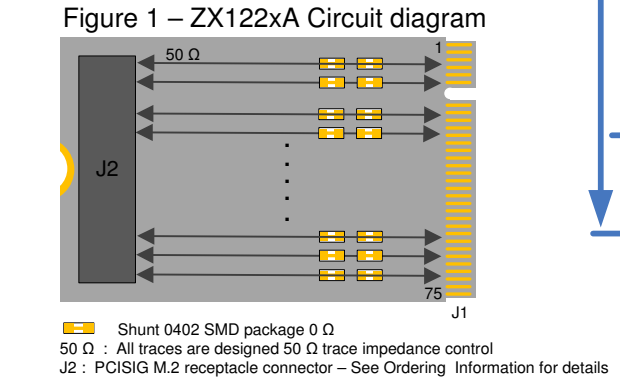
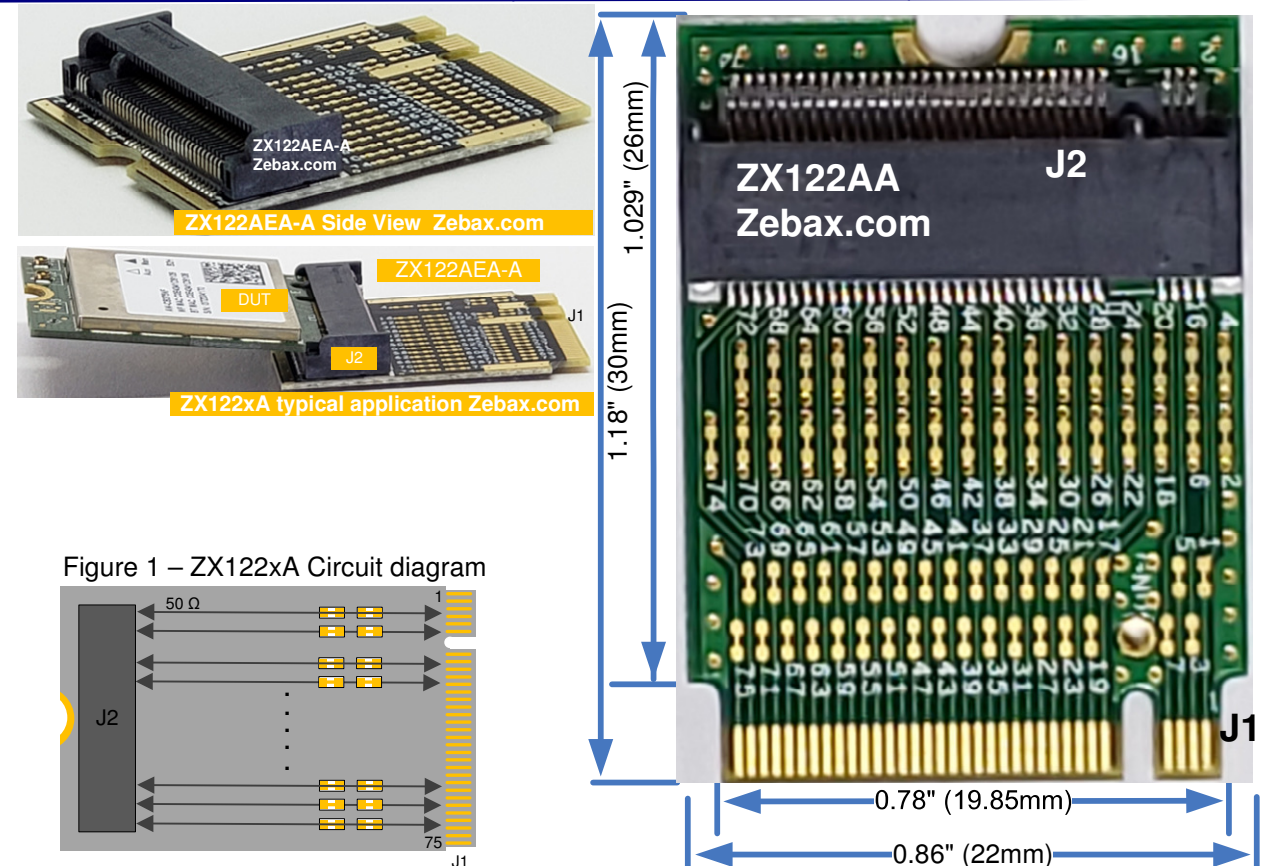


**Product Name: ZX122xA – PCISIG M.2 NGFF passive breakout adapter module offering all KEY type combinations**

**Product Description:** ZX122xA is PCISIG M.2 ( NGFF ) breakout adapter providing access to all PCISIG M.2 signals. It is designed to be placed in between Host and Target for real-time test and measurements. ZX122xA is breakout adapter designed for Test and measurement , signal integrity , characterization , test and debug of any PCISIG M.2 design via onboard 0405 SMD shunt landing pads.

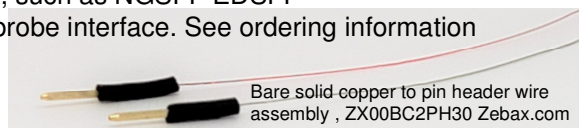
- a) All PCISIG M.2 signals are routed to 0402 SMD shunt package for easy probe access.
- b) Each 0402 SMD shunt package may be wired for signal measurement via scope / test equipment.
- c) Each 0402 SMD shunt package may be cut and redirected to another signal ( onboard or offboard ) for test and debug.
- d) Ideal breakout module for manufacturing / development loopback test.



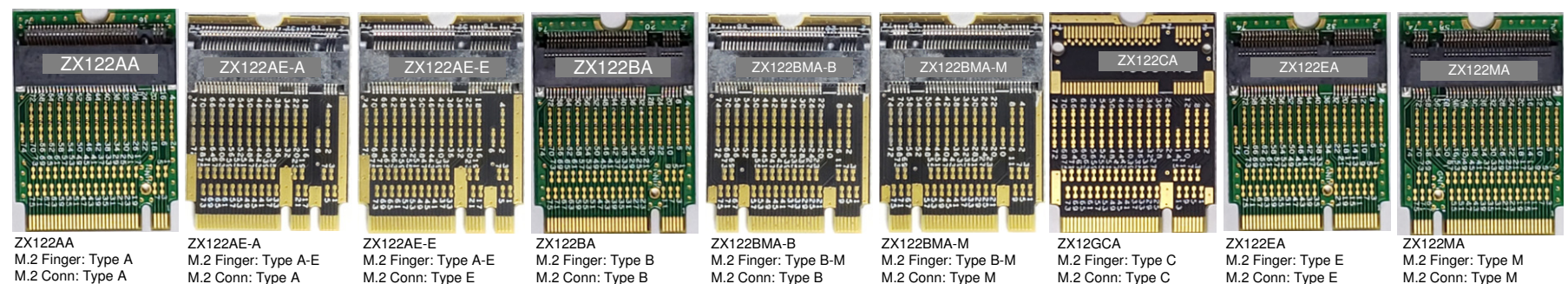
ZX122xA is commonly used throughout this document. It is referred to the ZX122xA module where the “x” will be different M.2 Key type , as listed in the Ordering Information on page 3

**ZX122xA features:**

- 1- Provides access to ALL PCISIG signals via onboard 0402 SMD shunt packages, ( 67 signals on single M.2 Key design ).
- 2- ZX122xA is designed to be inserted into host and interfaced ( wired or connected ) to target , or any evaluation board ( development board ) for purpose of debugging, development, testing and characterization.
- 3- Listed number adjacent to each 0402 SMD shunt package represents the associated PCISIG M.2 connector's pin number.
- 4- All traces are 50 Ohms impedance controlled with exceptional signal integrity & crosstalk.
- 5- Four layers PCB design, inner layers are GND planes with direct connection to GND stitching vias & top/bottom GND fills.
- 6- Accessible GND exposed copper, enabling for ease of access for test and measurement. see “ZX122xA Ground Access” on page 3
- 7- Mates with any key matching M.2 Host and Device / DUT
- 8- ZX122xA is offered in **7 different M.2 Key types**, serving variety of PCISIG M.2 applications. See *Ordering Information* section. ZX122AES and ZX122BMA are offered in two different onboard J2 connector Key configuration. They are ideal solution for converting one M.2 Key type to another M.2 Key type. see section “**Key Conversion**” on page 2
- 9- Compatible with other design derivatives utilizing PCISIG M.2 connectors, such as NGSFF EDSFF
- 10- Probing wire , ZX00BC2PH30, is offered to application requiring scope probe interface. See ordering information



**Electrical:** Insertion loss > -2dB @6GHz  
 Trace impedance: 50 Ohm  
 Operating Temperature: -65°C to +170°C  
 M.2 Edge Connector type ( J1 ) : see Ordering INFO  
 Mates with: see Ordering INFO  
 Plating: Gold 100U  
 M.2 Receptacle ( J2 ) :  
 Key Type: see Ordering INFO  
 Height: 0.16" (4.2mm) – See Figure 4  
 Spacer : 0.1" (2.54mm) – See Figure 4  
 Plating: Gold 100U  
 Current per pin: 0.5A ( maximum)  
 Shunt:  
 Package: 0402 SMD



**Application:** Bringup, testing, emulation, development, modular design evaluations of PCISIG M.2 ( NGFF – Next Generation Form Factor ). Manufacturing - Development loopback test. M.2 PCISIG module design test characterization. DP WIFI GPS GYRO Compass BT FM sensor module Add-in Card DisplayPort SDIO WWAN PCIe-based SSD SATA-based PCIe / USB 3.1 SSIC Gen1-Based Socket 1 2 3. All ZX122MA, ZX122BMA-M are compatible with NGSFF / NF1 ( Next Generation Small Form Factor ) as well as EDSFF ( Enterprise & Datacenter SSD Form Factor ) interface solution or any other design interface utilizing M.2 connector series.

**Mates with :** Any standard M.2 NGFF PCISIG connectors on host and device Key A B C E M A-E B-M  
 TE JAE Belwether Amphenol 2199125 2199119 2199230 2199133 SM3ZS067 SD-80148 SD-80149 SD-80152 SD-80159 NGSFF NF1 EDSFF

**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

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<b>DESCRIPTION: PCISIG M.2 NGFF passive breakout adapter module keys A A-E B B-M C E and M</b>		
<b>CHECKED:</b> M. MARINA	<b>DRAWN:</b> SONYA	<b>REVISION: 1.0</b> <b>SHEET: 1 OF 4</b>

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**Product Name: ZX122xA – PCISIG M.2 NGFF passive breakout adapter module offering all KEY type combinations, page 2 of 4**

**Breakout Access :** All ZX122xA breakout adapters provide breakout access via onboard 0402 SMD shunts landing pads, see Figure 3. All signals are accessible on top layer of the module. Each 0402 SMD shunt package may be wired for signal measurement via scope / test equipment. Additionally; each 0402 SMD shunt package may be cut and redirected to another signal ( onboard or offboard ) for test and debug.



Figure 3- 0402 SMD shunt – not scaled

**ZX122xA Ground Access :** ZX122xA provides exposed copper or GND test point ( depending to ZX122xA model ) for accessing the module’s ground reference. The ZX122xA is 4 layers PCB design, where the 2 inner layers are used as the module’s ground reference. The Ground stitching vias , the top / bottom ground fills and the inner ground planes are all interconnected, hence referred as “GND”. The exposed copper or the GND test point ( depending to ZX122xA model ) provide access to the ZX122xA GND reference. The exposed coppers provides ease of access to ZX122xA GND reference.

In order to improve signal integrity , please connect one of the exposed copper or the GND test point to your nearest system GND reference.

**Key Conversion :** ZX122AEA and ZX122BMA are offered in 2 different J2 M.2 Key types. This Key conversion is ideal solution for applications requiring to interface with the listed M.2 Key application.

Part number	PCB Edge	J2	Description
ZX122AEA-A	Key A-E	Key A	Convert M.2 PCISIG Key E to Key A
ZX122AEA-E	Key A-E	Key E	Convert M.2 PCISIG Key A to Key E
ZX122BMA-B	Key B-M	Key B	Convert M.2 PCISIG Key M to Key B
ZX122BMA-M	Key B-M	Key M	Convert M.2 PCISIG Key B to Key M

Please note, the dual M.2 Key modules ( such as ZX122AEA-E ) have two key notches on PCB edge finger connectors ( ZX122AEA-E has PCB edge finger connector Key A and Key E ). Therefore signals associated with the opposite Key type on the J2 connector will not be accessible due to dual key notch design.

Example: ZX122AEA-E Utilizes J2 M.2 connector of Key type E, therefore the “Key A” signals at J2 connector will be available at J2 connector, but they will be floating ( Not connected to any signal ) since the PCB Edge finger does have both A and E Key notches.

**Vertical M.2 connector Form Factor:** ZX122xA offers few modules in Vertical formfactor. This applies only to the onboard J2 M.2 connector formfactor, see Figure 4 and 5. The Vertical M.2 receptacle formfactor enables DUT to be inserted in Vertical direction as exhibited in Figure 5. The Vertical formfactor M.2 option provides access to both sides of DUT for test & measurement as well as unleashing design space constraints.

Only the -V option modules are available in the Vertical formfactor solutions. Please see Ordering Information.

**NGSFF NDSFF compatibility :** ZX122xA is PCISIG M.2 ( NGFF ) breakout adapter provides access to all PCISIG M.2 signals. There have been emerging design application solutions utilizing M.2 connector series, such as NGSFF / NF1 , EDSFF and more. ZX122xA is fully compatible with these design derivatives since it provides hardware test & measurement capability without any signal assignments.

**Module Insertion, Removal process:** In order to avoid any mechanical stress or damage to ZX122xA, please follow the below listed guidelines for insertion and removal process:

- 1- Move the Module against the housing chamber, see figure a
- 2- Rotate module to 25°, insert it until the module surface reaches the ramp, figure b, c
- 3- Rotate the module to horizontal position, see figure d
- 4- Fix the module by screw, see figure e

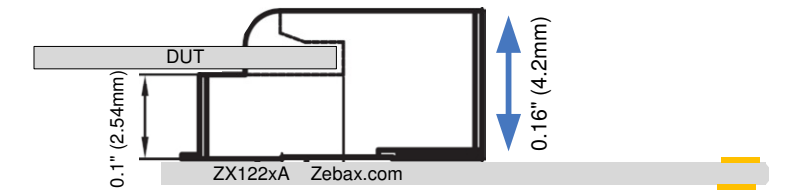
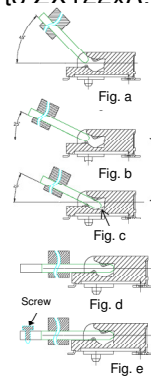


Figure 4- ZX122xA in standard, Std, M.2 style M.2 receptacle connector formfactor

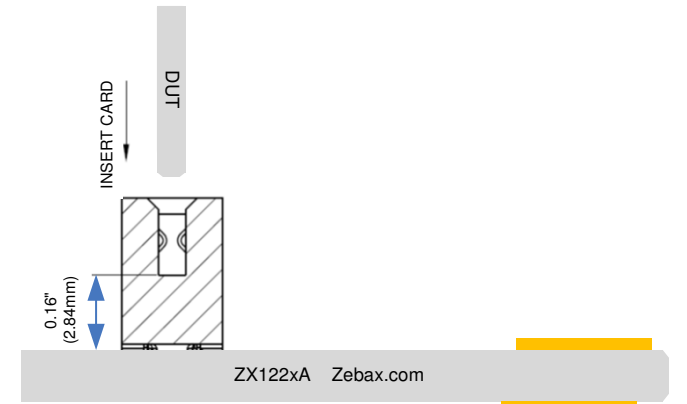
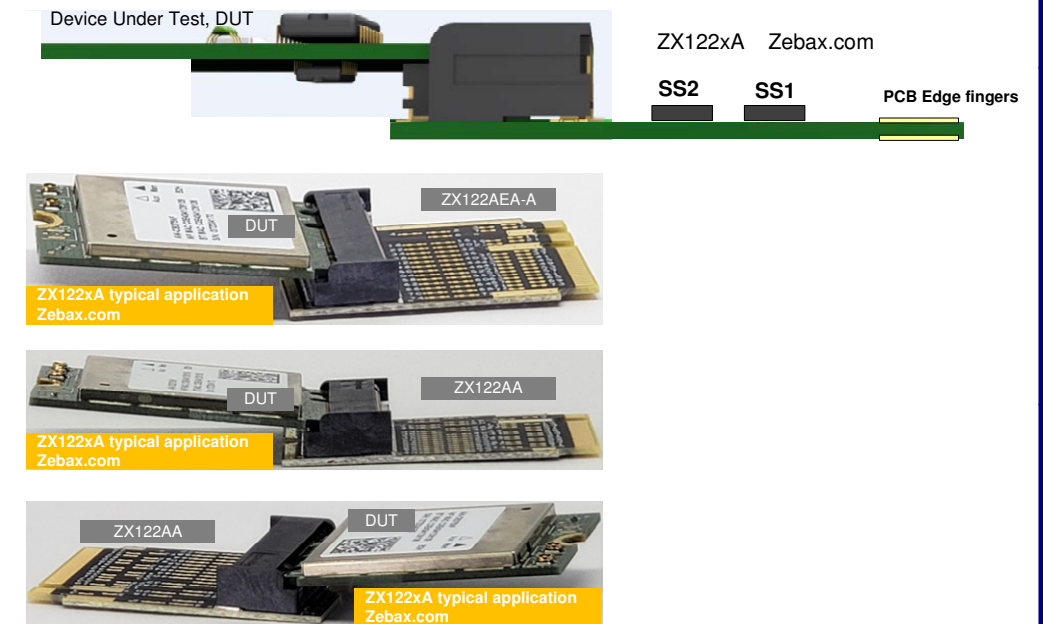


Figure 5 – ZX122xA in Vertical mount M.2 connector formfactor

Figure 6 – Typical application using ZX122xA Standard formfactor



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CHECKED: M. MARINA	DRAWN: SONYA	REVISION: 1.0
		SHEET: 2 OF 4

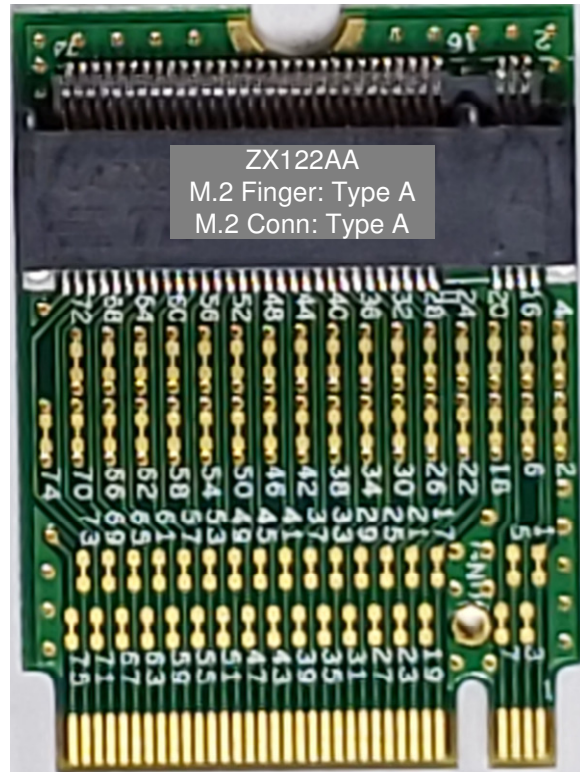
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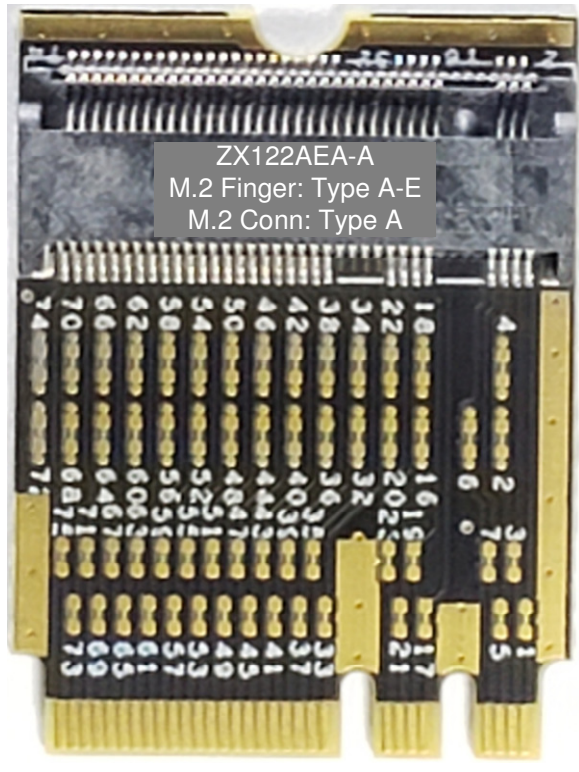
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**Product Name: ZX122xA – PCISIG M.2 NGFF passive breakout adapter module offering all KEY type combinations, page 3/4**

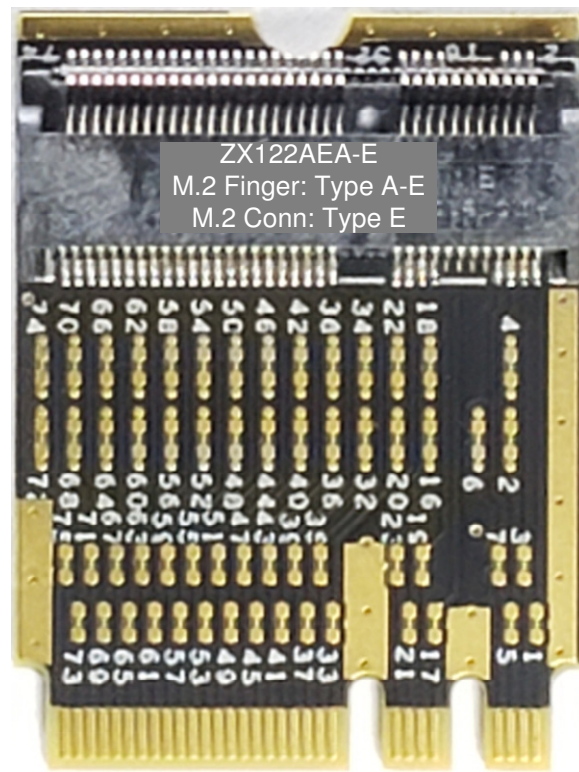
**ZX122xA part numbers :** ZX122xA is offered in 7 different M.2 Key types, serving variety of PCISIG M.2 breakout applications. Below are few ZX122xA modules for reference. ZX122AEA-x and ZX122BMA-x are offered with both M.2 Connector types.



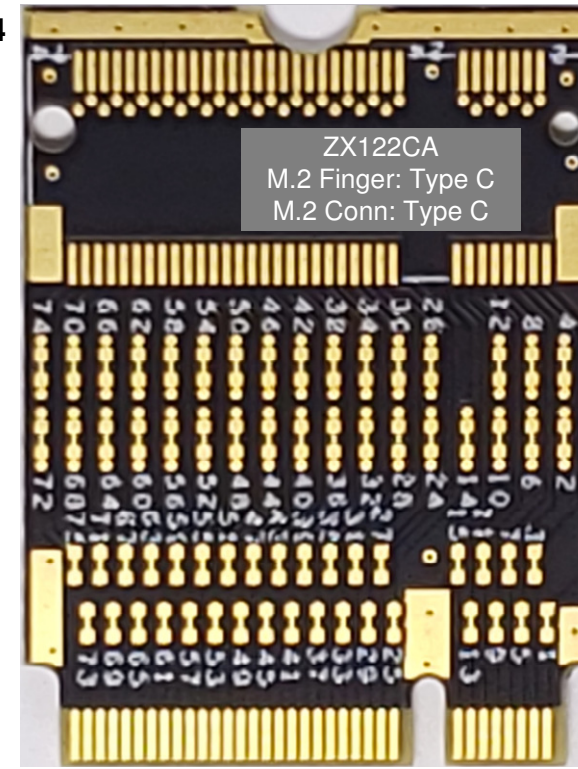
**ZX122AA**  
M.2 Finger: Type A  
M.2 Conn: Type A



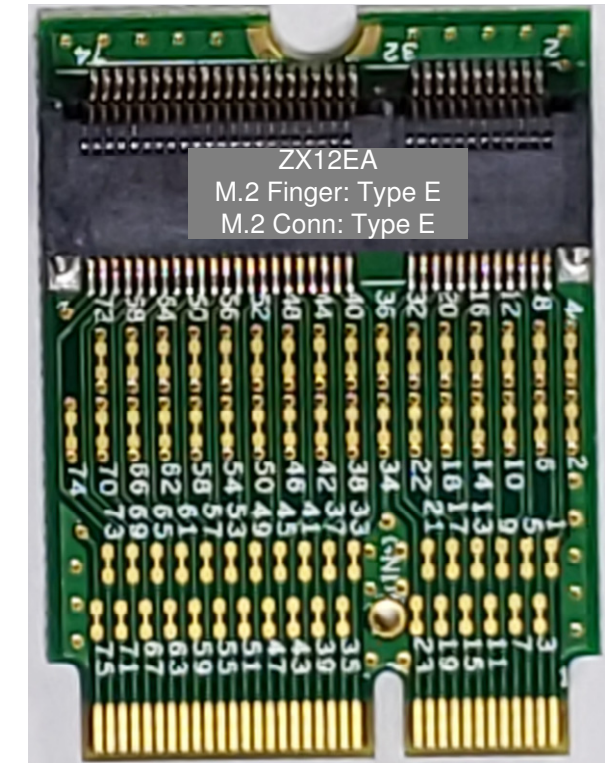
**ZX122AEA-A**  
M.2 Finger: Type A-E  
M.2 Conn: Type A



**ZX122AEA-E**  
M.2 Finger: Type A-E  
M.2 Conn: Type E



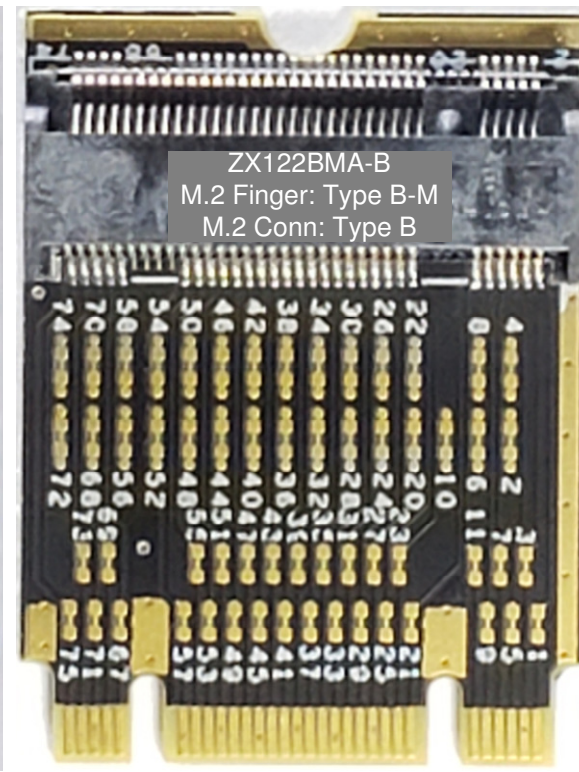
**ZX122CA**  
M.2 Finger: Type C  
M.2 Conn: Type C



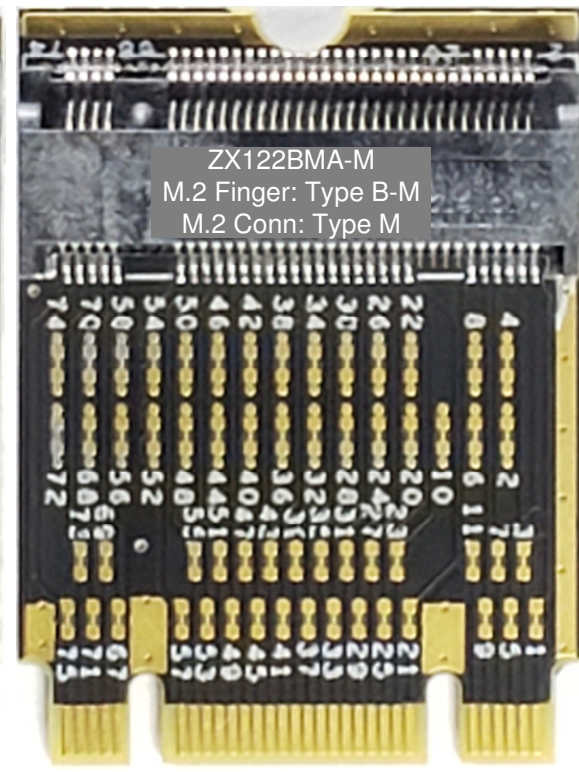
**ZX12EA**  
M.2 Finger: Type E  
M.2 Conn: Type E



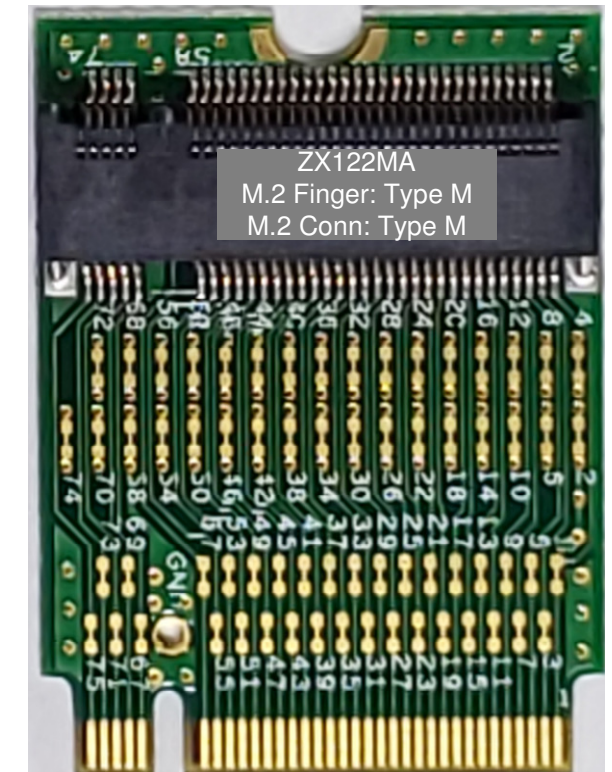
**ZX122BA**  
M.2 Finger: Type B  
M.2 Conn: Type B



**ZX122BMA-B**  
M.2 Finger: Type B-M  
M.2 Conn: Type B



**ZX122BMA-M**  
M.2 Finger: Type B-M  
M.2 Conn: Type M



**ZX122MA**  
M.2 Finger: Type M  
M.2 Conn: Type M

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**Product Name: ZX122xA – PCISIG M.2 NGFF passive breakout adapter module offering all KEY type combinations, page 4 of 4**

**ZX122xA part numbers** : ZX122xA is offered in 7 different M.2 Key types. The ZX122AEA-x and ZX122BMA-x are offered in two configurations as listed in Order Information section below.

**Ordering Information:**

Part number	PCB Edge	J2	Formfactor <sup>1</sup>	Description
ZX122AA	Key A	Key A	Std	PCISIG M.2 passive breakout adapter
ZX122AEA-A	Key A-E	Key A	Std	Convert M.2 PCISIG Key E to Key A
ZX122AEA-E	Key A-E	Key E	Std	Converts M.2 PCISIG Key A to Key E
ZX122BA	Key B	Key B	Std	PCISIG M.2 passive breakout adapter
ZX122BMA-B	Key B-M	Key B	Std	Convert M.2 PCISIG Key M to Key B
ZX122BMA-M	Key B-M	Key M	Std	Convert M.2 PCISIG Key B to Key M
ZX122BMA-MV	Key B-M	Key M	Vertical	Convert M.2 PCISIG Key B to Key M
ZX122CA	Key C	Key C		see Note 2
ZX122EA	Key E	Key E	Std	PCISIG M.2 passive breakout adapter
ZX122MA	Key M	Key M	Std	PCISIG M.2 passive breakout adapter
ZX122MA-V	Key M	Key M	Vertical	PCISIG M.2 passive breakout adapter

**Note:**

- 1 – Few selected modules are offered in Vertical or Standard ( Std) formfactor. This applies only to the onboard J2 M.2 connector formfactor – See Figure 2 and 3
- 2 - Due to un-availability of M.2 Key C receptacle in industry, ZX122CA is shipped without J2 connector.

[ZX00BC2PH30](#) 30AWG Bare Copper wire to pin header wire assembly

[ZX00BC2PH30 site page](#) for ordering ZX00BC2PH30 wire assembly

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