Product Name: **ZX122GxBB – PCISIG M.2 NGFF passive breakout module offering all KEY type combinations**

Product Description: ZX122GxBB is PCISIG M.2 (NGFF) breakout module providing access to all PCISIG M.2 signals. It is designed to facilitate real-time electrical test and measurements. ZX122GxBB is breakout module is designed for test and measurement , signal integrity , characterization , test and debug of any PCISIG M.2 design via onboard 0405 SMD shunt landing pads.

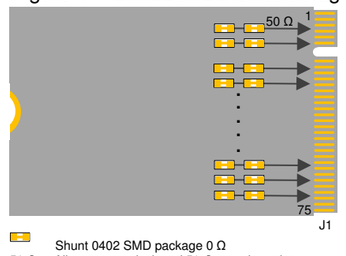
a) All PCISIG M.2 signals are routed to 0402 SMD shunt package for easy probe access.
b) All PCISIG M.2 reserved Ground (GND) signals are inner connected on the ZX122GxBB module, accessible via Exposed Copper
c) Each 0402 SMD shunt package may be wired for signal measurement via scope / test equipment.
d) Each 0402 SMD shunt package may be cut and redirected to another signal (onboard or offboard) for test and debug.
e) Ideal breakout module for manufacturing / development loopback test.

ZX122GxBB is commonly used throughout this document. It is referred to the ZX122GxBB module where the “x” will be different M.2 Key type , as listed in the *Ordering Information* on page 3

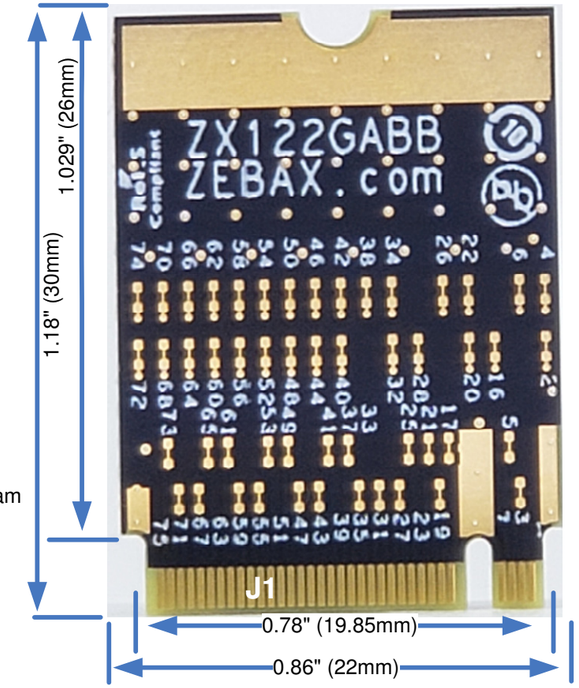
ZX122GxBB features:

1- Provides access to ALL PCISIG reserved signals (excluding the GND reserved signals) via onboard 0402 SMD shunt packages, (67 signals on single M.2 Key design).
2- All PCISIG M.2 reserved Ground (GND) signals are inner connected on the ZX122GxBB module. They’re accessible via Exposed Copper – See “**Signal assignment**” & “**ZX122GxBB Ground Access**” on pages 2 & 3 for specific ZX122GxBB signal assignment table listings.
3- ZX122GxBB is designed to interface with host only, enabling interfaced (wired or connected), or any evaluation board (development board) for purpose of debugging, development, testing and characterization.
4- Listed number adjacent to each 0402 SMD shunt package represents the associated PCISIG M.2 connector’s pin number.
5- All traces are 50 Ohms impedance controlled with exceptional signal integrity & crosstalk.
6- Mates with any matching key M.2 Host.
7- ZX122GxBB is offered in **7 different M.2 Key types**, See *Ordering Information* section.
8- Compatible with other design derivatives utilizing PCISIG M.2 connectors, such as NGSFF EDSFF
9 - Probing wire , ZX00BC2PH30, is offered to application requiring scope probe interface. See ordering information

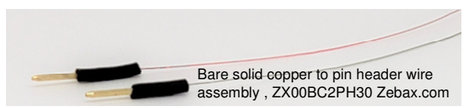
Figure 1 – ZX122GxBB Circuit diagram



Shunt 0402 SMD package 0 Ω
50 Ω : All traces are designed 50 Ω trace impedance control



Electrical:
Insertion loss > -2dB @6GHz
Trace impedance: 50 Ω
Operating Temperature: -65°C to +170°C
M.2 Edge Connector type (J1) : see Ordering INFO
Mates with: see Ordering INFO
Plating: Gold 100U
Shunt:
Package: 0402 SMD



Bare solid copper to pin header wire assembly , ZX00BC2PH30 Zebax.com

More pictures on pages 2 & 3

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, and ZX122BMA-M modules 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 2199125 2199119 2199230 2199133 JAE SM3ZS067
Bellwether: SD-80148 SD-80149 SD-80152 SD-80159 Amphenol
NGSFF NF1 EDSFF

NGSFF NDSFF compatibility : ZX122GxBB 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. ZX122GxBB is fully compatible with these design derivatives as long as PCISIG GND reference is assigned similar.

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

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: ZX122GxBB M.2 NGFF PCISIG

DESCRIPTION: PCISIG M.2 NGFF passive breakout module keys A A-E B B-M C E and M

CHECKED: M. MARINA
DRAWN: SONYA
REVISSION: 1.0
SHEET: 1 OF 3

Product Name: ZX122GxBB – PCISIG M.2 NGFF passive breakout adapter module offering all KEY type combinations

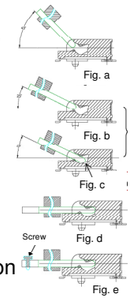
Breakout Access : All ZX122GxBB breakout adapters provide breakout access via onboard 0402 SMD shunts landing pads. All signals are accessible on top layer of the module. Dedicated GND test point interfacing with the inner ground layers + top/bottom GND fills.

Ground Access : ZX122GxBB provides exposed copper for accessing the module's ground reference. The ZX122GxBB 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 provide access to the ZX122GxBB GND reference. The exposed coppers provides ease of access to ZX122GxBB 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.

Module Insertion, Removal process: In order to avoid any mechanical stress or damage to ZX122GxB, please follow the below listed guidelines for insertion and removal process:

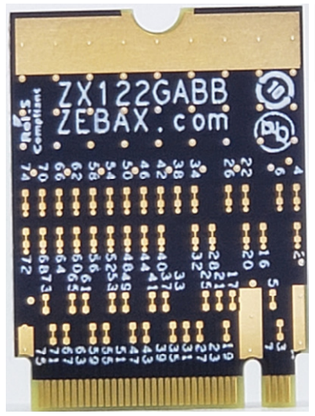
1- Move the Module against the housing chamber, see figure a
2- Rotate module to 25°, insert it until the module surface reaches the ramp, figure b, c
3- Rotate the module to horizontal position, see figure d
4- Fix the module by screw, see figure e



ZX122GxBB part numbers : ZX122GxBB is offered in 7 different M.2 Key types, targeting variety of PCISIG M.2 breakout application Below are each part number with associated Signal assignment table.

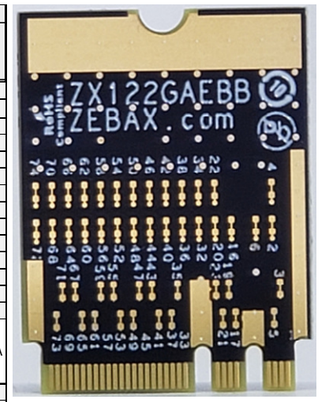
Signal assignments: The listed signal assignment tables exhibits only the reserved M.2 PCISIG GND reference signals. All reserved M.2 PCISIG GND reference signals are inner connected on ZX122GxBB modules. All other PCISIG M.2 signals are accessible on ZX122GxBB module.

PCISIG M.2 signals :
ZX122GxBB passes through all PCISIG M.2 signals (excluding the reserved GND signals) via onboard 0402 shunt SMD package. This includes NC or reserved PCISIG M.2 signals.



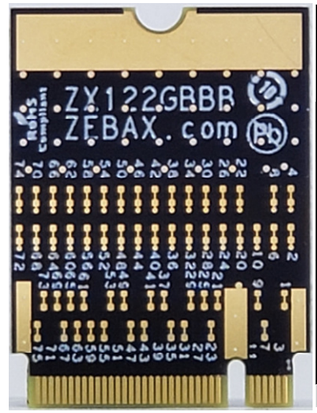
Socket 1 Key A						
Signal	PCISIG M.2 Edge finger Pin	ZX122GABB		Pin	Signal
GND	36	EP[1]			
GND	30				
GND	24			75	GND
GND	18			69	GND
ADD-IN CARD KEY A	14			63	GND
	12			57	GND
	10			51	GND
	8			45	GND
				39	GND
				33	GND
				29	GND
				23	GND
				15	ADD-IN CARD KEY A
				13	
				11	
				9	
			EP[1]	7	GND
				1	GND

Note **1:** Exposed Copper is connected to inner GND planes



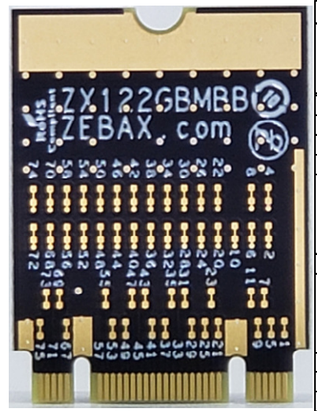
Socket 1 Key A-E					
Signal	PCISIG M.2 Edge finger Pin	ZX122GAEBB[2]		Pin	Signal
				75	GND
				69	GND
ADD-IN CARD KEY E	30			63	GND
	28			57	GND
	26			51	GND
	24			45	GND
GND	18	EP[1]		39	GND
	14			33	GND
ADD-IN CARD KEY A	12			31	ADD-IN CARD KEY E
	10			29	
	8			27	
				25	
				15	ADD-IN CARD KEY A
				13	
				11	
				9	
			EP[1]	7	GND
				1	GND

Note **1:** Exposed Copper is connected to inner GND planes
2: ZX122GAEB mates with host Key A or Key E - please see ordering information.



Socket 2 Key B					
Signal	PCISIG M.2 Edge finger Pin	ZX122GBBB		Pin	Signal
				75	GND
				69	GND
				63	GND
				57	GND
ADD-IN CARD KEY B	18		EP[1]	51	GND
	16			45	GND
	14			39	GND
	12			33	GND
				31	ADD-IN CARD KEY B
				29	
				27	
				25	
			EP[1]	7	GND
				1	GND

Note **1:** Exposed Copper is connected to inner GND planes.



Socket 2 Key B-M					
Signal	PCISIG M.2 Edge finger Pin	ZX122GBMBB[2]		Pin	Signal
			EP[1]	71	GND
				65	ADD-IN CARD KEY M
				63	
				61	
				59	
ADD-IN CARD KEY M	66			57	GND
	64			51	GND
	62			45	GND
	60		EP[1]	39	GND
				33	GND
ADD-IN CARD KEY B	18			27	GND
	16			19	ADD-IN CARD KEY B
	14			17	
	12			15	
				13	
			EP[1]	3	GND

Note **1:** Exposed Copper is connected to inner GND planes.
2: ZX122GBMB mates with host Key B or Key M - please see ordering information.

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SPECIFIED DIMENSIONS ARE INCHES (MM).
ROHS COMPLIANT

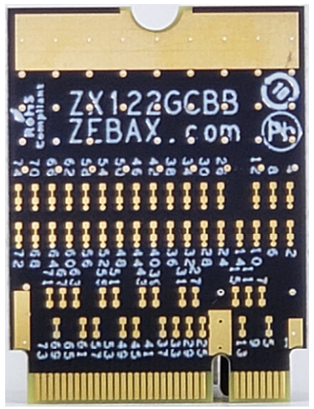
ASSEMBLY DRAWING

ITEM: ZX122GxBB M.2 NGFF PCISIG

DESCRIPTION: PCISIG M.2 NGFF passive breakout module keys A A-E B B-M C E and M

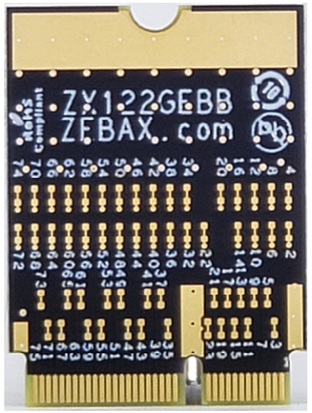
CHECKED: M. MARINA
DRAWN: SONYA
REVISSION: 1.0
SHEET: 2 OF 3

Product Name: ZX122GxBB – PCISIG M.2 NGFF passive breakout adapter module offering all KEY type combinations



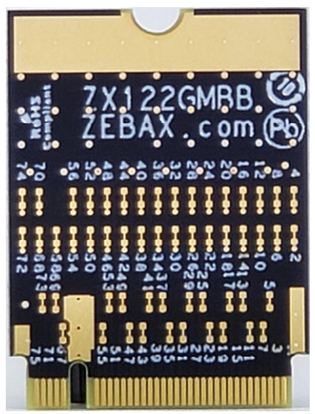
Socket 2 Key C						
Signal	PCISIG M.2 Edge finger Pin	ZX122GCBB			Pin	Signal
				EP[1]	75	GND
					73	GND
ADD-IN CARD KEY C	22				65	GND
	20				59	GND
	18				53	GND
	16				47	GND
					41	GND
					35	GND
					23	ADD-IN CARD KEY C
					21	
					19	
					17	
				EP[1]	9	GND
					3	GND
					1	GND

Note **1:** Exposed Copper is connected to inner GND planes.



Socket 1 Key E						
Signal	PCISIG M.2 Edge finger Pin	ZX122GEBB			Pin	Signal
				EP[1]	75	GND
					69	GND
ADD-IN CARD KEY E	30				63	GND
	28				57	GND
	26				51	GND
	24				45	GND
GND	18	EP[1]			39	GND
					33	GND
					31	ADD-IN CARD KEY E
					29	
					27	
					25	
				EP[1]	7	GND
					1	GND

Note **1:** Exposed Copper is connected to inner GND planes.



Socket 3 Key M						
Signal	PCISIG M.2 Edge finger Pin	ZX122GMBB			Pin	Signal
				EP[1]	75	GND
					71	GND
					65	ADD_IN CARD KEY M
ADD_IN CARD KEY M	66				63	
	64				61	
	62				59	
	60				57	GND
					51	GND
					45	GND
					39	GND
					33	GND
					27	GND
					21	GND
					15	GND
					9	GND
					3	GND
					1	GND

Note **1:** Exposed Copper is connected to inner GND planes.

Ordering Information:

Part number	PCB Edge	Mates with	Description
ZX122GABB	Key A	Key A	PCISIG M.2 passive breakout module
ZX122GAEBB	Key A-E	Key A or Key E	PCISIG M.2 passive breakout module
ZX122GBBB	Key B	Key B	PCISIG M.2 passive breakout module
ZX122GBMBB	Key B-M	Key B or Key M	PCISIG M.2 passive breakout module
ZX122GCBB	Key C	Key C	PCISIG M.2 passive breakout module
ZX122GEBB	Key E	Key E	PCISIG M.2 passive breakout adapter
ZX122GMBB	Key M	Key M	PCISIG M.2 passive breakout adapter

ZX00BC2PH30 30AWG Bare Copper wire to pin header wire assembly

ZX00BC2PH30 site page for ordering ZX00BC2PH30 wire assembly

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CHECKED: M. MARINA

DRAWN: SONYA

REVISSION: 1.0

SHEET: 3 OF 3