



PCI-SIG ENGINEERING CHANGE NOTICE

TITLE:	M.2 2242 WWAN Module
DATE:	Introduced: June 3, 2014 Updated: November 13, 2014 Final Approval: November 20, 2014
AFFECTED DOCUMENT:	PCI Express M.2 Specification, Revision 1.0
SPONSOR:	Will Harris; Advanced Micro Devices

Part I

1. Summary of the Functional Changes

Add 2242 form factor for WWAN modules using Socket 2 with key B.

2. Benefits as a Result of the Changes

There is a desire in the industry to shrink the dimensions for WWAN modules to address smaller tablets and notebooks. The 2242 form factor will allow for ~25% smaller WWAN modules.

3. Assessment of the Impact

The 2242 WWAN module is backwards compatible with 3042 socket 2 slots. No changes are needed to the connector.

4. Analysis of the Hardware Implications

The 2242 form factor will use the same connector and pinout as the 3042 form factor and can be used in existing platforms designed for the 3042 form factor. New platforms can take advantage of the smaller size of the 2242 form factor.

5. Analysis of the Software Implications

N/A

6. Analysis of the C&I Test Implications

N/A

Part II

Detailed Description of the change

Update Table 1 as follow:

Table 1. Optional Module Configurations

	Soldered-down			Connectorized			
	Type	Module Height Options	Pinout Key	Connector Key	Type	Module Height Options	Module Key
Socket 1 Connectivity	1216	S1, S3	E	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	A, E	1630	S1, D1, S3, D3, D4	A, E, A+E
	2226	S1, S3	E	A, E	2230	S1, D1, S3, D3, D4	A, E, A+E
	3026	S1, S3	A+E	A, E	3030	S1, D1, S3, D3, D4	A, E, A+E
Socket 2 WWAN/Other	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>B</u>	<u>2242</u>	<u>S1, D1, S3, D3, D4</u>	<u>B</u>
	N/A	N/A	N/A	B	3042	S1, D1, S3, D3, D4	B
Socket 2 SSD/Other	N/A	N/A	N/A	B	2230	S2, D2, S3, D3, D5	B+M
	N/A	N/A	N/A	B	2242	S2, D2, S3, D3, D5	B+M
	N/A	N/A	N/A	B	2260	S2, D2, S3, D3, D5	B+M
	N/A	N/A	N/A	B	2280	S2, D2, S3, D3, D5	B+M
	N/A	N/A	N/A	B	22110	S2, D2, S3, D3, D5	B+M
Socket 3 SSD Drive	N/A	N/A	N/A	M	2242	S2, D2, S3, D3, D5	M, B+M
	N/A	N/A	N/A	M	2260	S2, D2, S3, D3, D5	M, B+M
	N/A	N/A	N/A	M	2280	S2, D2, S3, D3, D5	M, B+M
	N/A	N/A	N/A	M	22110	S2, D2, S3, D3, D5	M, B+M

Add Chapter 2.3.2.2:

2.3.2.2 Type 2242 Specification

Type 2242 is a M.2 board/module size used on Socket 2 and intended to support WWAN solutions.

In principle the board is comprised of three sections:

- Host I/F section
- RF connector and mounting hole section
- Active Component section

The active component section is 22 mm wide with the same overall length of 42 mm like the other board/module intended for Socket 2.

An example of the Type 2242 board/module mechanical outline drawing is shown in Figure 10.

The board size supports up to four (4) RF connectors, which can be populated while maintaining the recommended 4.5 mm center-to-center distances. See section 2.3.7, RF Connectors in this document for recommended locations and assignments.

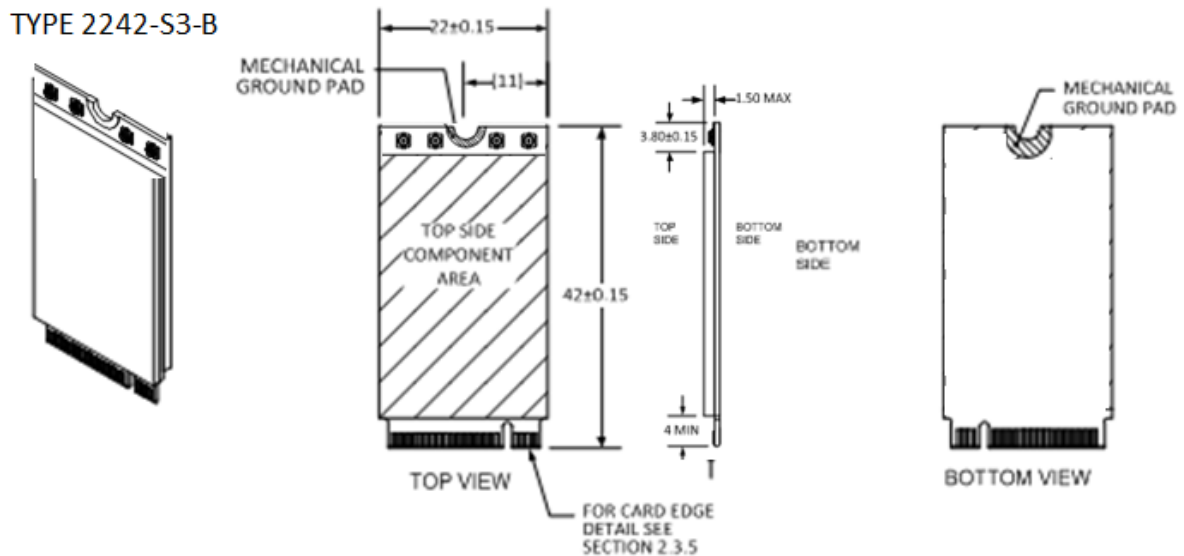


Figure 10. M.2 Type 2242-S3 Mechanical Outline Diagram Example

Update Chapter 2.3.7.1 as follows:

2.3.7.1 Socket 1 & 2 RF Connector Pin-Out

The RF Connector area will allow two (2), three (3), four (4), or six (6) RF connectors to be placed as a function of the board Type:

- Type 22xx can support up to four RF Connectors
- Type 1630 can support up to two RF Connectors
- Type 30xx can support up to six RF Connectors
- Type 1216 can support up to three RF Connectors

To remain consistent with the Host I/F pin order, the RF connectors are labeled ANT0, ANT1, ANT2, ANT3, ANT4, and ANT5 from right to left. The recommended antenna function allocation is given in Table 9.

Table 2. Recommended Antenna Function Allocation Table

Type	ANT5	ANT4	ANT3	ANT2	ANT1	ANT0
Socket 1 WiFi+BT (Type 1630)	N/A	N/A	N/A	WiFi1	WiFi2+BT	N/A
Socket 1 WiFi+BT+Other (Type 1630 , 2230, 3030, 2226)	N/A	Other Comm (when applicable)	WiFi3 (when applicable)	WiFi1	WiFi2+BT	N/A
Socket 2 WWAN+GNSS (Type 2242)	N/A	Vendor Specific	Vendor Specific	Vendor Specific	Vendor Specific	N/A
Socket 2 WWAN+GNSS (Type 3042)	Vendor Specific	Vendor Specific	Vendor Specific	Vendor Specific	Vendor Specific	Vendor Specific
Type 1216	N/A	N/A	Vendor Specific	Vendor Specific	Vendor Specific	N/A

Note: Actual RF connector functions to be defined by vendor ↔ customer if not using the recommended allocations in this table.

~~ANT0 and ANT5 are an expansion of the basic four antenna connections (ANT1-ANT4) when the board is 30 mm wide~~

The recommended WiFi antenna port assignment implies that the main WiFi antenna port (for example; WiFi 1x1) would use ANT2 and listed as WiFi1. When WiFi expands to a 2x2 configuration, it should share the antenna port with the BT using ANT1. This is listed as WiFi2+BT. In extended WiFi 3x3 solutions, the third antenna port used is ANT3 and this is listed as WiFi3. Other Comms should use ANT4 when more complex wireless Combo solutions are implemented.

Figure 34 and Figure 35 show Socket 1 Type 2230 and 3030 RF connector assignment recommendations.

Socket 2 Type [2242](#) and [3042](#) RF connector assignment recommendations are vendor-specific.