



Errata

CIFX M223090AE, CIFX M224290BM and CIFX HPCIE90

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1 Introduction

1.1 About this document

This document lists known issues for the PC cards:

- CIFS M223090AE-RE\F,
- CIFS M223090AE-DP\F,
- CIFS M223090AE-CO\F,
- CIFS M223090AE-DN\F,
- CIFS M224290BM-RE\F,
- CIFS M224290BM-DP\F,
- CIFS M224290BM-CO\F,
- CIFS M224290BM-DN\F,
- CIFS HPCIE90-RE\F,
- CIFS HPCIE90-DP\F,
- CIFS HPCIE90-CO\F, and
- CIFS HPCIE90-DN\F,

and gives solutions and workarounds if available.

1.2 List of Revisions

Index	Date	Section	Revisions
1	2022-02-03	all	Document created.
2	2022-03-09	all	CIFS HPCIE90-RE\F, CIFS HPCIE90-DP\F, CIFS HPCIE90-CO\F, CIFS HPCIE90-DN\F added.
3	2022-03-17	all	CIFS M224290BM-RE\F, CIFS M224290BM-DP\F, CIFS M224290BM-CO\F, CIFS M224290BM-DN\F added.

Table 1: List of Revisions

2 Errata

2.1 Errata for ASIX AX99100 on a PC card CIFX M223090AE, CIFX M224290BM or CIFX HPCIE90

Communication problem between some host processors and ASIX AX99100 on a PC card CIFX M223090AE, CIFX M224290BM or CIFX HPCIE90 or via PCI Express

Symptom

Windows: Reports stop code DPC_WATCHDOG_VIOLATION.

Linux: Reports "SPI transfer timed out".

Affected products

PC cards

- CIFX M223090AE-RE\F,
- CIFX M223090AE-DP\F,
- CIFX M223090AE-CO\F,
- CIFX M223090AE-DN\F,
- CIFX M224290BM-RE\F,
- CIFX M224290BM-DP\F,
- CIFX M224290BM-CO\F,
- CIFX M224290BM-DN\F,
- CIFX HPCIE90-RE\F,
- CIFX HPCIE90-DP\F,
- CIFX HPCIE90-CO\F, and
- CIFX HPCIE90-DN\F,

with ASIX AX99100.

Other PC cards cifX are not affected, because they use a different chip to connect to PCI Express.

Description

The PC cards CIFX M223090AE, CIFX M224290BM and CIFX HPCIE90 use the ASIX AX99100 as “PCI Express to SPI bridge” to connect the netX 90 to the PCI Express bus in a host system (PC). The host system then can access the PC card cifX via PCI Express. PCI Express uses tag fields to identify transactions. A tag field can have different length: 5 bit or 8 bit. Tag fields with 8 bits (and more) can be used, which is then considered as extended length.

Using tag field with 5 bit length works without errors.

The ASIX AX99100 does not support the function 'Extended Tag Fields'. The function 'Extended Tag Fields' is mandatory for PCI Express revision 3 and not clearly specified in revision 2. Therefore, the PC cards CIFX M223090AE, CIFX M224290BM and CIFX HPCIE90 cannot be used with host systems that use the 'Extended Tag Fields' feature.

Technical description in detail

For PCI Express, the Transaction Descriptor is a mechanism for transferring Transaction information between the Requester and the Completer (PCI Express specification revision 6, section 2.2.6). The Requester triggers for example a Memory Read while the Completer returns the requested data. The Transaction ID field as part of the Transaction Descriptor consists of two major sub-fields, the Requester ID and the Tag. The tags must be unique for each outstanding request. The length of the Tag field varies depending on the configuration and usage. PCI Express provides a length for tag fields of

- 5 bits (up to 32 different transaction IDs), which is the standard mode,
- 8 bits (up to 256 different transaction IDs), which is the extended mode.

For PCI Express, Completers need to support at least an 8-bit tag field (specification revision 6, section 2.2.6.2). Requesters are dependent on their capability and configuration (specification revision 6, sections 7.5.3.3 and 7.5.3.4).

Requesters are allowed to use extended tags (8 bit), but the ASIX bridge chip AX99100 as a Completer does not support tags with more than 5 bits and therefore cannot be used with extended tags.

Using extended tags triggers an undefined behavior in the bridge chip, which results in the bridge chip stopping all active transfers and it neither allows to start new transfers. The only way to start new transfers is a soft reset of the bridge chip. It is not possible to detect this failure status. From the host system point of view, accesses to the netX dual-port memory will fail with a timeout.

Verify before using a PC card CIFX M223090AE or CIFX HPCIE90

Before using a PC card CIFX M223090AE or CIFX HPCIE90, make sure that only tags with a maximum length of 5 bits are used. Otherwise your system will not work.

Workaround 1

Check in the BIOS of the host system for the root complex whether the tag field length can be configured. Set the length to 5.

Workaround 2

Check the host system processor manufacturer documentation to see if the tag field length is set to 5, or whether the tag field length can be set to 5.

Workaround 3

Integrate a PC card cifX that does not use ASIX AX99100 bridge chip, e.g. CIFX M3042100BM in an M.2 3042 Key B+M format. You can consult Hilscher's service and sales teams to find a solution for your dedicated system.

Future solution

ASIX is working on a solution to this issue. As soon as a solution is available, Hilscher will use it for the affected PC cards.

3 Appendix

3.1 References

PCI Express® Base Specification

PCI-SIG (Special interest Group), PCI Express Base Specification, Revision 6.0, English, 2021-12

3.2 Registered trademarks

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