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GRPCI Master/Target Abort Erratum

Technical note   2016-09-06

Doc. No GRLIB-TN-0003

Issue 1.1

CHANGE RECORD

Issue	Date	Section / Page	Description
1.0	2015-10-27	All	First issue under this document name. This document replaces the document TN-GRPCI-ABRT
1.1	2016-09-06	1.1	Update introduction section. Generated PDF had section about MMU instead of GRPCI.

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1 INTRODUCTION

1.1 Scope of the Document

This document describes an issue for the GRLIB GRPCI IP core where the AMBA ERROR response for a revived PCI target abort error may be lost.

The problem affects all versions of the GRPCI core up to GRLIB build 4155.

1.2 Distribution

LEON3, LEON3FT, LEON4 and LEON4FT users are free to use the material in this document in their own documents and to redistribute this document. Please contact Cobham Gaisler for inquires on other distribution.

1.2.1 Contact

For questions on this document, please contact Cobham Gaisler support at support@gaisler.com. When requesting support include the part name if the question is a specific device or the full GRLIB IP library package name if the question relates to a GRLIB IP library license.

1.2.1.1 Checking GRLIB version

The GRLIB build ID is present in the AMBA plug&play area. The build ID is also reported by the GRMON debug monitor when connecting to the device.

If you are licensing GRLIB for use in your own FPGA or ASIC design, this can be seen in the file name of the downloaded release package, in the directory name after unpacking the release, and in the file lib/grlib/stdlib/version.vhd in the release file tree (constant grlib_build).

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2   GRPCI MASTER-/TARGET-ABORT ERRATUM

2.1   Affected versions

All versions of the GRLIB IP Library before version 1.4.0-b4155 are affected. Note that this issue affects the GRPCI core. The GRPCI2 core is unaffected.

2.2   Affected components

The issue affects the following components
  - UT699
  - UT699E/UT700

Components that make use of the GRPCI2 core are not affected.

2.3   Description

When the GRPCI PCI master interface receives a Master-/Target-Abort error the corresponding AMBA access should receive an AMBA ERROR response. Depending on the timing of the completion of the PCI access and incoming AMBA AHB access the AMBA ERROR response may get cancelled. Users cannot rely on receiving an AMBA ERROR response when a PCI master/target abort error has occurred.

2.4   Workaround / Mitigation

A software workaround can be implemented where software checks the "Received Master-/Target-Abort" field after each transfer, of after a sequence of transfer if the user case allow this, to detect if an error has occurred. The "Received Master-/Target-Abort" field can be read via PCI configuration space (Status & Command Register, offset 0x04) and also via the GRPCI IP core's AMBA APB interface (Status & Command Register, offset 0x18). The field is set whenever a PCI Master-/Target-Abort is detected and will remain set until software writes this field with '1' to clear it. If the field is zero after a batch of transfers then no master/target abort has occurred.

The UT699E/UT700 component has the capability to generate an interrupt when a PCI Master-/Target-Abort is detected. This feature can be used by software to handle the error case when PCI Master-/Target-Abort has occurred.

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