



CoReUse 4.2 AMBA Policy



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1 Introduction

1.1 Scope

This document provides a policy guiding system architects and designers of re-usable IP functions on the use of AMBA bus protocol standards defined by ARM Ltd, and the use of related NXP in-house standards. Goal of the policy is to align the use of standards within PS, to reduce inter-operability issues for IP functions and to reduce support cost for these standards.

This document does not intend to give detailed specification information on the individual standards. For this, refer to [1] ...[6].

1.2 Glossary

AHB	Advanced High-Performance Bus
AMBA	Advanced Microcontroller Bus Architecture
APB	Advanced Peripheral Bus
ASB	Advanced System Bus
AXI	Advanced eXtensible Interface
CoReUse	NXP Semiconductors core reuse program to enable re-using existing IP, in order to competitively design large and complex Systems-on-a-Chip
DTL	Device Transaction Level (protocol)
IP	Intellectual Property, in this document used to indicate some hardware component
RTG	ReUse Technology Group
SoC	System on Chip
VPB	VLSI Peripheral Bus

2 AMBA Bus Protocol Standards

In Figure 1 the concept of the Advanced Microcontroller Bus Architecture (AMBA) is shown. It defines a partitioning into

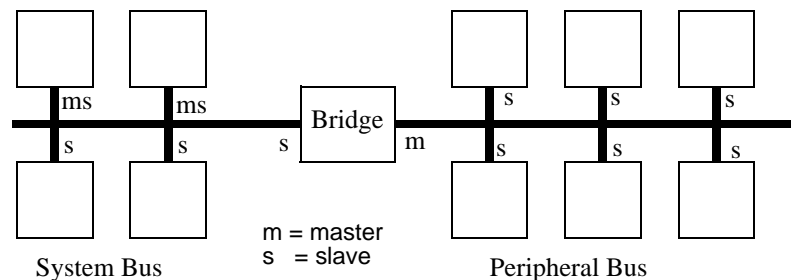
- multi-master/multi-slave *system bus*, and
- single-master/multi-slave *peripheral bus*.

A system may incorporate a multitude of such buses interconnected in a system specific fashion (not shown in Figure 1).

In the following subsections a brief overview on the individual AMBA protocol variants is given. For a detailed description of the individual protocols refer to [1]...[6].

Figure 1.

AMBA Bus Architecture Concept



2.1 AMBA System Bus Protocols

This revision of the AMBA Policy document no longer discusses the ASB bus from the first generation AMBA architecture (AMBA Specification rev. D, April 97, [1]). This standard has become obsolete and there are no longer ASB based IP functions in use at NXP Semiconductors.

The following AMBA system bus protocol choices exist today :

- Advanced High performance Bus (AHB)
- AHB-lite
- Advanced eXtensible Interface (AXI)

AHB

AHB has been defined in AMBA rev 2 for the application in a shared bus interconnect. This interconnect type was introduced along with the first series of ARM9 processors.

Key protocol features include the provision of a master arbitration scheme, 1-deep pipelined single element transactions, burst transactions, tightly coupled transfer of address and data, one address transfer per data element in a burst, locked atomic access, scalable data width. To improve bus performance by multiple masters in a