

Experiment -4

Building an SoC by interfacing UART with ARM Cortex M0

Introduction

The purpose of this experiment is to build a System on Chip-Integrating the AHB enabled UART peripheral with ARM Cortex M0 processor.

Objective

Transmit a single data via UART. Loop-back the transmitted data to the receiver in the same UART to check the correctness of data exchange.

Software tools Requirement

Modelsim (Siemens)/ Xilinx Vivado/ Icarus Verilog

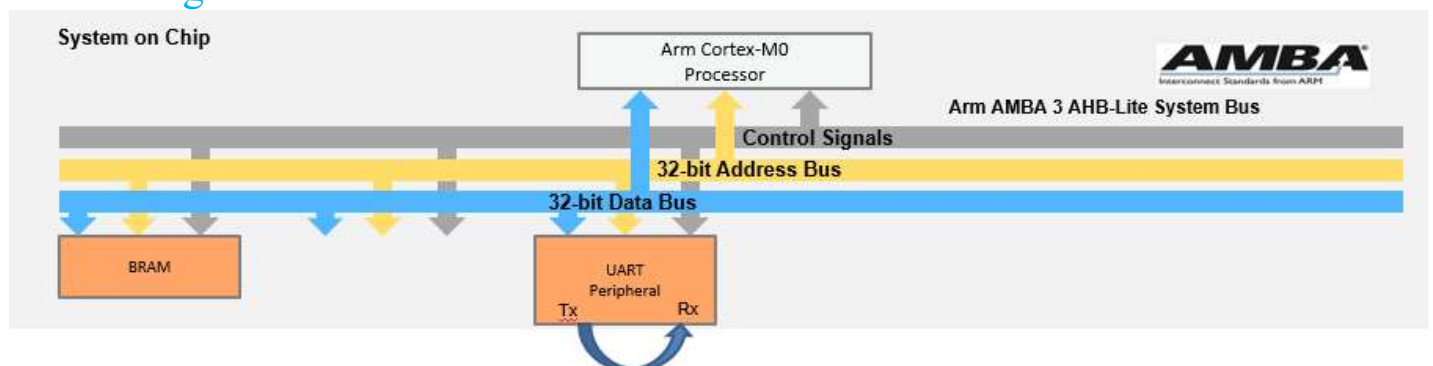
arm Keil μ vision 5.37



Software programming:

Program the Cortex-M0 processor using arm assembly language and generate the hex file using **arm Keil μ vision 5.37**

Block Diagram



Memory Map of Peripherals



Peripheral	Base address	End address	Size
BRAM	0x0000_0000	0x00FF_FFFF	16MB
VGA	0x5000_0000	0x50FF_FFFF	16MB
UART	0x5100_0000	0x51FF_FFFF	16MB

Peripheral Registers

Register	Base address	Size
Data	0x5100_0000	4 bytes
FIFO status	0x5100_0004	4 bytes

Outcome

After this experiment, the learner would get a basic idea about designing a simple SoC based on arm cores, how to interface peripherals to the core using the AHB Lite bus, and how to program the processor using Assembly language

Reference

Demo video in session 11

