ARM Experiment -3

Building an SoC by interfacing GPIO-LED with ARM Cortex M0

Introduction

The purpose of this experiment is to build a System on Chip-Integrating the GPIO-LED peripheral with ARM Cortex M0 processor using AHB Lite Bus and to Synthesis and Check the behavior of the same.

Objective

Implement an 8 bit binary counter, counting from FF to 00 in assembly language and make the LEDs toggle according to the changing values of counter.

Software tools Requirement

Modelsim (Siemens)/ Xilinx Vivado/ Icarus Verilog
arm Keil µvision 5.37

Software programming:

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

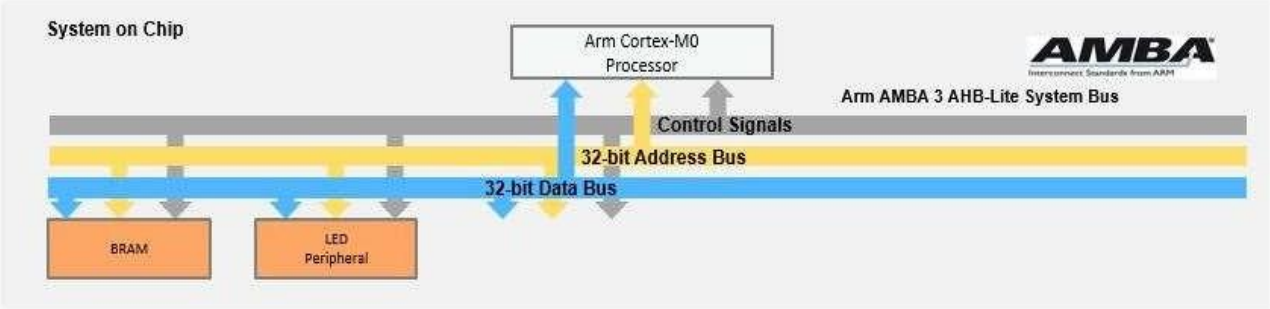
Synthesis

Synthesis the same on ARTY A7 FPGA Kit.
Results should have

- Synthesis Report
- RTL Schematic
- Pin Mapping Report

Screenshot of the Remote Lab-Showing outputs (if any)

Block Diagram



Memory Map of Peripherals

Peripheral	Base address	End address	Size
MEM	0x0000_0000	0x0000_FFFF	16MB
LED	0x5000_0000	0x50FF_FFFF	16MB

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 10