FPGA based Pong Game

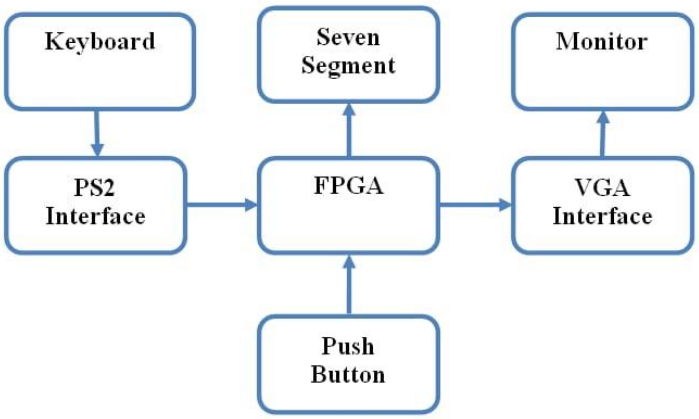
Introduction:

FPGA is a technology that we can design any digital device by programming. that means the fpga kit act as any digital device that based on our program. FPGAs can become video generators easily. The pong game consists of a ball bouncing on a screen. A paddle enables the user to make the ball bounce back up.

Problem Statement:

To design a fpga based pong game.

Block Diagram:



Software Requirement:

1. Altera Quartus II

Hardware Requirements:

1. DE0- cyclone III development board
2. Monitor
3. Keyboard

Altera DE0 Board:

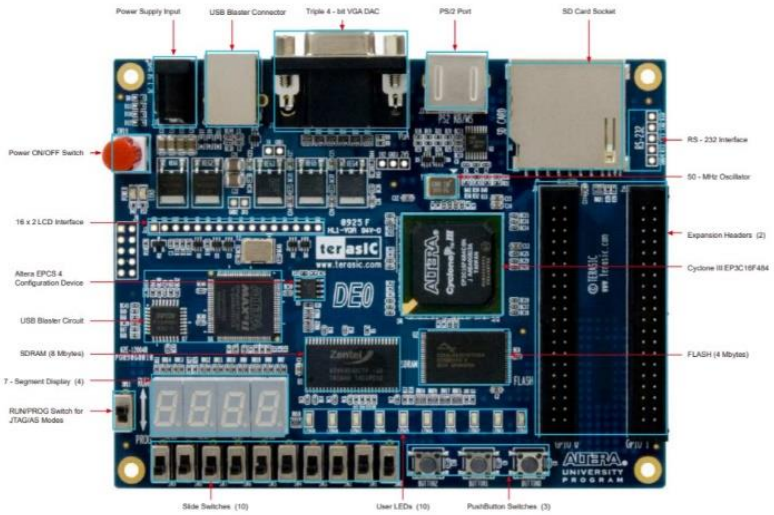


Figure 1: DE0 Board

The DE0 board has many features that allow the user to implement a wide range of designed circuits, from simple circuits to various multimedia projects.

The following hardware is provided on the DE0 board:

• Altera Cyclone® III 3C16 FPGA device

• Altera Serial Configuration device – EPCS4

• USB Blaster (on board) for programming and user API control; both JTAG and Active Serial (AS) programming modes are supported

• 8-Mbyte SDRAM

• 4-Mbyte Flash memory

• SD Card socket

• 3 pushbutton switches

• 10 toggle switches

• 10 green user LEDs

• 50-MHz oscillator for clock sources

• VGA DAC (4-bit resistor network) with VGA-out connector DE0 User Manual 5

• RS-232 transceiver

• PS/2 mouse/keyboard connector

• Two 40-pin Expansion Headers

Cyclone IIII 3C16 FPGA

- 15,408 LEs
- 56 M9K Embedded Memory Blocks
- 504K total RAM bits
- 56 embedded multipliers
- 4 PLLs
- 346 user I/O pins
- 6 FineLine BGA 484-pin package

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