

Datasheet for VGA Controller

Introduction

VGA (Video Graphics Array) is a basic standard for color resolution in computer monitors. It is a widely used analog interface between a computer and monitor as well as projectors.

Features:

- ◆ Simple Interface.
- ◆ Support display resolutions :
640x480, 800x600,
720x576, 1024x600,
1024x768, 1280x768,
1280x960, 1280x1024.

Functional Description:

The core has been validated on Xilinx Spartan-3A starter board. The Master register interface is used to set the desired display resolution. Depending on the display mode, user should provide the relevant clock to the core. Core internally generates the relevant control/timing signals depending on the master register settings. The RGB pixel data stored in "Video Buffer" memory is send to Video DAC during active video period.

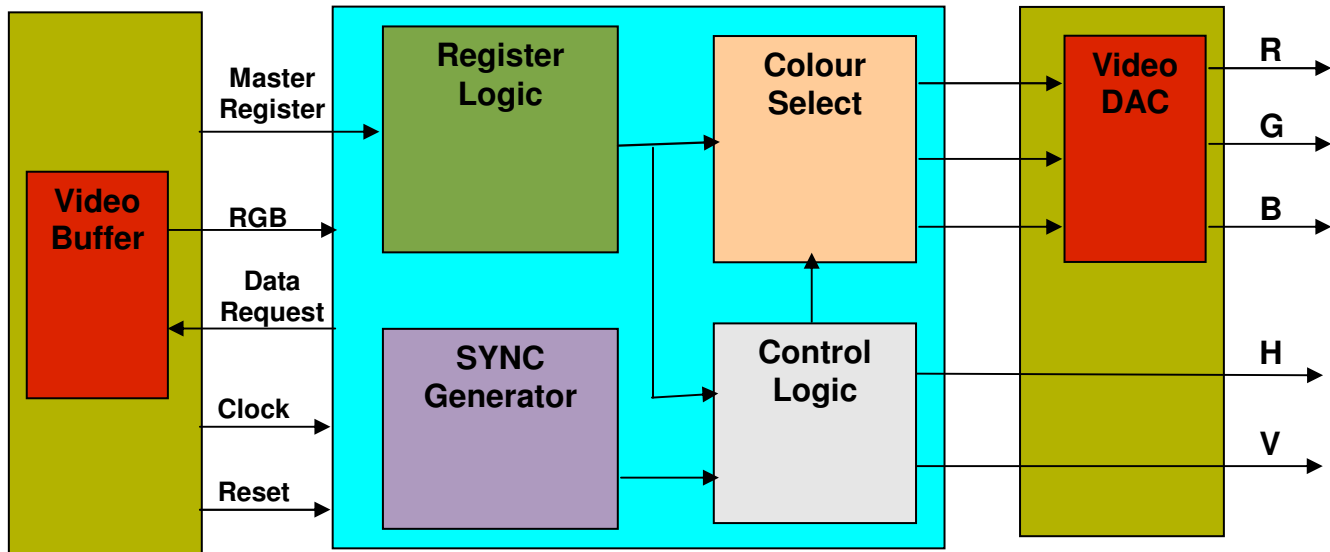


Fig 1 VGA Core Block Diagram

I/O Ports:

The Input/Output ports of the core are summarized in Table1.

Table1 I/O Ports

Port Name	Direction	Width (bit)	Description
RGB	Input	24	Data input
Reset	Input	1	System Reset. All synchronous logic is reset with this signal.
Clock	Input	1	Pixel Clock. All registers are synchronized to rising edge of this signal.
Data Request	Output	1	This signal will go high when a new data is required by the core.
R,G,B	output	8 bit each	Data output.
H,V	output	1 bit each	Control signal output.

Performance:

Device	Slice Count	LUT Count	Frequency
Spartan-3A (xc3s700a-4fg484)	225	376	105 MHz

Verification:

The VGA controller IP has been verified with following approaches:

- Exhaustive Functional/Timing simulation.
- Prototyped on Xilinx spartan3A starter development board.
- Tested with AOC, Samsung, Acer, Philips monitors as well as Sharp and NEC projectors.

Deliverables:

- Verilog RTL source code
- Test benches
- Synthesis and Simulation scripts
- Detailed user documentation, including RTL source code documentation