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DSP Solutions for Industry & Research

HSMC DVI 1080P Colour-Space Conversion Reference Design

Version 0.1

Revision history

Version	Comment
V0.1	Beta release

Introduction

Colour space conversion is the translation of the representation of a colour from one basis to another. This typically occurs in the context of converting an image that is represented in one colour space to another colour space, the goal being to make the translated image look as similar as possible to the original.

The Colour-Space conversion reference design extends the SDRAM Loop-through demo by adding a standard RGB-YCrCb colour space conversion. Such an operation is typical for HD 1080P systems that convert from computer RGB to HDMI graphics based systems.

A schematic of the demo is shown below in Figure 1. The CSC block accepts the output video stream and performs a RGB to Y Cr Cb colour conversion. The new video stream is then sent to the DVI port for connection to a monitor or TV via a DVI-to-HDMI converter cable.

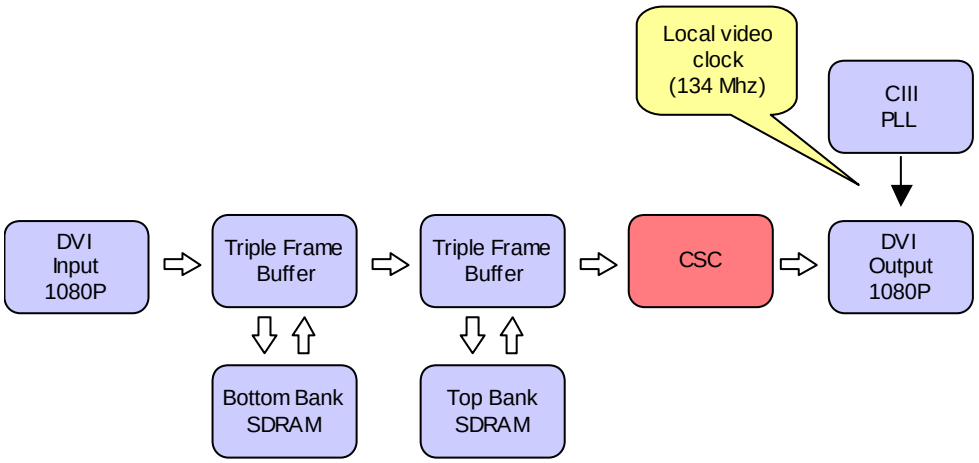

Figure 1

The SoPC builder is shown below. The two DDR2 memory banks run at 166Mhz and the local SoPC system clock is set to the bottom bank sys clock to avoid the need for two clock crossing bridges.

Details of the individual components can be found in the Altera VIP documentation.

The Colour-Space converter is highlighted with its corresponding connections to the Avalon fabric. The CSC block is clocked at the same rate as the video pipeline.

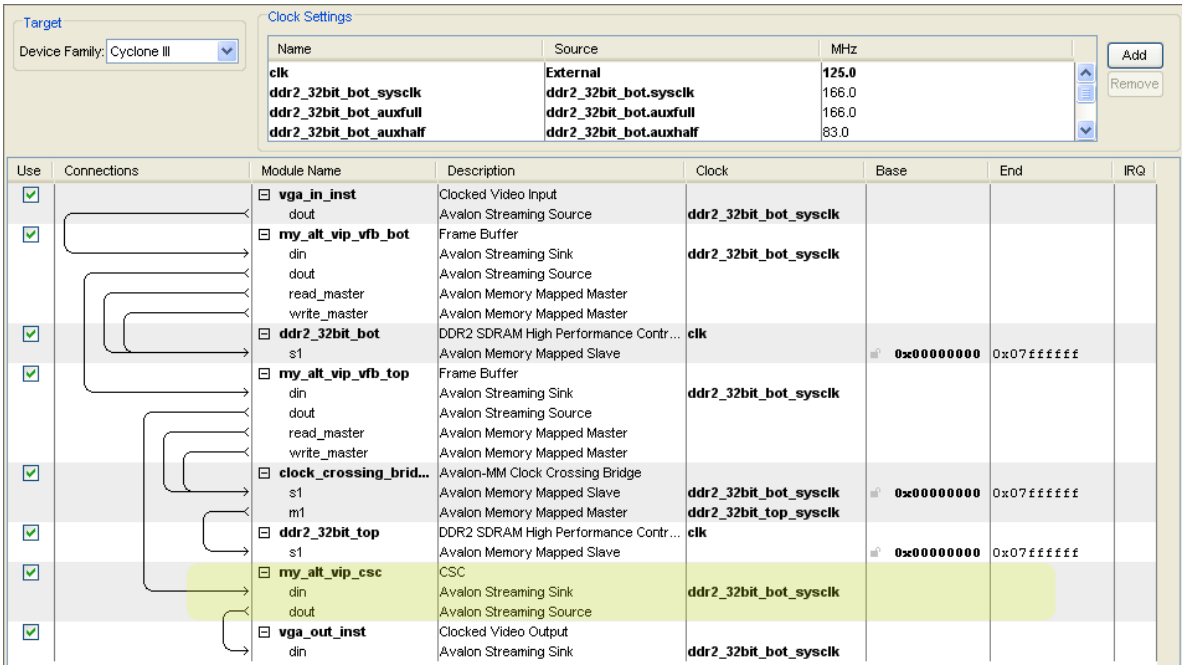

Figure 2

Installation

To run the design it is first necessary to obtain the source files and restore the Quartus Archive (QAR) file into a chosen directory.

A 1080P video source and capable display is required to run the demonstration. For correct operation it is necessary to configure the video test signal to have positive polarity on both the vertical and horizontal sync signals.

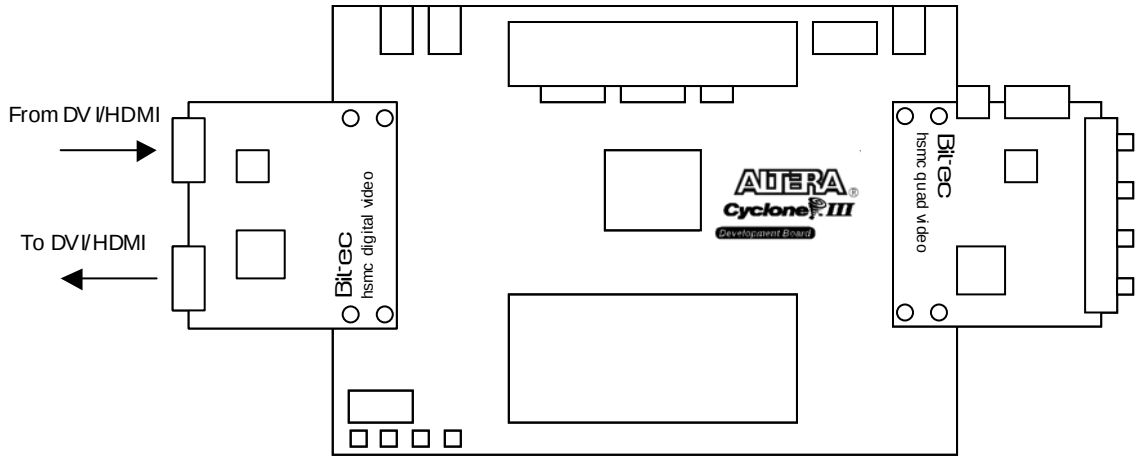

Figure 3

Once the hardware and software are ready, the sof file must be downloaded into the target Dev Kit board.

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