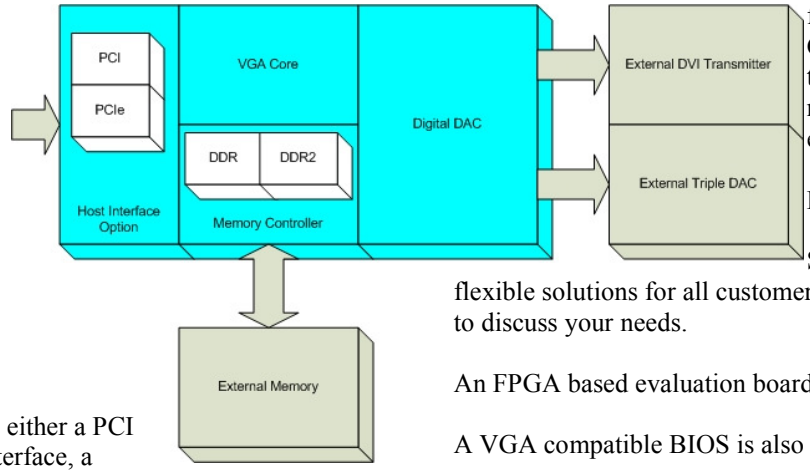
VGA Core

Data Sheet

Preliminary

Silicon Spectrum, Inc.

Silicon Spectrum offers two distinct core solutions for VGA compatibility. The first is the Straight IBM stamdard VGA core which is represented here.



Functions:

The core includes either a PCI or PCI express interface, a DDR or DDR2 Memory Controller and the digital portion of a VGA compatible RAMDAC. For applications requiring higher resolutions (up to 1600x1200x32 bit) or access to a linear framebuffer, you are encouraged to look at SSI's VESA 2.0 compatible VGA core which also contains backwards compatibility to the core here.

Documentation:

An SSI reference manual is available for programming the core from within a customer application. When used in a PC running most major operating systems, such as Microsoft Windows, DOS, or Linux, in conjunction with the SSI BIOS, no drivers are required.

Implementations:

The core has been implemented in Altera Stratix and Cyclone-2 parts as well as Xilinx Spartan-3 and vertex-2 parts. The design is highly efficient in area and speed requirements, only needing to run the memory at minimum DDR speeds to achieve all functions. The core itself runs at 50Mhz.

The core is uniquely designed to be completely synchronous at speeds up to 50Mhz. The external interfaces are fifo based and can easily cross clock boundaries. In our reference system, we run our PCI at 33/66Mhz and Memory Controller at up to 150Mhz. In FGPA Designs without an reprogrammable PLL, we offer a clock switching block that can generate necessary Pixel clocks for all display modes.

The core is ASIC ready and can easily be compiled with an ASIC synthesis tool. Scripts can be provided for Synopsys Design Compiler and Primetime. Being synchronous in nature, it is easily scan-able.

Deliverables:

Silicon Spectrum has flexible solutions for all customers. Please contact us to discuss your needs.

An FPGA based evaluation board is available.

A VGA compatible BIOS is also available.

Mode	Resln	Colors	Vert (Hz)	Horiz (kHz)	Pixclk (MHz)
0, 1	320x200	16	70	31.78	25.175
2, 3	640x200	16	70	31.78	25.175
0*, 1*	320x350	16	70	31.78	25.175
2*, 3*	640x350	16	70	31.78	25.175
0+, 1+	320x350	16	70	31.78	28.322
2+, 3+	640x350	16	70	31.78	28.322
4, 5	320x20	4	70	31.78	25.175
6	640x200	2	70	31.78	25.175
7	720x350	Mono	70	31.78	25.175
7+	720x400	Mono	70	31.78	25.175
D	320x200	16	70	31.78	25.175
E	640x200	16	70	31.78	25.175
F	640x350	Mono	70	31.78	25.175
10	640x350	16	70	31.78	25.175
11	640x480	2	60	31.78	25.175
12	640x480	16	60	31.78	25.175
13	320x200	256	70	31.78	25.175

Table 1: Supported Modes