

Requirements for VGA Capture PCB-v02

Desriptional Requirement:

- Capture VGA, digitize it and output the RGB data lines, Pixel Clock and HSOUT and VSOUT.
- Act as a EDID Slave seen by VGA Source and as EDID Master as seen by VGA Sink
- Auto-Detection of Expansion Board

Target:

- PCB / Schematic publish and available for V2 board.
- Working VGA expansion board V2 demonstrated.
 - Plug a the VGA expansion board into an Atlys board.
 - Program Atlys board with **(stock)** HDMI2USB firmware (which has expansion board detection code added).
 - HDMI2USB firmware detects VGA expansion board.
 - A computer is connected to the VGA expansion board.
 - The VGA expansion board provides a custom EDID information to the computer.
 - The computer detects the VGA board as a monitor and outputs data (even without a monitor connected).
 - A monitor is connected to the VGA expansion board.
 - The EDID information from the monitor is read.
 - The video output from the computer is passed to the monitor without modification.
 - Connecting and disconnecting a monitor should not affect the computer.
 - The above also works in reverse order (monitor is connected and then the PC).
 - *Nice to have: Monitor / Computer plug / unplug events are surfaced somehow.*
 - When the VGA output is selected as the capture source a clear stable picture is available on the USB uvcvideo output.

Current PCBv01 Features:

- 2 VGA Input channels. No Splitter/Output port.
- No EDID Mechanism. The I2C Lines are not connected.
- 1 ADP3303 3.3V Fixed Voltage Regulator for OVDD(Digital Output Voltage Supply)

- 2 ADP3334 Variable Reg. used as 1.8V for PVD (PLL Voltage Supply) and VD(AD9984A Logic Supply)
- Imperfect capturing as of now.

Improvements Required:

Absolutely needed:

- Voltage Test Pads
- Current measurement jumper
- I²C Test Pads
- Add test pin/pads for HSOUT, VSOUT, DATAACK, HSYNC, VSYNC (To be removed/unpopulated in production version, will only be used during testing and development)
- Fix to the currently swapped Red & Blue signals
- Fix to the faulty voltage feedback signals
- Fix for the VHDCI footprint and VGA connector footprint
- Longer pads on AD9984A footprint?
- Thermal Pad below AD9984A! (***must***)
- VGA Pass-through connector (ie 1x VGA_IN and 1x VGA_OUT)
- Provision/Footprint for EEPROM for auto-detection
- Anything else?
- **Dimensions & Aspect ratio decision**
- Decrease Resistor values for DATAACK, HSOUT, VSOUT and SOGOUT from 50 ohms to 22 ohms
- Decide on whether to use new 1.8V fixed regulators or to use the same ADP3334 variable voltage regulator.
- Add VGA-I2C signals for EDID support? (Pin count constraint?) and 5V translator/buffer?. IC Proposed: P82B96DR(Dual Bidirectional I2C Bus Buffer)

Optional but recommended:

- Remove unnecessary pins like ~~SOGOUT~~(Required), OE_Field, COAST & CLAMP
- Any other?
- *[Added Later by: rohitksingh] Not possible unless a 32-bit ARM processor with considerable memory for capture and storing or atleast buffering. mithro: Support replacing the VHDCI connector with a microcontroller for low speed capture? Kind of like how Ayush's motherboard can be connected*