Jitter-cleaning device improves both video source and display performance at top HDMI clock rates

Parade Technologies today announced a new addition to its portfolio of HDMI interface and signal conditioning devices. The new PS8401 is an HDMI jitter-cleaning repeater chip that compensates for HDMI signal skew caused by long signal traces, connectors and cables. Without jitter-cleaning technology, systems may fail the HDMI 1.4 jitter compliance test or exhibit poor video performance. The PS8401 was developed specifically to enable ease-of-design for higher interface rates up to 2.97Gbps, which are specified in the latest HDMI 1.4 standard.

HDMI interface clock rates have continued to increase as display resolution, color depth, and refresh rates increase. The HDMI 1.4 specification includes new display formats, such as 4K x 2K and 1080P 3D, which increase clock rate requirements up to 297MHz. This clock rate translates into a serial data interface rate of 2.97Gbps. At such high rates, the HDMI receiver or display is more sensitive to distortion or noise in the HDMI signal. Such noise can take the form of timing jitter, and excessive timing jitter on the HDMI signal can lead to undesirable display errors.

The PS8401 is designed to attenuate timing jitter and other noise from the HDMI signal. It contains an HDMI receiver that recaptures the signal data and removes noise, a retiming circuit that removes the timing jitter, and an HDMI transmitter that outputs a clean, restored HDMI signal. The HDMI receiver also includes an input equalizer to remove distortion from signal loss through the transmission path.

“Our job is all about making high speed signal implementation easier,” explained Jimmy Chiu, Executive VP of Marketing at Parade Technologies. “Before the 297MHz clock rate came along, our customers treated HDMI as just another high speed signal in their system design. But HDMI at 297MHz is a real game-changer. There is very little tolerance for system-generated interference and long circuit board traces, making system design quite challenging. The PS8401 now provides a means to remove these challenges, as it removes the jitter.”

In an HDMI video source, signal distortion and noise coupling can occur between the HDMI transmitter and the HDMI output connector. In this application, the PS8401 is placed physically near the connector to provide a clean output signal from the system. Likewise, in an HDMI receiver or display, distortion and noise coupling can occur in the HDMI cable, and between the HDMI input connector and HDMI demodulator chip, a signal path that may also include switch devices. Placing the PS8401 near the input connector restores the HDMI signal prior to the final signal path, providing more operating margin for the HDMI demodulator.

Restoring the intermediate transmission path signal improves system interoperability and increases compliance margin. It also provides increased flexibility to the system designer, adding more freedom in HDMI transmitter or

demodulator chip placement with the system.
Personal computers and portable devices can also benefit from jitter-reducing HDMI repeaters. The PS8401 is capable of receiving an AC-coupled signal--the desired format for highly integrated chips, such as processors and GPUs--and transmitting a DC-coupled signal that is common for an HDMI output connector. The computer system environment is especially prone to internal signal noise due to form factor constraints and nearby high-speed data signals.

Parade is widely recognized as a leading vendor of high-speed signal integrity devices. The company was among the first to offer repeaters for DisplayPort®, and among the first to have similar products for USB 3.0 and SATA 6Gbps. Parade also offers a full selection of HDMI receiver switch devices and TMDS level shifters for PC and DisplayPort cable adapter applications.

Price and Availability
The PS8401 is packaged in a 5x5mm TQFN, making it easy to place near an HDMI output or input receptacle.
The PS8401 is sampling now, and production volumes will be available in Q3 2012.
The PS8401 is priced at $1.25 / ea. in high volume.

http://www.paradetech.com [1].

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