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ARCHITECTURES: Transmitter marries DisplayPort and HDMI

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San Jose, Calif. -- One of the huge opportunities in digital media today lies in the move to a next-generation digital display interface for flat-panel monitors and TVs. Analogix Semiconductor Inc. hopes to surf that sea with an announcement this week of transmitters and receivers for the emerging DisplayPort standard.

Ratified in May by an ad hoc industry group including PC giants Hewlett-Packard and Dell, DisplayPort competes with the emerging Unified Display Interface (UDI) specification backed by Intel and Silicon Image as well as the existing High-Definition Multimedia Interface (HDMI), geared for digital TV systems. Analogix claims that DisplayPort is quietly winning the three-way interface war.

"DisplayPort has won the battle, and the UDI proponents have all been participating in DisplayPort for the past year," said chief operating officer Bill Eichen, who said he expects to see announcements of new DisplayPort backers before the end of September. "HDMI in the PC is not going to happen as people once thought," he added.

But Eichen said Analogix itself has not written off UDI or HDMI. It participates in the definition of UDI at the contributor level and will build products for UDI "as the market dictates," Eichen said.

The company is also "firmly committed" to HDMI, with six new products in design. Three are set to sample within a year, he added--a transmitter, a switch and a receiver for the HDMI 1.3 spec.

HDMI shipped on nearly 20 million set-top boxes and TVs in 2005, a number that could skyrocket to 300 million a year by 2009, according to market watcher InStat. Bowing to that reality, Analogix (Santa Clara, Calif.) made its DisplayPort transmitter compatible with HDMI. The ANX- 9801 includes a logical transmitter for the Digital Visual Interface (DVI), which is the physical basis for HDMI. It also supports the high-bandwidth digital content protection technology that, added to DVI, makes up HDMI.

The diagram for the transmitter shows two logical transmit blocks. But Eichen claims the chip handles both the embedded-clocking scheme of DisplayPort and the clock-forwarding scheme of HDMI with basically a single silicon block, thanks to some patented techniques.

The chip does require a passive connector or "dongle" to mate a DisplayPort connection to an HDMI output device. Eichen said that dongle contains a 10-kilohm resistor and would add about 75 cents to the bill of materials for a graphics card.

The transmitter delivers the full 10.8-Gbit/second total bandwidth of DisplayPort, based on up to four PCI Express-like lanes running at a maximum 2.7 GHz. It supports WQXGA resolution of 2,560 x 1,600 pixels at 60 Hz and a color depth of 30 bits/pixel.

The part, packaged in an 80-pin TQFP, will sample in late September and hit production by the end of the year. It

consumes 500 milliwatts average and 900 mW maximum when all lanes are running at maximum speed.

"We'll come in at about \$3 [apiece] for 10,000 units, but it will be less for those buying in higher quantities," said Eichen. The company plans on a selling price of \$1 a chip "when it sells in 20 [million] to 30 million unit volumes," he said.

The first-generation parts will not support the DisplayPort content protection scheme, which has not yet been ratified. But follow-on devices shipping in early 2007 will do so. Analogix is also developing DisplayPort receivers for monitors and TVs. These parts will sample at the end of the year and be in production early in 2007. It is working on specific versions of its receivers for notebook computers as well.

DisplayPort opens the door to monitors that are directly driven by a computer's graphics controller, eliminating \$3 in the electronics bill of materials for chips such as analog/digital converters and video scalars. Users will not have to adjust images via buttons on the resulting PC monitors.



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