Pentek OpenVPX board points the way to multi-Gbps optical backplanes using VITA 66.4 optical interconnect

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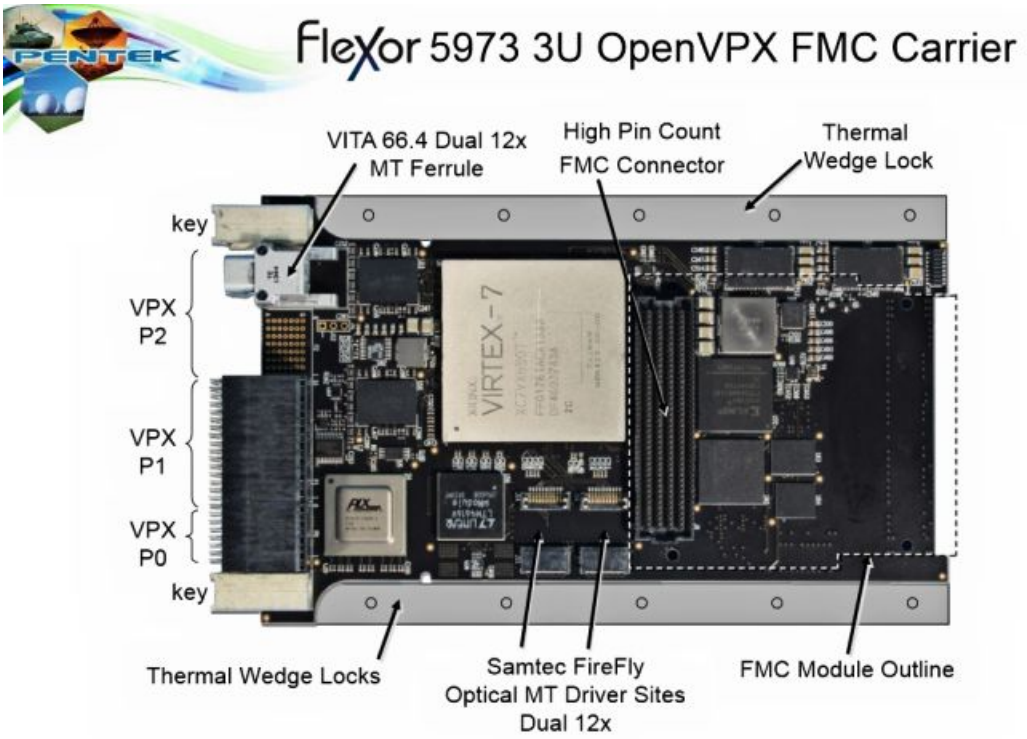
The Pentek Flexor 5973 3U OpenVPX FMC carrier board, introduced earlier this year, may indicate the shape of things to come for multi-Gbps backplanes that are starting to employ optical interconnects. The board incorporates the VITA 66.4 optical interconnect standard for OpenVPX, which delivers 12 optical duplex lanes to a backplane or for other board-to-board, high-data-rate connections.

Here's a photo of the Pentek board:



The VITA 66.4 optical connector appears on the left, in the area marked "VPX P2." What's shown is a metal ferrule, designed to hold the optical fibers. Along the bottom edge of the board, you'll see two connectors marked "Samtec FireFly Optical MT Driver Sites Dual 12x." These two connectors accept Samtec FireFly ECUO Active Optical Micro Flyover Cable Assemblies. The Pentek Flexor Model 5973 board employs one 12-channel FireFly Tx module and one 12 channel FireFly Rx module. The optical fibers from these modules route over the top of the board (that's why they're called "flyover" modules) and join at the board's MT ferrule at the VPX P2 location. Each optical FireFly channel operates at data rates to 14Gbps for an aggregate system data rate of 336Gbps through the optical interconnect. (That's fast, by the way.)

Here's a block diagram of the Pentek Flexor 5973 OpenVPX FMC Carrier board:

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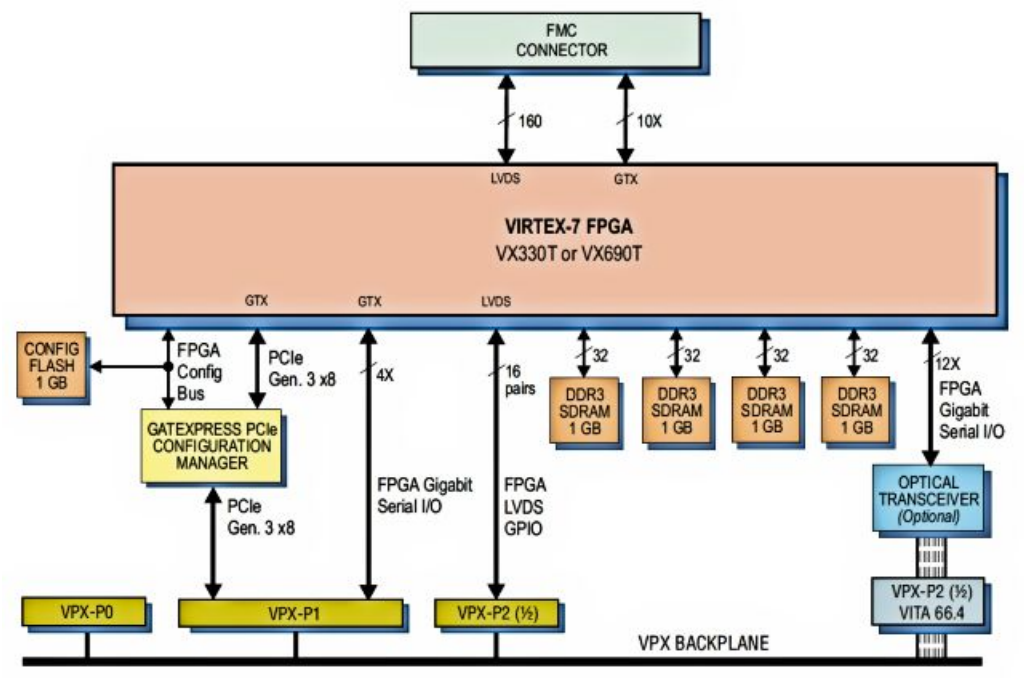
About the Author

XILINX sleibso
Director of Strategic Marketing and Business Planning

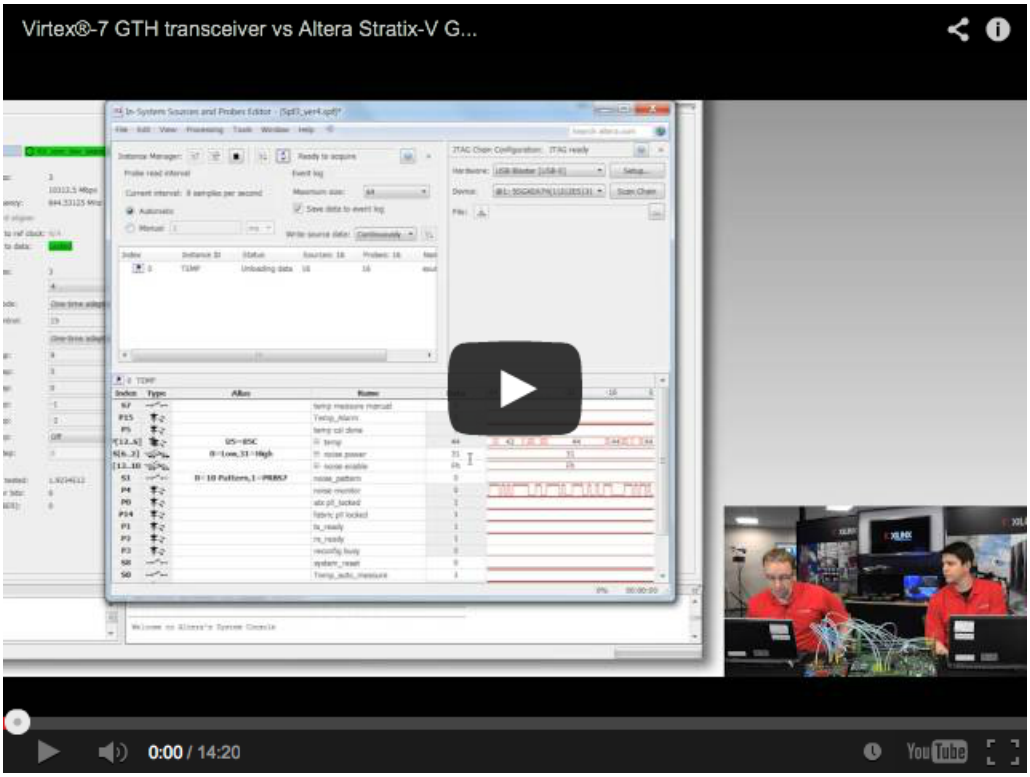
Steve Leibson is the Director of Strategic Marketing and Business Planning at Xilinx. He started as a design engineer at HP in the early days of desktop computing, then switched to EDA at Cadnetix, and



Pentek Flexor 5973 3U OpenVPX FMC Carrier Board Block Diagram

Note that Pentek is using the SerDes ports on a Xilinx Virtex-7 VX330T or VX690T FPGA (the Pentek board can be populated with either device) to drive the Samtec FireFly optical Tx and Rx assemblies. Both of these Virtex-7 FPGAs incorporate 13.1Gbps transceivers for this use. The Virtex-7 VX330T has 28 of these 13.1GHz SerDes transceivers and the Virtex-7 VX690T has 80 of these transceivers.

I posted this video about these Virtex-7 transceivers six months ago (see "SerDes Shootout: Excuse me, but did you just drop these bits?"), but this seems like a really good opportunity to repeat the posting in case you missed it:



Although the Pentek Flexor 5973 3U OpenVPX FMC carrier board is aimed at the military market, the optical interconnect as defined in the VITA 66.4 standard is likely to be used in many other types of high-performance systems as well, in markets including networking, telecom, server, storage, and high-performance computing (HPC).

subsequently became a technical editor for EDN Magazine. He's served as Editor in Chief of EDN Magazine, Embedded Developers Journal, and Microprocessor Report. He has extensive experience in computing, microprocessors, embedded systems design, design IP, EDA, and programmable logic.

For more information about the Samtec FireFly optical interconnect assembly, see "Pentek OpenVPX board points the way to multi-Gbps optical backplanes using VITA 66.4 optical interco...".)

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