Mercury’s EnsembleSeries™ SCFE6125 is a versatile OpenVPX FPGA processing module designed for high performance with integrated optical fiber FMCs. Incorporating Zynq UltraScale+™ FPGA processing power and an open architecture, this advanced module maximizes performance by locating the processing subsystem directly in the data path. With multiple cooling options available, the SCFE6125 is ideal for applications that require high-performance operation in harsh environments.

High Data Rate Optical Interface
Currently implemented at 10.3125Gbps, the SCFE6125 has integrated Fiber FMC boards for connectivity to external system components. Each VU9P FPGA has a FMC connected that provides the required 8Rx/8Tx fiber links per FPGA. The fiber connection is implemented with a MPO-24 fiber male connector.

Mercury’s processing modules are built around our EchoCore® FPGA IP to provide basic infrastructure functionality right out of the box. Mercury facilitates the re-use of common IP across FPGAs to optimize time-to-market and reduce development time. EchoCore IP allows customers to focus on their application while building upon the groundwork provided.

Mercury simplifies application integration by providing a standard control plane interface using AXI4-Lite control plane connectivity. Mercury uses a simple AXI4-Stream interface for our data plane with AXI4-Stream switches for routing data within the FPGA and to external interfaces, such as PCIe. Our customers can choose their tool of choice, such as parameterizable Xilinx IPs, HLS, or RTL to generate signal processing algorithms. The cores are then instantiated into a reserved user block and compiled into the FPGAs.

Specifications

- **Physical**
  - Single Slot 6U OpenVPX form factor
  - OpenVPX interface compliant with FMC ANSI/VITA 57.4

- **Optical Sites**
  - Each Fiber FMC: 12 Rx links (1-8 used) and 12 Tx links (1-8 used)

- **Backplane Interface**
  - VITA 65.0 slot profile SLT6-PAY-4F1Q1H2U2T1H-10.6.1-n.

- **FPGA processors**
  - Two Xilinx Virtex® UltraScale+™ VU9P Prosecutors
  - One Xilinx Zynq® UltraScale+™ ZU11EG Governor

- **Memory**
  - 20 GB of DDR4 SDRAM

- **Other**
  - Vita 46.11 IPMI controller
  - Sensor interface to monitor temperature, voltage
  - Power sequencing
  - Secure JTAG
  - Manufactured in an AS9100D facility
  - Advanced FPGA Functionality
SCFE6125 functional block diagram

Application Notes

Multiple generations of this product family protect have provided the signal processing functionality that enables systems to nimbly respond to emerging threats. Examples include:

- Wideband search using full sample-rate FFTs and threshold detection processing
- Channelizers and multiple independent/coherent digital down/ up converter channels with integrated filtering, gain balancing, high precision receive time tagging and transmit scheduling, VITA 49.2 signal data and context packet generation and reception / depacketizing

• Non-coherent and low latency coherent EA technique generation
• Communications modem functions

Instantaneous Bandwidths (IBW) in excess of 1 GHz have been implemented and transferred, as well as multiple simultaneous down-converted signal streams of over 100 MHz IBW.

Need more help? Need a variant of this product?

Contact Mercury’s Mixed Signal Engineering team at: digital.rf@mrcy.com or visit www.mrcy.com/mixed-signal-processing for a detailed listing of OpenVPX products.

Mercury Systems – Innovation That Matters®

Mercury Systems is the leader in making trusted, secure mission-critical technologies profoundly more accessible to the aerospace and defense industries. Optimized for customer and mission success, our innovative solutions power more than 300 critical aerospace and defense programs. Headquartered in Andover, Mass., and with manufacturing and design facilities around the world, Mercury specializes in engineering, adapting and manufacturing new solutions purpose-built to meet the industry’s current and emerging high-tech needs. Our employees are committed to Innovation that Matters®. To learn more, visit mrcy.com, or follow us on Twitter.

Copyright © 2020 Mercury Systems, Inc.