

New!

# Model 78800

# Kintex UltraScale FPGA Coprocessor- x8 PCIe



### Features

- Hi-performance coprocessor platform
- Supports Xilinx Kintex UltraScale FPGAs
- Front panel digital I/O can be used as a status and control or data interface
- PCI Express (Gen. 1, 2 & 3) interface up to x8
- VITA 42.0 XMC compatible with switched fabric interfaces
- Optional LVDS and gigabit serial connections to the FPGA for custom I/O
- Ruggedized and conduction-cooled versions available

### General Information

Model 78800 is a member of the Jade™ family of high-performance PCIe boards. The Jade architecture embodies a new streamlined approach to FPGA based boards, simplifying the design to reduce power and cost, while still providing some of the highest performance FPGA resources available today.

Designed to work with Pentek's new Navigator™ Design Suite of tools, the combination of Jade and Navigator offers users an efficient path to developing and deploying FPGA-based data processing IP.

In addition to supporting PCI Express Gen. 3 as a native interface, the Model 78800 includes optional high-bandwidth serial and parallel connections to the Kintex UltraScale FPGA for custom digital I/O.

### The Jade Architecture

Evolved from the proven designs of the Pentek Cobalt and Onyx families, Jade raises the processing performance with the new flagship family of Kintex UltraScale FPGAs from Xilinx. As the central feature of the board architecture, the FPGA has access to all data and control paths. The Jade architecture organizes the FPGA as a container for data-processing applications where each function exists as an intellectual property (IP) module.

Each member of the Jade family is delivered with factory-installed applications ideally matched to the board's interfaces. The 78800 factory-installed functions include a test signal generator, a metadata generator, a DDR4 SDRAM controller, and DMA engines for moving data on and off the board.

### Extendable IP Design

For applications that require specialized functions, users can install their own custom IP for data processing. The Pentek Navigator FPGA Design Kits include the board's entire FPGA design as a block diagram that can be edited in Xilinx's Vivado tool suite.

In addition to the block diagrams, all source code and complete IP core documentation is included. Developers can integrate their own IP along with the wide range of IP functions contained in the Navigator IP library, or use the Navigator kit to completely replace the Pentek IP with their own.

### Xilinx Kintex UltraScale FPGA

The Kintex UltraScale FPGA site can be populated with a range of FPGAs to match the specific requirements of the processing task, spanning the KU035 through KU115.

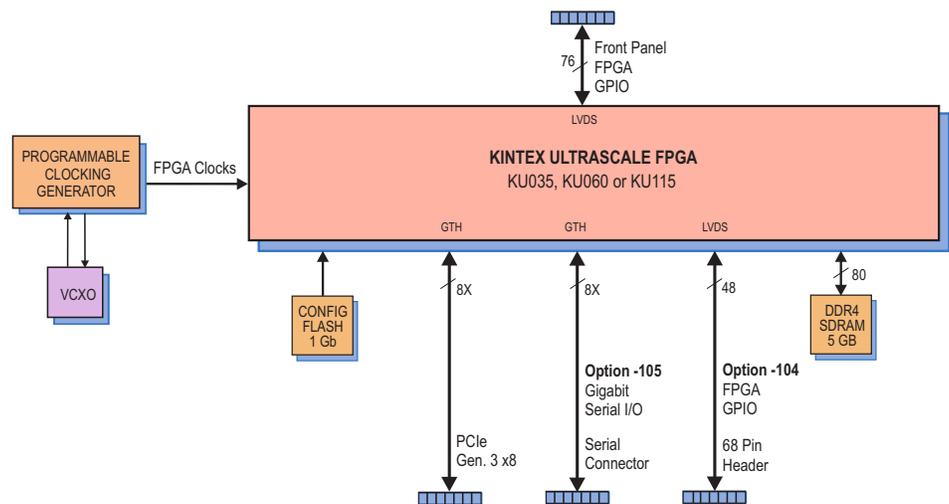
The KU115 features 5520 DSP48E2 slices and is ideal for modulation/demodulation, encoding/decoding, encryption/decryption, and channelization of the signals between transmission and reception. For applications not requiring large DSP resources or logic, a lower-cost FPGA can be installed.

Option -104 installs 24 pairs of LVDS connections from the FPGA to a 68-pin header for custom I/O.

Option -105 provides an 8X gigabit link between the FPGA and a serial connector to support serial protocols.

### Front Panel Digital I/O Interface

The 78800 includes an 80-pin front panel connector that provides 38 LVDS pairs connected to the FPGA. With user IP, these can be utilized for a control and status interface to other components of the system or as a data path. ➤



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## SPARK Development Systems

The SPARK Development Systems are fully-integrated platforms for Pentek Cobalt, Onyx, Jade and Flexor boards. Available in a PCIe rackmount (Model 8266), a 3U VPX chassis (Model 8267), or a 6U VPX chassis (Model 8264), they were created to save engineers and system integrators the time and expense associated with building and testing a development system. Each SPARK system is delivered with the Pentek board(s) and required software installed and equipped with sufficient cooling and power to ensure optimum performance.



### ► PCI Express Interface

The Model 78800 includes an industry-standard interface fully compliant with PCI Express Gen. 1, 2 and 3 bus specifications. Supporting PCIe links up to x8, the interface includes multiple DMA controllers for efficient transfers to and from the board.

### Memory Resources

The 78800 architecture supports a 5 GB bank of DDR4 SDRAM memory. User-installed IP along with the Pentek-supplied DDR4 controller core within the FPGA can take advantage of the memory for custom applications.

### Specifications

#### Front Panel Digital I/O

- Connector Type:** 80-pin connector, mates to a ribbon cable connector
- Signal Quantity:** 38 pairs
- Signal Type:** LVDS

#### Field Programmable Gate Array

- Standard:** Xilinx Kintex UltraScale XCKU035-2
- Option -084:** Xilinx Kintex UltraScale XCKU060-2
- Option -087:** Xilinx Kintex UltraScale XCKU115-2

### Custom I/O

- Option -104** installs 24 pairs of LVDS connections from the FPGA to a 68-pin header for custom I/O.
- Option -105** provides an 8X gigabit link between the FPGA and a serial connector to support serial protocols.

### Memory

- Type:** DDR4 SDRAM
- Size:** 5 GB
- Speed:** 1200 MHz (2400 MHz DDR)

### PCI-Express Interface

**PCI Express Bus:** Gen. 1, 2 or 3: x4 or x8

### Environmental

- Standard: L0 (air cooled)**
    - Operating Temp:** 0° to 50° C
    - Storage Temp:** -20° to 90° C
    - Relative Humidity:** 0 to 95%, non-condensing
  - Option -702: L2 (air cooled)**
    - Operating Temp:** -20° to 65° C
    - Storage Temp:** -40° to 100° C
    - Relative Humidity:** 0 to 95%, non-condensing
- Size:** PCIe card 4.375 in x 8.125 in (111.13 mm x 206.38 mm)

Kintex UltraScale FPGA Resources			
	XCKU035	XCKU060	XCKU115
System Logic Cells	444,000	726,000	1,451,000
DSP Slices	1,700	2,760	5,520
Block RAM (Mb)	19.0	38.0	75.9

## Ordering Information

Model	Description
78800	Kintex UltraScale FPGA Coprocessor - x8 PCIe

### Options:

- 084 XCKU060-2 FPGA
- 087 XCKU115-2 FPGA
- 104 LVDS FPGA I/O
- 105 Gigabit serial FPGA I/O
- 702 Air cooled, Level L2

Contact Pentek for complete specifications of rugged and conduction-cooled versions

