V1151
Quad-Port FPGA XMC Card

Benefits

High density FPGA XMC card for next generation data distribution and signal intelligence systems

Supports 1/10/25G Ethernet, 1/2/4/16/32G Fibre Channel, 1/2/2.5/10G sFPDP, 1-10G ARINC 818-2

A COTS solution optimized for SWaP (size, weight and power)

Next generation host interface connection bandwidths

A programmable FPGA with a powerful development framework

Real-time data streaming directly from sensors

Features

Four SFP28 ports accommodate either:

- 1x 100G Ethernet
- 1x 40G Ethernet
- 4x 25G Ethernet
- 4x 10G Ethernet
- 4x 1G Ethernet
- 4x 1/2/4/8/16/32G Fibre Channel
- 4x 1/2/2.5/10G sFPDP
- 4x 1-10G ARINC 818-2

Xilinx Virtex/Kintex Ultrascale+ FPGA

Supports PCIe Gen3 x 16 and Gen4 x 8

PPS time synchronization with μSec resolution

Thermal sensors for monitoring card temperature

Robust FPGA development framework

Advanced APIs that support multi-core and multi-processor architectures

Optimized Windows & Linux drivers and libraries

Offload engine for real-time communication

Streaming front-end FPGA core for quick sensor integration

Available in air- and conduction-cooled XMC form factors

Overview

Reducing system size, weight and power (SWaP), while increasing performance, is critical for operational life and budgetary constraints of military radar and remote sensing systems. The requirement for increasingly higher port density, bandwidth, and processing power to support larger arrays, while still staying within SWaP and budget requirements, is a significant challenge to engineering architects. New Wave DV satisfies these requirements with the V1151 FPGA XMC Card — dramatically increasing bandwidth while providing plenty of FPGA resources to process data and support PCIe host connectivity.

Increased Bandwidth & Flexibility

The V1151 is the industry's most advanced XMC solution designed to provide a real-time high-bandwidth network interface and processing module for next generation radar and signal intelligence systems. It comes with a range of Xilinx Virtex/Kintex UltraScale+ FPGAs, different memory configurations to meet application requirements, and support for different carrier boards using PCIe and XAUI. Design flexibility to meet application requirements results in optimized SWaP, shorter development cycle, and enhanced performance.

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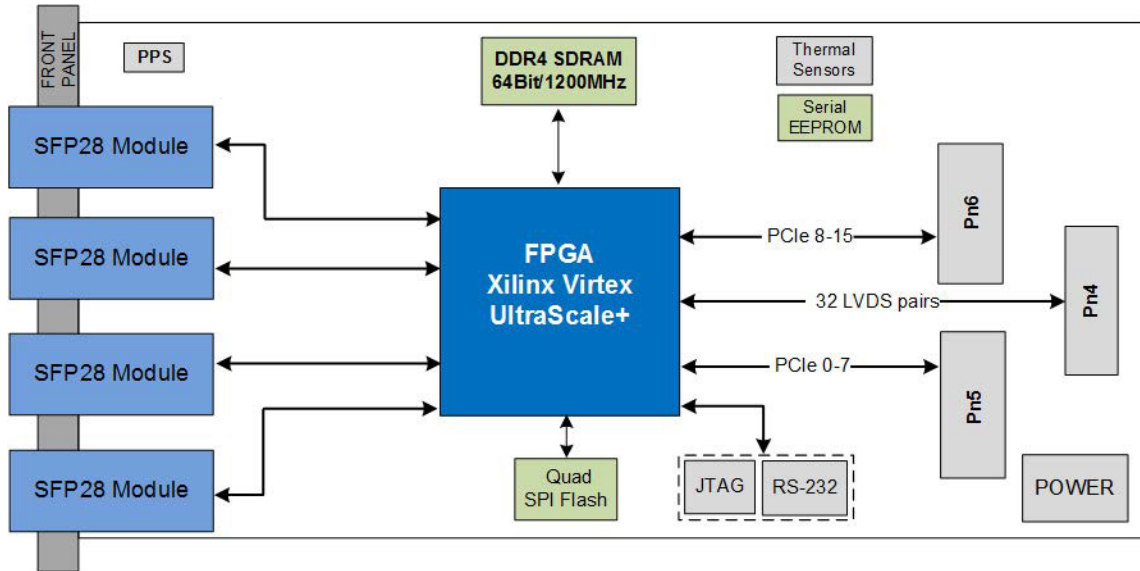
> V1151 XMC Block Diagram

Simplified Programmability Framework

The V1151 can optionally ship with a Development Framework, a fully-integrated and flexible toolset that provides the infrastructure necessary to ensure rapid deployment of custom applications. The framework abstracts the details of the protocol and interfaces, memory controllers and host fabric interfaces, thereby reducing the development effort and schedule for designers to implement custom solutions.

Optional Protocol Engines

The V1151 is an extremely flexible FPGA-based interface card. The card features all of the necessary hardware, FPGA IP cores, plus software drivers to support Ethernet, Fibre Channel, sFPDP, and ARINC 818. New Wave also offers options for custom high-speed serial protocols or user-developed IP cores.

Multi-processor Multi-core Support

The V1151 is uniquely suited to system architectures involving multiple processing cards on a common switched data plane. Specifically, the V1151 supports shared access from multiple host processors, enabling it to function as a cost-effective, high- performance gateway. This feature enables a single high-speed pipe to carry multiple virtual channels in systems that need to spread or load balance sensor data across processor farms.

Optional Protocol Engines

The V1151 is an FPGA based network card that can be customized to fit your requirements. New Wave provides access to the FPGA for customers to customize, however New Wave can also modify existing cores or develop new cores for your applications. If you have specific networking requirements, New Wave can help you accomplish your goals.

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Complete Product Support Program

New Wave prides itself on its excellent customer support, a fact that is echoed by our customers. New Wave DV provides industry standard warranty on its products, but it is the human factor that makes our support so valuable to our customers. Our team takes the time and effort to ensure that the customer experience with our products is a positive one.

Our Commitment

New Wave is committed to providing the latest innovations in technology, architectures, and techniques to keep our customers one step ahead of the rest. Our products, complete with the Development Framework, are intended to offer our customers an entirely unique out-of-the-box experience.

Alternate Form Factors

The V1151 is designed for use in a variety of mission-critical applications. Whether you need its capabilities in XMC or other form factors such as VPX, PCIe (double-width), PXIe, or others, we're happy to help accommodate your needs and provide you with the solution best suited for your success.

PXIe   VPX   PCIe

Technical Specifications

NETWORK INTERFACE
Four SFP28 optical ports

ETHERNET PROTOCOLS
RTPS, TCP, UDP, ARP, ICMP, Multicast, Broadcast

FIBRE CHANNEL PROTOCOLS
RDMA, AV, ASM

ADDITIONAL PROTOCOLS
sFPDP, ARINC 818-2

FPGA DEVICE
Xilinx Virtex UltraScale+ (VU3P)
Xilinx Virtex UltraScale (VU065 to VU095)
Xilinx Kintex UltraScale (KU095)

MEMORY
One bank of 8GB up to 1200MHz DDR4 SDRAM

FLASH
One 1Gb memory for storing a default configuration image

HOST INTERFACE
PCI Express (Gen4) x8 (Pn5)
PCI Express (Gen3) x16 (Pn5 & Pn6)
Two XAUI (Pn5), Two XAUI (Pn6)

EXTERNAL INTERFACE
32 differential pairs (user configurable)
PPS Interface for time synchronization with μsecond resolution
RS-232 serial interface for debug

THERMAL SENSORS
2 digital temperature sensors

COMPLIANCE
VITA 42.2, 42.3, 42.6
VITA 61.0
IEEE 802.3ae 2002 IEEE 802.3ba 2010
FC-FS-3 INCITS 470-2011
OMG RTPS DDS Interoperability Protocol 2.2

DIMENSIONS
74 mm (width) x 149 mm (length)
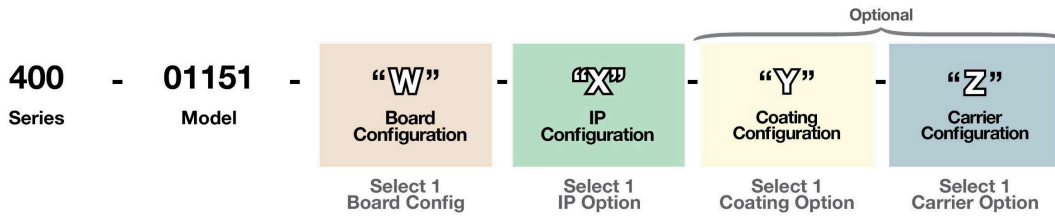
POWER REQUIREMENTS
Maximum 30W

TEMPERATURE
Operating: All components operationally rated -40 to +85C*
Storage: -40˚ C to 85˚ C

*Appropriate FPGA power dissipation required to keep junctions within rated specifications, operating temperature rating does not apply to SFP.

V1151 Hardware Part Number Configuration

Optional

400	-	01151	-	"W"	-	"X"	-	"Y"	-	"Z"
Series		Model		Board Configuration		IP Configuration		Coating Configuration		Carrier Configuration
				Select 1 Board Config		Select 1 IP Option		Select 1 Coating Option		Select 1 Carrier Option

W

Config #		Configuration Option Details			
VITA42	**VITA61**	**FPGA**	**DDR4**	**P14**	**Rate**
00	40	VU3P	DNP	DNP	1-25G
01	41	VU3P	DNP	P	1-25G
02	42	VU3P	P	P	1-25G
03	43	VU3P	P	DNP	1-25G
#04 - #09	#44 - #49	*Reserved*		*Reserved*	
10	50	KU095	DNP	DNP	1-10G
11	51	KU095	DNP	P	1-10G
12	52	KU095	P	P	1-10G
13	53	KU095	P	DNP	1-10G

*P = Populate; DNP = Do Not Populate

W	X	Y	Z

400-01151-____ ____ ____ ____
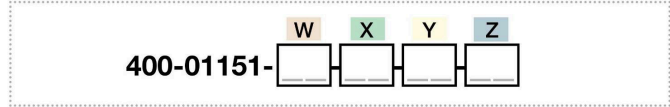
Y

Config #	Description
AR	Acrylic conformal coat
UR	Urethane conformal coat
ER	Epoxy conformal coat
SR	Silicone conformal coat
XY	Parylene conformal coat
BLANK	No conformal coat

X

Config #	Description
02	Fibre Channel ASM IP Core (4 Ports)
05	Ethernet 10G RTPS IP Core (4 Ports)
06	Ethernet 10G RTPS IP Core (2 Ports)
17	sFPDP IP Core (4 Ports)
21	Fibre Channel ULP IP Core (4 Ports)
22	ARINC-818 IP Core (4 Ports)
32	Fibre Channel ULP IP Core (2 Ports)
00	No IP

Z

Config #	Description
PE	XMC delivered in PCIe form factor via carrier card
3V	XMC delivered in conduction-cooled 3U VPX form factor
3A	XMC delivered in air-cooled 3U VPX form factor
PX	XMC delivered in PXIe form factor via carrier card
BLANK	XMC delivered in XMC form factor without carrier card
Additional options available. Please inquire.	