V1163

12-Port Rugged XMC ASoC Card

Benefits

Heterogeneous computing card combining hard ARM processor cores, large FPGA fabric, AI Engines, and high bandwidth interfaces

Designed specifically for AI workloads, digital signal processing, video processing, application co-processing, and secure networking

Perfect system addition for workloads requiring configurable ACAP (FPGA) resources, AI Engines, ARM processors, and/or rugged optics

Embedded focus with VITA 20 and VITA 47 compliance

Versatile design supports electrical or optical interfaces, optical options for both backplane or front-panel VPX support

Modular optics for flexibility in supporting 1-25Gbs per lane

Options for 3U VPX, 6U VPX, and PXIe form factor via carrier cards

Features

Xilinx® Versal™ ACAP (FPGA) with AI Engines (optional)

Up to twelve (12) 1G to 25G optical ports via MPO front panel I/O or VITA 66 optical backplane I/O. Electrical I/O via Pn6 also available

Supports PCIe Gen4/Gen3 x8/x16

Dual banks of LPDDR4 SDRAM

Thermal sensors for monitoring card temperature

Robust FPGA development framework

Overview

The V1163 is a powerful heterogeneous computing XMC with high bandwidth IO featuring the Xilinx® Versal™ Adaptive Compute Acceleration Platform (ACAP) and rugged optical and electrical IO. The V1163 provides options for Versal Prime or Versal AI Core part selection. In a single mezzanine card, the V1163 provides 100G optical interfaces, FPGA fabric, ARM processor cores, and optional AI engines. The V1163 is designed for applications requiring any combination of the following: high speed optical/electrical interfaces, FPGA processing resources, ARM processing cores, and AI engines. Use cases include sensor interface design, digital signal processing, video processing, application co-processing, and multi-level secure networking. Radar, SIGINT, video, storage, medical imaging, and embedded communications systems all have the ability to benefit from the V1163 module.

The V1163 provides electrical and optical IO options supporting high-speed serial 1-25Gbps per lane, up to 300Gbps aggregate. By leveraging the Versal hard silicon Ethernet interfaces, PCIe controllers, DMA engines, and associated software drivers Xilinx® has enabled a robust ecosystem for high-bandwidth Ethernet performance. In addition to the Ethernet interfaces described, the FPGA fabric provided within the ACAP part is capable of hosting New Wave DV IP cores for Fibre Channel, ARINC-818, sFPDP, Aurora, and others. This makes the V1163 an ideal hardware platform for mixed interface protocol needs or protocol bridging applications.

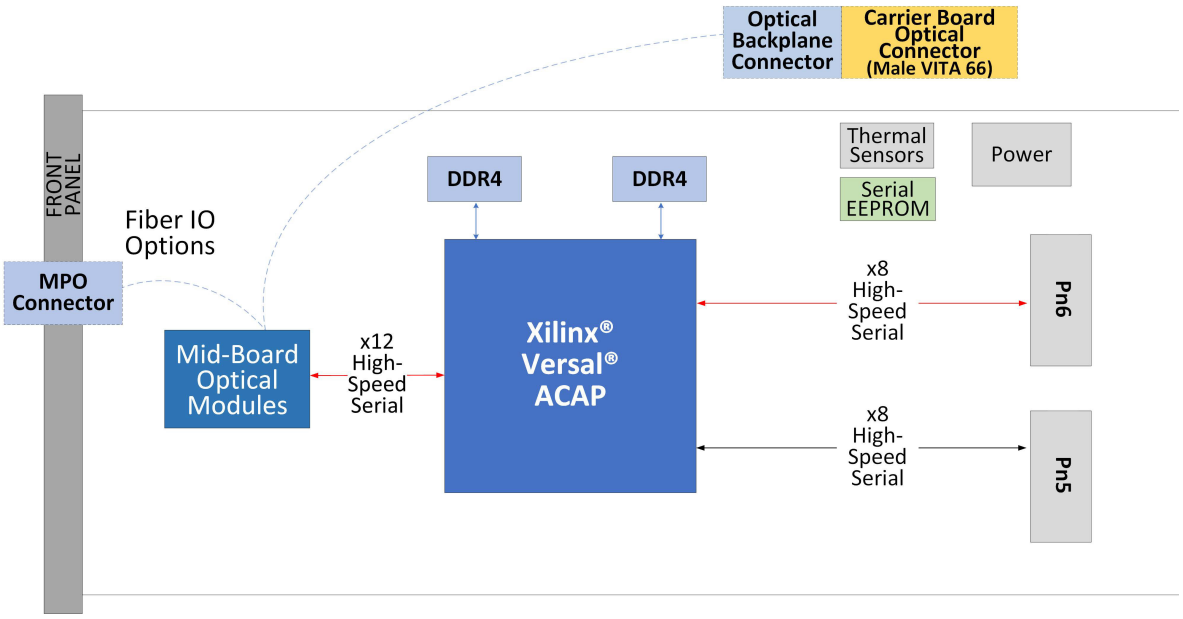
The convenient XMC form factor and rugged design of the V1163 can turn a VPX-based single board computer into a single-slot sensor interface and heterogeneous computing solution. The V1163 mounted on a x86 based single board computer will provide 100G optical interfaces, FPGA fabric, ARM processor cores, and AI Engines all in a single slot solution. V1163 is also available from New Wave DV in a 3U VPX form-factor instead of XMC if desired.

XILINX VERSAL™ FIREFLY™

SOSA™ Sensor Open Systems Architecture MEMBER

V1163

12-Port Rugged XMC ASoC Card



> V1163 XMC Block Diagram

Connector Types

The V1163 offers four different I/O options:

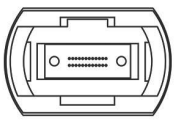
- **Electrical Backplane Connector via Pn6**
- **Optical Front Panel MPO Connector**
- **Optical Backplane MT Connector for VITA 66.5**
- **Custom Custom Optical Cabling/Connector Option**

Backplane Slot Profile

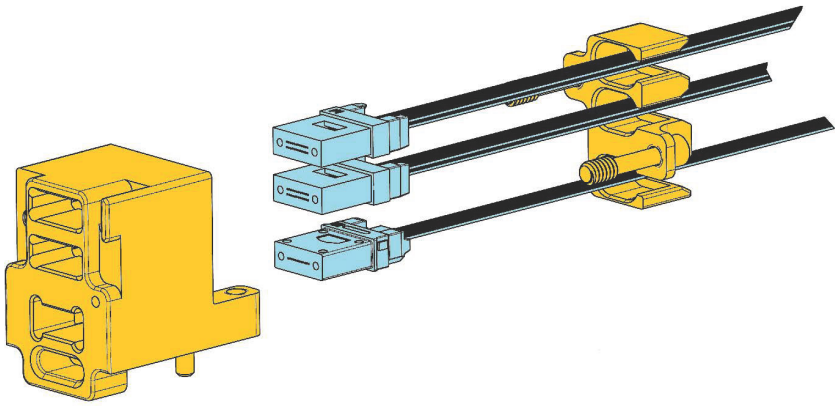
When hosted on a New Wave VPX carrier, VITA 65 slot profiles 14.6.11 or 14.6.13 are supported.

- When hosted on a 3rd party carrier, VITA 46.9 IO is supported.

1. Front Panel MPO (Female) I/O



2. VITA 66.5 Backplane MT I/O[1]



KEY
New Wave-Provided Hardware
Customer-Provided Hardware

1Common Terminations: VITA 66.5 Style C, Style D (pictured)

V1163

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Operation Customization

The V1163 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.

Complete Product Support Program

New Wave DV 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 DV 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 V1163 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 are happy to help accommodate your needs and provide you with the solution best suited for your success.


PXIe


VPX


PCIe

Technical Specifications

NETWORK INTERFACE
Up to twelve (12) 1G to 25G optical ports (front & backplane options)
- 850nm multi-mode optics

Up to eight (8) 1G to 25G electrical ports to Pn6 (high-speed mezzanine connector)

SUPPORTED PROTOCOLS
Ethernet, Fibre Channel, sFPDP, ARINC 818, Aurora

ASoC (FPGA) DEVICE
Xilinx® Versal™ VC1902, VM1802, VM1502
Visit Xilinx® Versal™ Datasheet1

MEMORY
2 banks of 4GB up to 1866MHz LPDDR4 SDRAM

HOST INTERFACE
PCI Express Gen4/Gen3 x8/x16

THERMAL SENSORS
2 digital temperature sensors

COMPLIANCE
VITA 20, 42.3, 47, 61.0, 66.5, 88

PHYSICAL CHARACTERISTICS
Dimensions: 74 mm (width) x 143.75 mm (length)
Weight: 0.276 lbs

POWER CHARACTERISTICS
Power Draw: Maximum 45W
Power Supply: 5V to 12V

TEMPERATURE
Operating: -40˚ C to 55˚ C at 250 LFM (air-cooled)
Operating: -40˚ C to 85˚ C (conduction-cooled)
Storage: -55˚ C to 105˚ C

1Xilinx Versal ACAP Datasheet:
https://docs.xilinx.com/v/u/en-US/ds950-versal-overview

New Wave Design

V1163 Hardware Part Number Configuration

Optional

400	-	01163	-	"WXYZ"	-	"IP"	-	"CC"	-	"NB"
Series		Model		Board Configuration		IP Configuration		Coating Configuration		Carrier Configuration
				Select 1 for each W, X, Y, and Z		Select 1 IP Option		Select 1 Coating Option		Select 1 Carrier Option

400-01163-W X Y Z IP CC NB

W

Config #	Description
F-4	*Reserved*
3	Xilinx Versal VC1902 ACAP
2	*Reserved*
1	Xilinx Versal VM1802 ACAP
0	Xilinx Versal VM1502 ACAP

X

Config #	Description
H	No optics populated
G	12-lane 1-10Gbps front panel MPO optics
F	12-lane 1-25Gbps front panel MPO optics
E	4-lane 1-10Gbps front panel MPO optics
D	4-lane 1-25Gbps front panel MPO optics
C	*Reserved*
B	8-lane 1-10Gbps front panel MPO optics
A	8-lane 1-25Gbps front panel MPO optics
9	*Reserved*
8	12-lane 1-10Gbps backplane VITA 66 optics MT-24 V65.0-6.5.3.5
7	12-lane 1-25Gbps backplane VITA 66 optics MT-24 V65.0-6.5.3.5
6	4-lane 1-10Gbps backplane VITA 66 optics MT-12 V65.0-6.5.2.2
5	4-lane 1-25Gbps backplane VITA 66 optics MT-12 V65.0-6.5.2.2
4	4-lane 1-10Gbps backplane VITA 66 optics MT-24 V65.0-6.5.3.5
3	4-lane 1-25Gbps backplane VITA 66 optics MT-24 V65.0-6.5.3.5
2	*Reserved*
1	8-lane 1-10Gbps backplane VITA 66 optics MT-24 V65.0-6.5.3.5
0	8-lane 1-25Gbps backplane VITA 66 optics MT-24 V65.0-6.5.3.5

Y

Config #	Connector	P16
B	VITA 88	DNP
A	VITA 88	P
9, 8	*Reserved*	
7	VITA 61	DNP
6	VITA 61	P
5, 4	*Reserved*	
3	VITA 42	DNP
2	VITA 42	P
1, 0	*Reserved*	

*P = Populate; DNP = Do Not Populate

Z

Config #	Description
1+	*Reserved*
0	Industrial Temp

IP

Config #	Description
1+	Reserved
00	Network Pass Through Example Design

CC

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

NB

Config #	Description
PE	XMC delivered in double-width PCIe form factor, PCIe carrier card
PX	XMC delivered in PXIe form factor, PXIe carrier card
BLANK	XMC form factor, no carrier card, no heatsink
HC	XMC form factor, no carrier card, conduction-cooled heatsink
HA	XMC form factor, no carrier card, air-cooled heatsink
Additional options available. Want this technology in 3U VPX? See the V6063.	

V1163 Hardware Part Number Configuration

Part Numbers from Table 2 are available with the shortest lead times.

Table 2

Front Panel Optical Variants

Config #	Description
400-01163-1F60-00	V1163 FPGA XMC Card, Xilinx Versal VM1802 ACAP, 12-lane 1-25Gbps front panel MPO optics, VITA 61 mezzanine connector(s), P16 populated, industrial temp
400-01163-1G60-00	V1163 FPGA XMC Card, Xilinx Versal VM1802 ACAP, 12-lane 1-10Gbps front panel optics, VITA 61 mezzanine connector(s), P16 populated, industrial temp
400-01163-3F60-00	V1163 FPGA XMC Card, Xilinx Versal VC1902 ACAP, 12-lane 1-25Gbps front panel MPO optics, VITA 61 mezzanine connector(s), P16 populated, industrial temp
400-01163-3G60-00	V1163 FPGA XMC Card, Xilinx Versal VC1902 ACAP, 12-lane 1-10Gbps front panel optics, VITA 61 mezzanine connector(s), P16 populated, industrial temp

VITA 66 Optical Variants

Config #	Description
400-01163-1760-00	V1163 FPGA XMC Card, Xilinx Versal VM1802 ACAP, 12-lane 1-25Gbps backplane VITA 66 optics MT-24 V65.0-6.5.3.5, VITA 61 mezzanine connector(s), P16 populated, industrial temp
400-01163-1860-00	V1163 FPGA XMC Card, Xilinx Versal VM1802 ACAP, 12-lane 1-10Gbps backplane VITA 66 optics MT-24 V65.0-6.5.3.5, VITA 61 mezzanine connector(s), P16 populated, industrial temp
400-01163-3760-00	V1163 FPGA XMC Card, Xilinx Versal VC1902 ACAP, 12-lane 1-25Gbps backplane VITA 66 optics MT-24 V65.0-6.5.3.5, VITA 61 mezzanine connector(s), P16 populated, industrial temp
400-01163-3860-00	V1163 FPGA XMC Card, Xilinx Versal VC1902 ACAP, 12-lane 1-10Gbps backplane VITA 66 optics MT-24 V65.0-6.5.3.5, VITA 61 mezzanine connector(s), P16 populated, industrial temp

No Optics

Config #	Description
400-01163-1H60-00	V1163 FPGA XMC Card, Xilinx Versal VM1802 ACAP, optics not populated, VITA 61 mezzanine connector(s), P16 populated, industrial temp
400-01163-3H60-00	V1163 FPGA XMC Card, Xilinx Versal VC1902 ACAP, optics not populated, VITA 61 mezzanine connector(s), P16 populated, industrial temp

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