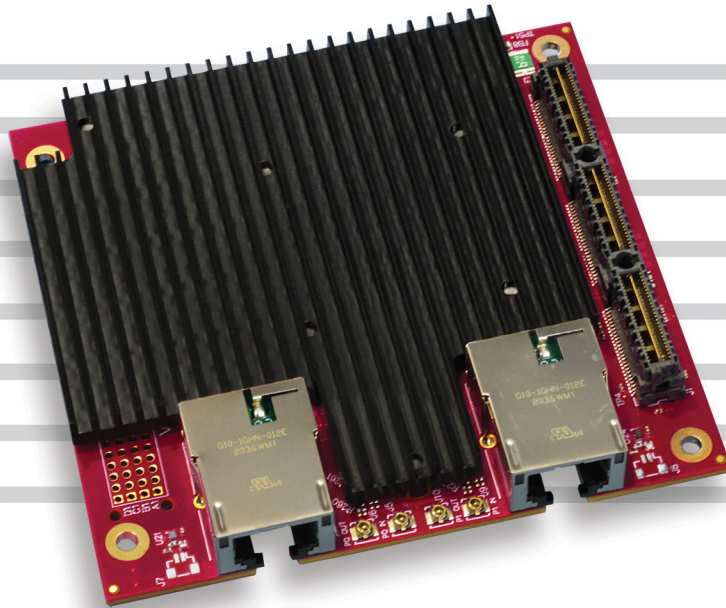# VL-EPM-E9E
10 Gigabit Ethernet Expansion Module

Overview

The "E9" module is an extremely rugged dual 10 Gigabit Ethernet add-on expansion card, for use with copper cabling. With its stack-down three-bank PCIe/104 pass-through connector, it is ready for inclusion in a PC/104 stack. On-board magnetically isolated RJ45 ports make for easy connection to other network nodes.

For environments with wide temperature challenges, the E9 is designed and tested for full-speed operation, from -40° to +85°C. The on-board heat sinks provide the needed thermal dissipation for uncompromised throughput even at the top of the operating range.

The E9 meets MIL-STD-202H specifications for shock and vibration and uses latching connectors to address cable detachment issues in hostile environments.

When deployed in lower-speed networks, the E9 will auto-negotiate down to: 1G, 2.5G, or 5G speed.

The E9 includes IEEE 1588/802.1AS Precision Time Protocol support. This enables precision time-synchronization between network nodes.

The E9 includes a pass-through PCIe/104 3-bank connector to enable PCIe signals to be passed through to other boards.

VersaLogic's 10+ year product life support programs ensure long-term availability. This avoids expensive upgrades and migrations that come from short, disposable lifecycle products.

Highlights

- **Dual 10 Gigabit ports**
  High-speed edge networking
- **PCIe/104 format**
  3-Bank Type 1 stack-down
- **Extremely rugged**
  Designed and tested to MIL-STD-202
  -40° to +85°C operating temperature

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Specifications

General

General	
Board Size	90 x 96 x 23mm (3.54 x 3.78 x 0.91"). PC/104 compatible.
Weight	148 grams (5.22 oz.)
Power Requirements	5V or 12V (supplied from PCIe/104 three-bank connector)
Stackable Bus	PCIe/104 Type 1, three-bank stack-down with pass-through connector.
Signal Type	PCI Express Gen 3, 2, or 1. Stack-down top x8 lanes consumed; x4, or x1 port widths supported with device. Unused x8 lanes (7-0) shifted to 15-8 for pass-through.
Manufacturing Standards	IPC-A-610 Class 2
Regulatory Compliance	RoHS (EU 2015/863), Conflict Minerals compliant.

Environmental	
Operating Temperature◊	-40° to +85°C
Airflow Requirements	1 Linear Meter per Second at or below +85°C
Storage Temperature	-40° to +85°C
Vibration, Sinusoidal Sweep †	MIL-STD-202H method MIL-STD-202-204, Condition A: 2g
Vibration, Random †	MIL-STD-202H method MIL-STD-202-214, Condition A: 5.35g rms
Mechanical Shock †	MIL-STD-202H method MIL-STD-202-213, Condition G: 20g half-sine

Network	
Ethernet	Two auto-negotiation 1G/2.5G/5G/10GBASE-T ports. Magnetically isolated RJ45 connectors. Copper wire interface.
Synchronization	IEEE 1588/802.1AS Precision Time Protocol
Indicators	On-board link speed and activity LEDs.
Network Boot	PXE
Efficiency	Energy Efficient Ethernet (IEEE 802.3-az) supported

Software	
Operating Systems	Compatible with Windows and Linux

◊ Derate -1.1°C per 305m (1,000 ft.) above 2,300m (7,500 ft.)

† MIL-STD-202H shock and vibe levels are used to illustrate the ruggedness of this product in general. Testing to higher levels and/or different types of shock or vibration methods can be accommodated per the specific requirements of the application. Contact VersaLogic Sales for further information.

Specifications are subject to change without notification. PCI Express is a registered trademark of the PCI-SIG. All other trademarks are the property of their respective owners.

Ordering Information

Model	Function	Pass-through PCIe/104 Connector	Operating Temp.
VL-EPM-E9E-A	Dual 10 Gigabit Ethernet Module (PCIe/104)	Yes	-40° to +85°C

Accessories

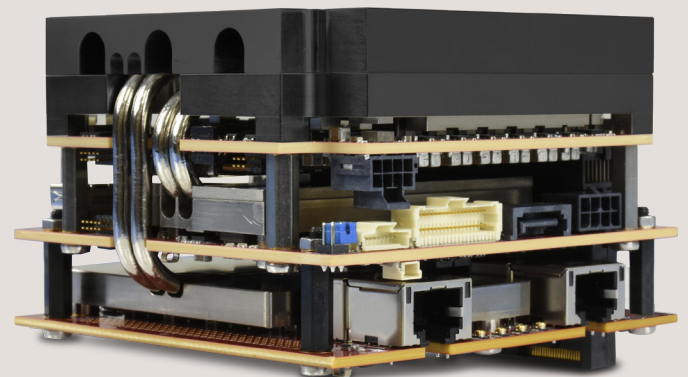| Part Number	Description
Hardware	
VL-HDW-105	0.6" Standoff Package, metric thread
VL-HDW-106	0.6" Standoff Package, English thread
VL-HDW-203	PC/104 extractor tool (metal)

Call VersaLogic Sales at (503) 747-2261 for more information!

Modify a Module to Your Exact Requirements

COTS modifications are available in quantities as low as 100 pieces. Options include conformal coating, application-specific testing, BOM revision locks, special labeling, and more.

Additional MCOT options are available if used in applications without external convection cooling:

1. Preinstalled on a Sabertooth (EPMe-51)

2. Customized with heat pipes, engineered for a PCIe/104 or PCI/104 Express SBC

EPM-E9 installed on a Sabertooth (EPMe-51)

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