VP1-250-eSSD(A/C)

Single-Slot 3U Open-VPX
Rugged NVMe Disk Module

USER'S MANUAL

Table of Contents

Disclaimer

Introduction

Phoenix International's VP1-250-eSSD NVMe based VPX blade delivers high capacity, high performance data storage for military, aerospace and industrial applications requiring rugged, secure and durable mass data storage.

The VP1-250-eSSD is a 3U VPX storage module that supports U.2 form factor NVMe solid-state hard drives. The VP1-250-eSSDs outstanding performance and versatility is enabled by Phoenix Internationals state-of-the-art technology which provides very high transfer and I/O rates, enhanced endurance and maximum data integrity.

Features

- Supports U.2 NVMe Solid State Storage Devices
- Conduction, REDI Conduction and Air Cooled Configurations
- Front Panel Drive Activity Indicator
- Operational Temperature from -40° to 85°C
- Optional Self Encrypting Drive (SED)
- Optional Military Grade Data Elimination

Module and Backplane Profile

The VP1-250-eSSD is compatible with the following VITA profile: MOD3-PER-1F-16.3.2-3

Handling

To prevent damaging the module, be aware of the precautions you need to follow when handling or installing the module. A discharge of static electricity from a finger or other conductor may damage static-sensitive devices. This type of damage may reduce the life expectancy of the device.

To prevent electrostatic damage:

- Avoid hand contact by transporting and storing products in static-safe containers.
- Keep electrostatic-sensitive parts in their containers until they arrive at static-protected workstations.
- Place parts in a static-protected area before removing them from their containers.
- Avoid touching pins, leads, or circuitry.
- Always be properly grounded when touching a static-sensitive component or assembly.

Grounding methods to prevent electrostatic discharge

Several methods are used for grounding. Use one or more of the following methods when handling or installing electrostatic-sensitive parts:

- Use a wrist strap connected by a ground cord to a grounded workstation or computer chassis. Wrist straps are flexible straps with a minimum of 1 Megaohm (± 10 percent)

resistance in the ground cords. To provide proper ground, wear the strap snug against the skin.
- Use heel straps, toe straps or boot straps at standing workstations. Wear the straps on both feet when standing on conductive floors or dissipating floor mats.
- Use conductive field service tools.
- Use a portable field service kit with a folding static-dissipating work mat.

Installation

Ensure that all power is removed from the VPX backplane before inserting the module. Prior to inserting the VP1-250-eSSD into the card cage, it is necessary to verify the slot the module will be inserted into is compatible with the module. VPX modules are typically keyed to prevent the insertion of a module into the wrong card cage slot. The VP1-250-eSSD utilizes two guide modules with keying. In the standard configuration both guide modules are not keyed. Caution must be used to ensure the module is not inserted into a slot that will cause damage to the module, the backplane, or any other device attached to the system. Guide module keying is available with no key, 0°, 45°, 90°, 270°, and 315°.

Considerations for airflow provided to the module are important. Ensure that proper airflow is provided to air-cooled modules. Conduction cooled modules should only be used in a properly configured conduction cooled card cage. Operation of a conduction cooled VPX module in an air cooled environment can result in overheating of the storage device.

The use of an NMVe device in a VPX environment requires the REF_CLK frequency be set to 100MHz. This is typically set in the BIOS of the VPX computer the NVMe module is attached to.

Option Configuration

Safety Ground, Jumpers JP1 & JP2:

By installing jumpers at locations JP1 and JP2 the ground plane of the VPX module will be connected to the VPX key guides. This allows for the option of connecting the VPX module ground plane directly to the VPX chassis ground plane.

Connector Pin Definitions

VPX Connector P0:

P0	A	B	C	D	E	F	G
1	NC	NC	NC	NC	+12V	+12V	+12V
2	NC	NC	NC	NC	+12V	+12V	+12V
3	+5V	+5V	+5V	NC	+5V	+5V	+5V
4	NVMRO	PERST0	GND	NC	GND	NC	NC
5	NC	NC	GND	NC	GND	NC	NC
6	NC	NC	GND	NC	GND	NC	NC
7	NC	NC	GND	NC	NC	GND	NC
8	GND	NC	NC	GND	REFCLK+	REFCLK-	GND

VPX Connector P1:

P1	A	B	C	D	E	F	G
1	PETP0	PETN0	GND	PERP0	PERN0	GND	NC
2	GND	PETP1	PETN1	GND	PERP1	PERN1	GND
3	PETP2	PETN2	GND	PERP2	PERN2	GND	NC
4	GND	PETP3	PETN3	GND	PERP3	PERN3	GND
5	NC	NC	GND	NC	NC	GND	NC
6	GND	NC	NC	GND	NC	NC	GND
7	NC	NC	GND	NC	NC	GND	NC
8	GND	NC	NC	GND	NC	NC	GND
9	NC	NC	GND	NC	NC	GND	NC
10	GND	NC	NC	GND	NC	NC	GND
11	NC	NC	GND	NC	NC	GND	NC
12	GND	NC	NC	GND	NC	NC	GND
13	NC	NC	GND	NC	NC	GND	NC
14	GND	NC	NC	GND	NC	NC	GND
15	NC	NC	GND	NC	NC	GND	NC
16	GND	NC	NC	GND	NC	NC	GND

2.5” U.2 NVMe Connector J1:

Pin	J1-1
S1	GND
S2	NC
S3	NC
S4	GND
S5	NC
S6	NC
S7	GND
S8	GND
S9	NC
S10	NC
S11	GND
S12	NC
S13	NC
S14	GND
S15	NC
S16	GND
S17	PETP1
S18	PETN1
S19	GND
S20	PERN1
S21	PERP1
S22	GND
S23	PETP2
S24	PETN2
S25	GND
S26	PERN2
S27	PERP2
S28	GND

Pin	J1-2
E1	NC
E2	NC
E3	NC
E4	NC
E5	PERST0
E6	NC
E7	REFCLK+
E8	REFCLK-
E9	GND
E10	PETP0
E11	PETN0
E12	GND
E13	PERN0
E14	PERP0
E15	GND
E16	NC
E17	PETP3
E18	PETN3
E19	GND
E20	PERN3
E21	PERP3
E22	GND
E23	NC
E24	NC
E25	NC

Pin	J1-3
P1	NC
P2	NC
P3	NC
P4	GND
P5	GND
P6	GND
P7	NC
P8	NC
P9	NC
P10	NC
P11	DRVACT
P12	GND
P13	+12VPRE
P14	+12V
P15	+12V

Specifications

Physical:

Form Factor:
3U VPX bus 6.30" (160mm), 3.94" (100.0mm)

Module Interface:
PCIe x4 (Gen 2 or 3)

Flammability:
UL94V-0 – PCB made in the USA by a UL recognized manufacturer

Environmental:

Air Cooled Temperature (VP1-250-eSSDA):
0° to 55° C (Air flow requirement as measured to be greater than 200 LFM)

Conduction-cooled with REDI (Vita 48) covers Temperature (VP1-250-eSSDC):
-40° to 85° C (Module MUST operate in a fully installed Conduction Cooled, REDI cover rack)

Vibration:
3.1 G_{RMS} 5–800Hz at 30 min/axis

Shock:
1500G @ 0.5ms half-sine

Storage Temperature:
-55° to 105° C

Relative Humidity:
5 to 95 percent, noncondensing

MTBF:
24,800,000 Hours @ 25° C (without drive).

* Must use a Solid State drive capable of temperature range and shock and vibration.

Compliance Specifications:

The VP1-250-eSSD SATA/SAS Drive Module is designed to meet CE Emissions specification EN 55022, CE Immunity specification EN 50082-2 and FCC 47 CFR, Part 15, Class A when tested in a shielded enclosure. Meets VITA 46.0, 48.2 and 65: VPX System Specifications and Practices.

Warranty and Support

Warranty Statement

Phoenix International VPX products come with a "return-to-factory" warranty which covers defects in materials and workmanship for a period of three years from the date of product shipment to the customer, provided the product is unmodified and has been subject to normal and proper use. Warranty on non-Phoenix International manufactured devices incorporated into Phoenix VPX products is restricted to that provided by their manufacturer only.

If You Have a Problem

If you are having a problem with a Phoenix International product, you should call our main number, (714) 283-4800, and ask for Customer Service. Please be prepared to supply as much detail as you can concerning the nature of the problem and the conditions in which the problem appeared.

Obtaining an RMA

In order to return the product for repair, the following steps are necessary:

1. Obtain a Return Materials Authorization number (RMA#) from Phoenix International Customer Service.
2. Ship the product prepaid to the designated repair point.
3. Provide with the product a written description of the claimed defect.

Shipping the Product

Any product returned to Phoenix International should be in its original shipping carton if possible. Otherwise the product should be carefully packaged in a conductive packing material and placed in a cushioned corrugated carton suitable for shipping. Please mark the shipping label with the RMA number and return it to:

Phoenix International
812 W. Southern Avenue
Orange, CA., 92865
Attn: Customer Service Department
RMA #: _____