VHDC–Series

DC/DC Converters

The Rajant VHDC—series consists of passive Power-over-Ethernet (PoE) compatible DC/DC converters designed for high reliability military and industrial applications. The VHDC-24V-50W-GbE model supports Ethernet data speeds up to 1000 Mbps, offering excellent throughput for Ethernet traffic such as mesh-to-wired network communications as well as BClCommander® and Automatic Protocol Tunneling (APT) control traffic. The other models in the VHDC series support 10/100 Mbps Ethernet data speeds. The VHDC-24V-50W-GbE, VHDC-24V-50W, and VHDC-48V-50W models offer sealed enclosures making them ideal for outdoor installations. The VHDC-24V-50W-LC model is the most-affordable, non-sealed version aimed at indoor installations.

VHDC–Series Features & Benefits

- Designed for high reliability military and industrial applications – featuring ruggedized enclosures, over-temperature, over-voltage, over-current, and short-circuit protection.

- **VHDC-24V-50W and VHDC-48V-50W** are designed to meet the IP67 (6: Dust-tight, 7: Waterproof) ingress protection specifications making them ideal for outdoor applications and extreme environmental conditions. **VHDC-24V-50W-GbE** is designed for IP66 (6: Dust-tight, 6: Water-resistant) and can be operated outdoors year-round.

- The user-replaceable input and self-resetting output fuses on the VHDC-24V-50W-GbE, manufacturer-replaceable input and user-replaceable output fuses on VHDC-24V-50W and VHDC-48V-50W, and user-replaceable input and output fuses on the VHDC-24V-50W-LC are designed to protect the devices from over-current conditions.

- Wide 10–36 V (VHDC-24V-50W, VHDC-48V-50W, and VHDC-24V-50W-LC) and 10-32 V (VHDC-24V-50W-GbE) input range versions are useful for stabilizing the power from input sources such as vehicle batteries, which can exhibit varying characteristics due to the sharing of power with other systems, and battery charge and discharge states.

- High power 24 V or 48 V, 50 W isolated and regulated output.

- High efficiency (83% typical).

VHDC-24V-50W

VHDC-48V-50W

VHDC-24V-50W-LC

VHDC-24V-50W-GbE

Model	Rajant Part Number	Output Voltage (V)	Max. Output Current (A)	Environmental
VHDC-24V-50W-GbE	01-000037-002	24	2.08	Sealed (IP66: 6-Dust-tight, 6-Water-resistant)
VHDC-24V-50W	01-000029-001	24	2.08	Sealed (IP67: 6-Dust-tight, 7-Waterproof)
VHDC-24V-50W-LC	01-000033-001	24	2.08	Non-sealed
VHDC-48V-50W	01-000029-048	48	1.04	Sealed (IP67: 6-Dust-tight, 7-Waterproof)

Input

Input Voltage Range	VHDC-24V-50W-GbE: 10-32 VDC VHDC-24V-50W, VHDC-48V-50W, and VHDC-24V-50W-LC: 10-36 VDC

Output

Output Voltage	VHDC-24V-50W-GbE, VHDC-24V-50W, and VHDC-24V-50W-LC: 24 V (nominal) VHDC-48V-50W: 48 V (nominal)
Max. Output Current	VHDC-24V-50W-GbE, VHDC-24V-50W, and VHDC-24V-50W-LC: 2.08 A VHDC-48V-50W: 1.04 A
Output Ripple	± 1% (maximum)
Line Regulation	± 0.2% (maximum)
Load Regulation	± 0.2% (maximum)
Short Circuit Protection	Continuous
Over-Voltage Protection Trip Range (%Vo Nominal)	115% (minimum), 140% (maximum)
Over-Current Protection (%Io Nominal)	110% (minimum), 160% (maximum)

General

Supported Data Speed	VHDC-24V-50W-GbE: 10/100/1000 Mbps VHDC-24V-50W, VHDC-48V-50W, and VHDC-24V-50W-LC: 10/100 Mbps
Efficiency	83% (typical)
Switching Frequency	300 kHz (nominal)
Thermal Shutdown Temp.	100 °C
Isolation Voltage	1500 VDC (minimum)
Isolation Resistance	100 MΩ (minimum)
Fuse	VHDC-24V-50W-GbE : Input : User replaceable 10 A, 32 VDC, Blade type Output : Self-resetting (does not need replacement) VHDC-24V-50W : Input : Manufacturer replaceable 10 A. Output : User replaceable, 2.5 A, cylindrical, 3AG fast-acting, ¼" x 1¼" (6 mm x 32 mm) VHDC-24V-50W-LC : Input : User replaceable, 7.5 A, ATO style. Output : User replaceable, 2 A, ATO style. VHDC-48V-50W : Input : Manufacturer replaceable 10 A. Output : User replaceable, 1.25 A, cylindrical, 3AG fast-acting, ¼" x 1¼" (6 mm x 32 mm)
Connector	VHDC-24V-50W and VHDC-48V-50W require 13/16"–28UN thread mating cable glands for their Input/Output ports. Rajant recommends the Amphenol LTW LTWRJ-00BMMA-SL7005 cable gland.

Physical

Dimensions	VHDC-24V-50W-GbE : 150 mm x 87 mm x 40 mm (5.90" x 3.40" x 1.56") VHDC-24V-50W and VHDC-48V-50W : 156 mm x 83 mm x 42 mm (6.125" x 3.250" x 1.650") VHDC-24V-50W-LC : 141 mm x 76 mm x 29 mm (5.531" x 3.006" x 1.120")
Weight	VHDC-24V-50W-GbE : 709 g (1.56 lb) VHDC-24V-50W and VHDC-48V-50W : 635 g (1.40 lb) VHDC-24V-50W-LC : 391 g (0.86 lb)
Temperature	Operating: -40 °C to 100 °C (-40 °F to 212 °F) Storage: -55 °C to 105 °C (-67 °F to 221 °F)
Enclosure	VHDC-24V-50W-GbE : Anodized aluminum, IP66 (6: Dust-tight, 6: Water-resistant). VHDC-24V-50W and VHDC-48V-50W : Anodized aluminum, IP67 (6: Dust-tight, 7: Waterproof). VHDC-24V-50W-LC : Anodized aluminum, non-sealed.
Humidity	95% (non-condensing)
Certification	FCC Part 15 Subpart B Class A (USA), ICES-003 Class A (Canada)
Warranty	90 Days

BreadCrumb® Model and Cable Length Dependencies for VHDC–Series Devices

It is important to choose the correct VHDC–series device to support the power requirements of a given BreadCrumb model and Data + Power output cable length combination. Please refer to the table below for the appropriate VHDC–series model(s) for your application.

BreadCrumb Model	Output Cable Length (24 AWG)	Recommended VHDC–Series Model(s)
JR2	0–100 m (0–328 ft)	VHDC-24V-50W, VHDC-24V-50W-LC
ME4	0–60 m (0–200 ft) 60–100 m (200–328 ft)	VHDC-24V-50W-GbE, VHDC-24V-50W, VHDC-24V-50W-LC, VHDC-48V-50W VHDC-24V-50W-GbE, VHDC-48V-50W
LX4	0–30 m (0–100 ft) 30–100 m (100–328 ft)	VHDC-24V-50W, VHDC-24V-50W-LC, VHDC-48V-50W VHDC-48V-50W
LX5	0–30 m (0–100 ft) 30–100 m (100–328 ft)	VHDC-24V-50W-GbE, VHDC-24V-50W, VHDC-24V-50W-LC, VHDC-48V-50W VHDC-24V-50W-GbE, VHDC-48V-50W

Warning on VHDC-24V-50W-GbE and BreadCrumb Ethernet Port Compatibility

This warning relates to the VHDC-24V-50W-GbE model only. VHDC-24V-50W-GbE applies DC power to all four Ethernet wire pairs at its output. This powering scheme is only compatible with BreadCrumb Ethernet ports that are capable of 1000 Mbps (Gigabit) operation. This is limited to both eth0 and eth1 on the LX5 and eth0 on the ME4.

Note on Waterproofing

Please refer to Rajant's technical service bulletin TSB 03-100136-001 for waterproofing the cable glands at the Input/Output ports of the VHDC-24V-50W and VHDC-48V-50W.

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