

Rugged VPX High Speed Ethernet Switches

- **Table of Contents**



- **3U VPX Ethernet**

- Switch** pg. 2-39

- **3U VPX RaptorLink 50G SOSA Ethernet Switch**
 - pg. 2-18
 - **3U VPX 10G Ethernet Switches**
 - pg. 19-30
 - **3U VPX 25G Ethernet Switches**
 - pg. 31-39

- **6U VPX Ethernet Switches** pg. 39-58

- **6U VPX 10G Rugged Switch**
 - pg. 40-42
 - **6U VPX Ethernet Switches (expanded)**
 - pg. 43-50
 - **6U VPX 25G Ethernet Switches**
 - pg. 51-59

- **Specialty VPX** pg. 60-66

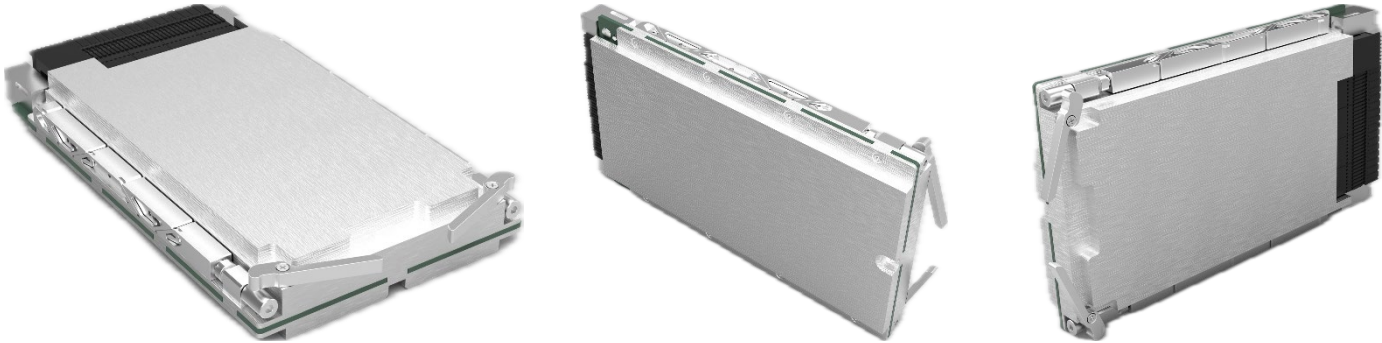
- **Time-Sensitive Networking (TSN) Ethernet Switches**
 - pg. 60-66

*For custom switch requests, please reach out to your
Amphenol representative*

RaptorLink 64X50 SOSA Ethernet Switch

Next Generation 64-Channel 50G 3U VITA-91 and
Legacy VPX SOSA Aligned Ethernet Switch Modules

PDS - 370



DESCRIPTION

SUMMARY

Amphenol's next-generation 3U VPX Ethernet switch, the RaptorLink 64X50, is SOSA-aligned and features VITA-91 connectivity, offering double density with support for speeds of up to 50G per lane on the backplane. The switch operates with 64 individual channels, supporting speeds of 1G, 10G, and 25G in NRZ mode, and 50G in PAM-4 mode. Additionally, it supports multiple ganged protocols, including 40Gx4, 50Gx2, and 100Gx4 in NRZ mode, and up to 400Gx8 in PAM-4 mode. This makes the Ethernet switch highly adaptable for future backplane architectures. All boards are built with Amphenol MIL-HD2 SOSA/VITA 91 and/or R-VPX Evolution series connectors which have datasheets available readily.

Management is handled by two on-board quad-core ARM processors, each with ample memory for complex networking applications. The switch includes a full suite of SOSA-aligned IPMI status functions for various chassis manager requirements. In summary, the RaptorLink 64X50 integrates two managed 32-channel, 50G Ethernet switches into a single, 3U SOSA-aligned, VITA-91 VPX board.

Several versions of the RaptorLink switch are available with 50G PAM-4 and NRZ connectivity configurations. Each model includes a comprehensive management software suite with features such as MACsec, Time-Sensitive Networking (TSN), and a 60-second boot time. The switches are offered in the following configurations:

- Dual 64x50G switch – SOSA aligned VITA-91 double density and speed connectors
- Single 32x50G switch – SOSA aligned VITA-91 double density and speed connectors
- Single 40x50G switch – SOSA aligned VITA-91 double density and speed connectors
- Additionally, a single 32x50G switch is available with legacy RVPX SOSA-aligned connectors.

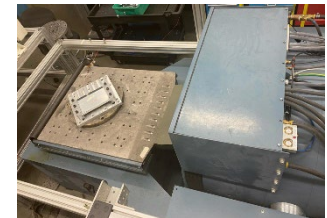
To meet the demands of applications requiring low power consumption and fast boot times (under 10 seconds), several configurations of the switch are available with up to 25G NRZ speeds and lightweight management software. These options include:

- Dual 64x25G switch – SOSA aligned VITA-91 double density and speed connectors
- Single 32x25G switch – SOSA aligned VITA-91 double density and speed connectors
- Single 32x25G switch (with legacy RVPX SOSA-aligned connectors)

Along with the switch and processing infrastructure available in many different configurations, the RaptorLink 64X60 has a VITA46.11 Tier 1 compliant IPMI solution for sensor, link state, health, BIT, and other reporting to chassis managers. It also supports redundant IPMB interfaces and IPMB fast modes.

FEATURES

- Dual 32-channel Ethernet switch chips, capable of speeds up to 50G PAM-4 and NRZ speeds up to 25G.
- Support for multiple speeds: 1G, 10G, 25G, 40G, 50G, 100G, and 400G (PAM-4 and NRZ formats).
- Layer 2 and Layer 3 network management capabilities, including support for time-sensitive networking (TSN), MACsec, and advanced routing applications.
- Dedicated management interfaces via dual RS-232 and 1GBase-T.
- SOSA-aligned 12V power input with a full IPMI controller for chassis management.
- Powered by dual quad-core ARM CPUs with DDR4-SDRAM, flash memory, and EEPROM.
- Linux OS with comprehensive network management software.



RUGGEDIZATION

- Fully ruggedized to withstand extreme environmental and EMI/EMP conditions.
- Interfaces for power diagnostics and more.
- Meets the following environmental specifications:
- Operating Temperature: -40°C to 85°C while operating.
- Storage Temperature: -55°C to 125°C.
- Humidity: 0-100% non-condensing humidity during operation.
- Vibration: 10g peak, 5-2,000 Hz sine vibration, and 40 G peak shock cycles.
- Altitude: -1,500 to 60,000 ft with rapid depressurization.
- EMC: Designed to comply with MIL-STD-461E.

ORDERING INFORMATION

PART NUMBER TABLE – VITA91 SOSA VARIANTS

CF-02W300-12X	Dual Switch – 64 channels @ 50G	Managed	150 Watts	~60 second boot
CF-02W300-13X	Single Switch – 32 channels @ 50G	Managed	75 Watts	~60 second boot
CF-02W300-14X	Signal Meshed Switch – 40 channels @ 50G	Managed	150 Watts	~60 second boot
CF-02W300-15X	Dual Switch – 64 channels @ 10G/25G	Light Mgmt	50 Watts	~10 second boot
CF-02W300-16X	Single Switch – 32 channels @ 10G/25G	Light Mgmt	25 Watts	~10 second boot

- Channel as defined as AC coupled CML SERDES Tx+/- and Rx+/- pair meant for backplane operation
- Media converters and other protocol variants are available upon request
- 'X' variants are conduction-cooled; For air-cooled variants, replace the 'X' with a 'V'

PART NUMBER TABLE – LEGACY RVPX SOSA VARIANTS

CF-02W300-17X	Single Switch – 32 channels @ 50G	Managed	75 Watts	~60 second boot
CF-02W300-18X	Single Switch – 32 channels @ 10G/25G	Light Mgmt	25 Watts	~10 second boot

- Channel as defined as AC coupled CML SERDES Tx+/- and Rx+/- pair meant for backplane operation
- Media converters and other protocol variants are available upon request
- 'X' variants are conduction-cooled; For air-cooled variants, replace the 'X' with a 'V'

PART NUMBER TABLE – REAR TRANSITION MODULES

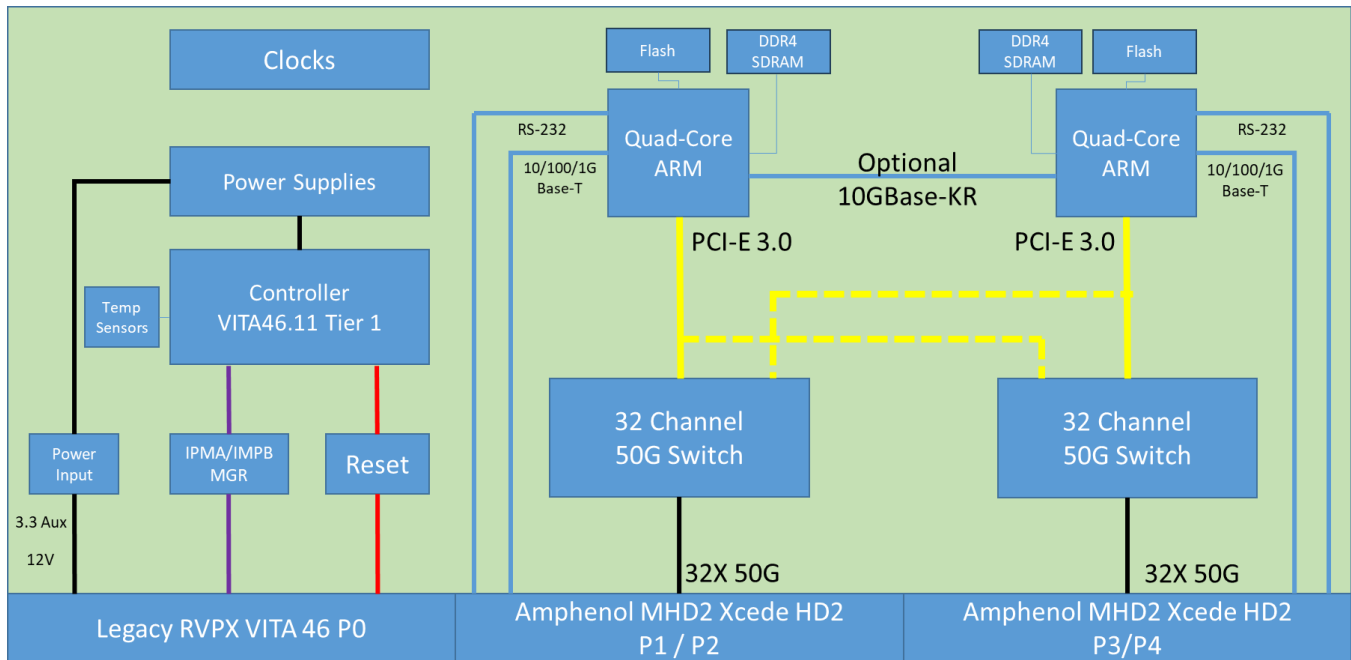
CF-02W300-12R	SOSA V91 Variant	Breakout RTM with up to 64 channels 25G fiber optics on MTPs
CF-020400-603R	Legacy RVPX SOSA Variant	Breakout RTM with up to 32 channels 25G fiber optics on MTPs

- Other variants are available upon request and these are meant to be utilized with commercial chassis components sold by Amphenol and listed in the accessories section of this datasheet

BLOCK DIAGRAMS

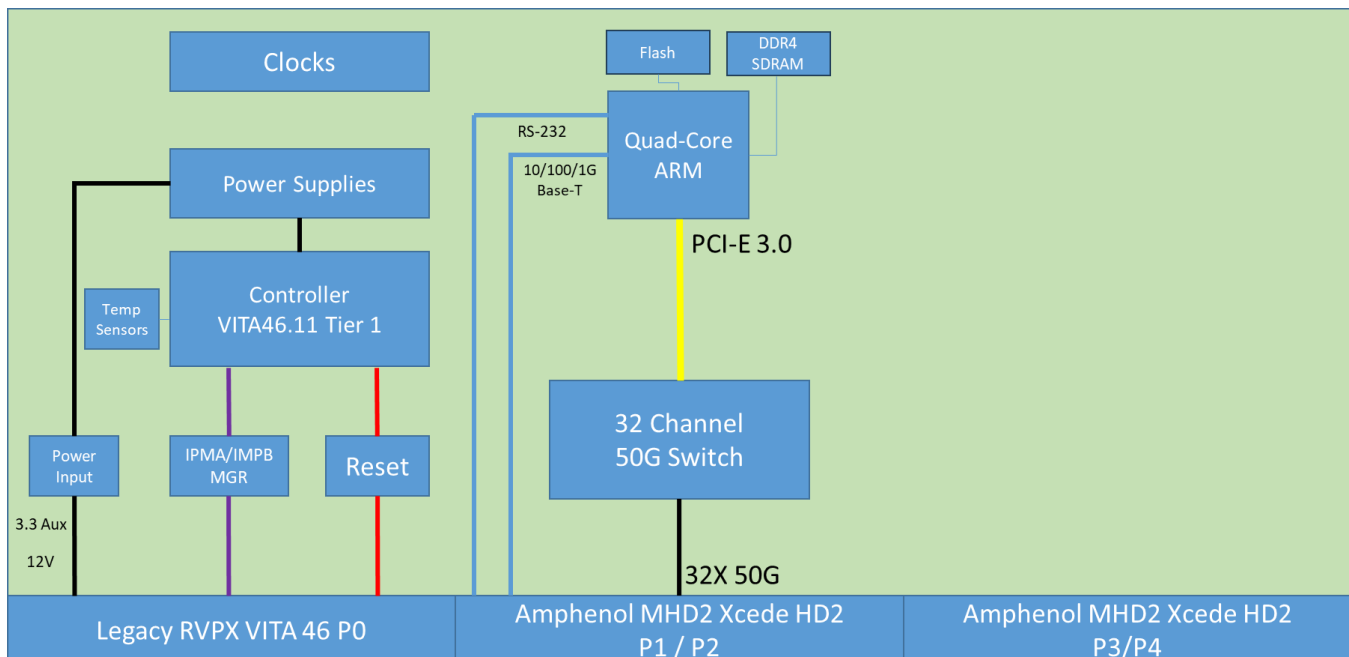
CF-02W300-12X – Dual Switch – 64 channels @ 50G; Managed; 150 Watts; ~60 second boot

VITA91 SOSA VARIANT



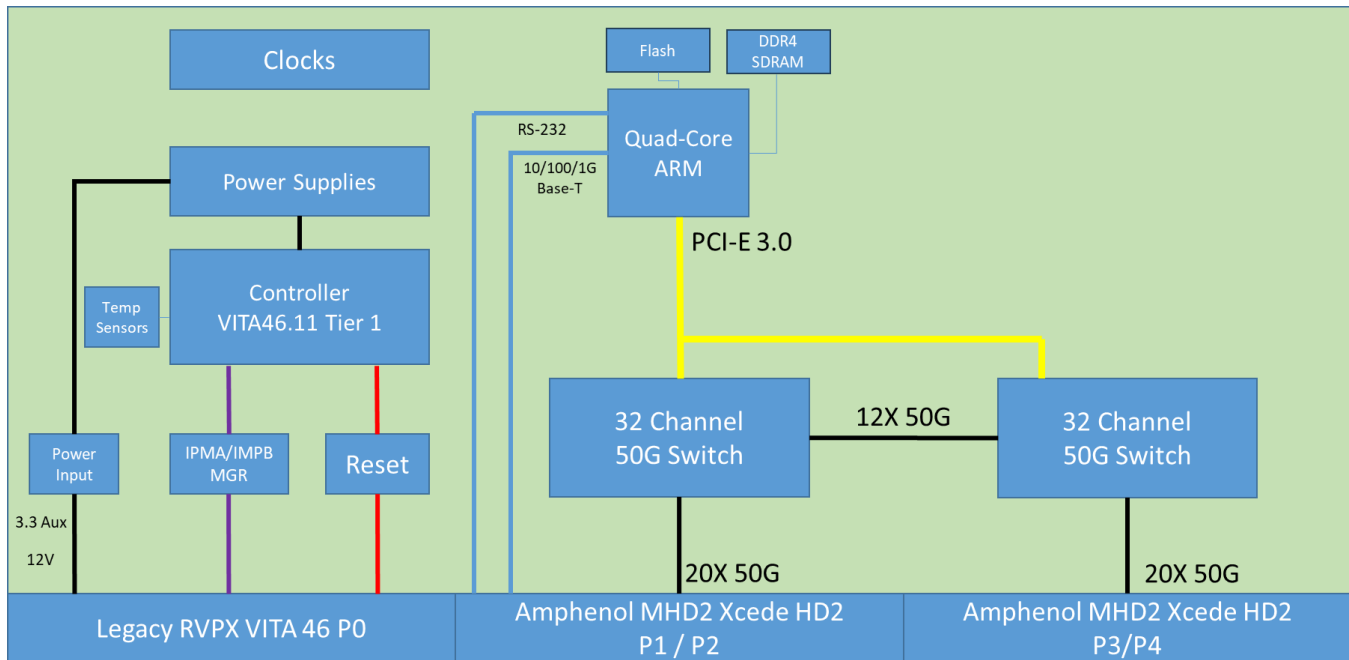
CF-02W300-13X – Dual Switch – 64 channels @ 50G; Managed; 150 Watts; ~60 second boot

VITA91 SOSA VARIANT



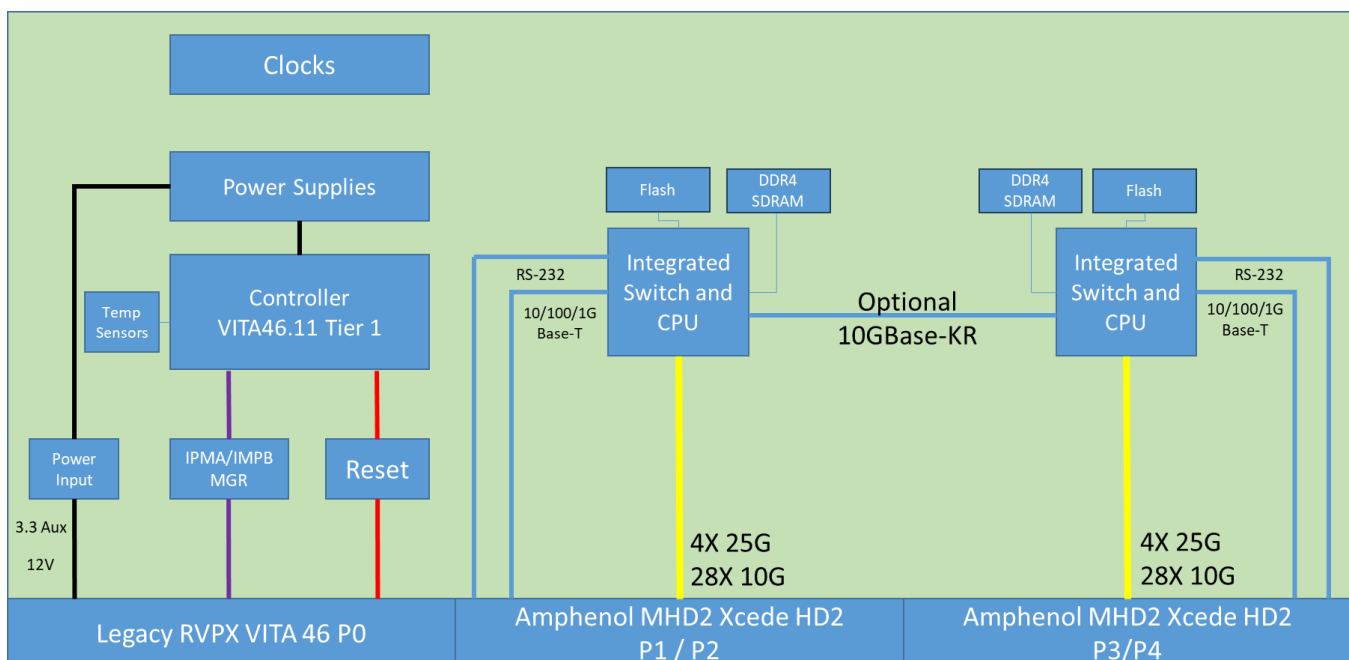
CF-02W300-14X – Single Meshed Switch – 40 Channels @ 50G

VITA91 SOSA VARIANT



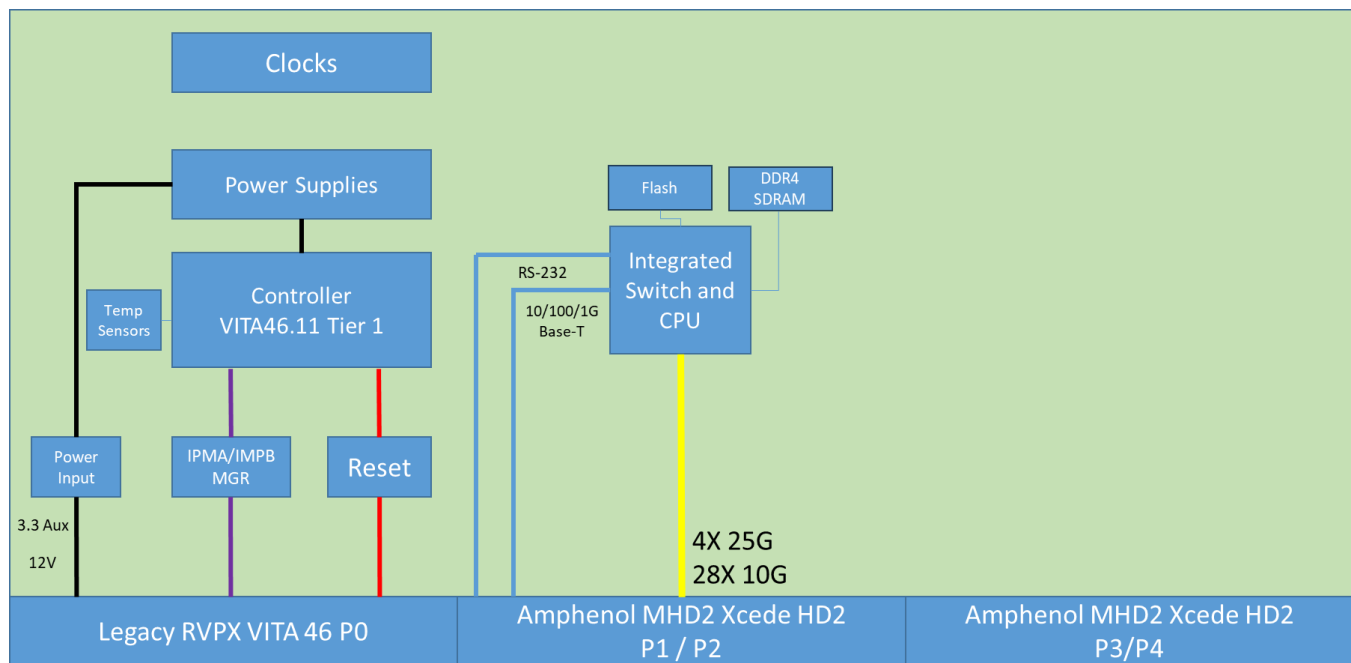
CF-02W300-15X – Dual Switch – 64 channels @ 10G/25G; Light Management; 50 Watts; ~10 second boot

VITA91 SOSA VARIANT



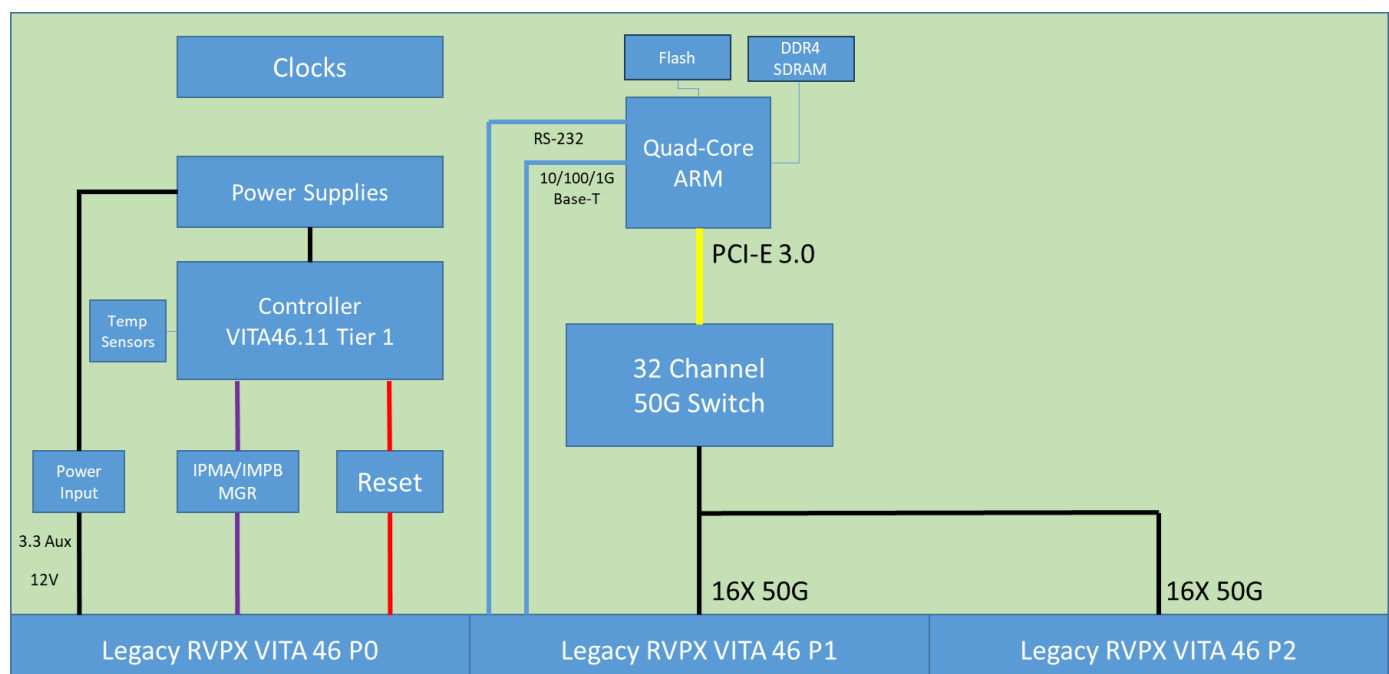
CF-02W300-16X – Single Switch – 32 channels @ 10G/25G; Light Management; 25 Watts; ~10 second boot

VITA91 SOSA VARIANT

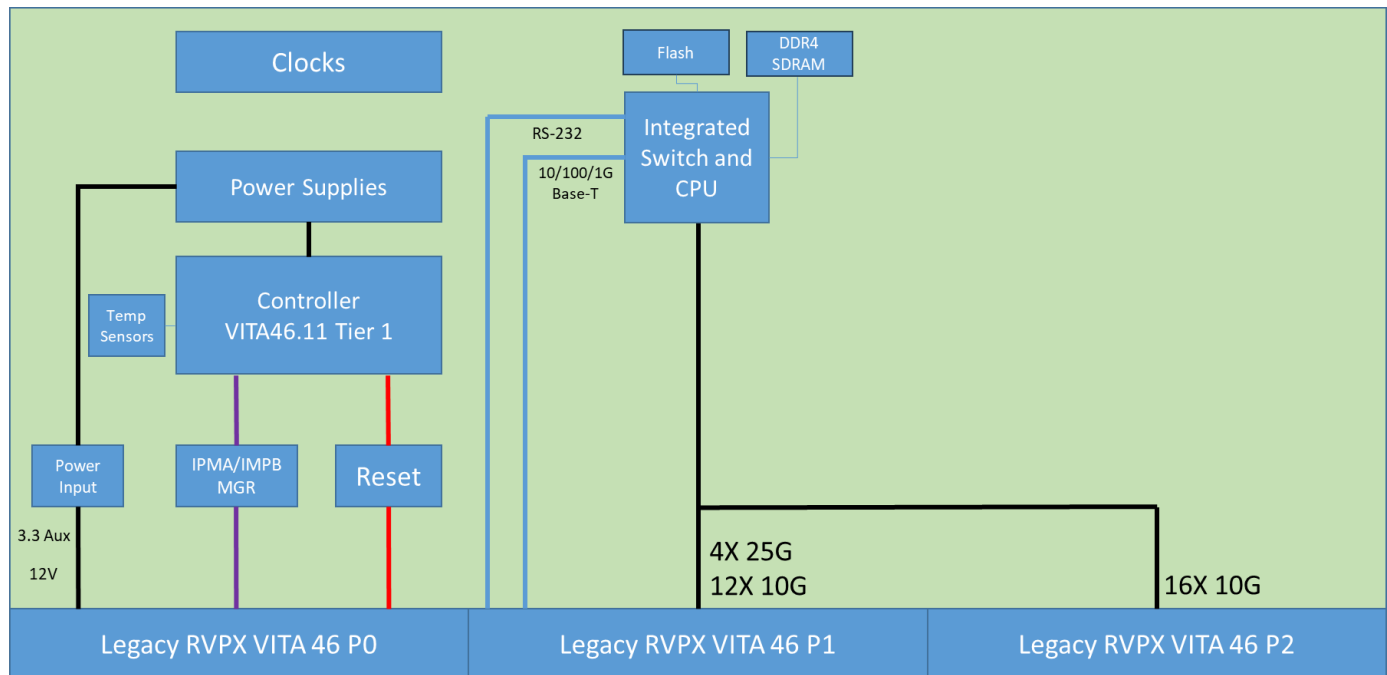


CF-02W300-17X – Single Switch – 32 channels @ 50G; Managed; 75 Watts; ~60 second boot

LEGACY RVPX SOSA VARIANT



CF-02W300-18X – Single Switch – 32 channels @ 25G; Light Management; 25 Watts; ~10 second boot
LEGACY RVPX SOSA VARIANT



OTHER MECHANICAL CONSIDERATIONS

Frame Components

The primary and secondary frame components are finished in accordance with MIL-DTL-5541 Type II, Class 3 on aluminum alloy. Additional materials and finishes are available upon request.

Extraction Levers

The extraction lever is crafted from 7075-T7351 aluminum alloy and treated with a black anodized finish per MIL-A-8625 Type II, Class 2 specifications.

Wedgelocks

We utilize a variety of wedgelocks per customer requirements, with our standard being the SW5T-475 series from WaveTherm. These wedgelocks are constructed from 6061-T6511 aluminum alloy and black anodized in compliance with MIL-A-8625 Type II, Class 2. They feature 300-series stainless steel fasteners, passivated per AMS2700.

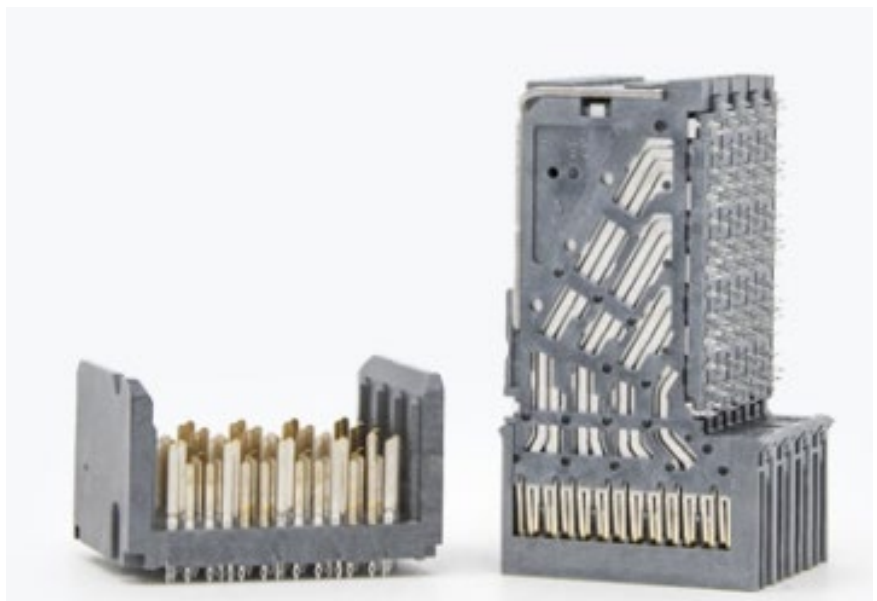
Labeling

Each board is equipped with an identification label, an ESD label, and is protected by a clear overlay.

Board Variants with SOSA VITA91 Connectors

Amphenol has designed these connectors in alignment with The Open Group Sensor Open Systems Architecture™ (SOSA) technical standard, MIL-HD2 provides developers with a readily available, robust open architecture solution for tighter card pitches and chassis designs where space requirements and density are critical. These connectors are available in 3-, 4-, and 6-pair configurations, providing the MIL-embedded market with the highest count of differential pairs available today in a 3U configuration at 56Gb/s PAM 4 speeds. This series was selected by the SOSA Consortium and provides a SOSA aligned solution for nextgen switch and payload card requirements enabling the MIL-embedded market to meet next-gen performance levels while still meeting COTS requirements.

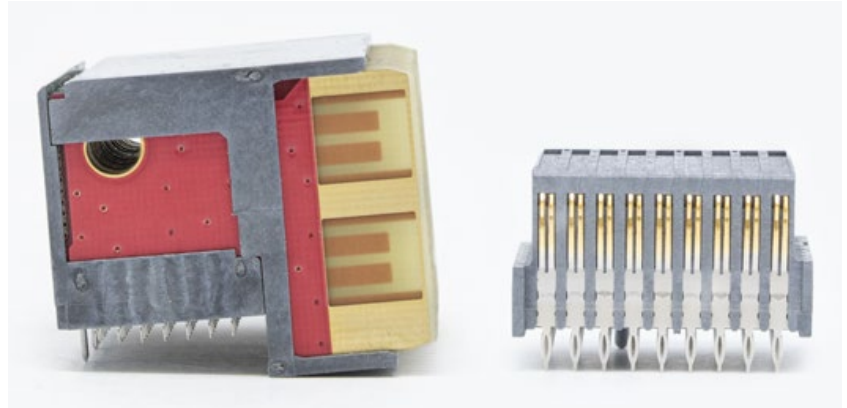
- Highest density with 1.80mm pitch
- 4 diff, 8 column - SOSA aligned configuration
- Data rates scalable to 56Gb/s PAM4 to support system upgrades without costly redesigns
- Proprietary crosstalk reducing technologies
- 15.7mil drill compliant pin allows deeper backdrilling
- Optimized footprints
- Shielded contacts mate before signal contacts, providing up to a 4mm minimum wipe
- Embedded capacitor available
- Differential pairs 28-84 per inch (11-33 differential pairs per centimeter)
- Proven EMI and signal integrity advantages
- Improved impedance matching
- Complete solution for unique customer requirements
- Enables hot plugging
- Meets high density application requirements



Board Variants with Legacy R-VPX 25G SOSA Connectors

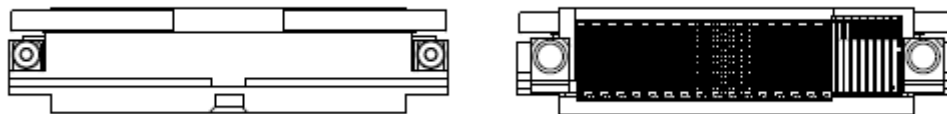
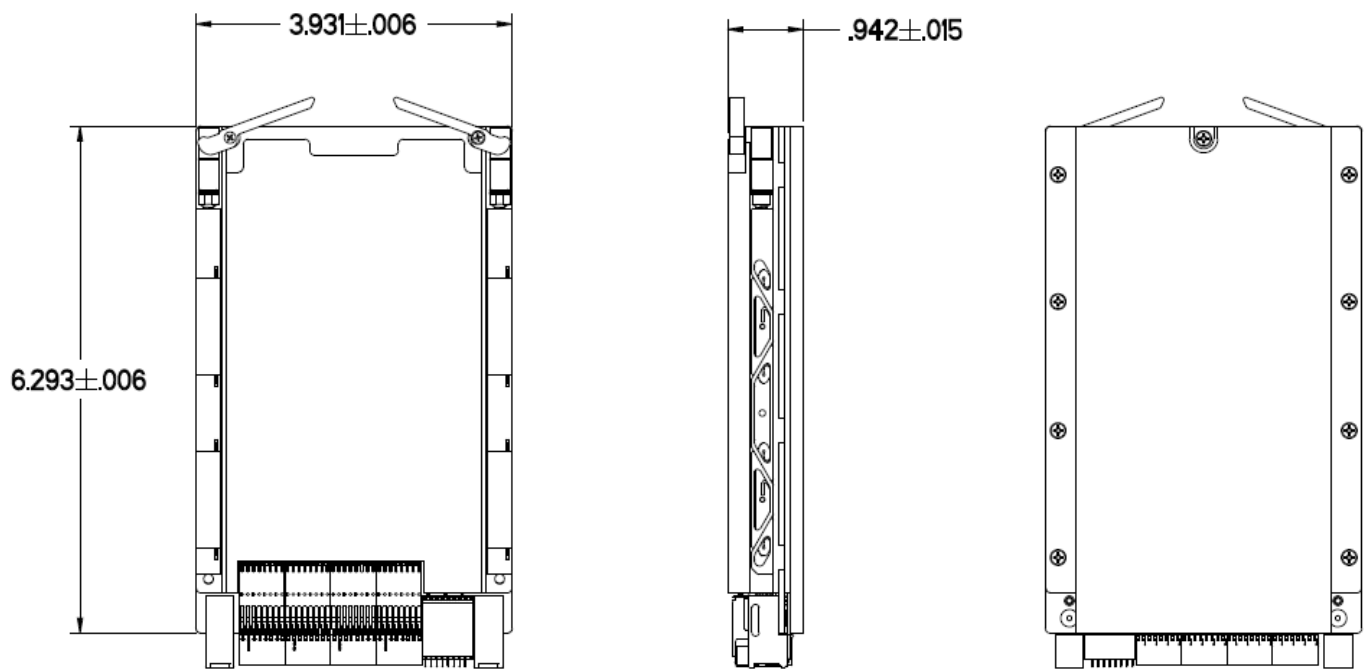
Improving off original Vita 46 standards, Amphenol's R-VPX Evolution 2.0 is the next generation of high-speed ruggedized backplane connectors. R-VPX Evolution 2.0 series connectors are designed and optimized to achieve data rates in excess of 25 Gb/s, meeting VITA 46.30 requirements. This makes the Evolution 2.0 Series connectors among the fastest VITA 46.30 connectors in the world. These connectors are tested to VITA 46 levels and are backward intermateable with R-VPX, R-VPX EVO 1 and VITA 46 qualified connectors.

- 25+ Gb/s performance
- Module and backplane connectors utilize smaller compliant contacts for increase Si performance
- Intermateable with existing/legacy VITA 46 connectors
- Qualified to VITA 46 spec
- Ruggedized 4-point contact system
- Passed VITA 72 vibration level testing with BER monitoring.

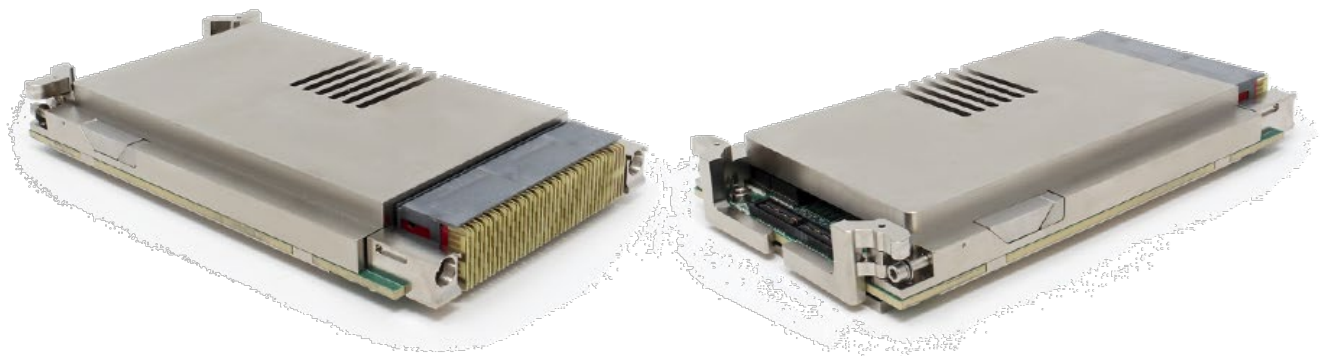
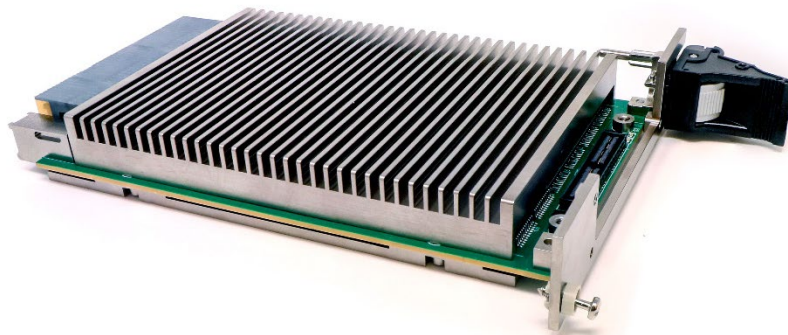
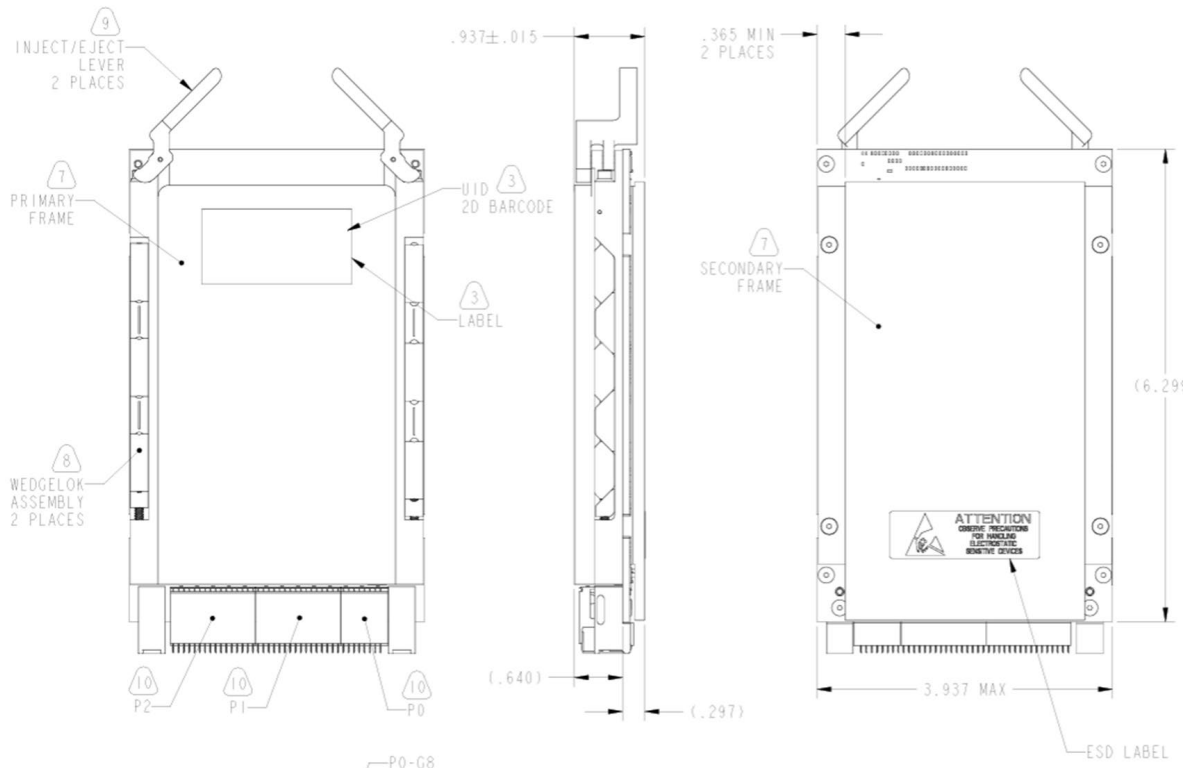


DIMENSIONAL INFORMATION

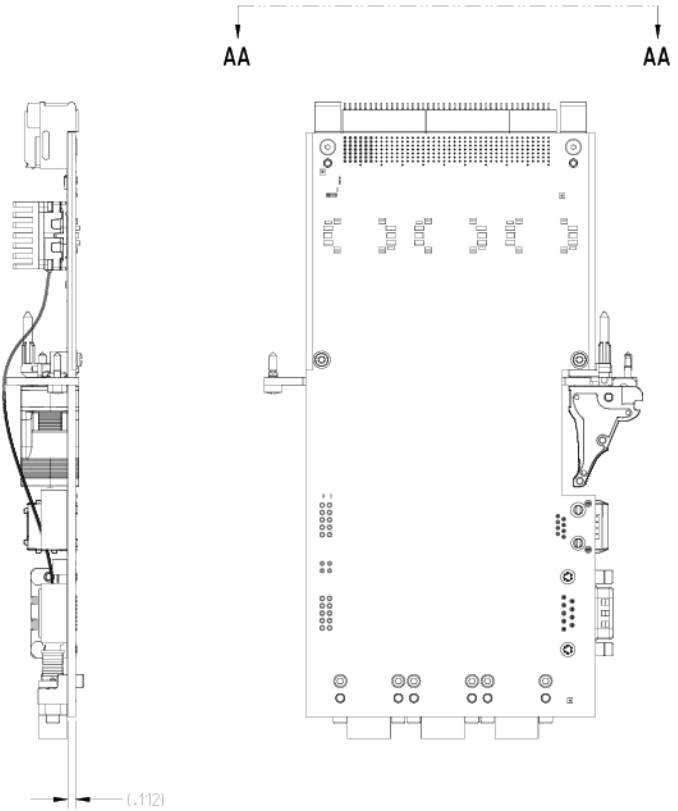
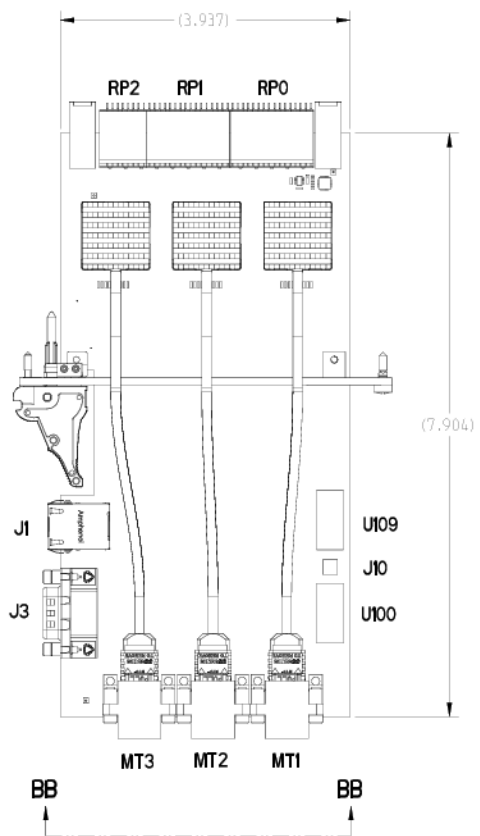
VITA91 SOSA Variant - Mechanical prints, pinouts, and step files available upon request



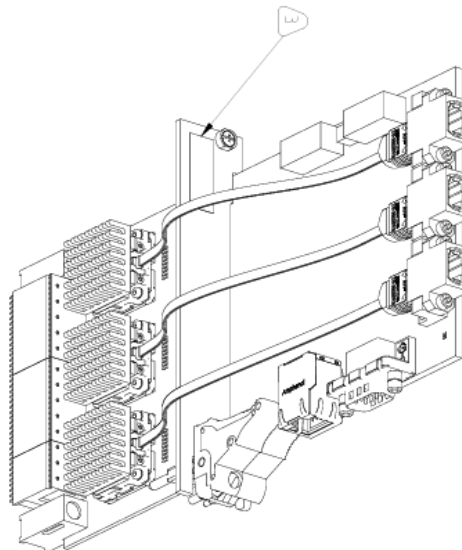
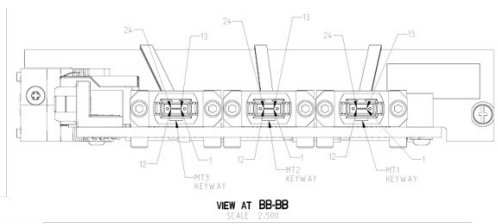
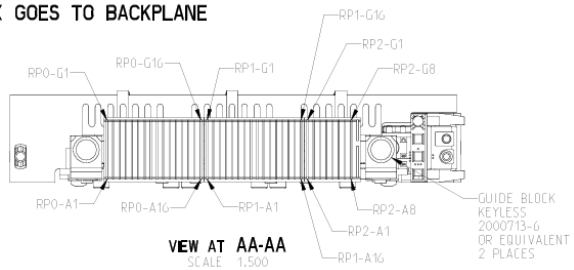
LEGACY RVPX SOSA Variant - Mechanical prints, pinouts, and step files available upon request



LEGACY RVPX RTM Variant - Mechanical prints, pinouts, and step files available upon request



NOTE: SIGNAL DIRECTION
 - TX COMES FROM BACKPLANE
 - RX GOES TO BACKPLANE



SOFTWARE

Fully Managed – 60 second boot - Manuals available upon request

Stacking	Configuring VLANs	Configuring IGMP Snooping
Stacking Ring Topology	Defining VLAN Properties	Configuring MLD Snooping
Stacking Chain Topology	Defining VLAN Membership	Viewing IGMP/MLD IP Multicast Groups
Stacking Members and Unit ID	Defining VLAN Interface Settings	Defining Multicast Router Ports
Removing and Replacing Stacking Member	Configuring GARP	Defining Forward All Multicast
Exchanging Stacking Members	Defining GARP	Defining Unregistered Multicast Settings
Switching the Stacking Master	Defining GVRP	Managing System Files
Configuring System Time	Viewing GVRP Statistics	Downloading System Files
Configuring Daylight Savings Time	Defining IP Addresses	Firmware Download
Configuring SNTP	Configuring IP Addressing	Configuration Download
Polling for Unicast Time Information	Defining IP Addresses	Uploading System Files
Polling for Anycast Time Information	Defining ARP	Upload Type
Broadcast Time Information	Defining Domain Name Servers	Software Image Upload
Defining SNTP Settings	Defining DNS Servers	Configuration Upload
Configuring Device Security	Defining DNS Host Mapping	Copying Files
Configuring Management Security	Defining the Forwarding Database	Restoring the Default Configuration File
Configuring Authentication Methods	Defining Static Forwarding Database Entries	Configuring Quality of Service
Defining Access Profiles	Defining Dynamic Forwarding Database Entries	Quality of Service Overview
Defining Profile Rules	Configuring Spanning Tree	VPT Classification Information
Defining Authentication Profiles	Defining Classic Spanning Tree	CoS Services
Mapping Authentication Methods	Defining STP on Interfaces	Defining General QoS Settings
Defining RADIUS Settings	Defining Rapid Spanning Tree	Configuring QoS General Settings
Defining TACACS+ Authentication	Defining Multiple Spanning Tree	Restoring Factory Default QoS Interface Settings
Configuring Passwords	Defining MSTP Instance Settings	Defining Queues
Defining Local Users	Defining MSTP Interface Settings	Defining Bandwidth Settings
Defining Line Passwords	Configuring SNMP	Mapping CoS Values to Queues
Defining Enable Passwords	SNMP v1 and v2c	Mapping DSCP Values to Queues
Configuring Network Security	SNMP v3	Defining QoS Basic Mode
Network Security Overview	Configuring SNMP Security	Defining Basic Mode Settings
Port-Based Authentication	Defining SNMP Security	Rewriting Basic Mode DSCP Values
Advanced Port-Based Authentication	Defining SNMP View	Defining QoS Advanced Mode
Defining Port Authentication Properties	Defining SNMP Group Profiles	Setting Policy Binding
Defining Port Authentication	Defining SNMP Group Members	Managing Device Diagnostics
Configuring Multiple Hosts	Defining SNMP Communities	Configuring Port Mirroring
Defining Authentication Hosts	SNMP Communities Basic Table	Viewing Statistics
Viewing EAP Statistics	SNMP Communities Advanced Table	Viewing Interface Statistics
Defining Access Control Lists	Configuring SNMP Notifications	Viewing Interface Statistics
Defining IP Based Access Control Lists	Defining SNMP Notification Global Parameters	Receive Statistics
Defining MAC Based Access Control Lists	Defining SNMP Notification Filters	Transmit Statistics
Binding Device Security ACLs	Defining SNMP Notification Recipients	Viewing Etherlike Statistics
Managing Port Security	SNMPv1,2c Notification Recipients	Managing RMON Statistics
Enabling Storm Control	SNMPv3 Notification Recipients	Viewing RMON Statistics
Configuring System Logs	Configuring Multicast Forwarding	Configuring RMON History
Defining General Log Properties	Multicast Forwarding	Defining RMON History Control
Viewing Memory Logs	Typical Multicast Setup	Viewing the RMON History Table
Viewing Flash Logs	Multicast Operation	Configuring RMON Events
Defining System Log Servers	Multicast Registration	Defining RMON Events Control
Configuring Interfaces	Multicast Address Properties	Viewing the RMON Events Logs
Configuring Ports	Defining Multicast Properties	Defining RMON Alarms
Aggregating Ports	Adding MAC Group Address	
Configuring LACP	Adding IP Multicast Groups	

Lightly Managed – 10 second boot - Manuals available upon request

CLI and Web Interface

IPV4 / IPV6 routing

Information on links and routing

Tagged and untagged VLAN configurations

Trunk Link Aggregation

Port Mirroring

Port Based QoS

802.1P QoS

Rate Limitations

Loop Detection

Multicast IGMP Snooping

Cable Diagnostics

CF020400-065

- System
- Port
- Statistics
- VLAN
- Trunking
- Mirror
- QoS
- Rate
- Loopback Detect
- Multicast
- Cable Diagnostic
- Access Control
- Password
- Logout

100G

25.50G

2.5-10G

10M-1G

AN

01

02

03

04

05

06

07

08

09

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

IEEE 802.1P QoS

Port-Based QoS

QoS Setting

Help

Scheduling Method:

Weighted Round Robin

Priority	(Low)	0	1	2	3	4	5	6	(High)	7	Weight
Queue 0 (Low)											1
Queue 1											2
Queue 2											4
Queue 3 (High)											8

ACCESSORIES

El Sharko - 3U VPX Development Chassis

Supporting Legacy RVPX and SOSA Aligned Payload Integration

The El Sharko is a versatile bench-top platform designed to provide the scalability needed for rapid development, demonstration, and evaluation of 3U VPX and SOSA-aligned systems. By streamlining design cycles, El Sharko helps accelerate deployment timelines. Its design allows for quick backplane replacements and seamless transitions between air-cooled and conduction-cooled slot inserts.

Featuring an open-frame design, El Sharko includes a backplane, power supply, fan cooling, and rear transition slots, supporting a wide range of test functions. It comes standard with an 8-slot, 1.2" pitch, 40Gb power and ground backplane to enhance your development capabilities.

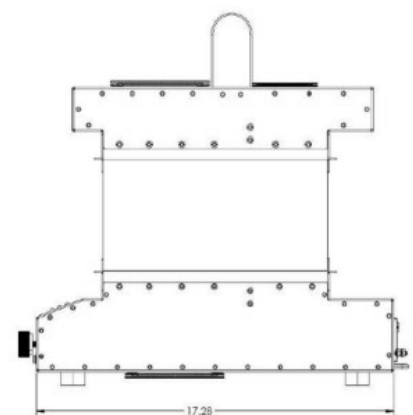
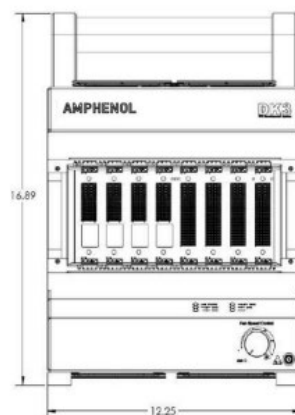
The platform is equipped with a balanced 12V/5V power supply for mixed power payloads, with an optional 12V-centric power supply available upon request. Both configurations are optimized to meet current and future VPX and SOSA-aligned module power requirements.

Datasheet:

<https://www.amphenol-aerospace.com/resources/literature/view/el-sharko-3u-vpx-dev-chassis-datasheet>

PART NUMBER TABLE

CF-020400-604	The El Sharko development chassis, 8 x 1.2" pitch air-cooled slots, power, and ground pass-thru 40Gb backplane with 4 x VITA67 full width apertures and balanced 12V/5V PSU. Consult Amphenol for 12V centric PSU and fully populated backplane availability
CF-020400-605	Conduction cooled guide accessory kit. Includes top and bottom guides plus mounting hardware



Nessie - 3U VPX 50G Development Chassis

Supporting new VITA-91 and SOSA Aligned Payload Integration

Nessie is the premier development chassis featuring high-density SOSA V91 connectors, specifically designed for next-generation VPX systems operating at 50Gbps. It offers unmatched scalability, making it ideal for rapid development, demonstration, and evaluation of MIL-HD2 Next-Gen SOSA/VITA 91-aligned connectors, perfectly suited for advanced switch and payload card requirements.

By accelerating design cycles, Nessie enables faster time to deployment. Its flexible design allows for quick backplane replacements and seamless transitions between air-cooled and conduction-cooled slot inserts, making it a versatile solution for a range of applications.

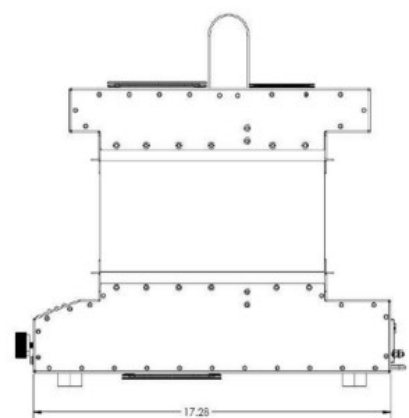
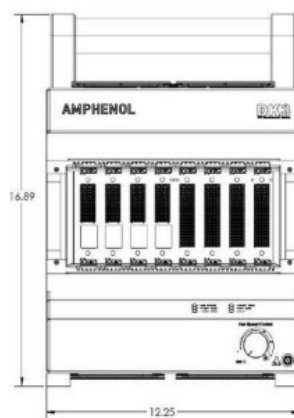
The open-frame chassis includes an integrated backplane, power supply, fan cooling, and rear transition slots, all supporting various test functions. Nessie comes standard with a 6-slot, 1.2" pitch, 50Gb backplane, ensuring robust support for your development needs. It also features a balanced 12V/5V power supply for mixed power payloads, with an optional 12V-centric power supply available on request, meeting the power requirements for both current and future VPX and SOSA-aligned modules.

Datasheet:

<https://www.amphenol-aerospace.com/resources/literature/view/3u-vpx-50g-development-chassis-nessie>

PART NUMBER TABLE

CF-020400-612	The Nessie development chassis, 6 x 1.2" pitch air-cooled slots, power, and ground pass-thru 50Gb backplane with 3 x VITA67 full width apertures and balanced 12V/5V PSU. Consult Amphenol for 12V centric PSU and fully populated backplane availability
CF-020400-605	Conduction cooled guide accessory kit. Includes top and bottom guides plus mounting hardware



Amphenol Ruggedization Pedigree

OVERVIEW:

Amphenol integrated electronic products are designed and manufactured to our Ruggedization guidelines listed below. These guidelines ensure years of reliable operation in harsh environment applications where extreme operating temperatures, shock, vibration, and corrosive atmospheres are regularly experienced. Unless otherwise noted, the parts conform to the below specifications

TEMPERATURE:

- Operating Temperature- Thermal Cycles between -40°C and 85°C while device is operating
- Temperature is measured at chassis housing or card edge
- Storage Temperature- Thermal Cycles between -55°C and 125°C

HUMIDITY:

- Operating Humidity- Humidity cycle between 0-100% non-condensing humidity while device operating
- Storage Humidity- Humidity cycle between 0-100% condensing humidity

SEALING:

- Sealing can be optionally provided at the MIL-DTL-38999 interface with up to 10-5 cc/sec performance

SHOCK AND VIBRATION:

- Sine Vibration - 10g Peak, 5-2,000Hz
 - Based on a sine sweep duration of 10 minutes per axis in each of three mutually perpendicular axes. May be displacement limited from 5 to 44 Hz, depending on specific test.
- Random Vibration - 0.0005 @ 5Hz, 0.1 @ 15 Hz, 0.1 @ 2,000 Hz
 - 60 minutes per axis, in each of three mutually perpendicular axes.
- 40 G Peak Shock Cycle
 - Three hits in each axis, both directions, ½ sine and terminal-peak saw tooth, Total 36 hits.

LIQUIDS SUSCEPTABILITY:

- MIL-DTL-38999 receptacle interface per EIA-364-10E

ALTITUDE:

- -1,500 to 60,000 ft Altitude Testing w/ Rapid Depressurization

ELECTROMAGNETIC COMPATIBILITY:

- Designed to comply with MIL-STD-461E

PRINTED CIRCUIT BOARD ASSEMBLIES:

- Conformal Coat
- Amphenol performs Conformal Coating to both sides of printed circuit board assemblies using HUSMISEAL IB31 in accordance with IPC-610, Class 3.
- Printed Circuit Board Rigidity
- Amphenol printed circuit boards are fabricated in accordance with IPC-6012, Class 3.
- Printed Circuit Board Fabrication
- Amphenol printed circuit boards acceptance criteria is in accordance with IPC-610, Class 3.

RELIABILITY PREDICTIONS (MTBF):

Amphenol can perform Mean Time Between Failure (MTBF) reliability analysis in full compliance with MIL-HDBK-217F-1 Parts Count Prediction and MIL-HDBK-217F-1 Parts Stress Analysis Prediction. We can also perform reliability analyses in full compliance of ANSI/VITA 51.1 if it is required or preferred over the later met

Notice: Specifications are subject to change without notice. Contact your nearest Amphenol Corporation Sales Office for the latest specifications. All statements, information and data given herein are believed to be accurate and reliable but are presented without guarantee, warranty, or responsibility of any kind, expressed or implied. Statements or suggestions concerning possible use of our products are made without representation or warranty that any such use is free of patent infringement and are not recommendations to infringe any patent. The user should assume that all safety measures are indicated or that other measures may not be required. Specifications are typical and may not apply to all connectors.

AMPHENOL is a registered trademark of Amphenol Corporation.

©2023 Amphenol Corporation REV: PRELIMINARY



40-60 Delaware Avenue
Sidney, NY 13838
amphenol-aerospace.com | amphenolmao.com

3U 10G VPX ETHERNET SWITCH

AMPHENOL FAMILY OF RUGGEDIZED ETHERNET SWITCHES

PDS - 301



DESCRIPTION

Amphenol's 3U VPX-managed Ethernet Switches are configurable for system connectivity, speeds, port types, and interoperation with various high-speed media converters and connectors for system interfacing. The configurability to meet system requirements is achieved through superior product design. Each port is capable of 10G Ethernet -- some ports can either be configured as 10G-Base-T (also supporting 100-Base-T and 1G-Base-T) or 10G-Base-KR (also supporting 1000-Base-X and SGMII). The switching throughput is up to 480 Gbps when using all 48 ports on the switch. In addition, the switch is non-blocking and low-latency for high-throughput architectures and applications. While the backplane is providing the highest densities of port count, the front-panel connections operate with various copper/fiber media converters and high-speed system connectors. Finally, the management software provides a command line interface, SNMP, and other web-based options for configuring the switch. It is capable of a full complement of virtualization, quality of service, security, tunneling, precision-time protocol, and other capabilities.

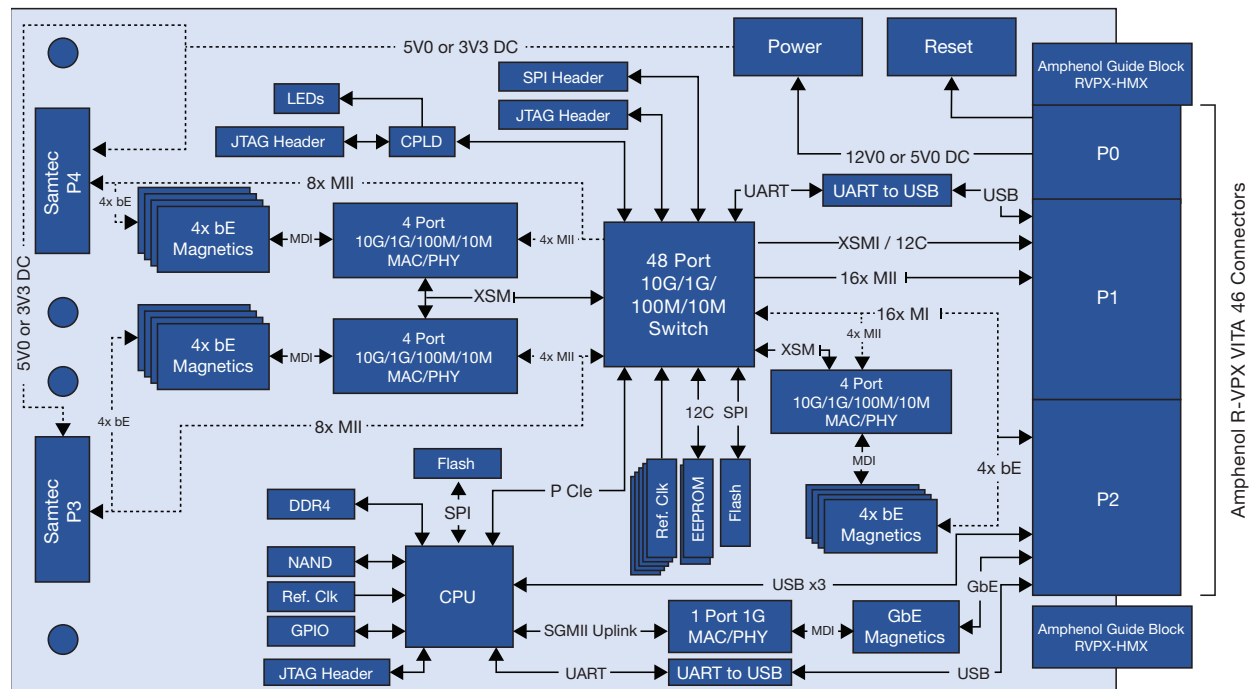
FEATURES & BENEFITS

- Up to 48 channels of 10 GbE interfaces on a single card. Many of the ports are configurable between 10G-Base-T and 10G-Base-KR. While the ports are all 10G capable, they also work in 100M and 1G modes.
- Line rate forwarding up to 480 Gbps
- Configurable for multiple backplane pinouts and profiles
- Highly managed multi-layer switching services to include multicast, QoS, and security features
- Precision time protocol (IEEE 1588v1/v2) support
- VITA 46 3U VPX available in conduction cooled -40-+85C environments as well as harsh vibration profiles

AAO Part Number	Cooling Method	Backplane			Top			AAO RTM Part Number
		AAO RTM Part Number 1/2.5/10G/10G-KR/40G-KR4*	100/1000M Base-T	10G Base-T	1/2.5/10G/10G-KR/40G-KR4* 1/2.5/10G/10G-KR/40G-KR4*	100/1000/10G Base-T	1G/10G/25G/40G/100G MMF	
CF-020400-022	Conduction	24		4	0	8	0	CF-020400-022R
CF-020400-023	Conduction	28		2	8	4	0	CF-020400-023R
CF-020400-024	Conduction	32		0	16	0	0	CF-020400-024R
CF-020400-026	Conduction	24		4	8	4	0	CF-020400-022R
CF-020400-027	Convection	24		4	8	4	0	CF-020400-022R
CF-020400-059	Conduction	32		0	0	8	0	CF-020400-024R
CF-020400-082	Conduction	8	12	0	0	0	0	CF-020400-082R
CF-020400-094	Conduction	32		0	0	0	24	CF-020400-024R

* Note: If 40G is enabled the port count gets divided by 4

BLOCK DIAGRAM



Compliant with Amphenol Part Numbers:

10-646402-272X	CF-20010-20X	CF-20010-348	CF-20010-1XX
10-646402-273X	CF-20010-21X	CF-20010-64X	CF-20010-2XX
CF-20010-19X	CF-20010-275	CF-20010-8XX	CF-20010-908

ETHERNET INTERFACES - BACKPLANE

- 28 ports of 10G-Base-KR / SGMII / 1000-Base-X are static
- 4 ports of 10G-Base-T / 1G-Base-T / 100-Base-T – each of these channels can also (via population options) be converted to 10G-Base-KR / SGMII / 1000-Base-X. In the even only 10G-Base-KR / SGMII / 1000-Base-X is needed, these 4 channels become 8 channels of 10G-Base-KR / SGMII / 1000-Base-X because of the reduced signal count
- A maximum of 36 channels of 10G-Base-KR / SGMII / 1000-Base-X can be brought to the backplane
- This part is also compliant with Amphenol LightConex technology thereby removing a half differential pair wafer and replacing with backplane blind mate compliant fiber to copper and copper to fiber conversion. By utilizing Light Conex, 8 channels of 10G-Base-KR / SGMII / 1000-Base-X will be replaced by 4 channels of 10G-Base-SR / 1G-Base-SX. If LightConex is of interest, please contact the factory.

ETHERNET INTERFACES - FRONT PANEL

- By using 2 Samtec HQDP-020 headers for right angle installs of Samtec ribbon cables (with screw down option), 8 channels 10G-Base-T / 1G-Base-T-100-Base-T are accessible.
- In the event an application requires 10G-Base-KR / SGMII / 1000-Base-X, these 8 channels become 16 channels and they can be used for media conversion or other system components.
- Any mix of 10G-Base-T / 1G-Base-T / 100-Base-T and 10G-Base-KR / SGMII / 1000-Base-X is configurable

TECHNICAL SPECIFICATIONS

LAYER 2 SWITCHING ENGINE

- 802.1Q-compliant bridging
- Large forwarding database for MAC entries, IGMPv3/MLDv2 IP multicast, FCoE entries, and router host entries
- Learning and forwarding based on virtual ports (ePorts) and virtual bridge domains
- L2 ECMP and link aggregation groups

LAYER 3 WIRE-SPEED ROUTING ENGINE

- Longest prefix match for IPV4/6 and IP Multicast
- Policy based routing
- VRF, VRF-Lite, BGP/MPLS IP VPNs
- Multicast routing supporting PIM-SM/DM and PIM-bidirectional routing protocols
- ECMP routing for load balancing traffic
- Network address translation (NAT 44,66)

INTEROPERABILITY WITH AMPHENOL HIGH SPEED CONNECTORS

- Many options exist including Amphenol 10-646402-273X and 10-646402-272X which are Amphenol Octonet 10G-Base-T / 1G-Base-T connectors with Samtec HQDP accessible sites.
- Many options for system cables exist including Amphenol CA-628485-C00 and CA-628485-C01 which work with the 10-646402-273X and 10-646402-272X.

INTEROPERABILITY WITH AMPHENOL FIBER/ COPPER MEDIA CONVERTERS

- By using the board top Samtec HQDP connectors as well as Samtec HQDP configurable ribbons, the 3U VPX switch is easily connected to endless Amphenol fiber/ copper media converters. Examples are below.
- Many other options exist and can be tailored to customer system architectures.

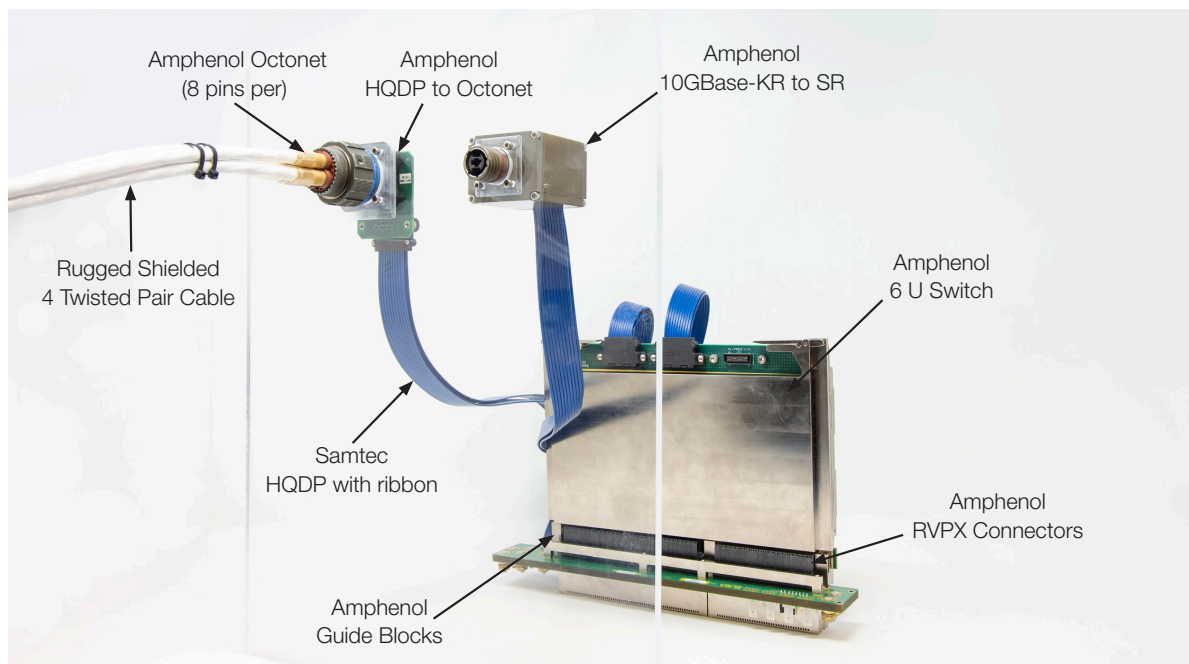
EXAMPLES

CF-020011-1XX – quad channel 10G-Base-KR / 1000-Base X to 10G-Base-SR / 1G-Base-S converter

CF-020010-277 – dual channel 1000-Base-X / SGMII to 1G-Base-LX single mode fiber optic converter

CF-020010-657 – dual channel 1000-Base-X / SGMII to 1G-Base-SX multi-mode fiber optic converter

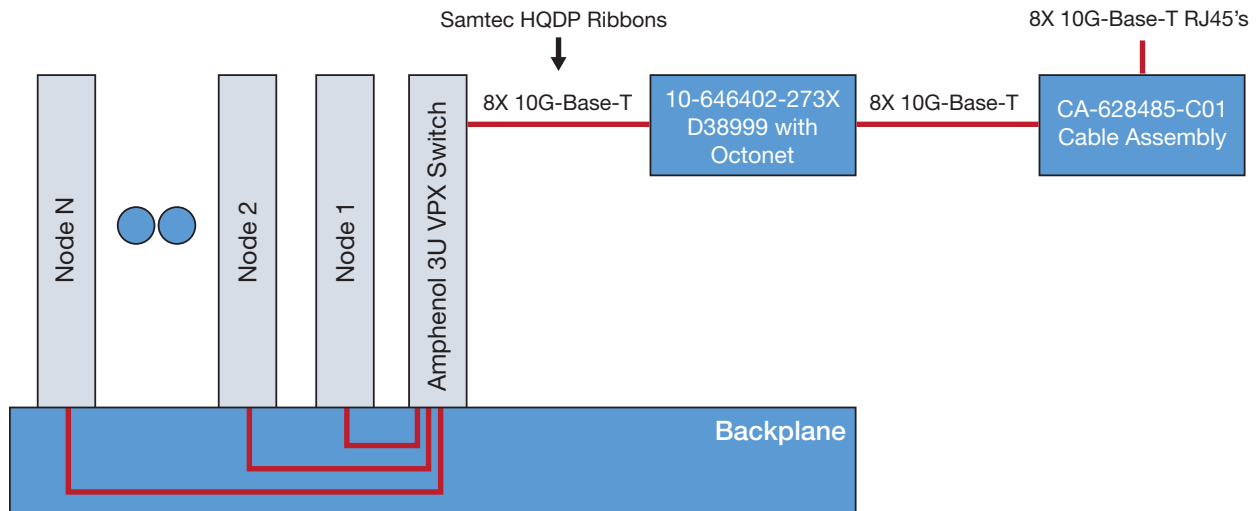
CF-020010-29NZ – 16 channel 1000-Base-X / 10G to 10G-Base-SR / 1G-Base-SR multi-mode fiber optic media converter



APPLICATION EXAMPLES

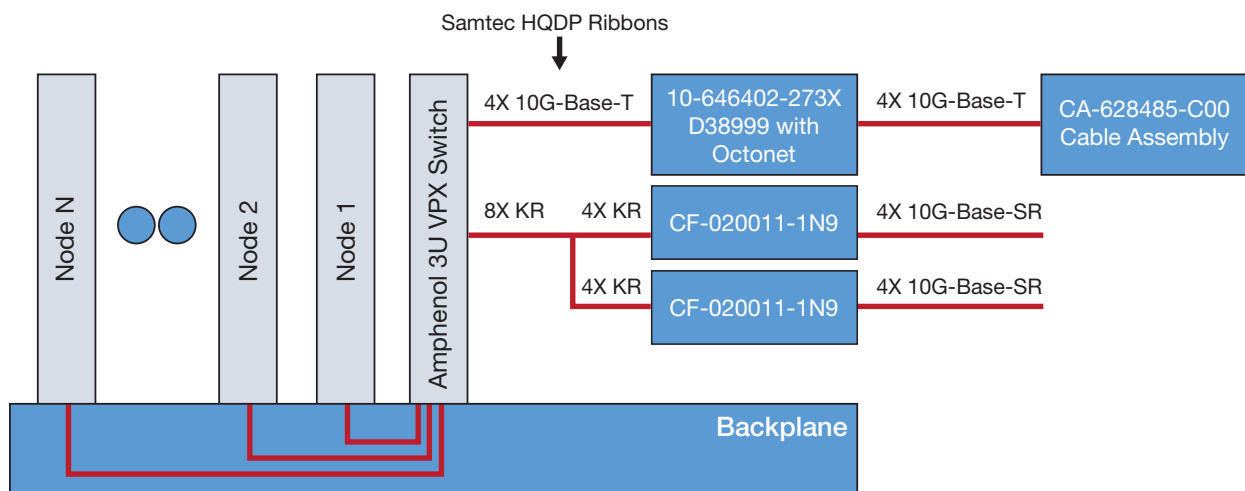
Example 1

Amphenol VPX switch coupled with Samtec HQDP cable, Amphenol Octonet Connector, and Amphenol breakout cable for system connectivity of 8X 10G-Base-T channels. 10G-Base-T can also be 1G-Base-T and 100-Base-T.



Example 2

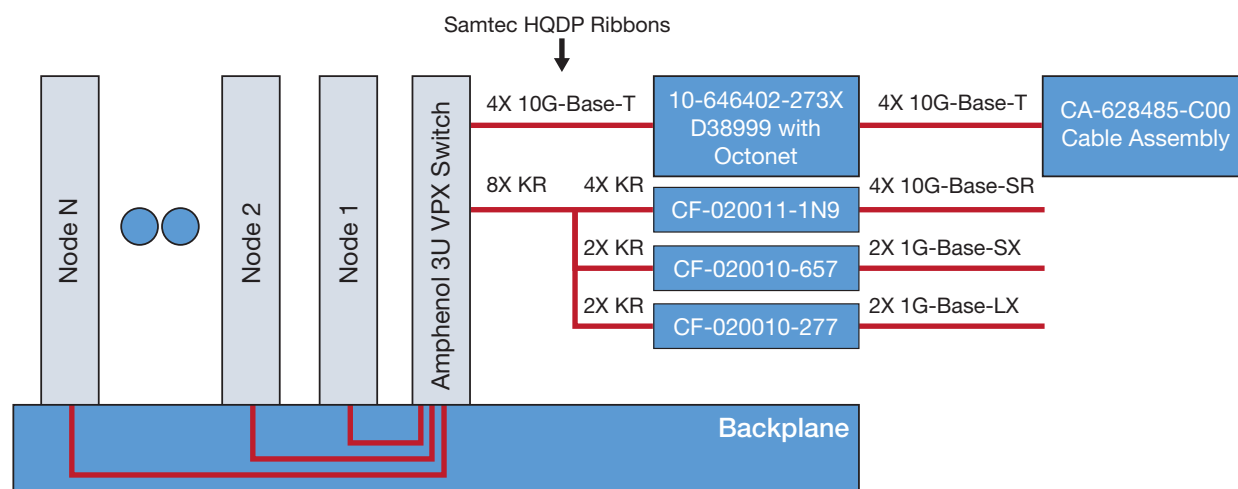
Amphenol VPX switch coupled with Samtec HQDP cable, Amphenol Octonet Connector, and Amphenol breakout cable for system connectivity of 4X 10G-Base-T channels. 10G-Base-T can also be 1G-Base-T and 100-Base-T. The Amphenol VPX switch is also coupled with another Samtec HQDP cable and Amphenol media converter CF-020011-1N9 for conversion of 8X channels of 10G-Base-KR to 8X channels of 10G-Base-SR 850nm multi-mode fiber optic links. The optical links also work at 1G speeds.



APPLICATION EXAMPLES

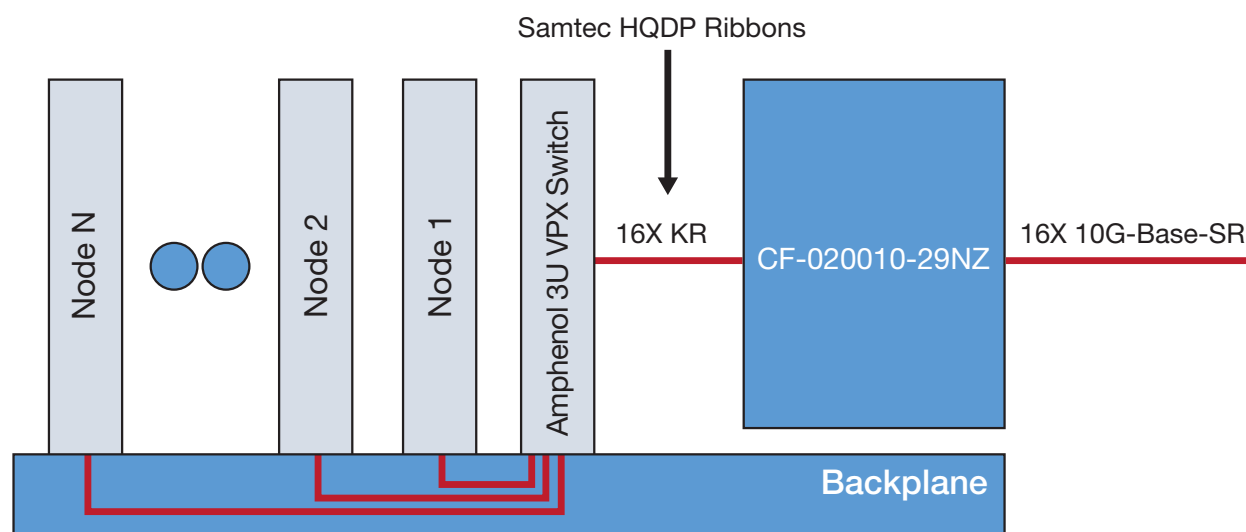
Example 3

Amphenol VPX switch coupled with Samtec HQDP cable and Amphenol media converter CF-020010-29NZ for conversion of 16X channels of 10G-Base-KR to 10G-Base-SR 850nm multi-mode fiber optic links. The optical links also work at 1G speeds. Amphenol VPX switch coupled with Samtec HQDP cable, Amphenol Octonet Connector, and Amphenol breakout cable for system connectivity of 4X 10G-Base-T channels. 10G-Base-T can also be 1G-Base-T and 100-Base-T. The Amphenol VPX switch is also coupled with another Samtec HQDP cable and Amphenol media converter CF-020011-1N9 for conversion of 4X channels of 10G-Base-KR to 4X channels of 10G-Base-SR 850nm multi-mode fiber optic links. The optical links also work at 1G speeds. Finally, 4X channels of 10G-Base-KR are also coupled with Amphenol Media Converters CF-020010-657 and CF-020010-277 for 4X fiber links of 2X 1G-Base-SX and 2X 1G-Base-LX.



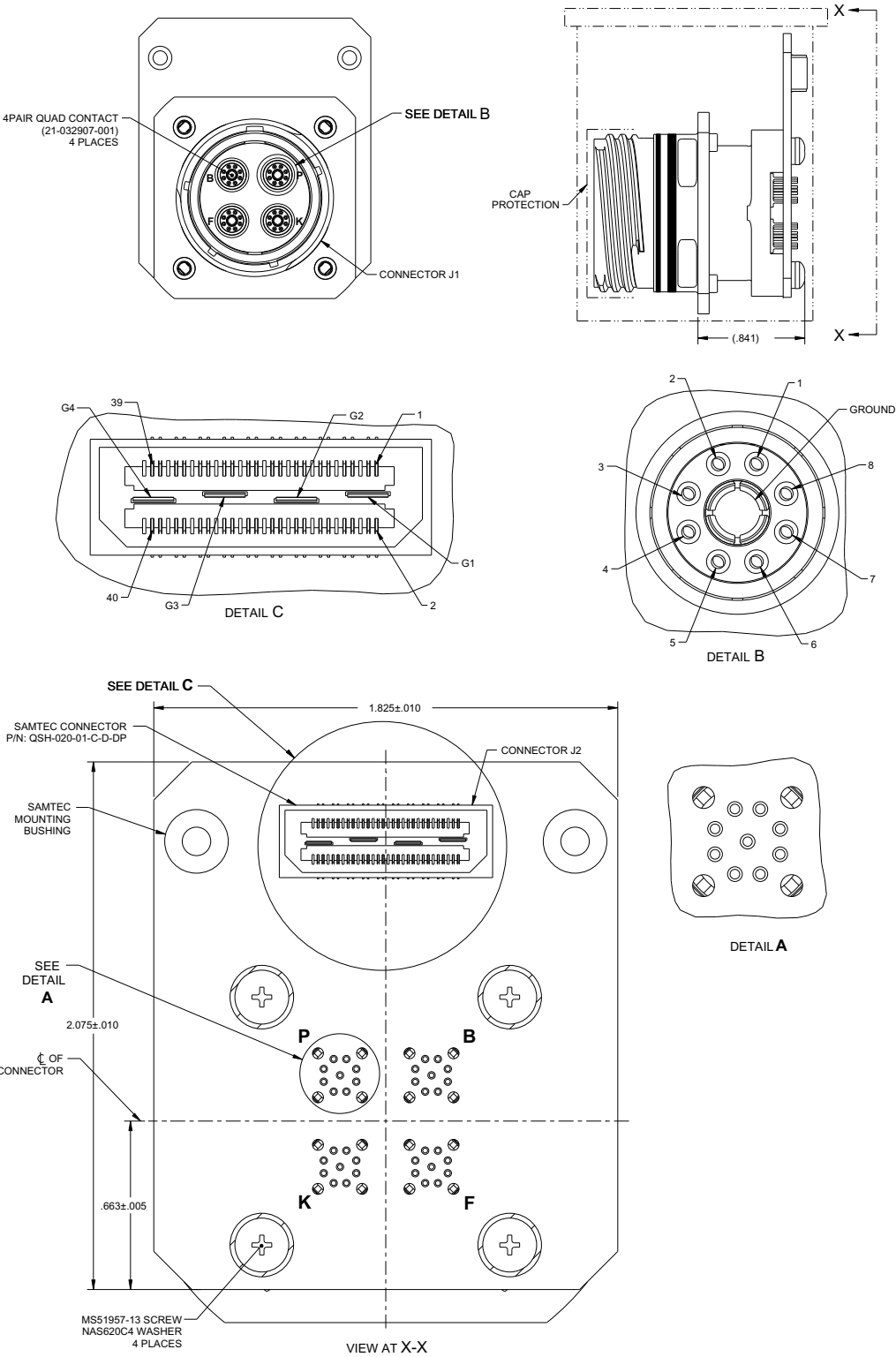
Example 4

Amphenol VPX switch coupled with Samtec HQDP cable and Amphenol media converter CF-020010-29NZ for conversion of 16X channels of 10G-Base-KR to 10G-Base-SR 850nm multi-mode fiber optic links. The optical links also work at 1G speeds.



10-646402-272X: CONNECTOR DETAILS

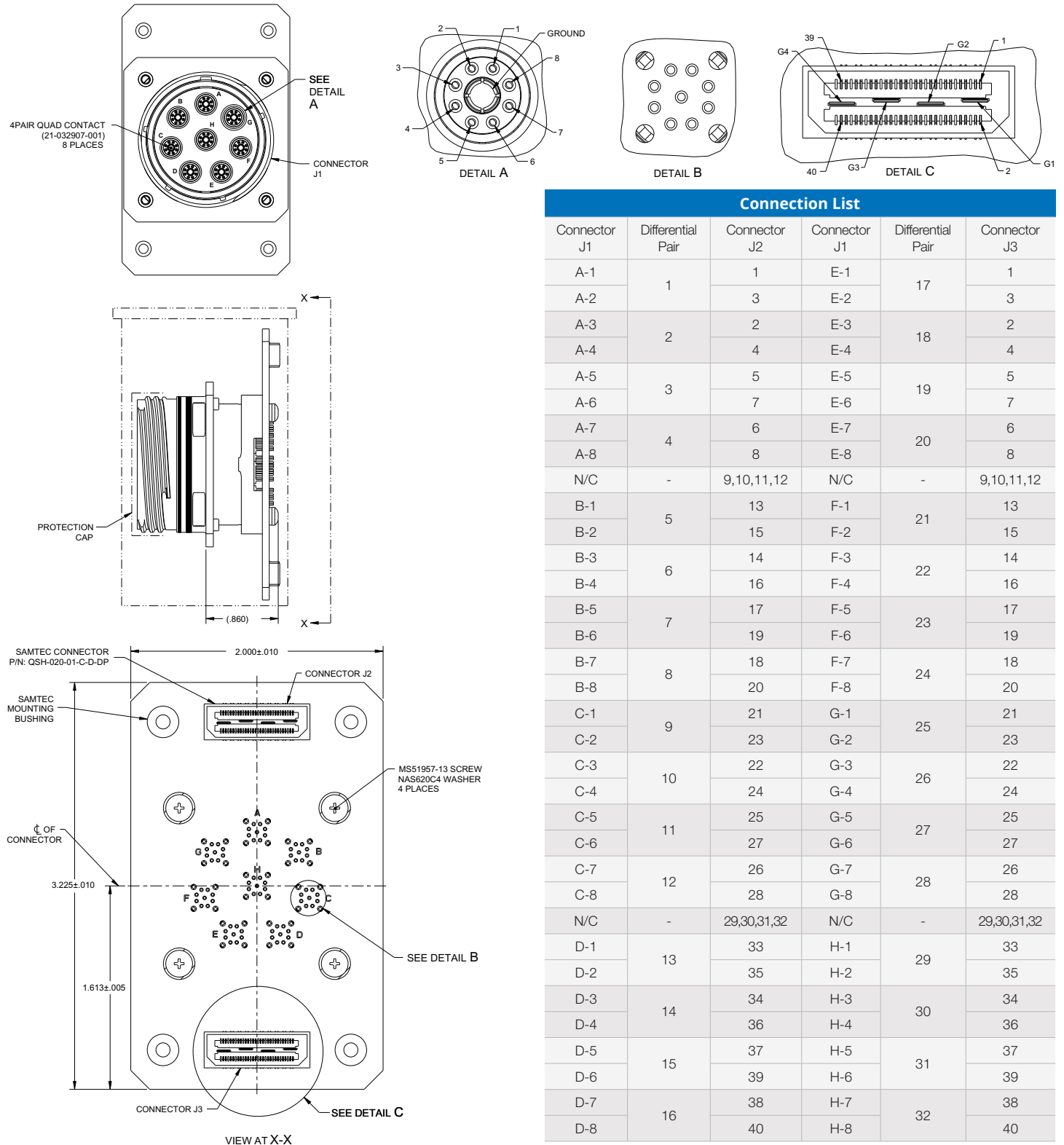
Receptacle Connector; TV40GQDZ-19-ABS; Ground Plane; 4-pair Quad Contact



Connection List		
Connector J1	Differential Pair	Connector J3
E-1	17	1
E-2		3
E-3	18	2
E-4		4
E-5	19	5
E-6		7
E-7	20	6
E-8		8
N/C	-	9,10,11,12
F-1	21	13
F-2		15
F-3	22	14
F-4		16
F-5	23	17
F-6		19
F-7	24	18
F-8		20
G-1	25	21
G-2		23
G-3	26	22
G-4		24
G-5	27	25
G-6		27
G-7	28	26
G-8		28
N/C	-	29,30,31,32
H-1	29	33
H-2		35
H-3	30	34
H-4		36
H-5	31	37
H-6		39
H-7	32	38
H-8		40

10-646402-273X: CONNECTOR DETAILS

Receptacle Connector; TV40GQDZ-25-8S; Ground Plane; 4-pair Quad Contact

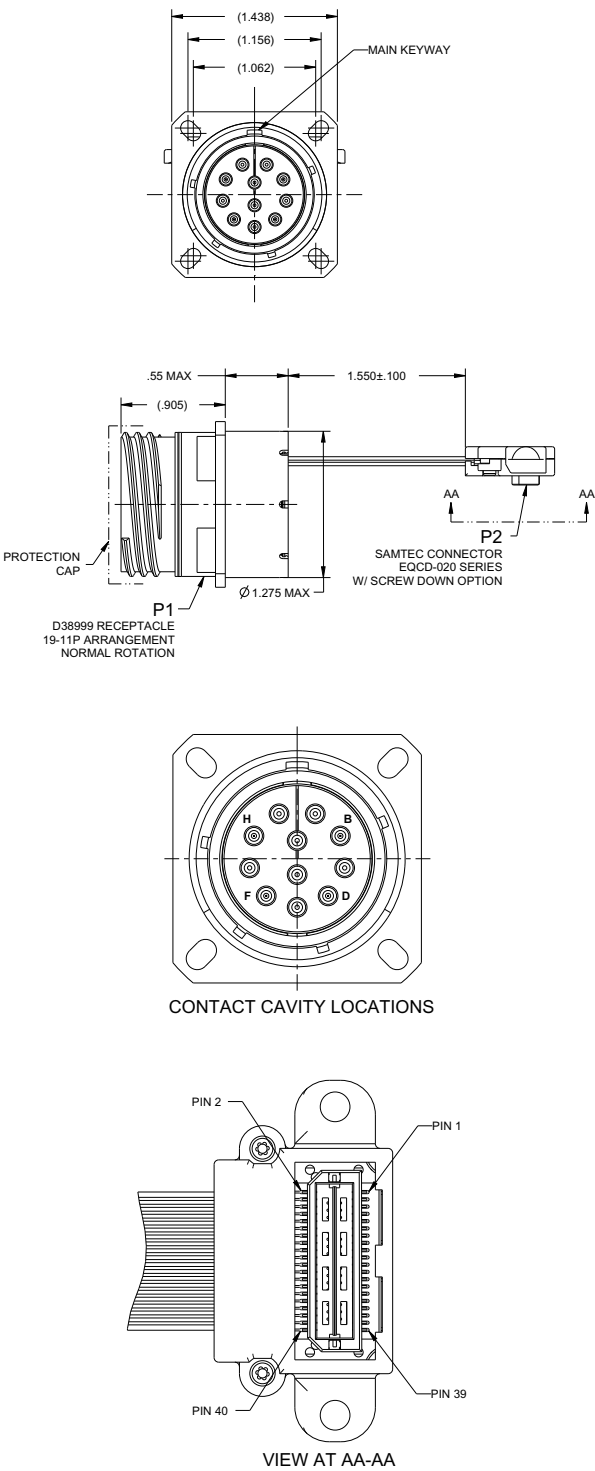


Connection List

Connector J1	Differential Pair	Connector J2	Connector J1	Differential Pair	Connector J3
A-1	1	1	E-1	17	1
A-2		3	E-2		3
A-3	2	2	E-3	18	2
A-4		4	E-4		4
A-5	3	5	E-5	19	5
A-6		7	E-6		7
A-7	4	6	E-7	20	6
A-8		8	E-8		8
N/C	-	9,10,11,12	N/C	-	9,10,11,12
B-1	5	13	F-1	21	13
B-2		15	F-2		15
B-3	6	14	F-3	22	14
B-4		16	F-4		16
B-5	7	17	F-5	23	17
B-6		19	F-6		19
B-7	8	18	F-7	24	18
B-8		20	F-8		20
C-1	9	21	G-1	25	21
C-2		23	G-2		23
C-3	10	22	G-3	26	22
C-4		24	G-4		24
C-5	11	25	G-5	27	25
C-6		27	G-6		27
C-7	12	26	G-7	28	26
C-8		28	G-8		28
N/C	-	29,30,31,32	N/C	-	29,30,31,32
D-1	13	33	H-1	29	33
D-2		35	H-2		35
D-3	14	34	H-3	30	34
D-4		36	H-4		36
D-5	15	37	H-5	31	37
D-6		39	H-6		39
D-7	16	38	H-7	32	38
D-8		40	H-8		40

CF-020010-277: FIBER OPTIC TRANSCEIVER DETAILS

Fiber Optic, Single Mode, 19-11P, Optoelectronic Transceiver; OD-CAD, ESD Sensitive Components

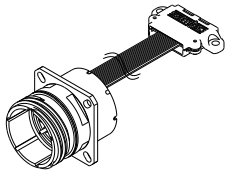
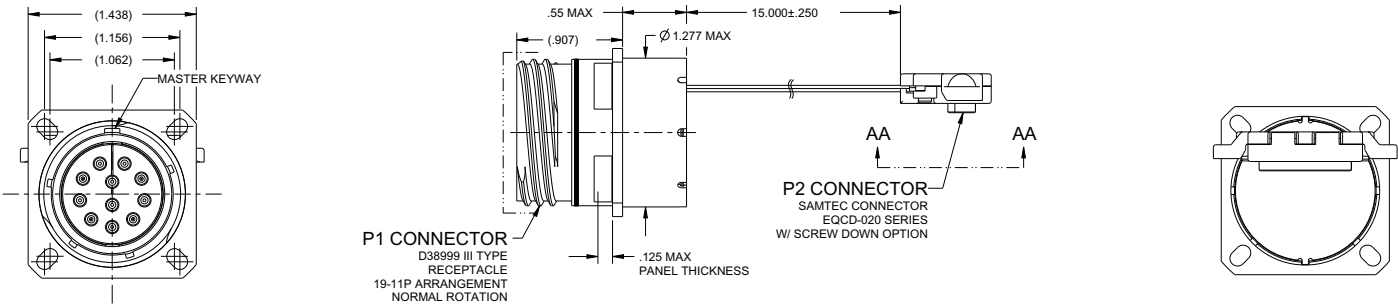


P1 I/O Chart		
Cavity ID	Signal	Description
B	TX2	Transmit CH2, Optical
D	TX1	Transmit CH1, Optical
F	RX1	Receive CH1, Optical
H	RX2	Receive CH2, Optical

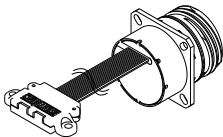
J2 I/O		
PIN Number	Signal Name	Description
1	FI-LOS	Loss of Signal Channel 1_ROSA
2	GND	GROUND
3	ETH1-SIN-N	Channel 1 Receive Negative
4	NOT CONNECTED	
5	ETH1-SIN-P	Channel 1 Recieve Positive
6	FI-TXDIS	Channel 1 TOSA Disable
7	ETH1-SOUT-N	Channel 1 Transmit Negative
8	3.3V-RX1	3.3V
9	ETH1-SOUT-P	Channel 1 Transmit Positive
10	3.3V-TX1	3.3V
11	F2-LOS	Loss of Signal Channel 2_ROSA
12	GND	GROUND
13	ETH2-SIN-N	Channel 2 Receive Negative
14	NOT CONNECTED	
15	ETH2-SIN-P	Channel 2 Receive Positive
16	F2-TXDIS	Channel 2 TOSA Disable
17	ETH2-SOUT-N	Channel 2 Transmit Negative
18	3.3V-RX2	3.3V
19	ETH2-SOUT-P	Channel 2 Transmit Positive
20	3.3V-TX2	3.3V
21-40	NOT CONNECTED	

CF-020010-657: FIBER OPTIC TRANSCEIVER DETAILS

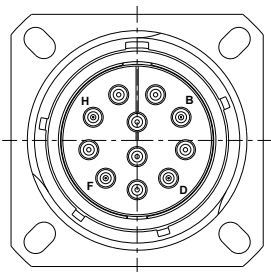
Fiber Optic, Multi-Mode, 19-11P, Optoelectronic Transceiver; Black Zinc Nickel Plated



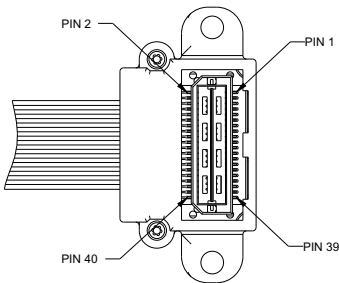
FRONT ISOMETRIC VIEW



REAR ISOMETRIC VIEW



CONTACT CAVITY LOCATIONS
P1 CONNECTOR



VIEW AT AA-AA
P2 CONNECTOR

P2 I/O Chart

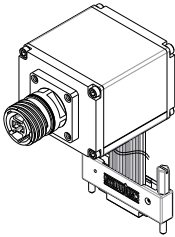
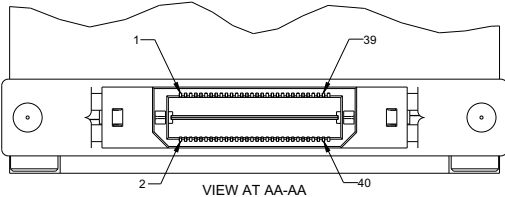
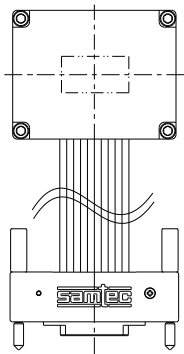
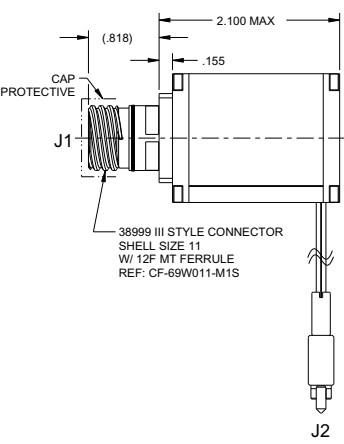
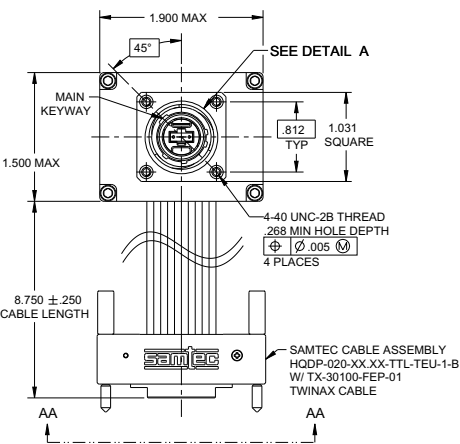
PIN Number	Signal Name
1	LOS1
2	GND
3	TX1-
4	N/C
5	TX1+
6	TXDIS1
7	RX1-
8	3.3V
9	RX1+
10	3.3V
11	LOS2
12	GND
13	TX2-
14	N/C
15	TX2+
16	TXDIS2
17	RX2-
18	3.3V
19	RX2+
20	3.3V
21-40	Not Connected

P1 I/O Chart

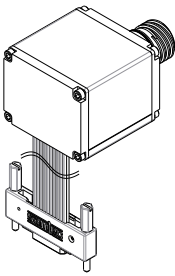
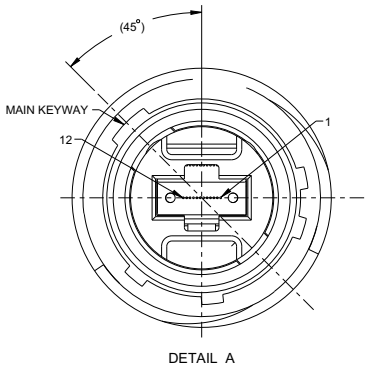
Cavity ID	Signal
A	N/C
B	TX2
C	N/C
D	TX1
E	N/C
F	RX1
G	N/C
H	RX2
J	N/C
K	N/C
L	N/C

CF-020011-1XX CONVERTER DETAILS

Converter 10G-BASE-KR / 10G-BASE-SR; 4 Channels



FRONT ISO VIEW



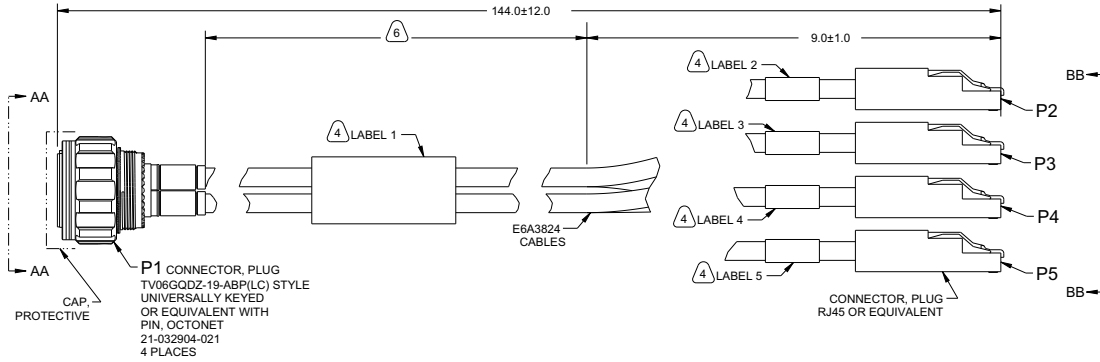
REAR ISO VIEW

J2 I/O			
ID	Signal	ID	Signal
1	KR_0_RX_P	2	KR_0_TX_P
3	KR_0_RX_N	4	KR_0_TX_N
5	KR_1_RX_P	6	KR_1_TX_P
7	KR_1_RX_N	8	KR_1_TX_N
9	N/C	10	N/C
11	N/C	12	N/C
13	N/C	14	N/C
15	N/C	16	N/C
17	+5V	18	+5V
19	GND	20	+5V
21	GND	22	SDA
23	GND	24	SCL
25	N/C	26	N/C
27	N/C	28	N/C
29	N/C	30	N/C
31	N/C	32	N/C
33	KR_2_RX_P	34	KR_2_TX_P
35	KR_2_RX_N	36	KR_2_TX_N
37	KR_3_RX_P	38	KR_3_TX_P
39	KR_3_RX_N	40	KR_3_TX_N

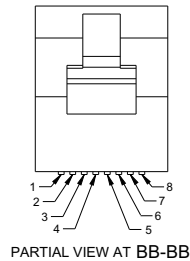
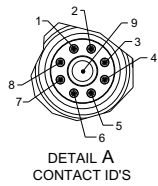
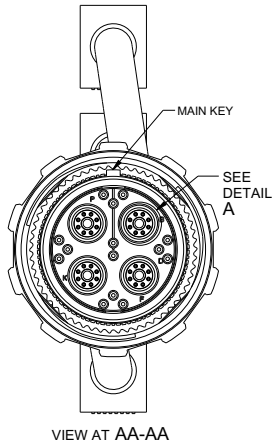
J1 I/O	
ID	Signal
1	RX0
2	RX1
3	RX2
4	RX3
5	N/C
6	N/C
7	N/C
8	N/C
9	TX3
10	TX2
11	TX1
12	TX0

CA-628485-C00: TEST CABLE DETAILS

Universally Keyed; TV06GQDZ-19-ABP to RJ45; Zinc Nickel Plated; 12 ft.



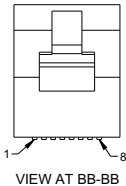
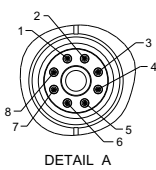
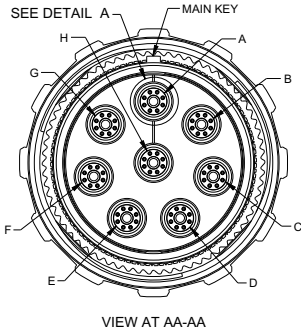
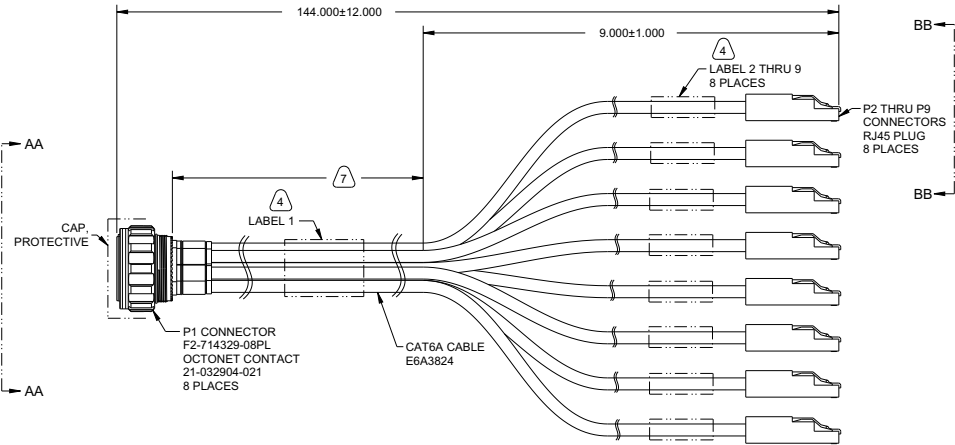
Marking Table	
Label ID	Marking
Label 1	AMPHENOL CA- 6284850-C00 DATE CODE PER 9-9172-3 & LOT NO.
Label 2	B
Label 3	F
Label 4	K
Label 5	P



Wiring Table			Wiring Table (Continued)		
P1 Connector Cavity ID	P2 Connector PIN ID	P3 Connector PIN ID	P1 Connector Cavity ID	P4 Connector PIN ID	P5 Connector PIN ID
B : 1	1	-	K : 1	1	-
B : 2	2	-	K : 2	2	-
B : 3	3	-	K : 3	3	-
B : 4	6	-	K : 4	6	-
B : 5	4	-	K : 5	4	-
B : 6	5	-	K : 6	5	-
B : 7	7	-	K : 7	7	-
B : 8	8	-	K : 8	8	-
F : 1	-	1	P : 1	-	1
F : 2	-	2	P : 2	-	2
F : 3	-	3	P : 3	-	3
F : 4	-	4	P : 4	-	4
F : 5	-	5	P : 5	-	5
F : 6	-	6	P : 6	-	6
F : 7	-	7	P : 7	-	7
F : 8	-	8	P : 8	-	8
B : 9 B : Outer	Outer	-	K : 9 K : Outer	Outer	-
F : 9 F : Outer	-	Outer	P : 9 P : Outer	-	Outer

CA-628485-C01: TEST CABLE DETAILS

Cable Assembly; Octonet Test; Universal Key



Wiring Table		Wiring Table	
P1 Cavity	P () Connector	P1 Cavity	P () Connector
A-1	P2-1	E-1	P6-1
A-2	P2-2	E-2	P6-2
A-3	P2-3	E-3	P6-3
A-4	P2-4	E-4	P6-4
A-5	P2-5	E-5	P6-5
A-6	P2-6	E-6	P6-6
A-7	P2-7	E-7	P6-7
A-8	P2-8	E-8	P6-8
B-1	P3-1	F-1	P7-1
B-2	P3-2	F-2	P7-2
B-3	P3-3	F-3	P7-3
B-4	P3-4	F-4	P7-4
B-5	P3-5	F-5	P7-5
B-6	P3-6	F-6	P7-6
B-7	P3-7	F-7	P7-7
B-8	P3-8	F-8	P7-8
C-1	P4-1	G-1	P8-1
C-2	P4-2	G-2	P8-2
C-3	P4-3	G-3	P8-3
C-4	P4-4	G-4	P8-4
C-5	P4-5	G-5	P8-5
C-6	P4-6	G-6	P8-6
C-7	P4-7	G-7	P8-7
C-8	P4-8	G-8	P8-8
D-1	P5-1	H-1	P9-1
D-2	P5-2	H-2	P9-2
D-3	P5-3	H-3	P9-3
D-4	P5-4	H-4	P9-4
D-5	P5-5	H-5	P9-5
D-6	P5-6	H-6	P9-6
D-7	P5-7	H-7	P9-7
D-8	P5-8	H-8	P9-8

3U VPX 56 CHANNEL 25G ETHERNET SWITCH

AMPHENOL FAMILY OF RUGGEDIZED ETHERNET SWITCHES

PDS - 313

3U Conduction Cooled (CC) 25G SWITCH:

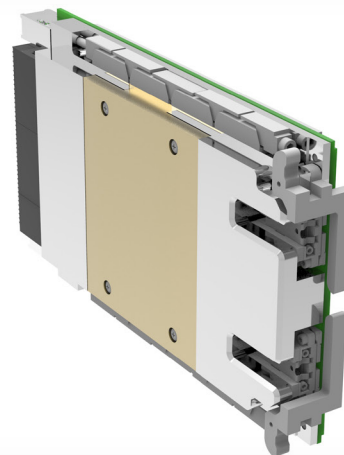
CF-020400-069

3U Air Cooled (AC) 25G SWITCH:

CF-020400-070

3U 25G Rear Transition Module (RTM):

CF-020400-069R



The 56 channel 25G ethernet switch is configurable for system connectivity, speeds, port types, and inter-operation of various media converters and connectors for system interfacing. The configuration to meet system requirements is achieved through superior product design. Each port is capable of 100G, 25G, 10G, 1G, or 100M Ethernet. The backplane consists of 32 channels of SERDES 25GBase-KR channels and the top of the board has 24 channels of 25GBase-SR fiber optics. Any four channels of the board can be ganged together for a 100G connection. The switching throughput is 1.4Tbps when using all 56 ports on the switch. In addition, the switch is non-blocking and low-latency for high-throughput architectures and applications. Finally, the management software provides a command line interface, SNMP, and other web based options for configuring the switch which is capable of a full complement of virtualization, quality of service, security, tunneling, PTP, and other capabilities.

FEATURES & BENEFITS

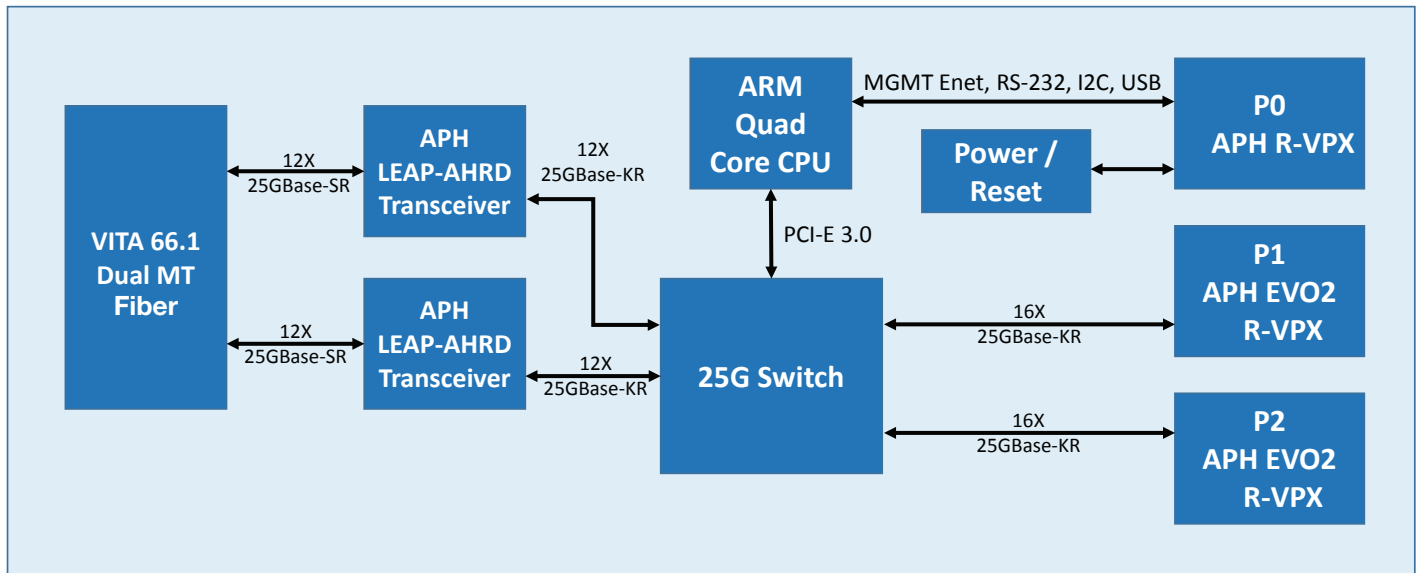
- Up to 56 channels of 25G interfaces on a single card. Ports are configurable for 100G, 25G, 10G, 1G, and 100M speeds.
- Line rate forwarding up to 1.4Tbps
- L2 / L3 managed switch
- PTP IEEE 1588v1/v2 support
- VITA 46 3U VPX available in conduction and air cooled configurations for -40-85C environments as well as harsh vibration profiles

ORDERING INFORMATION

Part Number	Cooling	Top Fiber	VPX SERDES
CF-020400-069	Conduction	24	32
CF-020400-070	Air	24	32
CF-020400-069R Rear Transition Module			

For other options, please contact factory.

BLOCK DIAGRAM



ETHERNET INTERFACES

- 1X 100/1GBase-T Management Interface
- 32X 25GBase-KR copper off P1 and P2 - Can be configured from 100M to 25GBase-KR
- 24X 25GBase-SR fiber off VITA connector on top of board

OTHER FEATURES

- Built in test on each port
- DHCP client, server per VLAN (4000+ available) instantiated
- Status interface – temperature, serdes, set speed, port packet counters
- NTP, ping, FEC, IGMP
- SNMP
- Custom routing
- Syslog
- SSH
- Web servers for status

TECHNICAL SPECIFICATIONS

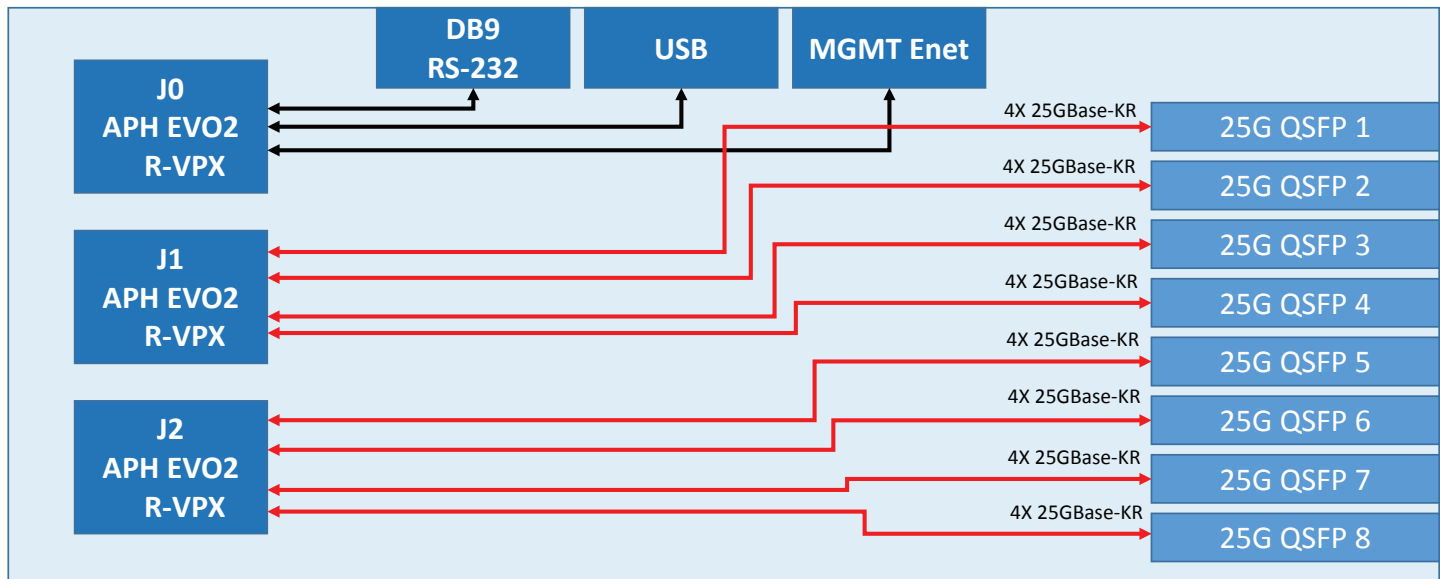
LAYER 2 SWITCHING ENGINE

- 802.1Q-compliant bridging
- Large forwarding database for MAC entries, IGMPv3/MLDv2 IP multi-cast, FCoE entries, and router host entries
- Learning and forwarding based on virtual ports (ePorts) and virtual bridge domains
- L2 ECMP and link aggregation groups

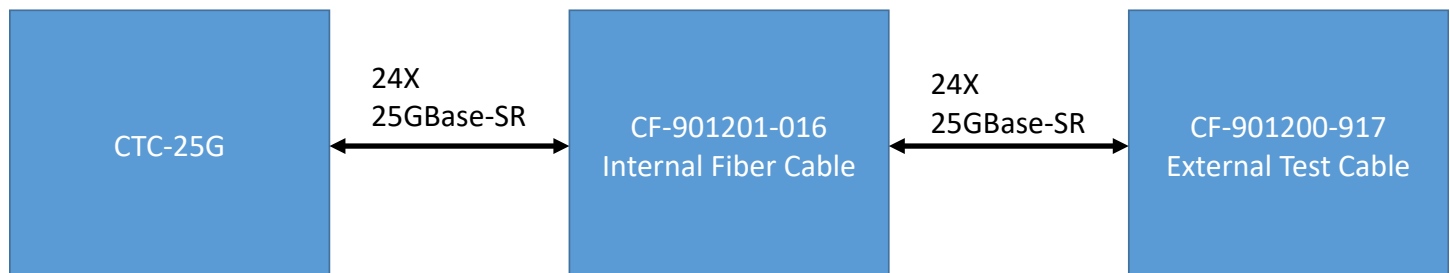
LAYER 3 WIRE-SPEED ROUTING ENGINE

- Longest prefix match for IPV4/6 and IP Multi-cast
- Policy based routing
- VRF, VRF-Lite, BGP/MPLS IP VPNs
- Multi-cast routing supporting PIM-SM/DM and PIM-bidirectional routing protocols
- ECMP routing for load balancing traffic
- Network address translation (NAT 44,66)

BLOCK DIAGRAM 3U REAR TRANSITION MODULE (RTM)

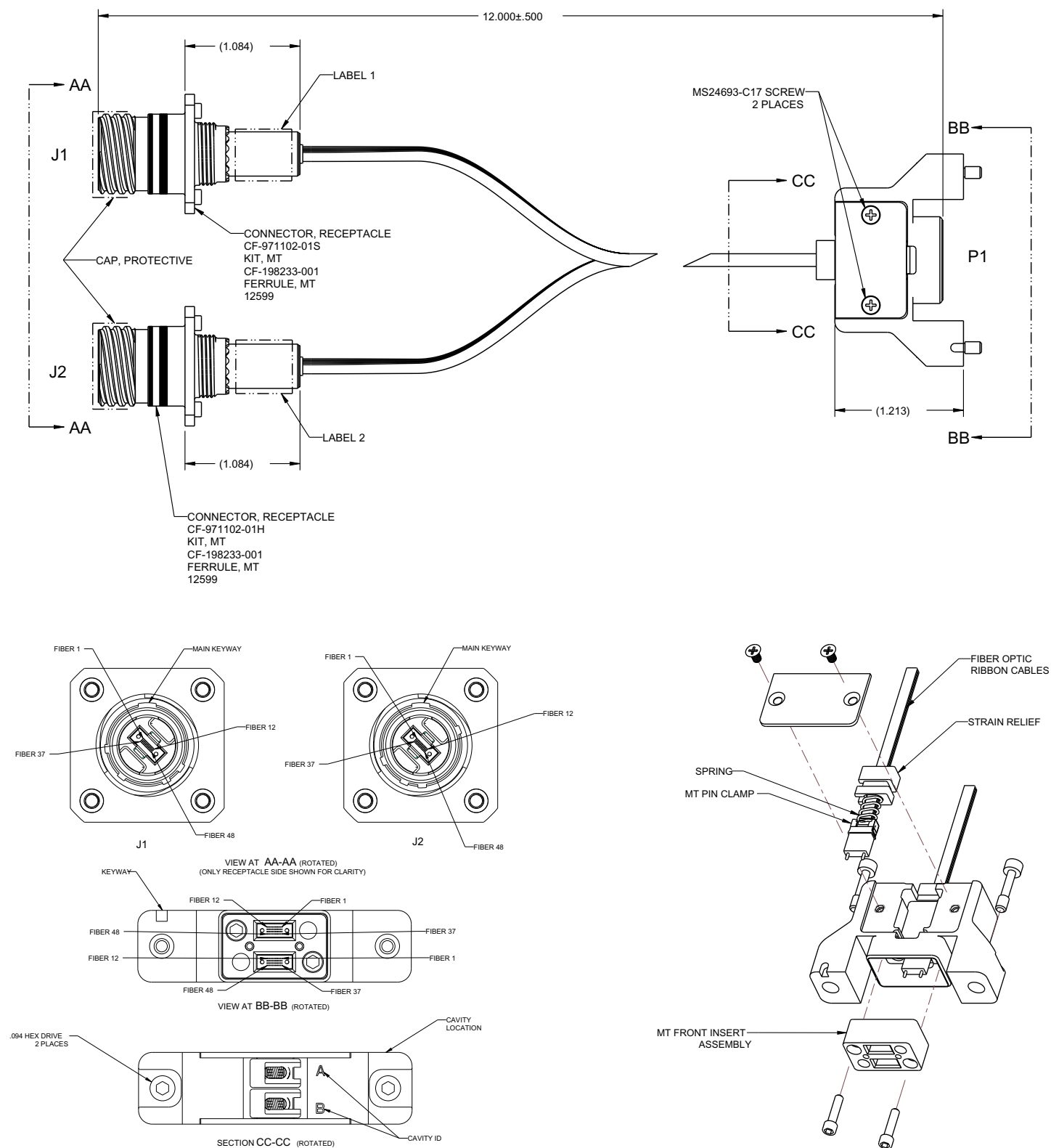


FIBER OPTIC CABLE TO TOP OF SWITCH

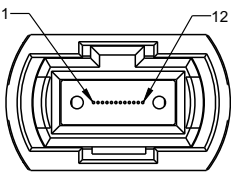
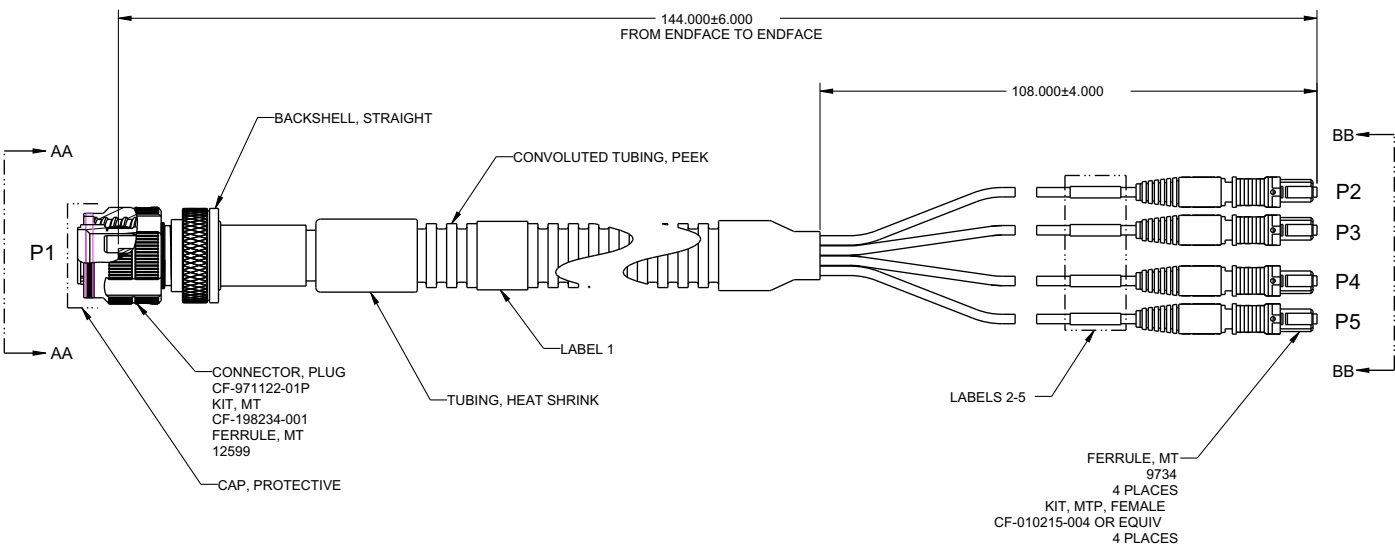


CF-901201-016: CONNECTOR DETAILS

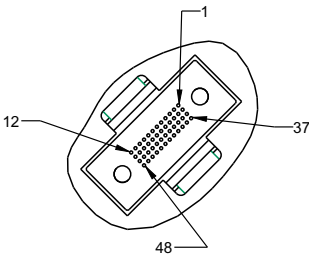
CABLE FIBER OPTIC: 2 48MT TO 2MT MODULE



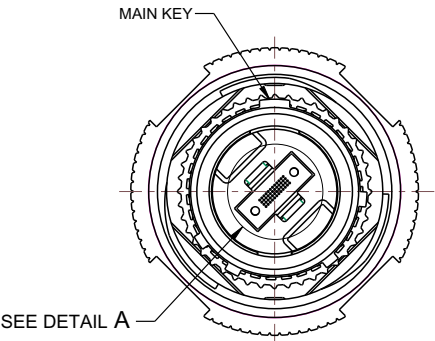
CF-901200-917: CONNECTOR DETAILS



VIEW AT BB-BB



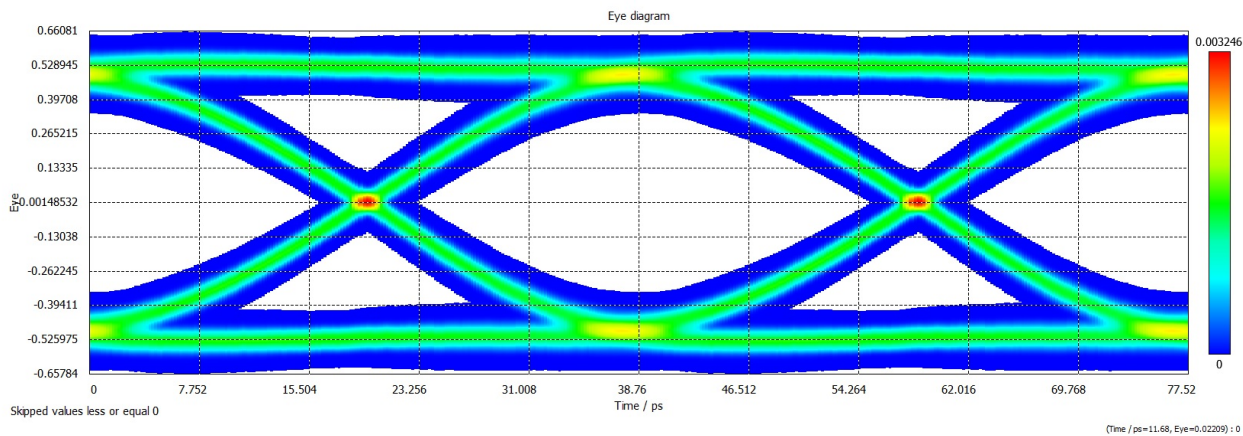
DETAIL A



INTRODUCTION

The changes in technology where R-VPX connectors are used has rapidly evolved in recent years, specifically driving a demand for higher data rates from copper contact based connectors, which have typically resided in the 10 & 16 Gbps speed realm. The fastest connector in the market to date is performing to 25 Gbps, but the market demands even faster speeds. This is where Amphenol's new EVO2 R-VPX connector is designed to dominate; as the first and only 32 Gbps+ VITA 46.30 connector available.

Eye pattern @ 25.8 Gbps



Note: PRBS-23 signal through D7E7-E7F7 pair with all surrounding pairs as active aggressors

DESIGN AND CONSTRUCTION

Amphenol Corporation is uniquely integrated to be able to provide collaborative design results, which R-VPX EVO2 development required. The expertise for this project was the same team that developed R-VPX and R-VPX EVO1, a blend of Amphenol design teams from AAO in Sidney, NY and Amphenol TCS in Nashua, NH. This team designed R-VPX EVO2 by borrowing proven characteristics from our R-VPX and R-VPX EVO1 series connectors, using high performance dielectric PCB material, reducing the surface area of the contacts in both connectors, and tirelessly tuning and testing the trace geometries for signal integrity to match impedance goals. The latter changes also reduce crosstalk between pairs. The addition of the organizer reduced the impedance in the gap at the mounting interface between the backplane connector and the backplane PCB. These changes enable the speed performance improvement in this new connector series while meeting all of the requirements of the VITA 46.30 specification and maintaining all backwards intermateability. See the next page for visual differences.

The new design resulted in three noticeable visual differences for end users:

1. The R-VPX EVO2 compliant eye size on the module (daughter card) connection region is smaller as compared to R-VPX connectors. (See Figure 1)
2. The R-VPX EVO2 compliant eye is smaller on the backplane connector compared to both R-VPX and R-VPX EVO1 connectors. (See Figure 2)
3. The R-VPX EVO2 backplane connector adds an organizer to the compliant PCB tail connection region. (This organizer remains on the interface and poses no additional steps to the customer during the installation of the connector. (See Figure 2)

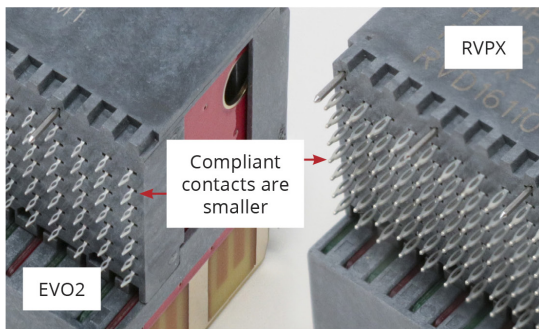


Figure 1 - Daughtercards

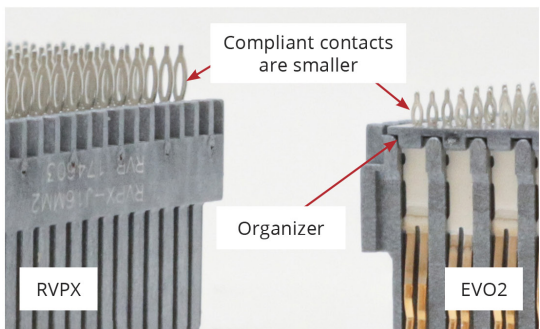


Figure 2 - Backplanes

THE VITA ECOSYSTEM

R-VPX EVO2 is a VITA 46 compliant connector system. The R-VPX EVO2 connectors, like previous R-VPX and R-VPX EVO1 versions, are fully intermateable with the aforementioned connectors. (as well as RT2, RT2-R, & RT3 from TE) Intermountability is described below:

	R-VPX Back- plane	R-VPX EVO1 Back- plane	R-VPX EVO2 Back- plane	R-VPX Module	R-VPX EVO1 Module	R-VPX EVO2 Module	RT2/RT2R	RT3
R-VPX Backplane	•	•					•	
R-VPX EVO1 Backplane	•	•					•	
R-VPX EVO2 Backplane			•					•
R-VPX Module				•			•	
R-VPX EVO1 Module					•	•		•
R-VPX EVO2 Module					•	•		•

Amphenol has mechanically tested RT3 to ensure intermateability/ intermountability with R-VPX EVO2 DC/BP and R-VPX EVO1 DC and RT2-R for intermateability/intermountability with R-VPX DC/BP.

EVO2 CONNECTOR VERIFICATION

Amphenol Aerospace's R-VPX EVO2 connector passed connector qualification per the VITA 46 and Telecordia GR-1217-CORE test specifications. Testing was conducted by a combination of Contech Research of Rumford, RI and by Amphenol TCS test lab in Nashua, NH. Amphenol Aerospace R-VPX EVO2 and TE's RT3 connectors were intermated through relevant tests in both the VITA 46 and Telecordia GR-1217-CORE testing. Tests performed included, but were not limited to the list below. Test reports can be provided upon request.

- LCR
- Durability
- Temp Life
- Mechanical Shock
- Thermal Aging
- Mate/Unmate
- Dust
- Random Vibration

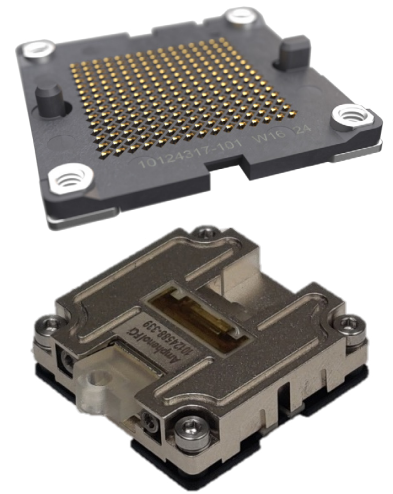
CONCLUSION

Amphenol Aerospace's R-VPX EVO2 connectors are the fastest VITA 46.30 connectors in the world, achieving data rates in excess of 32 Gbps while meeting the specification requirements. R-VPX EVO2 connectors will enable the embedded market to meet and exceed the demanding requirements of today's protocols including 25G Ethernet (100GBASE-KR4) and PCIE Gen 5 (32G).

LEAP-AHRD ON BOARD TRANSCEIVER

AMPHENOL HIGH SPEED SOLUTIONS RUGGED DEVICE

Amphenol 300Gb/s Leap-AHRD® High-Speed Optical Module is faster, smaller, more cost and power efficient than most conventional data center interconnects.



FEATURES & BENEFITS

- 300Gb/s High-Speed Optical Module
- Small, fast, high density, and power efficient
- Capable of speeds up to 25Gbps and distances up to 100 meters
- 300Gbps total through-put requires only one square inch of board space and 5.4W of power
- Optical cable can be routed above around other components in the design
- Integrated heat sink design
- Class 1M laser version available
- Enhanced Bit Error Rate (1e-12) requires no or limited FEC
- Compatible with Amphenol socket
- Easy to install
- Transceivers can be placed in 2-dimensional layout grid with 1" pitch between adjacent transceivers
- Uses 2.5x less board space than QSFP28 (12-channels)
- Ethernet transmission distance up to 100m (multi mode fiber)
- Uses off-the-shelf MT optical interface
- No through holes to connect transceiver – one side of board only
- Allows for transceiver optimization and monitoring connection discovery, channel diagnostics, and signal status monitoring

R-VPX EVOLUTION

HIGH SPEED



AMPHENOL INTRODUCES R-VPX EVOLUTION MODULE CAPABLE OF 16+ GBPS DATA RATE

Evolution is specifically designed to support the latest high-speed protocols while still meeting open VPX requirements. Evolution meets the performance requirements of VITA 46 & 47. Evolution is designed to be intermateable with existing VITA 46 backplane connectors and still achieve 16Gbps of performance. This connector system is optimized for speed and ruggedized to handle harsh environment requirements in military applications across the board.

FEATURES & BENEFITS

- PCIe Gen 4
- 1000BASE-KX
- 10GBASE-KX4
- 100GBASE-KR4
- Infiniband SDR, DDR, and QDR
- Serial RapidIO 12.5 Gbaud

RUGGED 24 CHANNEL 6U VPX SWITCH

Ruggedized Ethernet Switch Low Power, Short Boot Cycles, Lightly Managed

PDS - 330



DESCRIPTION

Amphenol Aerospace is the world's leader in high-end performance interconnect products for rugged environment markets. Media and protocol conversion is an important capability enabling system connectivity from commercial off-the-shelf switches, processors, and I/O boards.

Amphenol's Rugged 24 Channel 6U VPX Ethernet Switch features an integrated high-speed ARM Cortex-A9 processor, embedded Cortex-R5 processor and consists of 16 channels of 1GBase-T, four channels of 10GBase-T, and four channels of 10GBase-KR. Our switch includes IEEE standards-compliant functionality such as Time-Aware Scheduling, Preemption, and High-availability Seamless Redundancy to support Time Sensitive Networks. Port extension capability containing a controlling bridge can consistently manage and enforce Quality of Service to support VNTag and IEEE 802.1BR. Synchronous Ethernet Clock recovery is supported on any of the ports to support physical layer clock synchronization, provide hooks for both 1588v2 and IEEE 802.1, offer integrated DPLL for recovered clock cleanup as well as G.823 and G.824-compliant clock synthesizer.

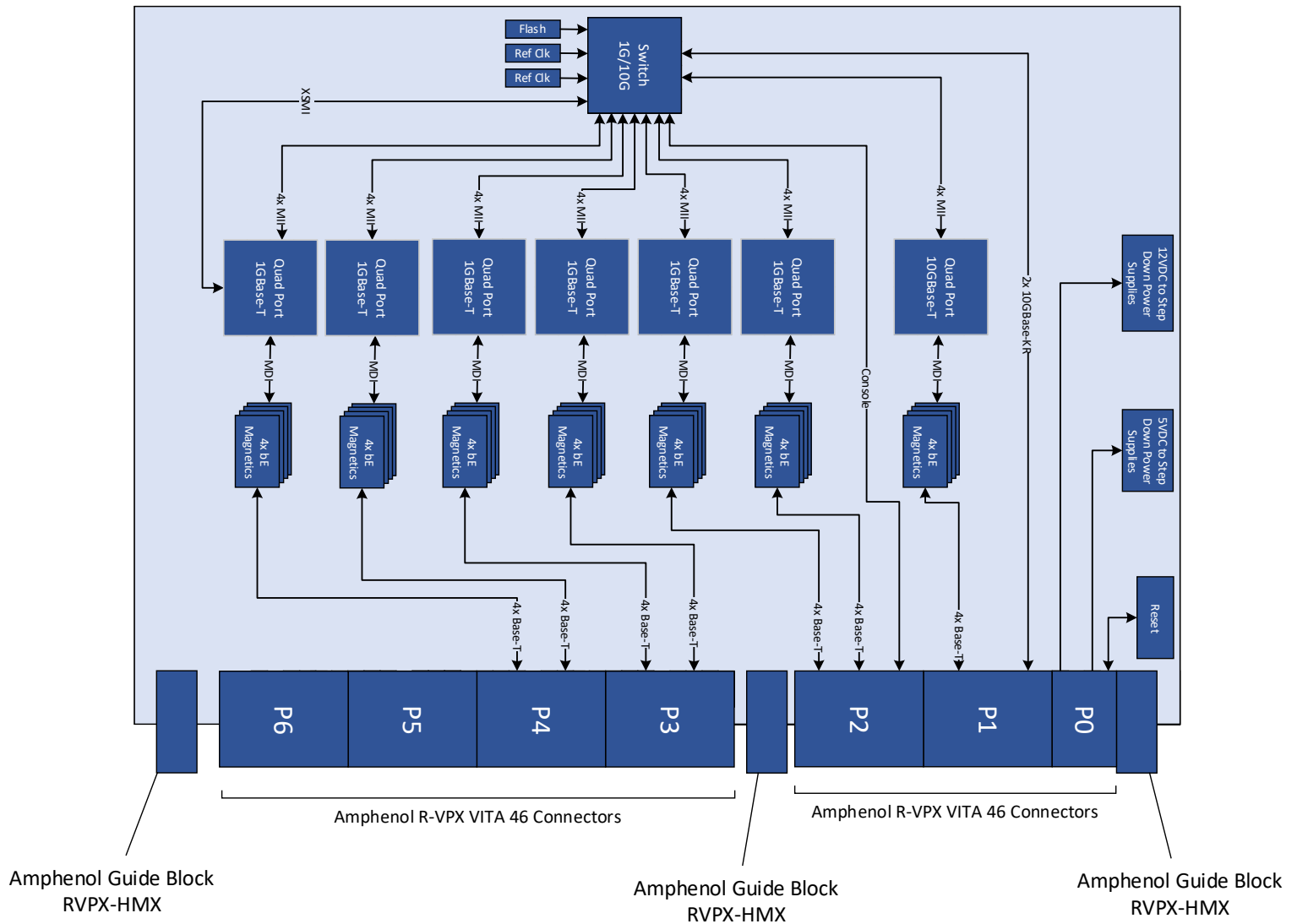
These array of features within our switch coupled with low power and short boot times makes our switch the perfect fit for rugged applications including harsh environment avionics, ground systems, or naval applications and is configurable for system connectivity, speeds, port types, and interoperability with various high-speed media converters and connectors for system interfacing.

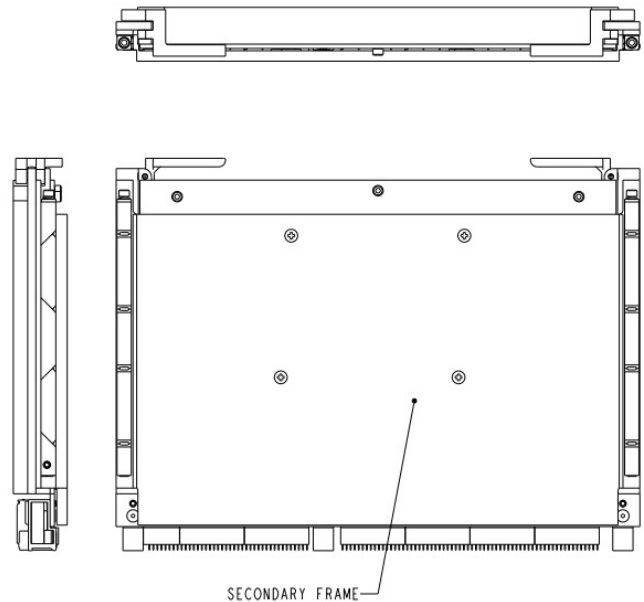
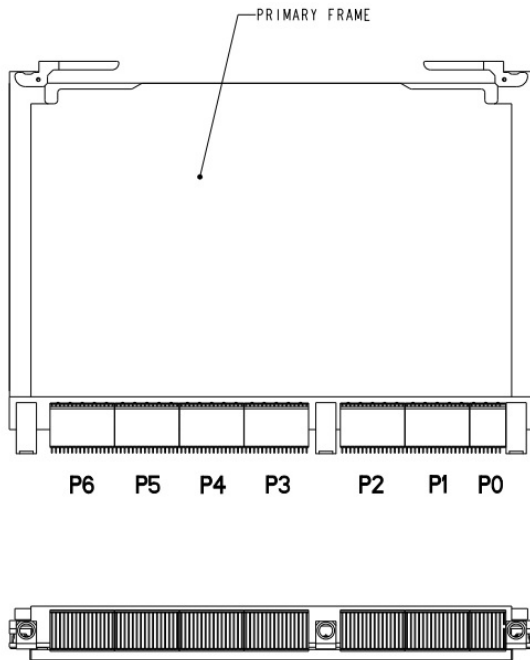
FEATURES & BENEFITS

- 24 channel counts: 16X 1GBase-T, 4X 10GBase-T, 4X 10GBase-KR
- Power: 12 and 5V input, less than 50 watts
- High-performance ARM Cortex-A9 processor
- RS-232 CLI interface
- Precision time protocol
- External Reset
- Short boot time
- Low-power 28 nm CMOS process
- Vita 46 6U VPX available in conduction cooled -40°F (-40°C) to 185°F (85°C) temperature environments as well

*Note Base T is auto-negotiated for 10 Base-T to Mode Speed

BLOCK DIAGRAM





Notice: Specifications are subject to change without notice. Contact your nearest Amphenol Corporation Sales Office for the latest specifications. All statements, information and data given herein are believed to be accurate and reliable but are presented without guarantee, warranty, or responsibility of any kind expressed or implied. Statements or suggestions concerning possible use of our products are made without representation or warranty that any such use is free of patent infringement and are not recommendations to infringe any patent. The user should not assume that all safety measures are indicated or that other measures may not be required. Specifications are typical and may not apply to all connectors.

© 2021 Amphenol Corp.

Printed in U.S.A. 10-2021

6U VPX ETHERNET SWITCH

AMPHENOL FAMILY OF RUGGEDIZED ETHERNET SWITCHES



DESCRIPTION

Amphenol Aerospace has developed a new 6U VPX Ethernet Switch -- the second in a series of ruggedized Ethernet Switches that provide an unmatched level of flexibility to meet any system requirement. The 48-port 6U VPX-managed Ethernet Switch is configurable for system connectivity, speeds, port types, and interoperation with various high-speed media converters and connectors for system interfacing. The new 6U VPX switch is a form, fit, and function replacement to the GXB-460.

The configurability to meet system requirements is achieved through superior product design. For starters, each port is capable of 10G Ethernet -- some ports can either be configured as 10G-Base-T (also supporting 100-Base-T and 1G-Base-T) or 10G-Base-KR (also supporting 1000-Base-X and SGMII). The switching throughput is up to 480 Gbps when using all 48 ports on the switch. In addition, the switch is non-blocking and low-latency for high-throughput architectures and applications. While the backplane is providing the highest densities of port count, the front-panel connections operate with various copper/fiber media converters and high-speed system connectors. Finally, the management software provides a command line interface, SNMP, and other web-based options for configuring the switch. It is capable of a full complement of virtualization, quality of service, security, tunneling, precision-time protocol, and other capabilities.

FEATURES & BENEFITS

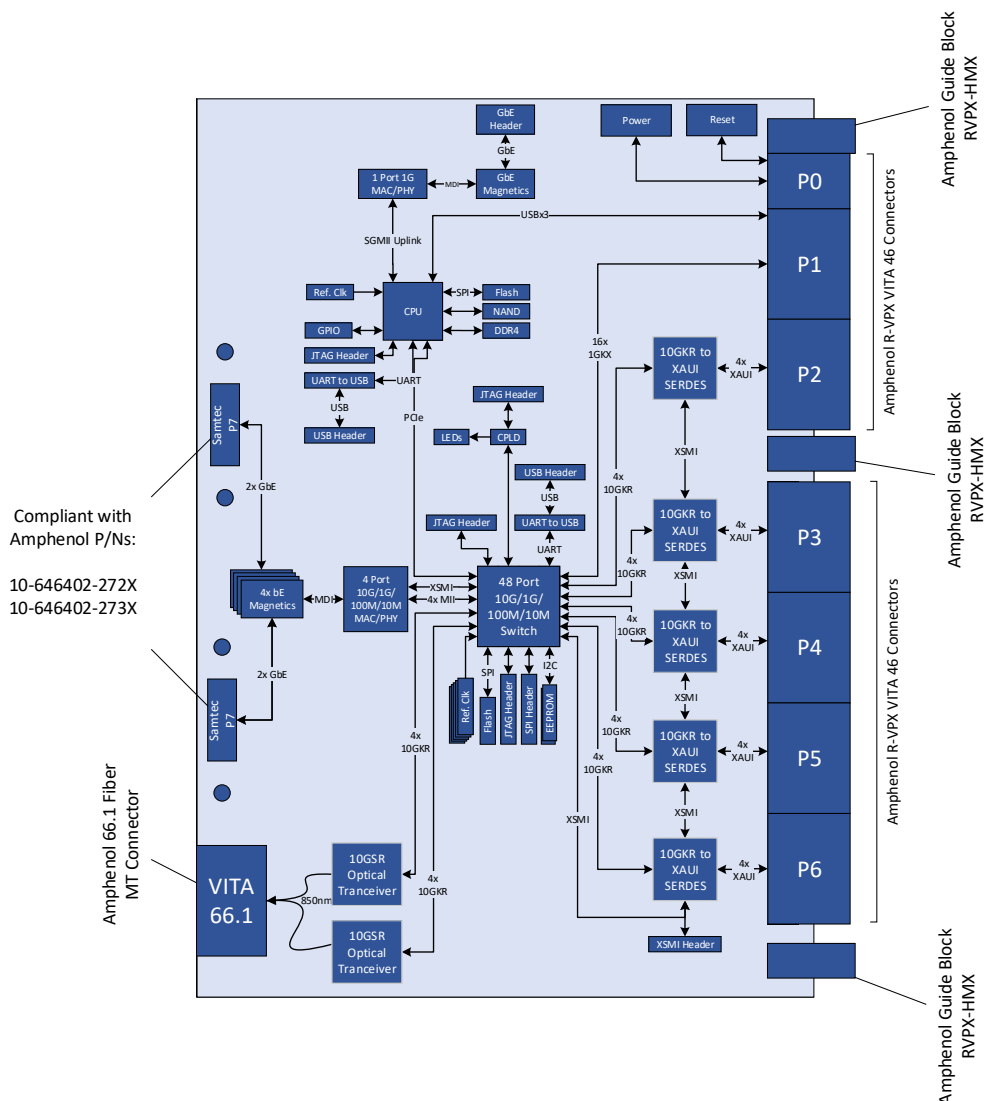
- Up to 48 channels of 10 GbE interfaces on a single card. Many of the ports are configurable between 10G-Base-T and 10G-Base-KR. While the ports are all 10G capable, they also work in 100M and 1G modes.
- Line rate forwarding up to 480 Gbps
- Configurable for multiple backplane pinouts and profiles
- Highly managed multi-layer switching services to include multicast, QoS, and security features
- Precision time protocol (IEEE 1588v1/v2) support
- VITA 46 6U VPX available in conduction cooled -40-+85C environments as well as harsh vibration profiles

ORDERING INFORMATION

Part Number	Backplane XAUI or 10G Base-KXY	Backplane 10G-Base-KR	Top Base-T	Top 10G-Base-SR
CTC-202440-VPX6	20	24	4	0
CTC-202044-VPX6	20	20	4	4
CTC-201648-VPX	20	16	4	8

For other options, please contact factory.

BLOCK DIAGRAM



Compliant with Amphenol Part Numbers:

10-646402-272X

10-646402-273X

CA-628485-C00

CA-628485-C01

ETHERNET INTERFACES - BACKPLANE

- 16 ports of 10G-Base-KR / SGMII / 1000-Base-X are static
- 4 ports of 10G-Base-T / 1G-Base-T / 100-Base-T
- 20 ports of XAUI/10G-Base-KX4 are static from top HQDP Headers
- A maximum of 44 channels of 10G-Base-KR / SGMII / 1000-Base-X can be brought to the backplane
- This part is also compliant with Amphenol LightConex technology thereby removing a half differential pair wafer and replacing with backplane blind mate compliant fiber to copper and copper to fiber conversion. By utilizing Light Conex, 8 channels of 10G-Base-KR / SGMII / 1000-Base-X will be replaced by 4 channels of 10G-Base-SR / 1G-Base-SX. If LightConex is of interest, please contact the factory.
- 8 ports can each be either 10G-Base SR off the top Vita 66.1 connector or 10G-Base-KR/SGMII 1000-Base X off VPX Connectors" should be "8 ports can each be either 10G-Base-SR off the top Vita 66.1 connector or 10G-Base-KR/SGMII off the VPX Connectors"

TECHNICAL SPECIFICATIONS

LAYER 2 SWITCHING ENGINE

- 802.1Q-compliant bridging
- Large forwarding database for MAC entries, IGMPv3/MLDv2 IP multicast, FCoE entries, and router host entries
- Learning and forwarding based on virtual ports (ePorts) and virtual bridge domains
- L2 ECMP and link aggregation groups

LAYER 3 WIRE-SPEED ROUTING ENGINE

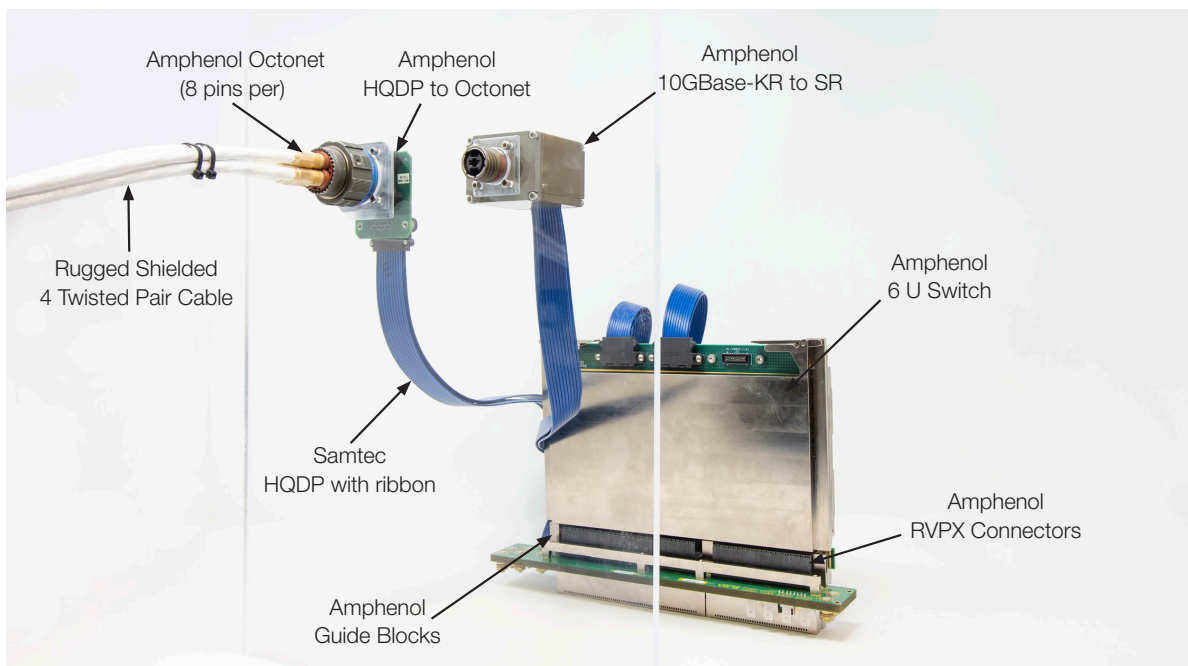
- Longest prefix match for IPV4/6 and IP Multicast
- Policy based routing
- VRF, VRF-Lite, BGP/MPLS IP VPNs
- Multicast routing supporting PIM-SM/DM and PIM-bidirectional routing protocols
- ECMP routing for load balancing traffic
- Network address translation (NAT 44,66)
- 10-646402-272X copper connectors Plus MT D38999 fiber connector for system interconnect

INTEROPERABILITY WITH AMPHENOL HIGH SPEED CONNECTORS

- Many options exist including Amphenol 10-646402-273X and 10-646402-272X which are Amphenol Octonet 10G-Base-T / 1G-Base-T connectors with Samtec HQDP accessible sites.
- Many options for system cables exist including Amphenol CA-628485-C00 and CA-628485-C01 which work with the 10-646402-273X and 10-646402-272X.

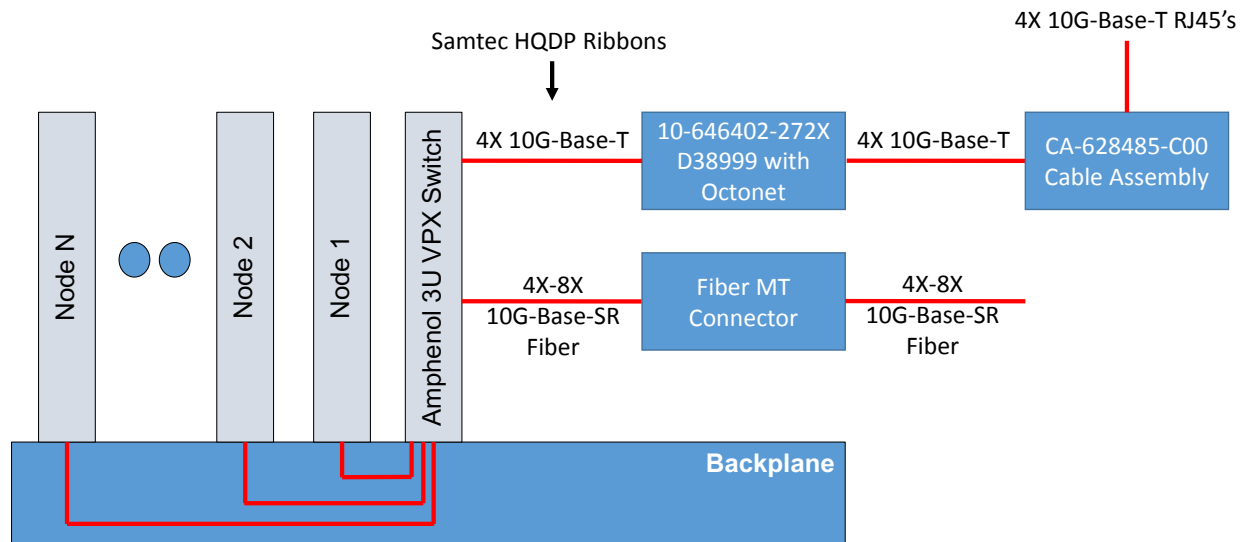
INTEROPERABILITY WITH AMPHENOL FIBER/ COPPER MEDIA CONVERTERS

- By using the board top Samtec HQDP connectors as well as Samtec HQDP configurable ribbons, the 6U VPX switch is easily connected to endless Amphenol fiber/ copper media converters. Examples are below.
- Many other options exist and can be tailored to customer system architectures.



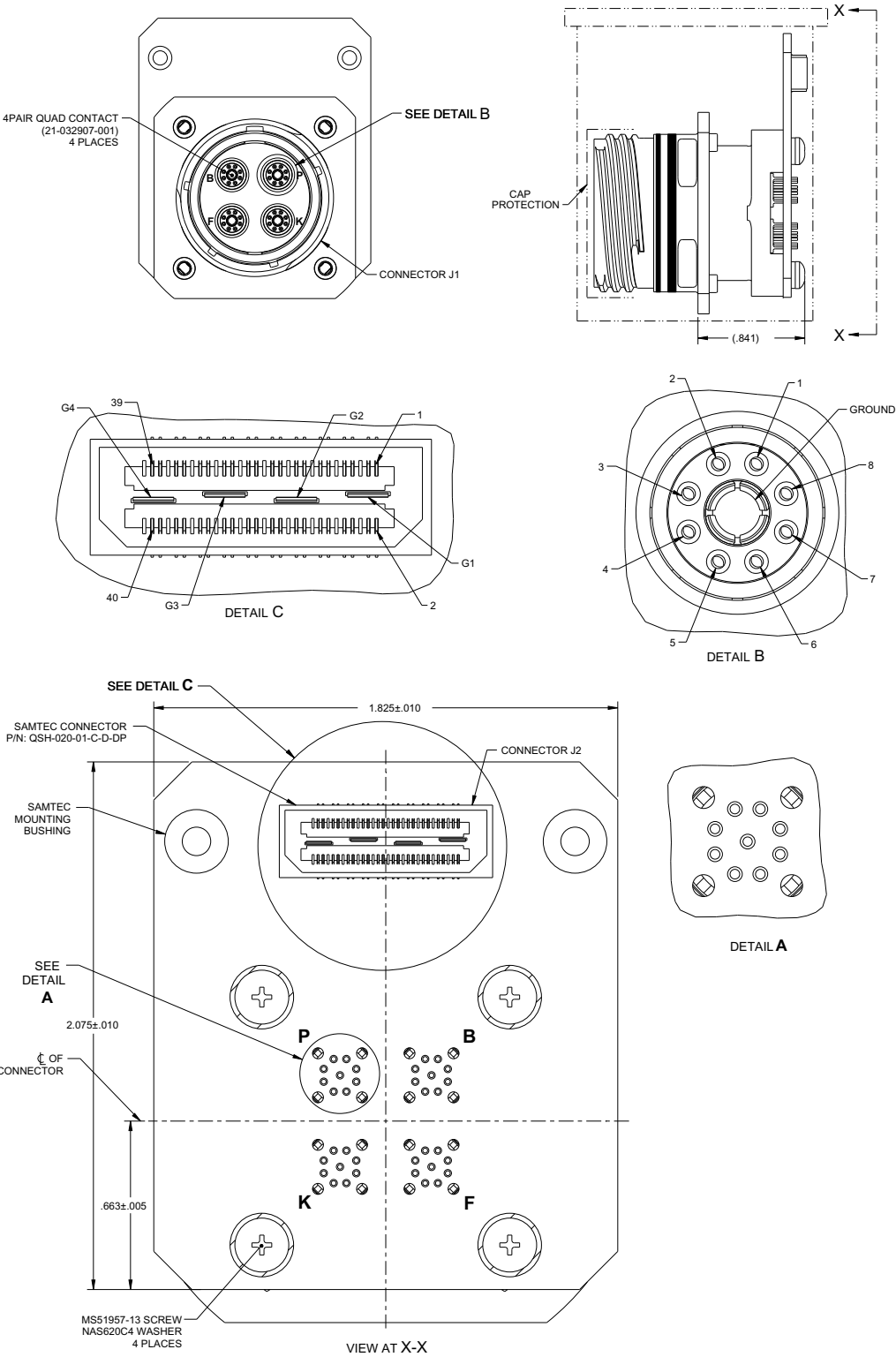
APPLICATION EXAMPLE

Amphenol VPX switch coupled with Samtec HQDP cable, Amphenol Octonet Connector, and Amphenol breakout cable for system connectivity of 8X 10G-Base-T channels. 10G-Base-T can also be 1G-Base-T and 100-Base-T.



10-646402-272X: CONNECTOR DETAILS

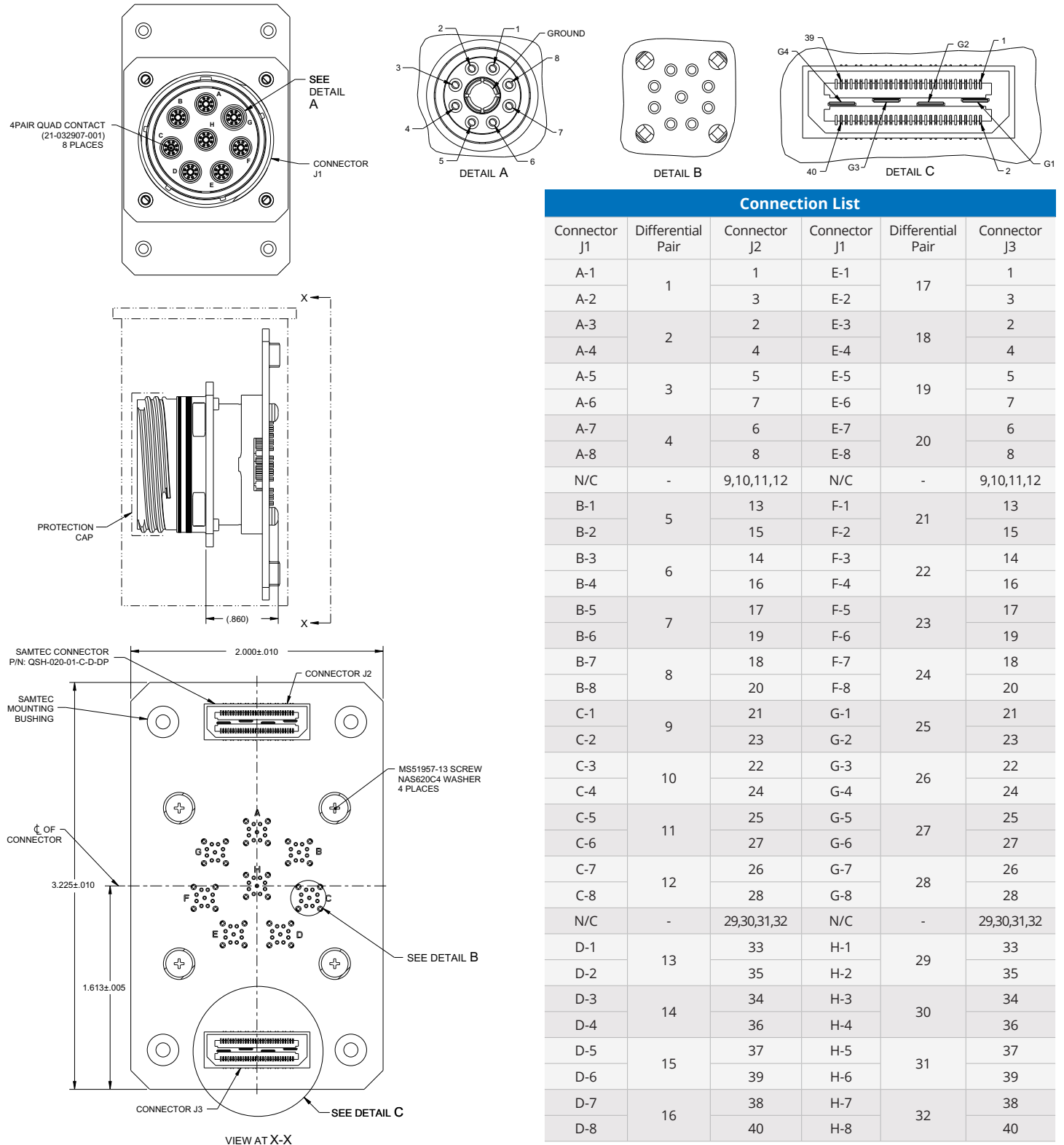
Receptacle Connector; TV40GQDZ-19-ABS; Ground Plane; 4-pair Quad Contact



Connection List		
Connector J1	Differential Pair	Connector J3
E-1	17	1
E-2		3
E-3	18	2
E-4		4
E-5	19	5
E-6		7
E-7	20	6
E-8		8
N/C	-	9,10,11,12
F-1	21	13
F-2		15
F-3	22	14
F-4		16
F-5	23	17
F-6		19
F-7	24	18
F-8		20
G-1	25	21
G-2		23
G-3	26	22
G-4		24
G-5	27	25
G-6		27
G-7	28	26
G-8		28
N/C	-	29,30,31,32
H-1	29	33
H-2		35
H-3	30	34
H-4		36
H-5	31	37
H-6		39
H-7	32	38
H-8		40

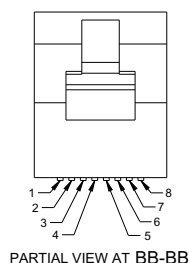
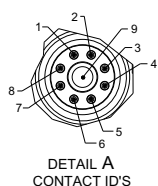
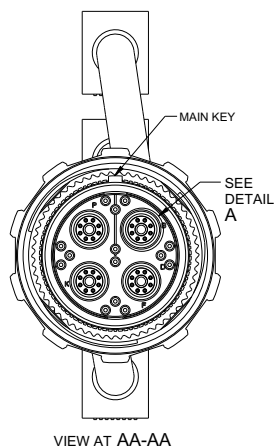
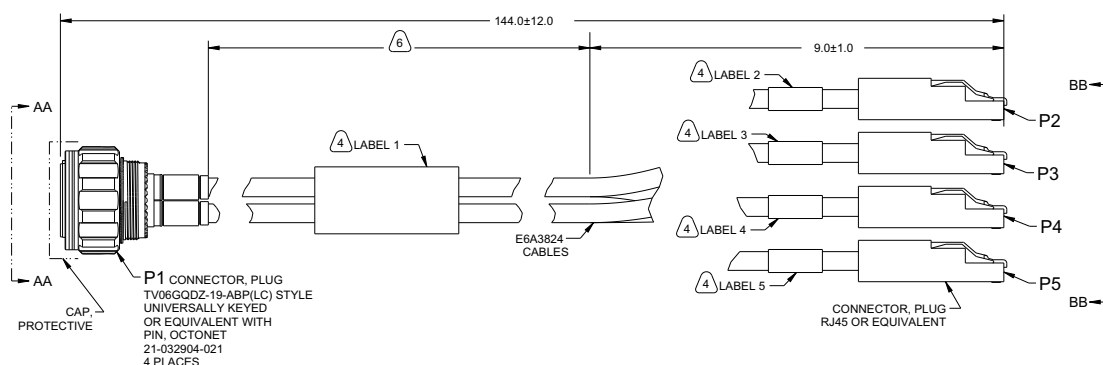
10-646402-273X: CONNECTOR DETAILS

Receptacle Connector; TV40GQDZ-25-8S; Ground Plane; 4-pair Quad Contact



CA-628485-C00: TEST CABLE DETAILS

Universally Keyed; TV06GQDZ-19-ABP to RJ45; Zinc Nickel Plated; 12 ft.

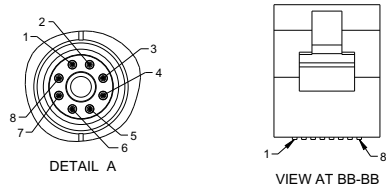
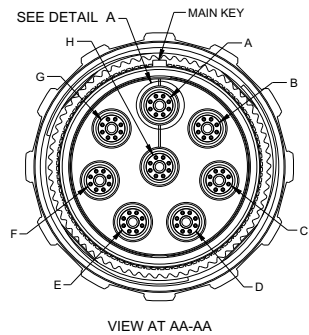
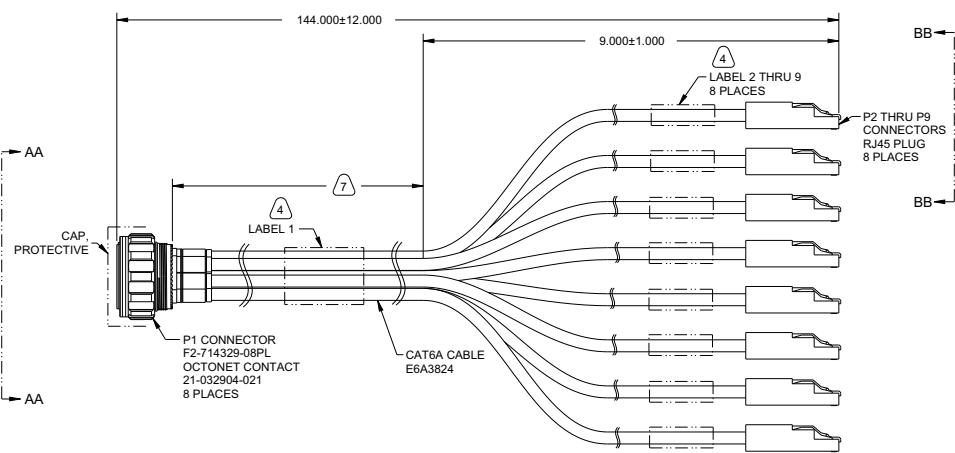


Marking Table	
Label ID	Marking
Label 1	AMPHENOL CA-6284850-C00 DATE CODE PER 9-9172-3 & LOT NO.
Label 2	B
Label 3	F
Label 4	K
Label 5	P

Wiring Table			Wiring Table (Continued)		
P1 Connector Cavity ID	P2 Connector PIN ID	P3 Connector PIN ID	P1 Connector Cavity ID	P4 Connector PIN ID	P5 Connector PIN ID
B : 1	1	-	K : 1	1	-
B : 2	2	-	K : 2	2	-
B : 3	3	-	K : 3	3	-
B : 4	6	-	K : 4	6	-
B : 5	4	-	K : 5	4	-
B : 6	5	-	K : 6	5	-
B : 7	7	-	K : 7	7	-
B : 8	8	-	K : 8	8	-
F : 1	-	1	P : 1	-	1
F : 2	-	2	P : 2	-	2
F : 3	-	3	P : 3	-	3
F : 4	-	4	P : 4	-	4
F : 5	-	5	P : 5	-	5
F : 6	-	6	P : 6	-	6
F : 7	-	7	P : 7	-	7
F : 8	-	8	P : 8	-	8
B : 9 B : Outer	Outer	-	K : 9 K : Outer	Outer	-
F : 9 F : Outer	-	Outer	P : 9 P : Outer	-	Outer

CA-628485-C01: TEST CABLE DETAILS

Cable Assembly; Octonet Test; Universal Key



Wiring Table		Wiring Table	
P1 Cavity	P () Connector	P1 Cavity	P () Connector
A-1	P2-1	E-1	P6-1
A-2	P2-2	E-2	P6-2
A-3	P2-3	E-3	P6-3
A-4	P2-4	E-4	P6-4
A-5	P2-5	E-5	P6-5
A-6	P2-6	E-6	P6-6
A-7	P2-7	E-7	P6-7
A-8	P2-8	E-8	P6-8
B-1	P3-1	F-1	P7-1
B-2	P3-2	F-2	P7-2
B-3	P3-3	F-3	P7-3
B-4	P3-4	F-4	P7-4
B-5	P3-5	F-5	P7-5
B-6	P3-6	F-6	P7-6
B-7	P3-7	F-7	P7-7
B-8	P3-8	F-8	P7-8
C-1	P4-1	G-1	P8-1
C-2	P4-2	G-2	P8-2
C-3	P4-3	G-3	P8-3
C-4	P4-4	G-4	P8-4
C-5	P4-5	G-5	P8-5
C-6	P4-6	G-6	P8-6
C-7	P4-7	G-7	P8-7
C-8	P4-8	G-8	P8-8
D-1	P5-1	H-1	P9-1
D-2	P5-2	H-2	P9-2
D-3	P5-3	H-3	P9-3
D-4	P5-4	H-4	P9-4
D-5	P5-5	H-5	P9-5
D-6	P5-6	H-6	P9-6
D-7	P5-7	H-7	P9-7
D-8	P5-8	H-8	P9-8

6U VPX 144 CHANNEL 25G ETHERNET SWITCH

PDS - 312

AMPHENOL FAMILY OF RUGGEDIZED ETHERNET SWITCHES



DESCRIPTION

Amphenol Aerospace has developed a new 6U 144 channel and 25Gbps VPX conduction and air cooled Ethernet switch. This is in addition to our tried and true 10Gbps technology in 3U and 6U configurations. The 144 channel 25G switch is configurable for system connectivity, speeds, port types, and interoperation of various media converters and connectors for system interfacing. The configurability to meet system requirements is achieved through superior product design.

For starters, each port is capable of 100G, 25G, 10G, 1G, or 100M Ethernet. The backplane consists of 96 channels of SERDES 25GBase-KR channels and the top of the board has 48 channels of 25GBase-SR fiber optics. Any 4 channels of the board can be ganged together for a 100G connection. The switching throughput is 3.6 Tbps when using all 144 ports on the switch. In addition, the switch is non-blocking and low-latency for high-throughput architectures and applications. Finally, the management software provides a command line interface, SNMP, and other web based options for configuring the switch which is capable of a full complement of virtualization, quality of service, security, tunneling, PTP, and other capabilities.

FEATURES & BENEFITS

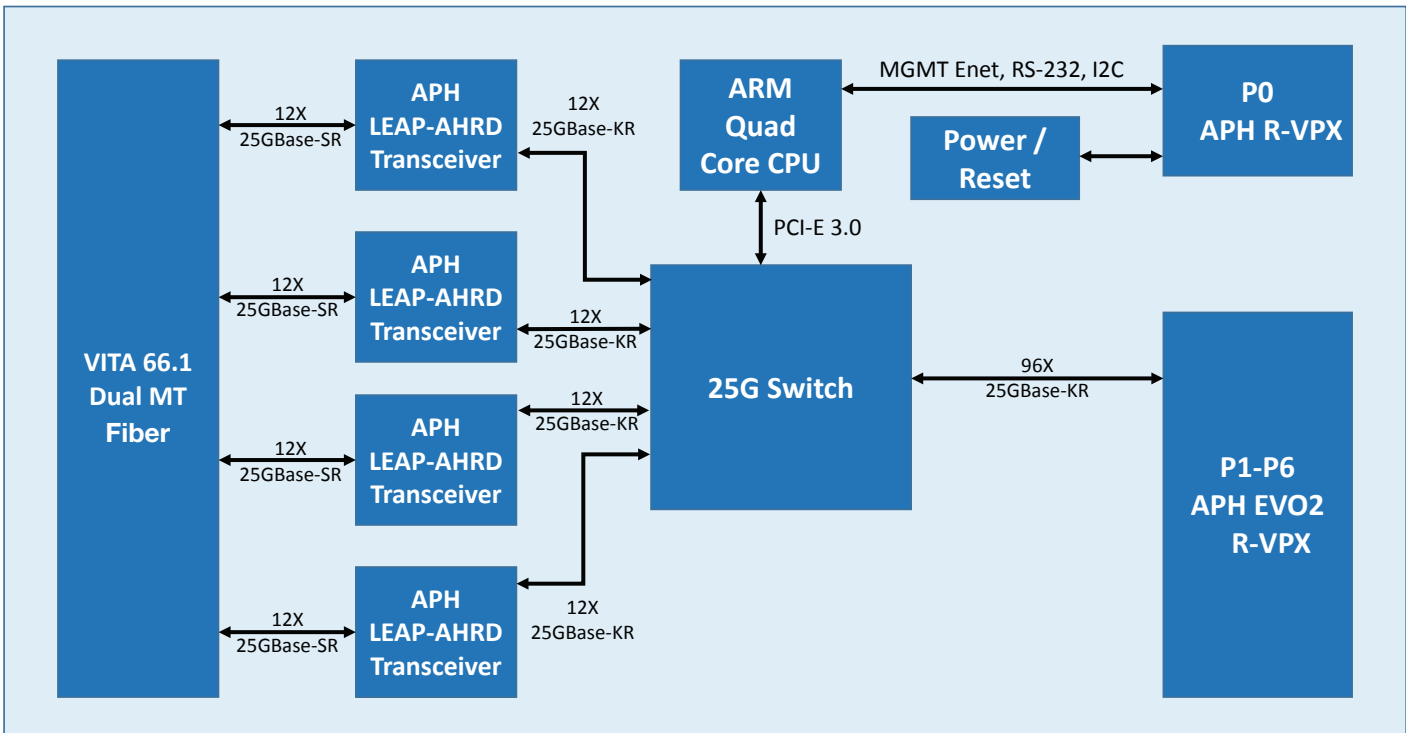
- Up to 144 channels of 25G interfaces on a single card. Ports are configurable for 100G, 25G, 10G, 1G, and 100M speeds.
- Line rate forwarding up to 3.6 Tbps
- L2 / L3 managed switch
- PTP IEEE 1588v1/v2 support
- VITA 46 6U VPX available in conduction and air cooled configurations for -40-85C environments as well as harsh vibration profiles

ORDERING INFORMATION

Part Number	Cooling	Top Fiber	VPX SERDES
CF-020400-071	Conduction	48	96
CF-020400-072	Air	48	96
CF-020400-071R Rear Transition Module			

For other options, please contact factory.

BLOCK DIAGRAM



ETHERNET INTERFACES

- 1X 100/1GBase-T Management Interface
- 96X 25GBase-KR copper off P1 and P2 - Can be configured from 100M to 25GBase-KR
- 48X 25GBase-SR fiber off VITA connector on top of board

OTHER FEATURES

- Built in test on each port
- DHCP client, server per VLAN (4000+ available) instantiated
- Status interface – temperature, serdes, set speed, port packet counters
- NTP, ping, FEC, IGMP
- SNMP
- Custom Routing
- Syslog
- SSH
- Web servers for status

TECHNICAL SPECIFICATIONS

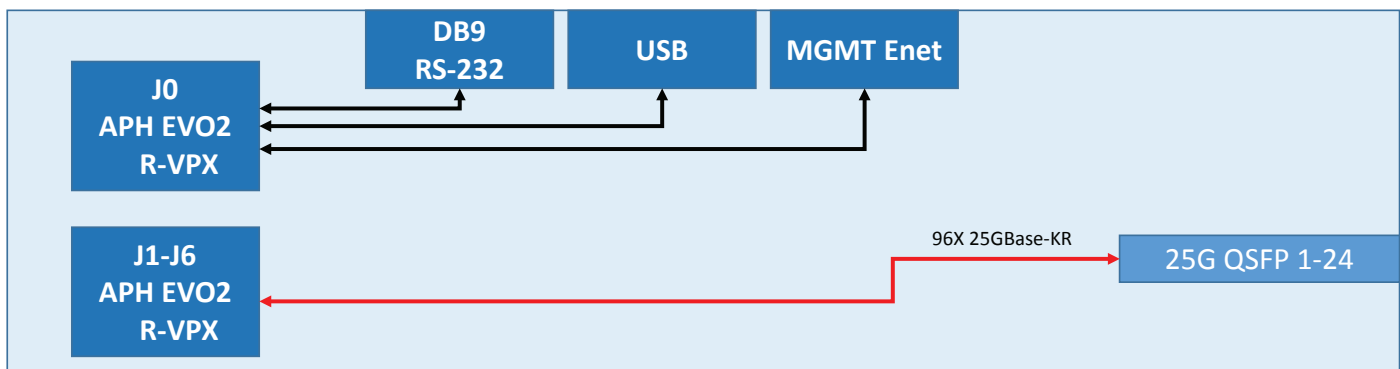
LAYER 2 SWITCHING ENGINE

- 802.1Q-compliant bridging
- Large forwarding database for MAC entries, IGMPv3/MLDv2 IP multicast, FCoE entries, and router host entries
- Learning and forwarding based on virtual ports (ePorts) and virtual bridge domains
- L2 ECMP and link aggregation groups

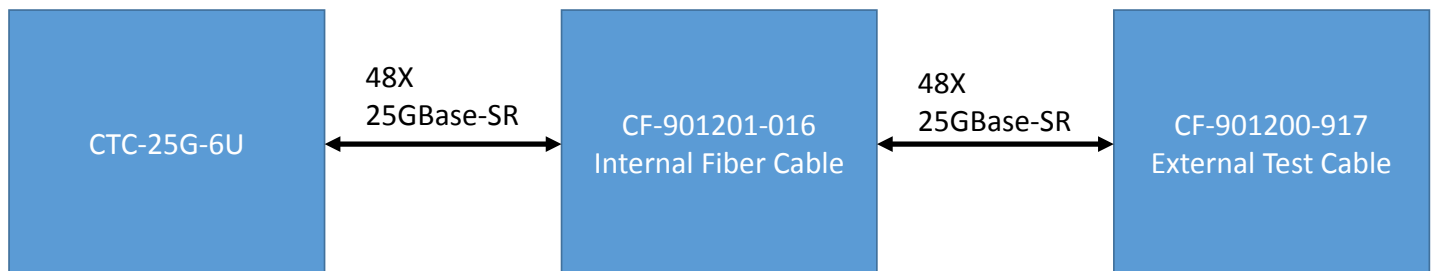
LAYER 3 WIRE-SPEED ROUTING ENGINE

- Longest prefix match for IPV4/6 and IP Multicast
- Policy based routing
- VRF, VRF-Lite, BGP/MPLS IP VPNs
- Multicast routing supporting PIM-SM/DM and PIM-bidirectional routing protocols
- ECMP routing for load balancing traffic
- Network address translation (NAT 44,66)

BLOCK DIAGRAM 6U REAR TRANSITION MODULE (RTM)

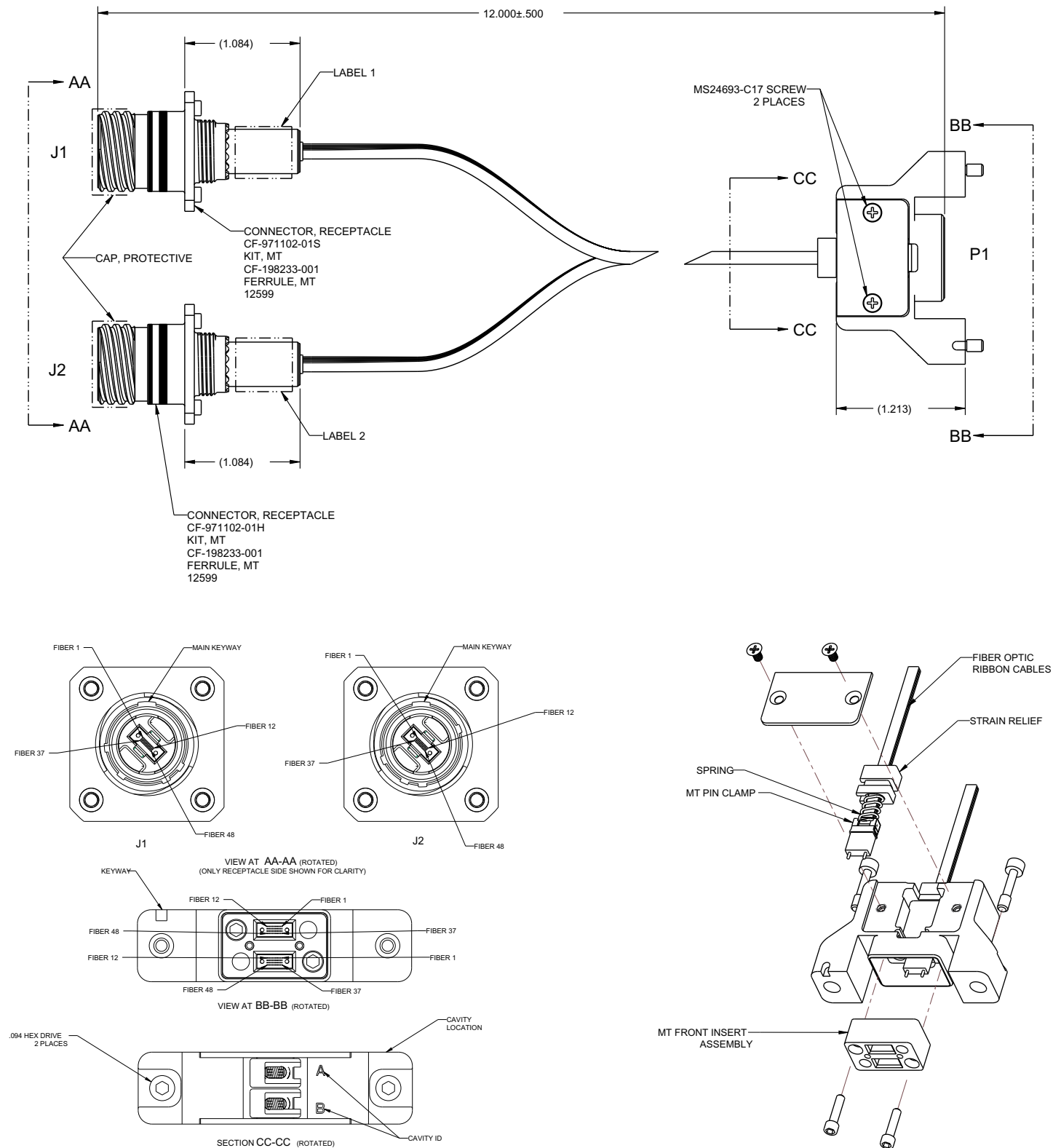


FIBER OPTIC CABLE TO TOP OF SWITCH

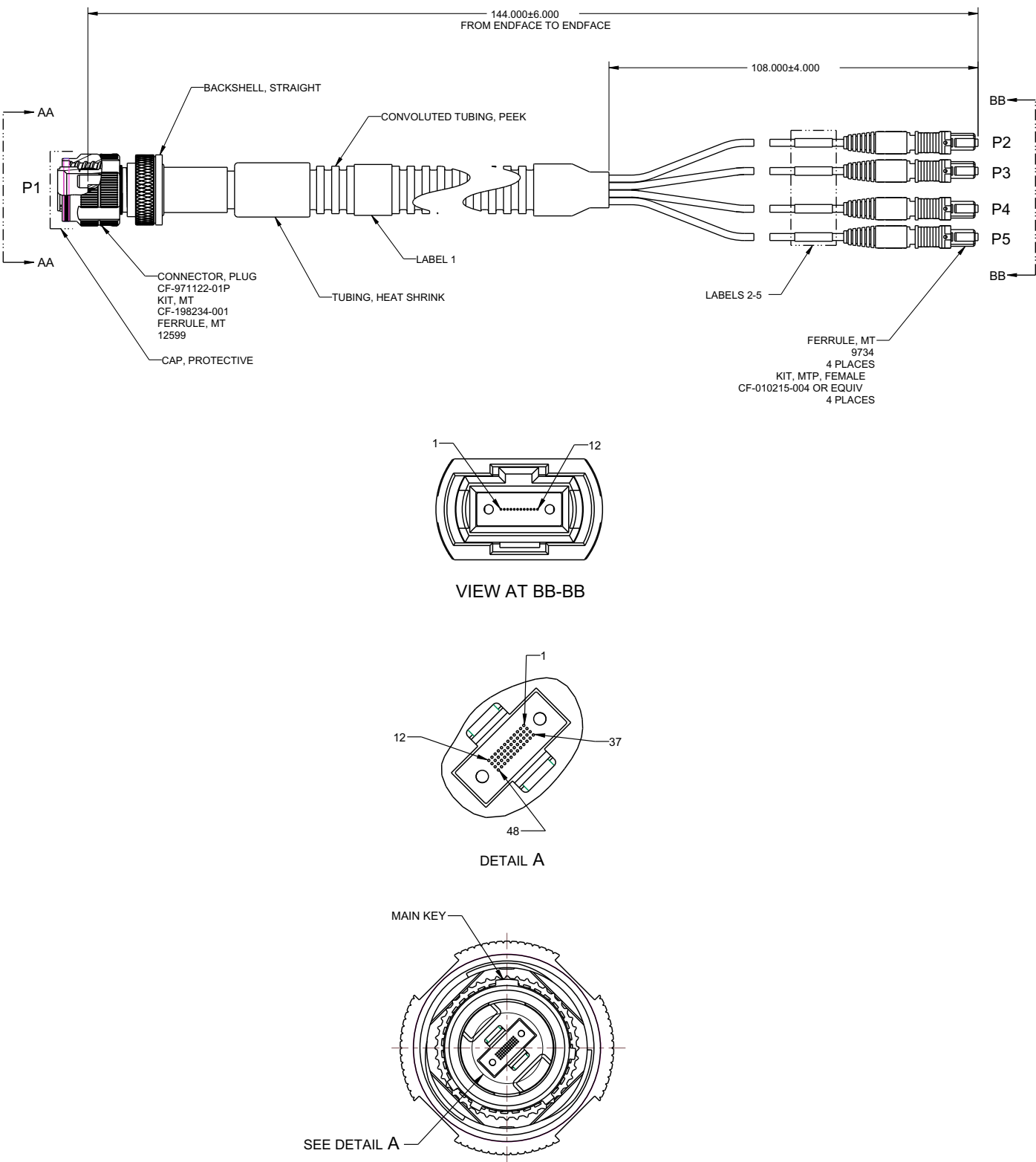


CF-901201-016: CONNECTOR DETAILS

CABLE FIBER OPTIC: 2 48MT TO 2MT MODULE



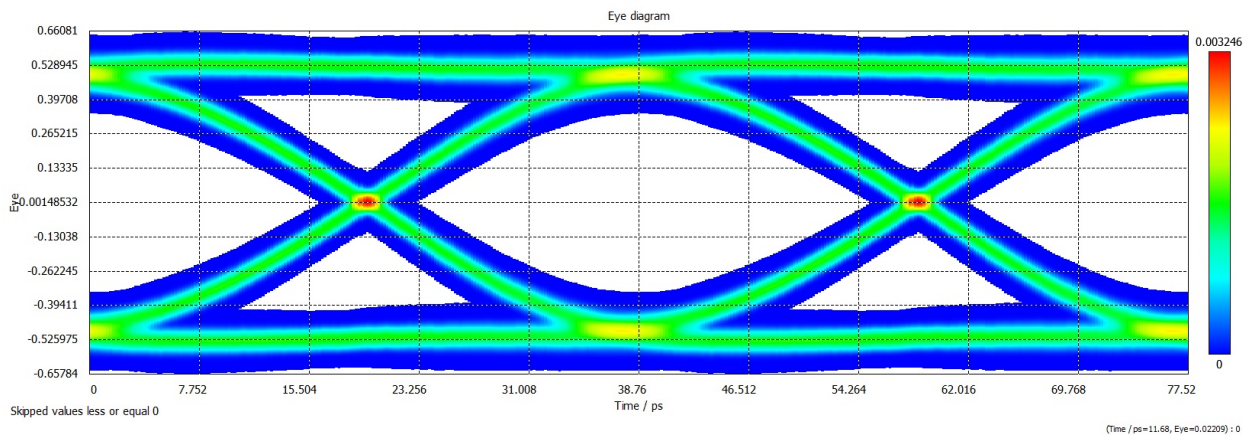
CF-901200-917: CONNECTOR DETAILS AND WIRING TABLE



INTRODUCTION

The changes in technology where R-VPX connectors are used has rapidly evolved in recent years, specifically driving a demand for higher data rates from copper contact based connectors, which have typically resided in the 10 & 16 Gbps speed realm. The fastest connector in the market to date is performing to 25 Gbps, but the market demands even faster speeds. This is where Amphenol's new EVO2 R-VPX connector is designed to dominate; as the first and only 32 Gbps+ VITA 46.30 connector available.

Eye pattern @ 25.8 Gbps



Note: PRBS-23 signal through D7E7-E7F7 pair with all surrounding pairs as active aggressors

DESIGN AND CONSTRUCTION

Amphenol Corporation is uniquely integrated to be able to provide collaborative design results, which R-VPX EVO2 development required. The expertise for this project was the same team that developed R-VPX and R-VPX EVO1, a blend of Amphenol design teams from AAO in Sidney, NY and Amphenol TCS in Nashua, NH. This team designed R-VPX EVO2 by borrowing proven characteristics from our R-VPX and R-VPX EVO1 series connectors, using high performance dielectric PCB material, reducing the surface area of the contacts in both connectors, and tirelessly tuning and testing the trace geometries for signal integrity to match impedance goals. The latter changes also reduce crosstalk between pairs. The addition of the organizer reduced the impedance in the gap at the mounting interface between the backplane connector and the backplane PCB. These changes enable the speed performance improvement in this new connector series while meeting all of the requirements of the VITA 46.30 specification and maintaining all backwards intermateability. See the next page for visual differences.

The new design resulted in three noticeable visual differences for end users:

1. The R-VPX EVO2 compliant eye size on the module (daughter card) connection region is smaller as compared to R-VPX connectors. (See Figure 1)
2. The R-VPX EVO2 compliant eye is smaller on the backplane connector compared to both R-VPX and R-VPX EVO1 connectors. (See Figure 2)
3. The R-VPX EVO2 backplane connector adds an organizer to the compliant PCB tail connection region. (This organizer remains on the interface and poses no additional steps to the customer during the installation of the connector. (See Figure 2)

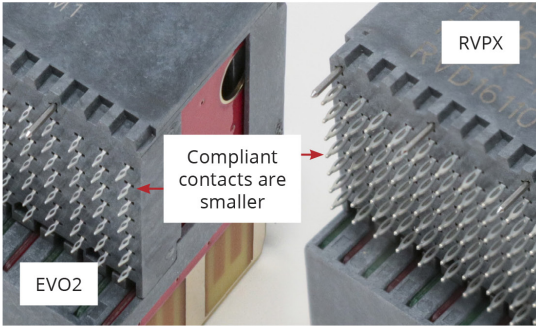


Figure 1 - Daughtercards

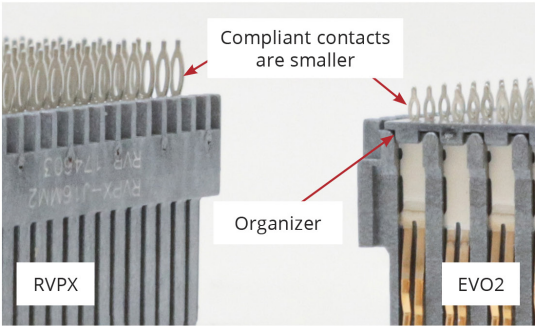


Figure 2 - Backplanes

THE VITA ECOSYSTEM

R-VPX EVO2 is a VITA 46 compliant connector system. The R-VPX EVO2 connectors, like previous R-VPX and R-VPX EVO1 versions, are fully intermateable with the aforementioned connectors. (as well as RT2, RT2-R, & RT3 from TE) Intermountability is described below:

	R-VPX Back- plane	R-VPX EVO1 Back- plane	R-VPX EVO2 Back- plane	R-VPX Module	R-VPX EVO1 Module	R-VPX EVO2 Module	RT2/RT2R	RT3
R-VPX Backplane	•	•					•	
R-VPX EVO1 Backplane	•	•					•	
R-VPX EVO2 Backplane			•					•
R-VPX Module				•			•	
R-VPX EVO1 Module					•	•		•
R-VPX EVO2 Module					•	•		•

Amphenol has mechanically tested RT3 to ensure intermateability/ intermountability with R-VPX EVO2 DC/BP and R-VPX EVO1 DC and RT2-R for intermateability/intermountability with R-VPX DC/BP.

EVO2 CONNECTOR VERIFICATION

Amphenol Aerospace's R-VPX EVO2 connector passed connector qualification per the VITA 46 and Telecordia GR-1217-CORE test specifications. Testing was conducted by a combination of Contech Research of Rumford, RI and by Amphenol TCS test lab in Nashua, NH. Amphenol Aerospace R-VPX EVO2 and TE's RT3 connectors were intermated through relevant tests in both the VITA 46 and Telecordia GR-1217-CORE testing. Tests performed included, but were not limited to the list below. Test reports can be provided upon request.

- LCR
- Durability
- Temp Life
- Mechanical Shock
- Thermal Aging
- Mate/Unmate
- Dust
- Random Vibration

CONCLUSION

Amphenol Aerospace's R-VPX EVO2 connectors are the fastest VITA 46.30 connectors in the world, achieving data rates in excess of 32 Gbps while meeting the specification requirements. R-VPX EVO2 connectors will enable the embedded market to meet and exceed the demanding requirements of today's protocols including 25G Ethernet (100GBASE-KR4) and PCIE Gen 5 (32G).

LEAP-AHRD ON BOARD TRANSCEIVER

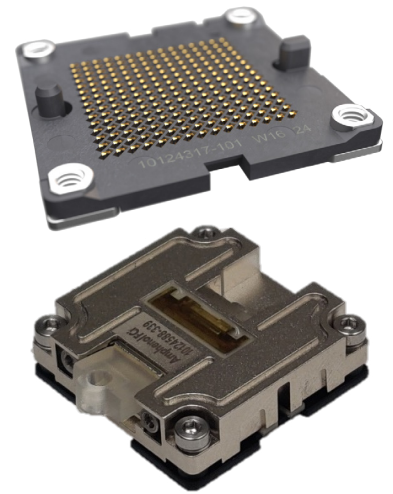
AMPHENOL HIGH SPEED SOLUTIONS RUGGED DEVICE

DESCRIPTION

Amphenol 300Gb/s Leap-AHRD® High-Speed Optical Module is faster, smaller, more cost and power efficient than most conventional datacenter interconnects.

FEATURES & BENEFITS

- 300Gb/s High-Speed Optical Module
- Small, fast, high density, and power efficient
- Capable of speeds up to 25Gbps and distances up to 100 meters
- 300Gbps total through-put requires only one square inch of board space and 5.4W of power
- Optical cable can be routed above around other components in the design
- Integrated heat sink design
- Class 1M laser version available
- Enhanced Bit Error Rate (1e-12) requires no or limited FEC
- Compatible with Amphenol socket
- Easy to install
- Transceivers can be placed in 2-dimensional layout grid with 1" pitch between adjacent transceivers
- Uses 2.5x less board space than QSFP28 (12-channels)
- Ethernet transmission distance up to 100m (multi mode fiber)
- Uses off-the-shelf MT optical interface
- No through holes to connect transceiver – one side of board only
- Allows for transceiver optimization and monitoring connection discovery, channel diagnostics, and signal status monitoring



R-VPX EVOLUTION

HIGH SPEED



AMPHENOL INTRODUCES R-VPX EVOLUTION MODULE CAPABLE OF 16+ GBPS DATA RATE

Evolution is specifically designed to support the latest high-speed protocols while still meeting open VPX requirements. Evolution meets the performance requirements of VITA 46 & 47. Evolution is designed to be intermateable with existing VITA 46 backplane connectors and still achieve 16Gbps of performance. This connector system is optimized for speed and ruggedized to handle harsh environment requirements in military applications across the board.

FEATURES & BENEFITS

- PCIe Gen 4
- 1000BASE-KX
- 10GBASE-KX4
- 100GBASE-KR4
- Infiniband SDR, DDR, and QDR
- Serial RapidIO 12.5 Gbaud

Time-Sensitive Networking (TSN) 10G Ethernet Switches

High Speed Rugged TSN Enabled Switches



DESCRIPTION

Amphenol Military High Speed is continually evolving our line of industry-leading, rugged, and high-speed media converters and Ethernet switches. This latest high speed enabled Ethernet Switches include support for the highest speeds, rugged applications, and Time-Sensitive Networking (TSN) protocols.

The following set of switch products feature an integrated high speed ARM Cortex A9 processor along with an embedded Cortex R5 processor with enterprise-level buffer and table sizes. Each product includes TSN features such as Preemption, Time Aware Scheduling, and Seamless Redundancy to provide deterministic behavior to Ethernet networks.

FEATURES

- Multiple channel count densities depending on form factor with 3U VPX, 6U VPX, and stand-alone variants supported.
- Flexible I/O configurations for each variant.
- Cut-through switching for low-latency applications.
- Complete TSN feature implementation:
 - Path control and reservation (IEEE 802.1Qca)
 - Time aware shaper (IEEE 802.1Qbv)
 - Frame preemption (IEEE 801Qbu/IEEE 802.3br)
 - Cyclic queueing and forwarding (IEEE 802.1Qch)
 - Timing and Synchronization, PTP, IEEE 82.1AS-Rev, 1588v2
 - Stream reservation protocol Enhancement (IEEE 802.1Qcc)
 - Time based Ingress Policer (IEEE 802.1Qci)
 - Frame replication and elimination for reliability (IEEE 802.1CB)
 - Front-haul network profile (IEEE 802.1CM)
- Interfaces for power, diagnostics, and others.
- Operational temperature of -40°C to +85°C

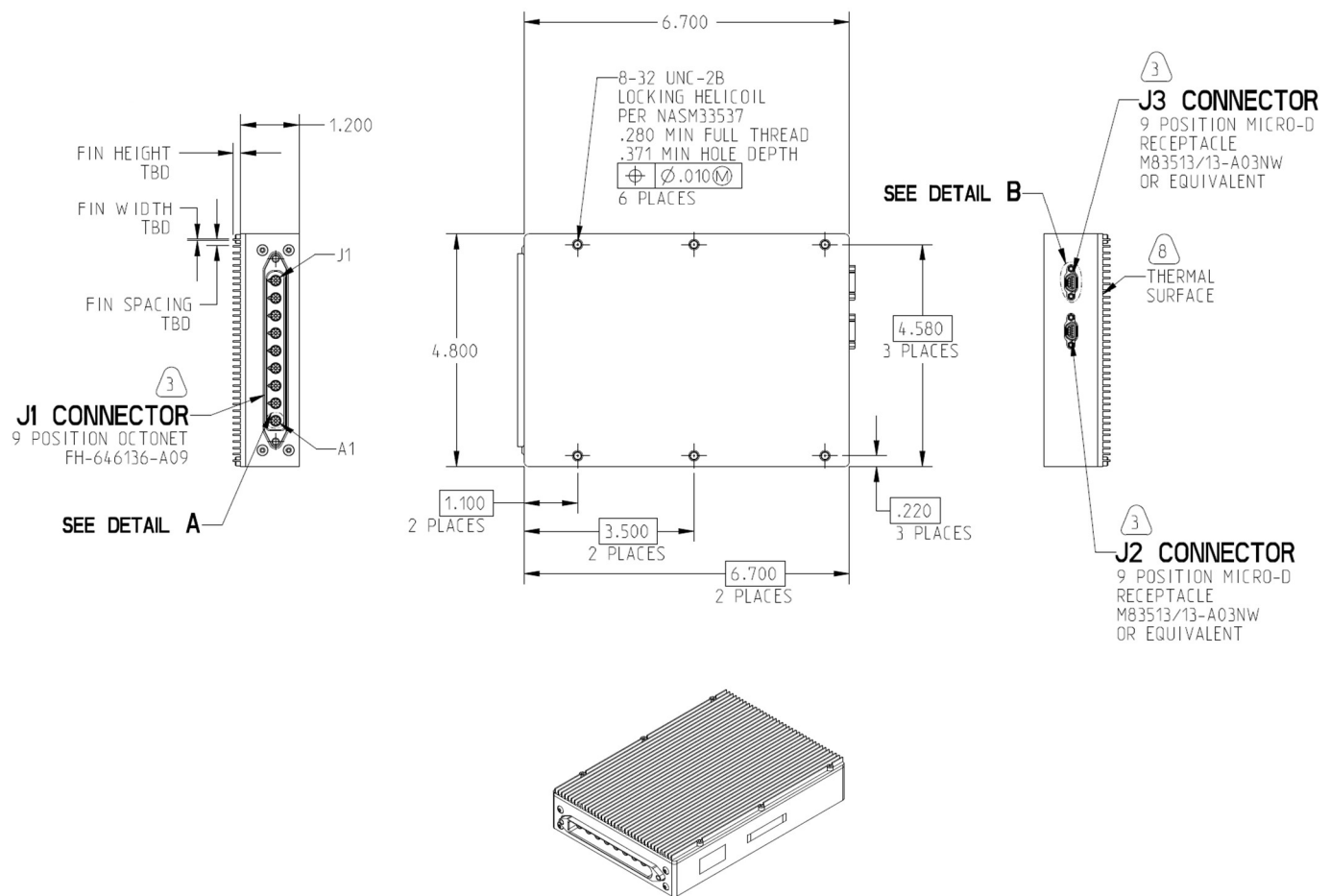


ORDERING INFORMATION

PART NUMBER	DESCRIPTION	Interfaces
CF-02WA00-10X	Stand-Alone "Cassette" Switch	9 channels up to 10GBase-T; Control and 28V power
CF-020400-076	Stand-Alone Switch	12 channels up to 10GBase-T; Control and 28V power
CF-020400-065	6U VPX Switch	4 channels up to 10GBase-T; 24 channels of 1GBase-T; 2 @ KR
TBD	3U VPX Switch	Up to 32 channels of 10GBase-T

MECHANICAL SPECIFICATIONS

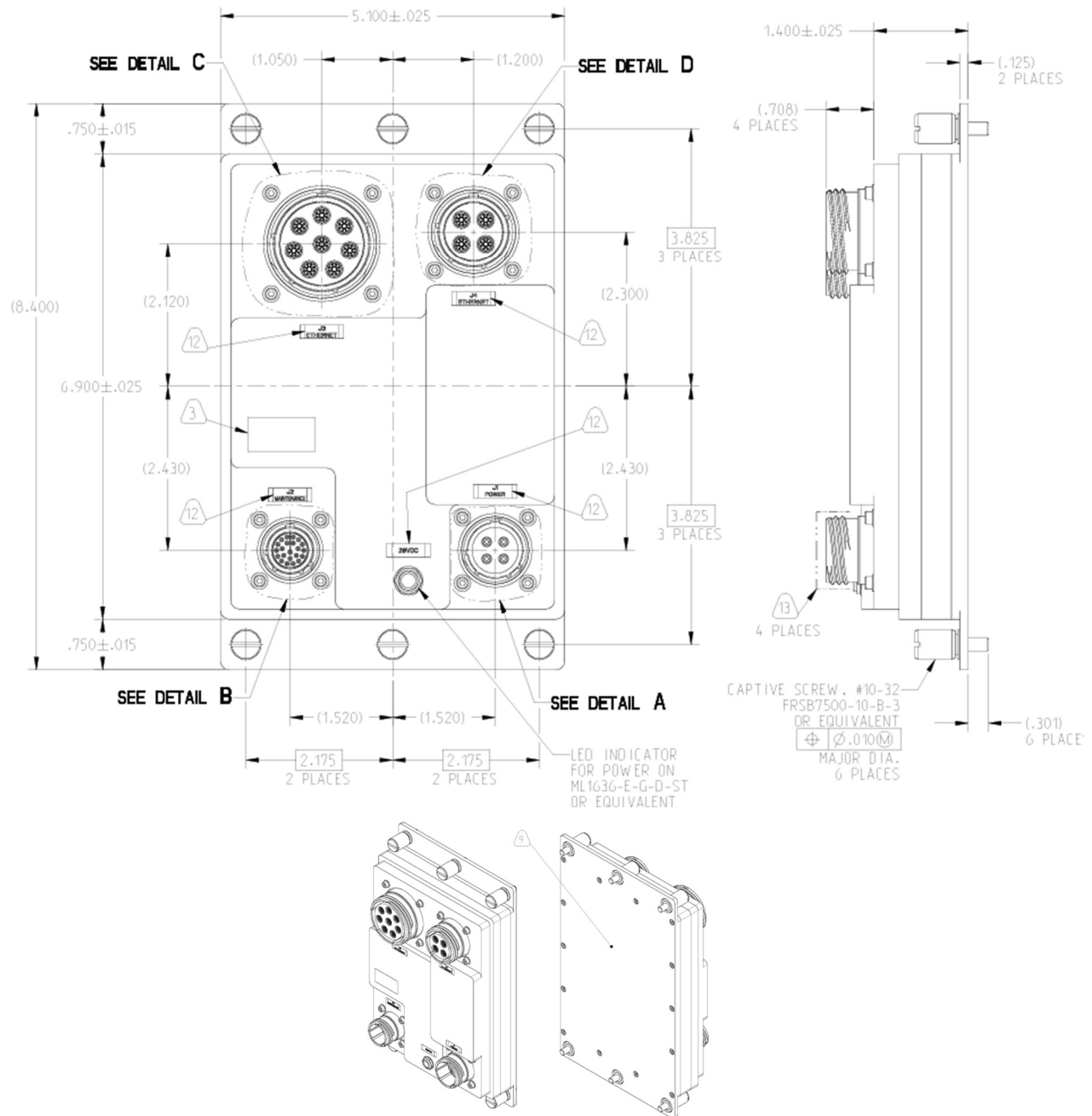
CF-02WA00-10X



Amphenol
MILITARY HIGH SPEED

40-60 Delaware Avenue
Sidney, NY 13838
amphenol-aerospace.com | amphenolmao.com

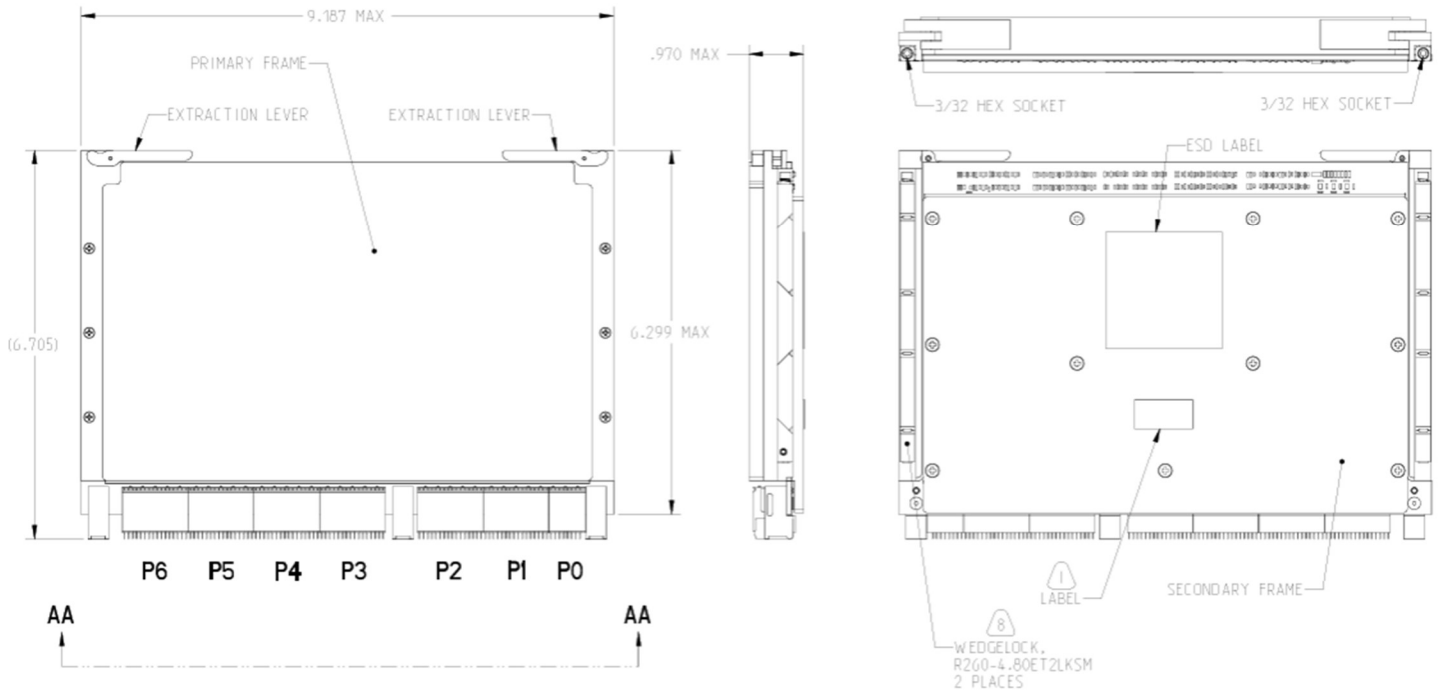
CF-020400-076



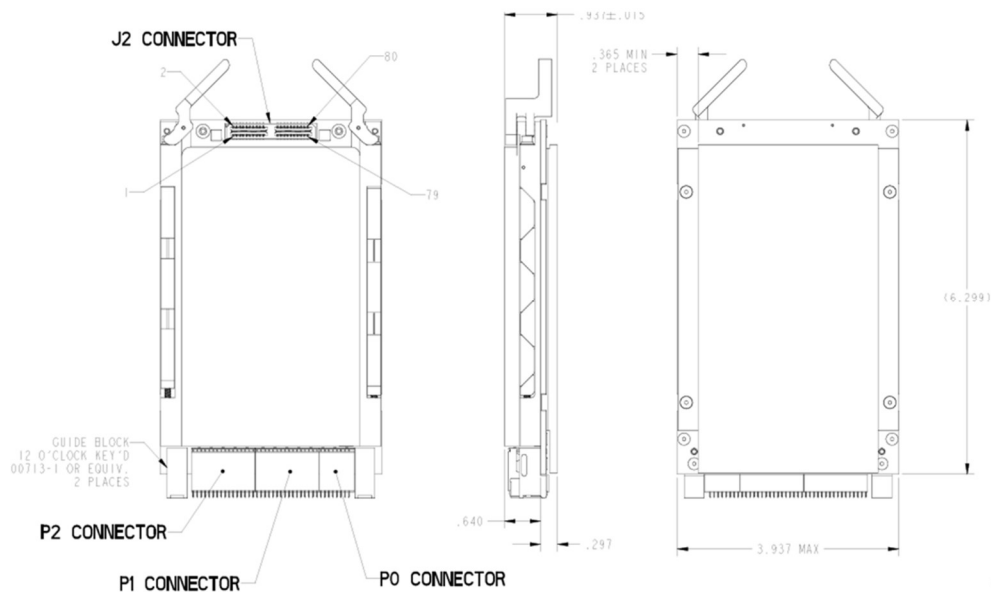
Amphenol

40-60 Delaware Avenue
Sidney, NY 13838
amphenol-aerospace.com | amphenolmao.com

6U Variants



3U Variants



Amphenol
MILITARY HIGH SPEED

40-60 Delaware Avenue
Sidney, NY 13838
amphenol-aerospace.com | amphenolmao.com

ADDITIONAL FEATURES

- Line-rate, non-blocking architecture
- Redundancy features (IEC 5243903 C4 and IEC 62439-3 C5)
- Support for port extender applications (IEEE 802.1br, eTAG, VNTag, HiGig™)
- Layer 2, IPV4/IPv6 Layer 3, Layer 4, and user-defined field (UDF) based packet classification.
- Priority-based Flow Control (PFC)
- Synchronized Ethernet (SyncE)
- OAM (IEEE 802.1ag and ITU-T Y.1731)



Amphenol
MILITARY HIGH SPEED

40-60 Delaware Avenue
Sidney, NY 13838
amphenol-aerospace.com | amphenolmao.com

Amphenol Ruggedization Design

OVERVIEW:

Amphenol integrated electronic products are designed and manufactured to our Ruggedization guidelines listed below. These guidelines ensure years of reliable operation in harsh environment applications where extreme operating temperatures, shock, vibration, and corrosive atmospheres are regularly experienced. Unless otherwise noted, the parts conform to the below specifications

TEMPERATURE:

- Operating Temperature- Thermal Cycles between -40°C and 85°C while device is operating
- Temperature is measured at chassis housing or card edge
- Storage Temperature- Thermal Cycles between -55°C and 125°C

HUMIDITY:

- Operating Humidity- Humidity cycle between 0-100% non-condensing humidity while device operating
- Storage Humidity- Humidity cycle between 0-100% condensing humidity

SEALING:

- Sealing can be optionally provided at the MIL-DTL-38999 interface with up to 10⁻⁵ cc/sec performance

SHOCK AND VIBRATION:

- Sine Vibration - 10g Peak, 5-2,000Hz
 - Based on a sine sweep duration of 10 minutes per axis in each of three mutually perpendicular axes. May be displacement limited from 5 to 44 Hz, depending on specific test.
- Random Vibration - 0.0005 @ 5Hz, 0.1 @ 15 Hz, 0.1 @ 2,000 Hz
 - 60 minutes per axis, in each of three mutually perpendicular axes.
- 40 G Peak Shock Cycle
 - Three hits in each axis, both directions, ½ sine and terminal-peak saw tooth, Total 36 hits.

FLUIDS SUSEPTABILITY:

- MIL-DTL-38999 receptacle interface per EIA-364-10E

ALTITUDE:

- -1,500 to 60,000 ft Altitude Testing w/ Rapid Depressurization



40-60 Delaware Avenue
Sidney, NY 13838
amphenol-aerospace.com | amphenolmao.com

ELECTROMAGNETIC COMPATIBILITY:

- Designed to comply with MIL-STD-461E

PRINTED CIRCUIT BOARD ASSEMBLIES:

- Conformal Coat
- Amphenol performs Conformal Coating to both sides of printed circuit board assemblies using HUSMISEAL IB31 in accordance with IPC-610, Class 3.
- Printed Circuit Board Rigidity
- Amphenol printed circuit boards are fabricated in accordance with IPC-6012, Class 3.
- Printed Circuit Board Fabrication
- Amphenol printed circuit boards acceptance criteria is in accordance with IPC-610, Class 3.

RELIABILITY PREDICTIONS (MTBF):

Amphenol can perform Mean Time Between Failure (MTBF) reliability analysis in full compliance with MIL-HDBK-217F-1 Parts Count Prediction and MIL-HDBK-217F-1 Parts Stress Analysis Prediction. We can also perform reliability analyses in full compliance of ANSI/VITA 51.1 if it is required or preferred over the later method.

Notice: Specifications are subject to change without notice. Contact your nearest Amphenol Corporation Sales Office for the latest specifications. All statements, information and data given herein are believed to be accurate and reliable but are presented without guarantee, warranty, or responsibility of any kind, expressed or implied. Statements or suggestions concerning possible use of our products are made without representation or warranty that any such use is free of patent infringement and are not recommendations to infringe any patent. The user should assume that all safety measures are indicated or that other measures may not be required. Specifications are typical and may not apply to all connectors.

AMPHENOL is a registered trademark of Amphenol Corporation.

©2023 Amphenol Corporation REV: PRELIMINARY



40-60 Delaware Avenue
Sidney, NY 13838
amphenol-aerospace.com | amphenolmao.com