12-CHANNEL RUGGED ETHERNET SWITCH

10/100/1G/2.5G/5G/10GBase-T Compatibility

DESCRIPTION

Amphenol's 12-channel Rugged Ethernet Switchbox is conduction cooled and configurable for system connectivity, various speeds, port types, as well as interoperation with several high-speed media converters and cable assemblies for system interfacing.

Each copper port is capable of 10/100/1G/2.5G/5G/10GBASE-T Ethernet connectivity. In Amphenol's state of the art communications testing center, the switchbox is aggressively tested at line rates to RFC 2889 for switch and RFC 2544 for L2/L3 performance, latency, packet forwarding and other key items.

The switch is manufactured using derivates of Amphenol's MIL-DTL-38999 Series III connectors. These connectors contain standard AS39029 qualified Size 22D contacts and Octonet contacts. Amphenol's Octonet contacts are a proven design used in a variety of military programs. The Octonet is a Size 8 contact that houses four differential pairs, capable of a data rate of 4Gbps maximum and 100Ohm impedance. This contact system has been tested and passed all specification requirements of AS39029 qualification.

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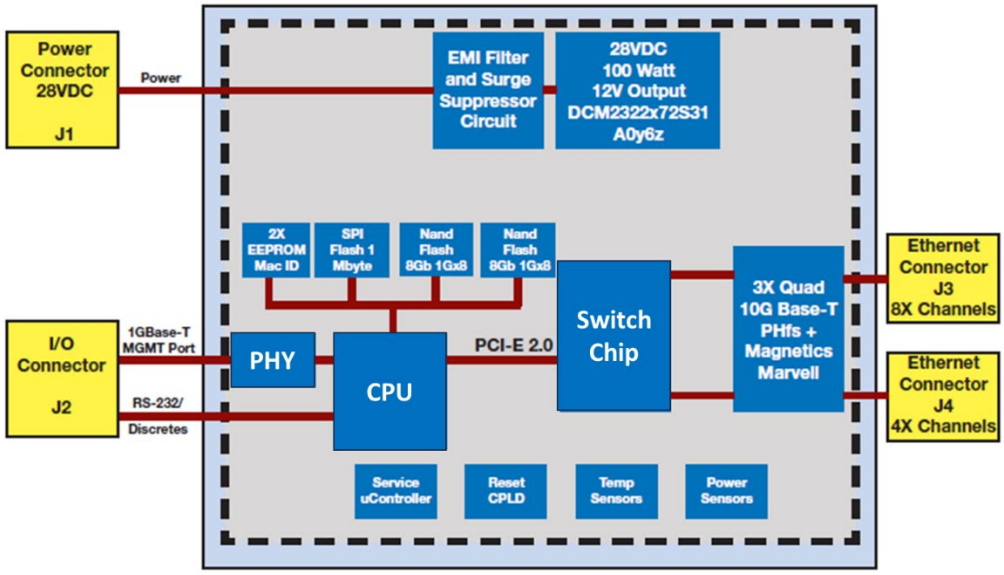
FEATURES AND BENEFITS

- 12-Channels of copper 10/100/1G/2.5G/5G/10GBASE-T
- 28V MIL-STD-740F input module – see this specification for input power considerations.
- 40 watts or less typical power consumption
- Less than 10 second boot time from power on to traffic switching.
- Mil-spec power supply with hold-up capacitor and in-rush current limiting circuit
- Built in test functionality for power up, initiated, and continuous operation.
- MIL-DTL-38999 power, debug/maintenance, and data connectors
- Mil-spec black painted chassis with cold plate external conduction cooling
- Host management process with expanded Ethernet features including:
  - CLI interface and web interface
  - IPV4 / IPV6 routing
  - Information on links and port counters
  - 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
  - Access control

BLOCK DIAGRAM



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SOFTWARE FEATURES

Stacking
Stacking Ring Topology
Stacking Chain Topology
Stacking Members and Unit ID
Removing and Replacing Stacking Members
Exchanging Stacking Members
Switching the Stacking Master
Configuring System Time
Configuring Daylight Savings Time
Configuring SNTP
Polling for Unicast Time Information
Polling for Anycast Time Information
Broadcast Time Information
Defining SNTP Settings
Configuring Device Security
Configuring Management Security
Configuring Authentication Methods
Defining Access Profiles
Defining Profile Rules
Defining Authentication Profiles
Mapping Authentication Methods
Defining RADIUS Settings
Defining TACACS+ Authentication
Configuring Passwords
Defining Local Users
Defining Line Passwords
Defining Enable Passwords
Configuring Network Security
Network Security Overview
Port-Based Authentication
Advanced Port-Based Authentication
Defining Port Authentication Properties
Defining Port Authentication
Configuring Multiple Hosts
Defining Authentication Hosts
Viewing EAP Statistics
Defining Access Control Lists
Defining IP Based Access Control Lists
Defining MAC Based Access Control Lists
Binding Device Security ACLs
Managing Port Security
Enabling Storm Control
Configuring System Logs
Defining General Log Properties
Viewing Memory Logs
Viewing Flash Logs
Configuring Interfaces
Configuring Ports
Aggregating Ports
Configuring LACP
Configuring VLANs
Defining VLAN Properties
Defining VLAN Membership
Defining VLAN Interface Settings
Configuring GARP
Defining GARP
Defining GVRP
Viewing GVRP Statistics

Defining IP Addresses
Configuring IP Addressing
Defining IP Addresses
Defining ARP
Defining Domain Name Servers
Defining DNS Servers
Defining DNS Host Mapping
Defining the Forwarding Database
Defining Static Forwarding Database Entries
Defining Dynamic Forwarding Database Entries
Configuring Spanning Tree
Defining Classic Spanning Tree
Defining STP on Interfaces
Defining Rapid Spanning Tree
Defining Multiple Spanning Tree
Defining MSTP Instance Settings
Defining MSTP Interface Settings
Configuring SNMP
SNMP v1 and v2c
SNMP v3
Configuring SNMP Security
Defining SNMP Security
Defining SNMP View
Defining SNMP Group Profiles
Defining SNMP Group Members
Defining SNMP Communities
SNMP Communities Basic Table
SNMP Communities Advanced Table
Configuring SNMP Notifications
Defining SNMP Notification Global Parameters .
Defining SNMP Notification Filters
Defining SNMP Notification Recipients
SNMPv1,2c Notification Recipients
SNMPv3 Notification Recipients
Configuring Multicast Forwarding
Multicast Forwarding
Typical Multicast Setup
Multicast Operation
Multicast Registration
Multicast Address Properties
Defining Multicast Properties
Adding MAC Group Address
Adding IP Multicast Groups
Configuring IGMP Snooping
Configuring MLD Snooping
Viewing IGMP/MLD IP Multicast Groups
Defining Multicast Router Ports
Defining Forward All Multicast
Defining Unregistered Multicast Settings

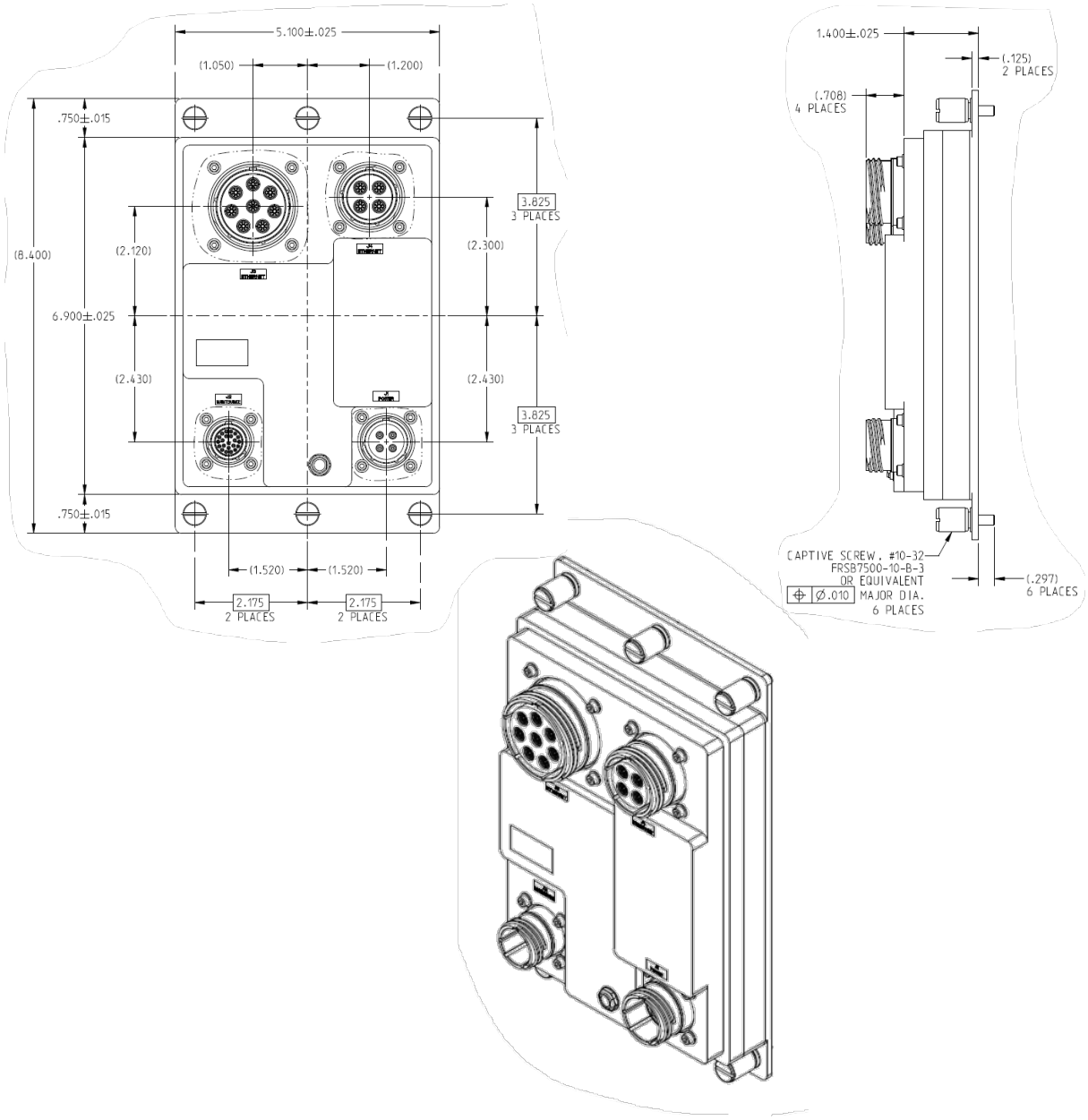
Managing System Files
Downloading System Files
Firmware Download
Configuration Download
Uploading System Files
Upload Type
Software Image Upload
Configuration Upload
Copying Files
Restoring the Default Configuration File
Configuring Quality of Service
Quality of Service Overview
VPT Classification Information
CoS Services
Defining General QoS Settings
Configuring QoS General Settings
Restoring Factory Default QoS Interface Settings
Defining Queues
Defining Bandwidth Settings
Mapping CoS Values to Queues
Mapping DSCP Values to Queues
Defining QoS Basic Mode
Defining Basic Mode Settings
Rewriting Basic Mode DSCP Values
Defining QoS Advanced Mode
Setting Policy Binding
Managing Device Diagnostics
Configuring Port Mirroring
Viewing Statistics
Viewing Interface Statistics
Viewing Interface Statistics
Receive Statistics
Transmit Statistics
Viewing Etherlike Statistics
Managing RMON Statistics
Viewing RMON Statistics
Configuring RMON History
Defining RMON History Control
Viewing the RMON History Table
Configuring RMON Events
Defining RMON Events Control
Viewing the RMON Events Logs
Defining RMON Alarms

ORDERING INFORMATION

PART NUMBER	DESCRIPTION
CF-020400-076	12-channel rugged network switch, 12x 10/100/1G/2.5G/5G/10GBASE-T

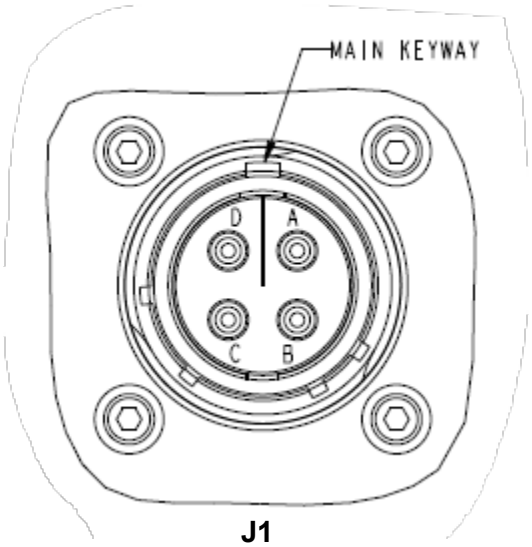
MECHANICAL SPECIFICATIONS

CF-020400-076

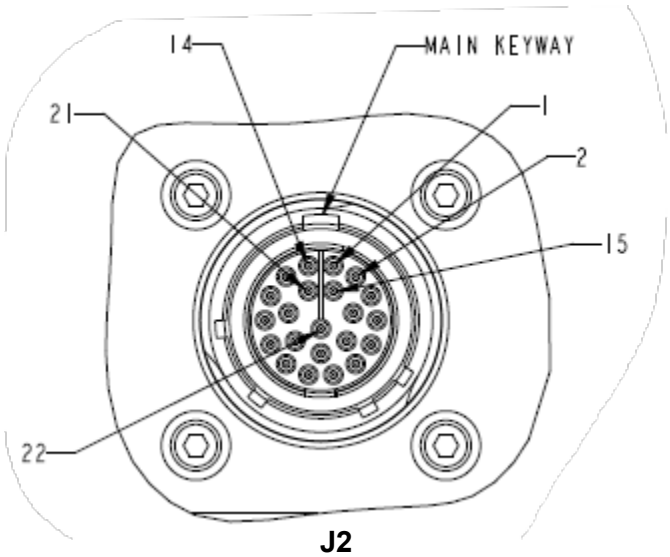


CF-020400-076 PINOUT

I/O CHART			
CONNECTOR DESCRIPTION	**PIN NO.**	**DATA DIRECTION**	**SIGNAL NAME**
J1 (POWER) 15-4P	A	IN	280VDC_IN
	B	OUT	28VDC_RTN
	C	--	SAFETY GROUND / CHASSIS
	D	--	NOT CONNECTED
	SHELL	--	CHASSIS
J2 (MAINTENANCE) 13-35P	1	OUT	RS232_CONSOLE_TX
	2	IN	RS232_CONSOLE_RX
	3	--	RS232_CONSOLE_GND
	4	OUT	POWER_SUPPLY_STATUS
	5	IN	RS232_PIC_RX
	6	OUT	RS232_PIC_TX
	7	OUT	CHASSIS_STATUS
	8	--	RS232_PIC_GND
	9	OUT	TEMP_WARNING_STATUS
	10	BI	DEBUG_I2C_SCL
	11	BI	DEBUG_I2C_SDA
	12	--	RESET
	13	--	RESET_RETURN
	14	BI	DEBUG_CPU_1GBASET_DA+
	15		DEBUG_CPU_1GBASET_DA-
	16		DEBUG_CPU_1GBASET_DB+
	17		DEBUG_CPU_1GBASET_DB-
	18		DEBUG_CPU_1GBASET_DC+
	19		DEBUG_CPU_1GBASET_DC-
	20		DEBUG_CPU_1GBASET_DD+
	21		DEBUG_CPU_1GBASET_DD-
	22	--	NOT CONNECTED
	SHELL	--	CHASSIS

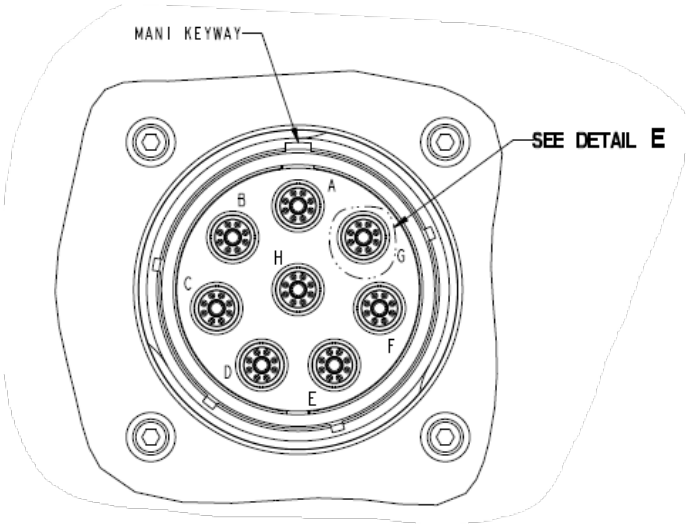


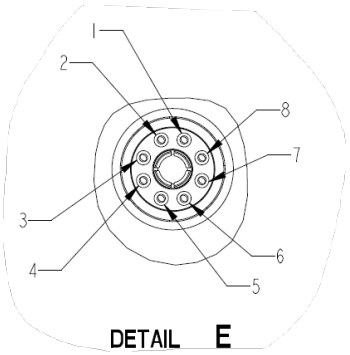
J1



J2

I/O CHART			
CONNECTOR DESCRIPTION	PIN NO.	DATA DIRECTION	SIGNAL NAME
J3 10GBASE-T 25-8S	A-1	BI	PORT1_10GBASE-T_DA+
	A-2		PORT1_10GBASE-T_DA-
	A-3		PORT1_10GBASE-T_DB+
	A-4		PORT1_10GBASE-T_DB-
	A-5		PORT1_10GBASE-T_DC+
	A-6		PORT1_10GBASE-T_DC-
	A-7		PORT1_10GBASE-T_DD+
	A-8		PORT1_10GBASE-T_DD-
	A-OUTER		CHASSIS
	B-1	BI	PORT2_10GBASE-T_DA+
	B-2		PORT2_10GBASE-T_DA-
	B-3		PORT2_10GBASE-T_DB+
	B-4		PORT2_10GBASE-T_DB-
	B-5		PORT2_10GBASE-T_DC+
	B-6		PORT2_10GBASE-T_DC-
	B-7		PORT2_10GBASE-T_DD+
	B-8		PORT2_10GBASE-T_DD-
	B-OUTER		CHASSIS
	C-1	BI	PORT3_10GBASE-T_DA+
	C-2		PORT3_10GBASE-T_DA-
	C-3		PORT3_10GBASE-T_DB+
	C-4		PORT3_10GBASE-T_DB-
	C-5		PORT3_10GBASE-T_DC+
	C-6		PORT3_10GBASE-T_DC-
	C-7		PORT3_10GBASE-T_DD+
	C-8		PORT3_10GBASE-T_DD-
	C-OUTER		CHASSIS
	D-1	BI	PORT4_10GBASE-T_DA+
	D-2		PORT4_10GBASE-T_DA-
	D-3		PORT4_10GBASE-T_DB+
	D-4		PORT4_10GBASE-T_DB-
	D-5		PORT4_10GBASE-T_DC+
	D-6		PORT4_10GBASE-T_DC-
	D-7		PORT4_10GBASE-T_DD+
	D-8		PORT4_10GBASE-T_DD-
	D-OUTER		CHASSIS
	E-1	BI	PORT5_10GBASE-T_DA+
	E-2		PORT5_10GBASE-T_DA-
	E-3		PORT5_10GBASE-T_DB+
	E-4		PORT5_10GBASE-T_DB-
	E-5		PORT5_10GBASE-T_DC+
	E-6		PORT5_10GBASE-T_DC-
	E-7		PORT5_10GBASE-T_DD+
	E-8		PORT5_10GBASE-T_DD-
	E-OUTER		CHASSIS
	F-1	BI	PORT6_10GBASE-T_DA+
	F-2		PORT6_10GBASE-T_DA-
	F-3		PORT6_10GBASE-T_DB+
	F-4		PORT6_10GBASE-T_DB-
	F-5		PORT6_10GBASE-T_DC+
	F-6		PORT6_10GBASE-T_DC-
	F-7		PORT6_10GBASE-T_DD+
	F-8		PORT6_10GBASE-T_DD-
	F-OUTER		CHASSIS





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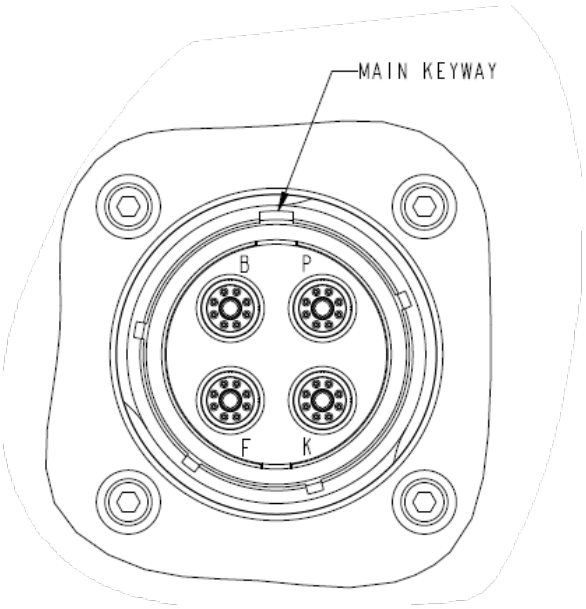
I/O CHART			
CONNECTOR DESCRIPTION	PIN NO.	DATA DIRECTION	SIGNAL NAME
J3 10GBASE-T 25-8S	G-1	BI	PORT7_10GBASE-T_DA+
	G-2		PORT7_10GBASE-T_DA-
	G-3		PORT7_10GBASE-T_DB+
	G-4		PORT7_10GBASE-T_DB-
	G-5		PORT7_10GBASE-T_DC+
	G-6		PORT7_10GBASE-T_DC-
	G-7		PORT7_10GBASE-T_DD+
	G-8		PORT7_10GBASE-T_DD-
	G-OUTER		CHASSIS
	H-1	BI	PORT8_10GBASE-T_DA+
	H-2		PORT8_10GBASE-T_DA-
	H-3		PORT8_10GBASE-T_DB+
	H-4		PORT8_10GBASE-T_DB-
	H-5		PORT8_10GBASE-T_DC+
	H-6		PORT8_10GBASE-T_DC-
	H-7		PORT8_10GBASE-T_DD+
	H-8		PORT8_10GBASE-T_DD-
	H-OUTER		CHASSIS
	SHELL	--	CHASSIS
J4 10GBASE-T 19-ABS	B-1	BI	PORT9_10GBASE-T_DA+
	B-2		PORT9_10GBASE-T_DA-
	B-3		PORT9_10GBASE-T_DB+
	B-4		PORT9_10GBASE-T_DB-
	B-5		PORT9_10GBASE-T_DC+
	B-6		PORT9_10GBASE-T_DC-
	B-7		PORT9_10GBASE-T_DD+
	B-8		PORT9_10GBASE-T_DD-
	B-OUTER		CHASSIS
	F-1	BI	PORT10_10GBASE-T_DA+
	F-2		PORT10_10GBASE-T_DA-
	F-3		PORT10_10GBASE-T_DB+
	F-4		PORT10_10GBASE-T_DB-
	F-5		PORT10_10GBASE-T_DC+
	F-6		PORT10_10GBASE-T_DC-
	F-7		PORT10_10GBASE-T_DD+
	F-8		PORT10_10GBASE-T_DD-
	F-OUTER		CHASSIS
	K-1	BI	PORT11_10GBASE-T_DA+
	K-2		PORT11_10GBASE-T_DA-
	K-3		PORT11_10GBASE-T_DB+
	K-4		PORT11_10GBASE-T_DB-
	K-5		PORT11_10GBASE-T_DC+
	K-6		PORT11_10GBASE-T_DC-
	K-7		PORT11_10GBASE-T_DD+
	K-8		PORT11_10GBASE-T_DD-
	K-OUTER		CHASSIS
	P-1	BI	PORT12_10GBASE-T_DA+
	P-2		PORT12_10GBASE-T_DA-
	P-3		PORT12_10GBASE-T_DB+
	P-4		PORT12_10GBASE-T_DB-
	P-5		PORT12_10GBASE-T_DC+
	P-6		PORT12_10GBASE-T_DC-
	P-7		PORT12_10GBASE-T_DD+
	P-8		PORT12_10GBASE-T_DD-
	P-OUTER		CHASSIS
	SHELL	--	CHASSIS



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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
  - PORT1_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

ELECTRONMAGNETIC 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.

OTHER:

- Designed for MIL-STD-704F Power
- Salt/Fog/Dust
- Fluids and Rain
- Explosive atmosphere

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.

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Amphenol
MILITARY HIGH SPEED

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