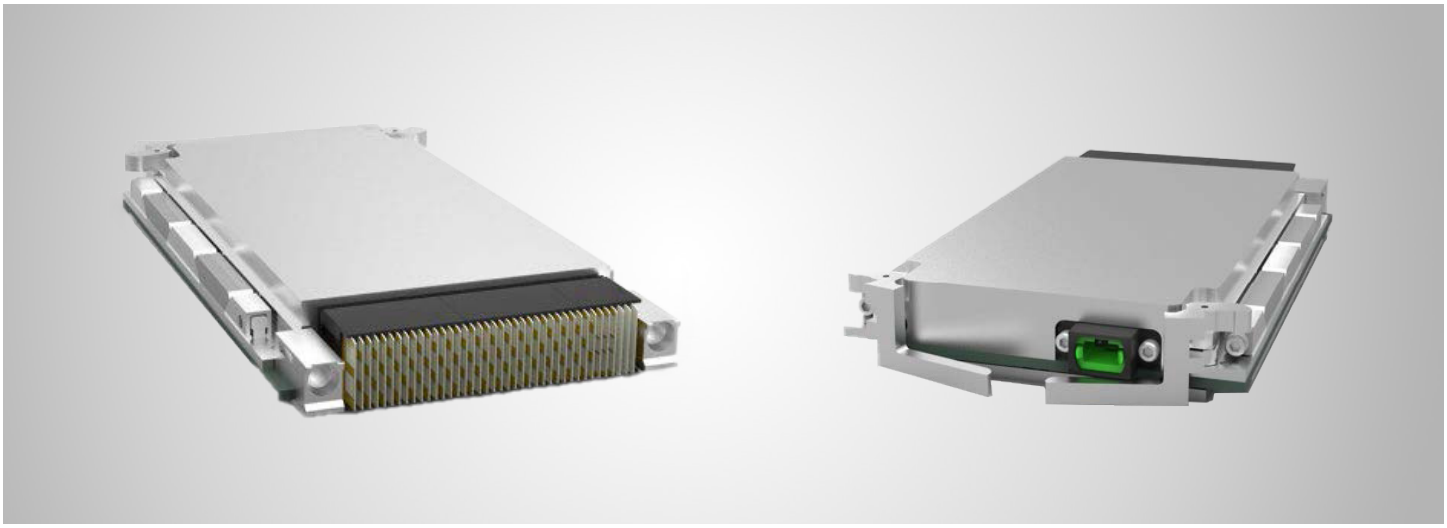
Amphenol
MILITARY HIGH SPEED

SOSA-ALIGNED 3U R-VPX HIGH SPEED ETHERNET SWITCH

ENABLED WITH 10G/25G TSN MACSEC PROTOCOLS

PDS - 380



36-Channel Switch that Conforms to SLT3-SWH-6F1U7U-14.4.14 and MOD3-SWH-6F1U7U-16.4.15-2 Slot Profiles.

Amphenol's 36-Channel 1G/10G/25G copper and fiber optic Ethernet switch in 3U VPX SOSA-aligned form factor conforms to SLT3-SWH-6F1U7U-14.4.14 and MOD3-SWH-6F1U7U-16.4.15-2 slot profiles. The switch consists of a TSN and MACSec enabled 12-channel Ethernet switch for the seven control plane ports, four fiber optic ports, and a trunk port to the data plane switched devices. The data plane switched devices have access to the entire Ethernet mesh through a low power, less managed, and short boot-time 10G Ethernet switch ASIC.

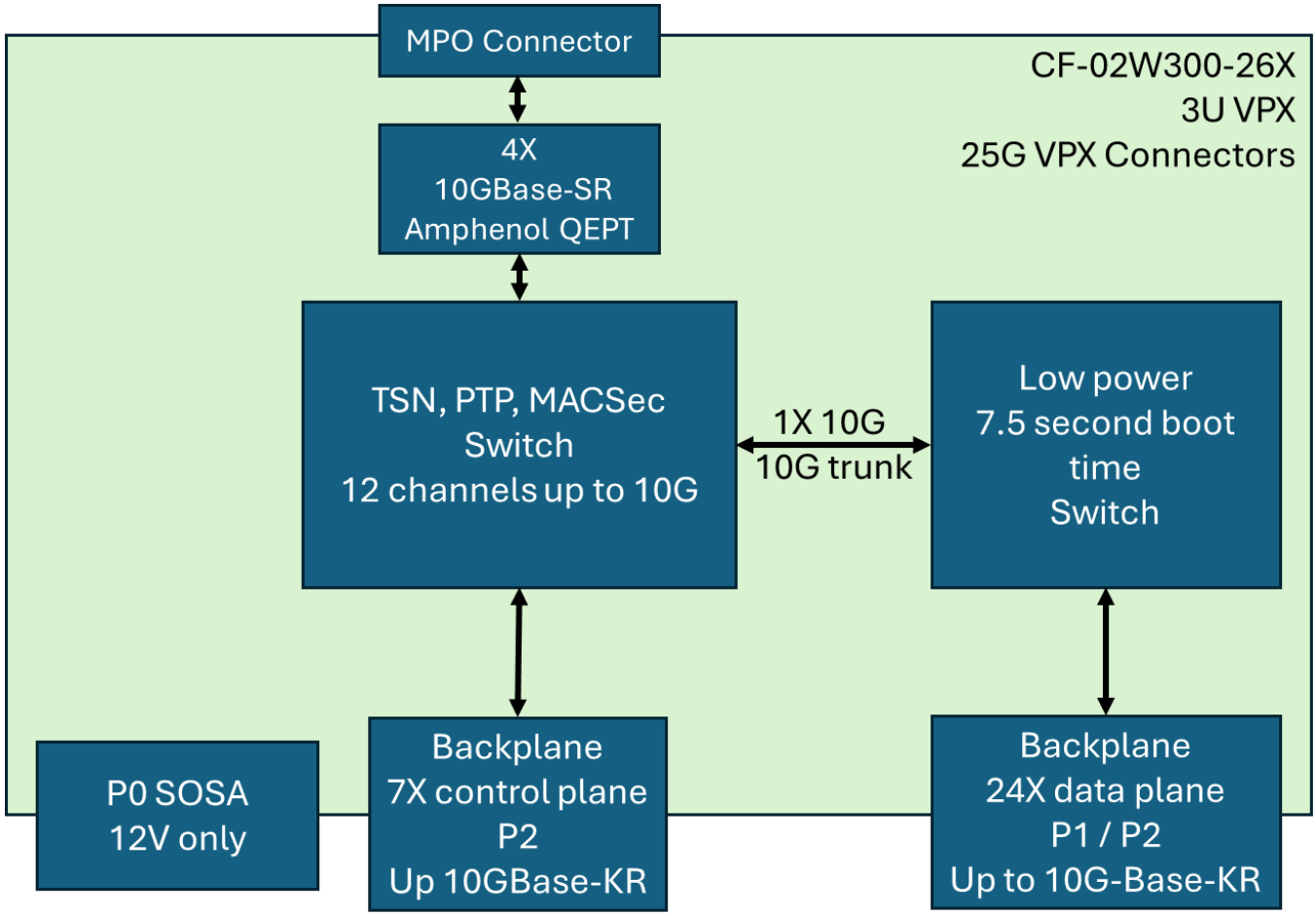
FEATURES & BENEFITS:

- 34-Channel Support: Seven control plane channels at up to 10GBase-KR and four channels of up to 10GBase-SR with fill acceleration for TSN/MACSec functions. 24 channels of data plane switching up to 10GBase-SR.
- Multimode Fiber Compatibility: Designed for OM3/OM4/OM5 multimode fiber systems typically used in data center environments through rugged MTP connector.
- SOSA-aligned slot profile: for 24 channels of data plane devices and 7 channels of control plane devices.
- Low power and rugged operation: Designed for -40-+85C operation in rugged military environments at high altitudes. Typical power consumption at 50 watts or less.
- Designed for Industry 4.0 and IoT.

Part Number	Description
CF-02W300-26X	Switch – Conduction Cooled

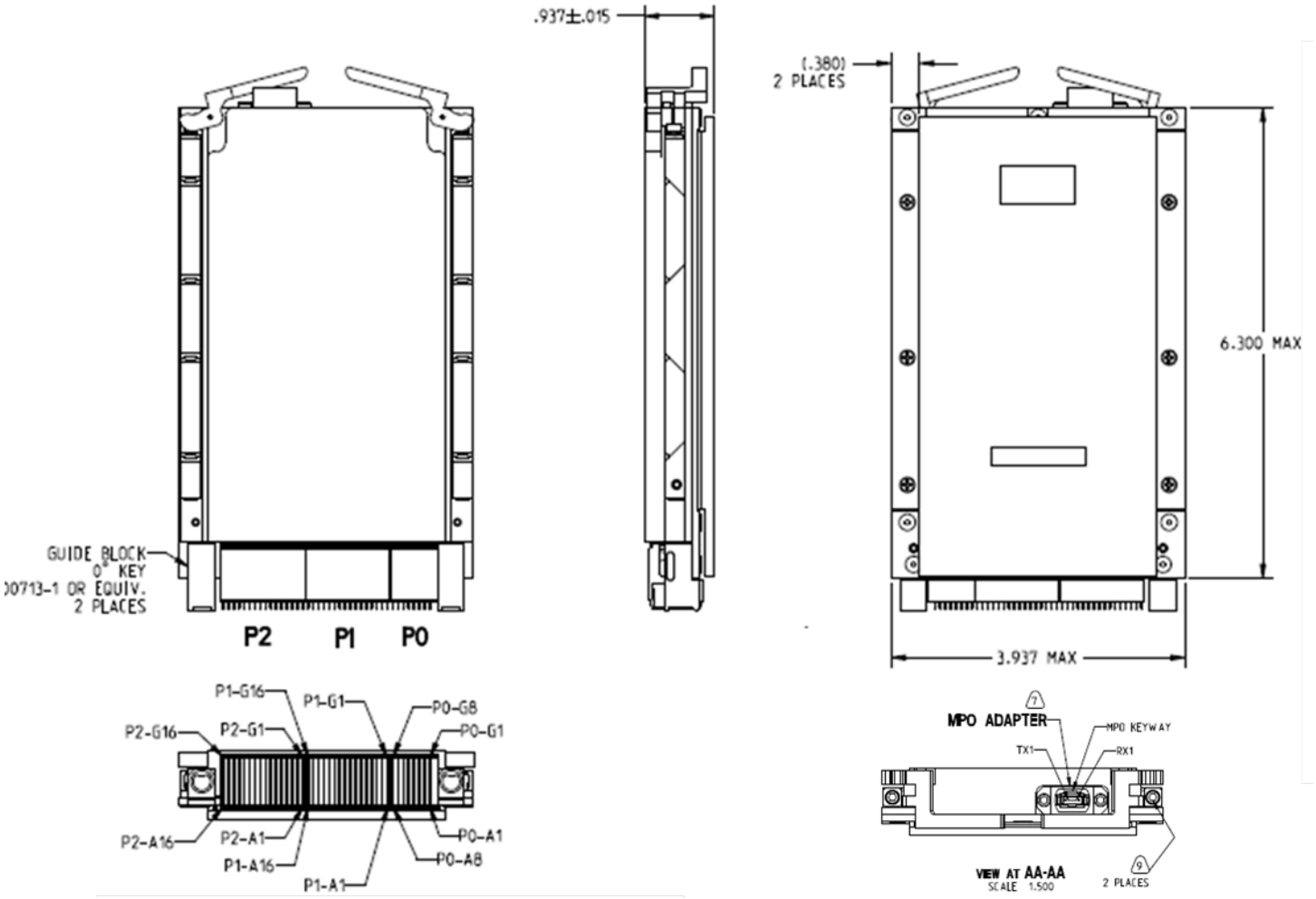
Jared Sibrava • +1 (607) 643-1845 • jsibrava@amphenol-aao.com
amphenol-aerospace.com

BLOCK DIAGRAM



Jared Sibrava • +1 (607) 643-1845 • jsibrava@amphenol-aao.com
amphenol-aerospace.com

DIMENSIONAL INFORMATION



Jared Sibrava • +1 (607) 643-1845 • jsibrava@amphenol-aao.com
amphenol-aerospace.com

I/O CHART

P0 I/O CHART

	G	F	E	D	C	B	A
1	+12V	+12V	+12V	NC	NC	NC	NC
2	+12V	+12V	+12V	NC	NC	NC	NC
3	NC	NC	NC	NC	NC	NC	NC
4	ISCL2	ISDA2	GND	NC	GND	BPRSETn	NVMRO
5	GAP	GA4	GND	NC	GND	ISCL1	ISDA1
6	GA3	GA2	GND	NC	GND	GA1	GA0
7	TCK	GND	TDO	TDI	GND	TMS	NC
8	GND	NC	NC	GND	NC	NC	GND

MPO ADAPTER I/O CHART

ID	SIGNAL
RX1	25G-SR_RX1
RX2	25G-SR_RX2
RX3	25G-SR_RX3
RX4	25G-SR_RX4
TX4	25G-SR_TX4
TX3	25G-SR_TX3
TX2	25G-SR_TX2
TX1	25G-SR_TX1

P1 I/O CHART

		G	F	E	D	C	B	A
1	DATA PLANE STACKING PORT	GDiscrete1	GND	P1_10G-KR_TX#	P1_10G-KR_TX	GND	P1_10G-KR_RX#	P1_10G-KR_RX
2		GND	P2_10G-KR_TX#	P2_10G-KR_TX	GND	P2_10G-KR_RX#	P2_10G-KR_RX	GND
3		P1-VBAT	GND	P3_10G-KR_TX#	P3_10G-KR_TX	GND	P3_10G-KR_RX#	P3_10G-KR_RX
4		GND	P4_10G-KR_TX#	P4_10G-KR_TX	GND	P4_10G-KR_RX#	P4_10G-KR_RX	GND
5	DATA PLANE PORT 1	SYS_CON*	GND	P5_10G-KR_TX#	P5_10G-KR_TX	GND	P5_10G-KR_RX#	P5_10G-KR_RX
6		GND	P6_10G-KR_TX#	P6_10G-KR_TX	GND	P6_10G-KR_RX#	P6_10G-KR_RX	GND
7		Reserved	GND	P7_10G-KR_TX#	P7_10G-KR_TX	GND	P7_10G-KR_RX#	P7_10G-KR_RX
8		GND	P8_10G-KR_TX#	P8_10G-KR_TX	GND	P8_10G-KR_RX#	P8_10G-KR_RX	GND
9	DATA PLANE PORT 2	MP01-TD	GND	P9_10G-KR_TX#	P9_10G-KR_TX	GND	P9_10G-KR_RX#	P9_10G-KR_RX
10		GND	P10_10G-KR_TX#	P10_10G-KR_TX	GND	P10_10G-KR_RX#	P10_10G-KR_RX	GND
11		MP01-RD	GND	P11_10G-KR_TX#	P11_10G-KR_TX	GND	P11_10G-KR_RX#	P11_10G-KR_RX
12		GND	P12_10G-KR_TX#	P12_10G-KR_TX	GND	P12_10G-KR_RX#	P12_10G-KR_RX	GND
13	DATA PLANE PORT 3	Reserved	GND	P13_10G-KR_TX#	P13_10G-KR_TX	GND	P13_10G-KR_RX#	P13_10G-KR_RX
14		GND	P14_10G-KR_TX#	P14_10G-KR_TX	GND	P14_10G-KR_RX#	P14_10G-KR_RX	GND
15		MaskableRST*	GND	P15_10G-KR_TX#	P15_10G-KR_TX	GND	P15_10G-KR_RX#	P15_10G-KR_RX
16		GND	P16_10G-KR_TX#	P16_10G-KR_TX	GND	P16_10G-KR_RX#	P16_10G-KR_RX	GND

P2 I/O CHART

		G	F	E	D	C	B	A
1	DATA PLANE PORT 4	Reserved	GND	P17_10G-KR_TX#	P17_10G-KR_TX	GND	P17_10G-KR_RX#	P17_10G-KR_RX
2		GND	P18_10G-KR_TX#	P18_10G-KR_TX	GND	P18_10G-KR_RX#	P18_10G-KR_RX	GND
3		Reserved	GND	P19_10G-KR_TX#	P19_10G-KR_TX	GND	P19_10G-KR_RX#	P19_10G-KR_RX
4		GND	P20_10G-KR_TX#	P20_10G-KR_TX	GND	P20_10G-KR_RX#	P20_10G-KR_RX	GND
5	DATA PLANE PORT 5	Reserved	GND	P21_10G-KR_TX#	P21_10G-KR_TX	GND	P21_10G-KR_RX#	P21_10G-KR_RX
6		GND	P22_10G-KR_TX#	P22_10G-KR_TX	GND	P22_10G-KR_RX#	P22_10G-KR_RX	GND
7		Reserved	GND	P23_10G-KR_TX#	P23_10G-KR_TX	GND	P23_10G-KR_RX#	P23_10G-KR_RX
8		GND	P24_10G-KR_TX#	P24_10G-KR_TX	GND	P24_10G-KR_RX#	P24_10G-KR_RX	GND
9	GND	GND	GND	GND	GND	GND	GND	GND
10	7 CONTROL PLANE ONE OF WHICH IS STACKING	GND	CS01_10G-KR_TX#	CS01_10G-KR_TX	GND	CS01_10G-KR_RX#	CS01_10G-KR_RX	GND
11		MP02-TD	GND	CP04_10G-KR_TX#	CP04_10G-KR_TX	GND	CP04_10G-KR_RX#	CP04_10G-KR_RX
12		GND	CP03_10G-KR_TX#	CP03_10G-KR_TX	GND	CP03_10G-KR_RX#	CP03_10G-KR_RX	GND
13		MP02-RD	GND	CP02_10G-KR_TX#	CP02_10G-KR_TX	GND	CP02_10G-KR_RX#	CP02_10G-KR_RX
14		GND	CP01_10G-KR_TX#	CP01_10G-KR_TX	GND	CP01_10G-KR_RX#	CP01_10G-KR_RX	GND
15		NC	GND	CP06_10G-KR_TX#	CP06_10G-KR_TX	GND	CP06_10G-KR_RX#	CP06_10G-KR_RX
16		GND	CP05_10G-KR_TX#	CP05_10G-KR_TX	GND	CP05_10G-KR_RX#	CP05_10G-KR_RX	GND

SOFTWARE – Control Plane Side - ~50 second boot

Manuals available upon request

Based on a new generation of highly integrated packet processors, this module is designed to deliver a full portfolio of scalable, high-performance, low-power, small-footprint, feature-rich Ethernet switch modules, optimized for industrial and Internet of Things (IoT) applications operating in extended temperature range. The extensive support in Time-Sensitive Networking (TSN) IEEE standards and High-availability Seamless Redundancy (HSR/PRP), empowers the transition to real-time communication solutions.

Offering these standards in a single chip guarantees end-to-end transmission of high-priority traffic with deterministic latency and increased reliability. Ironman integration of groundbreaking technologies TIPS (Telemetry, Intelligence, Performance, Security) technology lays out the essential foundation for innovations in network visibility, intelligence, performance, and security. Intelligent workload management provides optimized data processing at or near the network access edge, reducing hybrid cloud bandwidth requirements; insightful telemetry reinforces automation and expedites forensic analytics; advanced security features underpin trustworthiness and provide network embedded protection from ever evolving security threats. Integrates forwarding tables, Longest Prefix Match (LPM) tables, and flexible multiple TCAM lookups, designed to address Industrial Access deployment needs. With comprehensive embedded security services include high-bandwidth IEEE 802.1AE Media Access Control Security (MACsec) Engine, at full device bandwidth processing capacity can provide cryptography-based security for Ethernet traffic. The family also supports device level security including Secured Boot and Secured Storage. The module Integrates Dual-Core ARM-v8.2 Cortex-A55 high-performance CPU Cluster, designed to meet requirements of modern Network Operation Systems. Additionally, the module integrates multiple ARMv7 Cortex-M3 (CM3) uControllers, each with its own memory that can be used running control functions such as PoE Stack, Device Initialization, Telemetry Collection or User-Specific processes and tasks. The Control and Management subsystem integrates a16-bit DDR4 memory controller and supports rich interfaces for the internal and external management functions, that include PCI Express (PCIe) Gen3.0, Ethernet Port, eMMC, QSPI-Flash, NAND-Flash, USB 2.0 and others.

Furthermore, the module allows a wide-range modern packet processing feature-set, based on Marvell® extended-bridging (eBridge) architecture; virtual overlay networking with programmable tunnel header encapsulation; real-time flow granular telemetry and observability capabilities to facilitate network adaptation; robust QoS, load-balancing schemes and advanced congestion mechanisms, designed to meet the modern networks' needs. The device is compatible with the Marvell Prestera® DX Family software to enable a rapid product development and time-to market.

Network Features

- Jumbo Frames support
- Cut-through operation to minimize traffic latency
- IEC 62439-3 - HSR/PRP High available seamless redundancy (Parallel Redundancy Protocol)
- Time-Sensitive Networking (TSN) IEEE
- Parallel (x8) and Serial LED interface for port activity status
- Highly scalable (cascade up to 1K modules)

Memory, Security, and Hardware Features

- High bandwidth DDR4 (1G/2G options)
- eMMC (up to 256G)
- PCIe Gen3 dev
- Trusted / secure boot support

- IEEE 802.3ae standard compliant MACsec engine with capacity to process, encrypt, and decrypt the entire devices bandwidth bi-directional traffic

Industrial Features

- G.8032, ERPS Ring Protection
- High accuracy one and two-step PTP compliant with IEEE 1588v1/v2 and ITU-T G.8273.2 Class C with IEEE 802.1AS02020 support
- SyncE compliant
- IEC 62439-3 – HSR/PRP high available seamless redundancy (Parallel Redundancy Protocol)

TSN

- IEEE 802.1CM-2018 profile B
- IEEE 802.1AS-2020 – timing synchronization with 4 time domains plus 1 free running clock
- IEEE 802.1Qav, IEEE 802.1Qbv, IEEE 802.1Qbu and 802.3br, IEEE 802.1Qci, IEEE 802.1CB

Many more features and manual available on request.

Stacking
Stacking Ring Topology
Stacking Chain Topology
Stacking Members and Unit ID
Removing and Replacing Stacking Member
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
ConfiguringManagement Security
Configuring AuthenticationMethods
Defining Access Profiles
Defining Profile Rules
Defining Authentication Profiles
Mapping AuthenticationMethods
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
Defining System Log Servers
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 Entrie
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 Setting
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

SOFTWARE – Data Plane Side – ~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

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:

- Opperating Temperature - thermal cycles between -40ºC and 85ºC while device is operating.
- Temperature is measured at chassis housing or card edge
- Storage temperature - thermal cycles between -55ºC and 125ºC

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
  - o 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
  - o 60 minutes per axis, in each of three mutually perpendicular axes.
- 40 G Peak Shock Cycle
  - o Three hits in each axis, both directions, 1/2 sine and terminal-leak saw tooth, total 36 hits

Fluid 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-STL-461E

Printed Circuit Board Assemblies

- Conformal Coat
- Amphenol performs Conformal Coting 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

Amphenol
MILITARY HIGH SPEED

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