Amphenol
MILITARY HIGH SPEED

34-CHANNEL 10G COPPER RUGGED ETHERNET SWITCH

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

Miracle Switch

PRODUCT HIGHLIGHTS

- *Boot time is less than 10 seconds*
- *Power consumption is less than 50 watts*
- *Lightly managed switching functionality*
- *Source code available for 3rd party applications*
- *Secure and rugged for the harshest environments*

DESCRIPTION

Amphenol's 34-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.

28 ports are capable of 10/100/1G Base-T compatibility, and 6 ports are capable of 10/100/1G/2.5G/5G/10G Base-T compatibility. 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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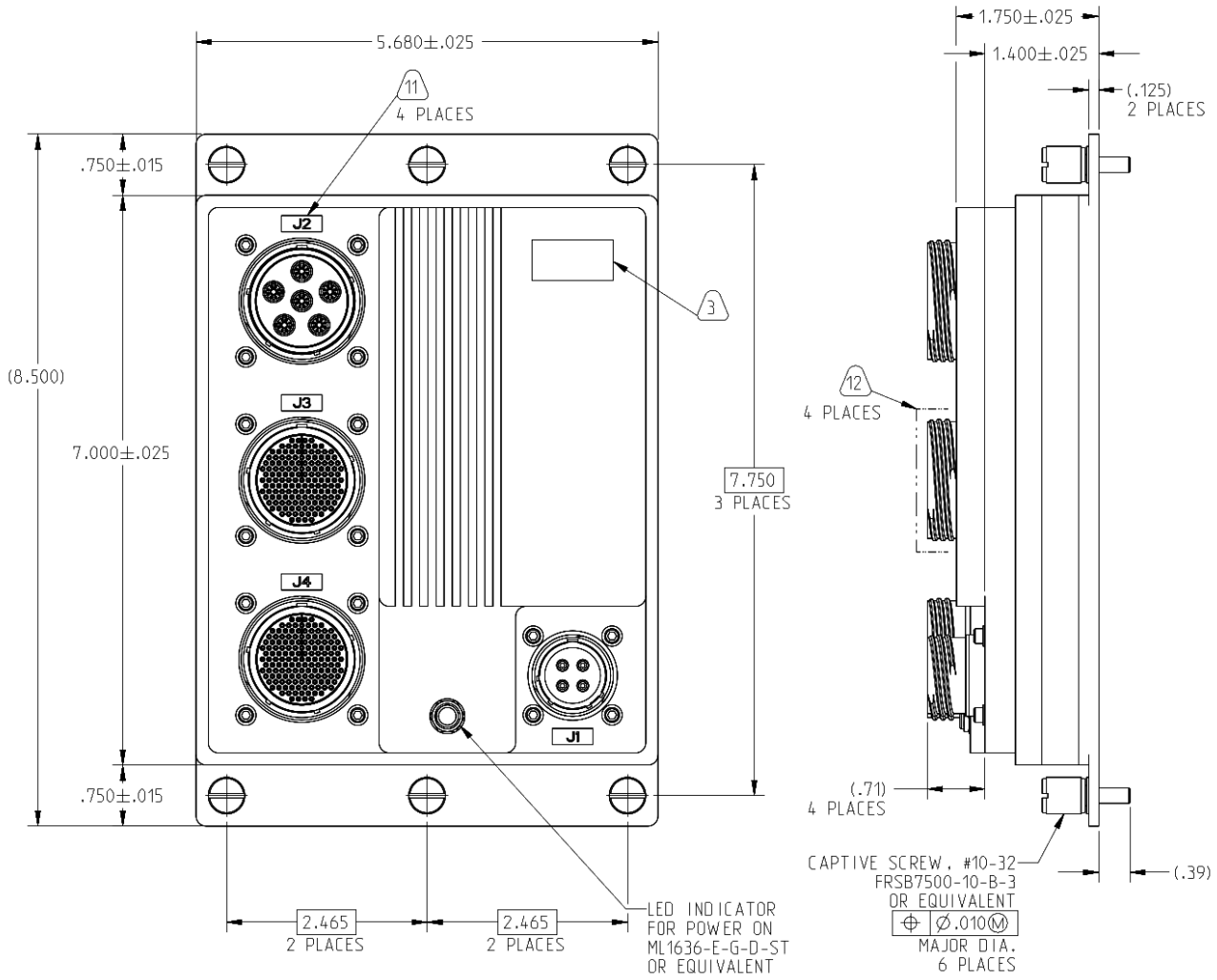
FEATURES & BENEFITS

- 28 ports are capable of 10/100/1G Base-T compatibility
- 6 ports are capable of 10/100/1G/2.5G/5G/10G Base-T compatibility
- 28V MIL-STD-740A input module – see this specification for input power considerations.
- 50 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:
  - o CLI interface and web interface
  - o IPV4 / IPV6 routing
  - o Information on links and port counters
  - o Tagged and untagged vlan configurations
  - o Trunk link aggregation
  - o Port mirroring
  - o Port based QoS
  - o 802.1P QoS
  - o Rate limitations
  - o Loop detection
  - o Multicast IGMP snooping
  - o Reset functionality with authenticated Ethernet command
  - o CNSA 1.0 algorithms
  - o Secure Methods for logging into switch over management Ethernet
  - o Approved zeroization methods
  - o Denial of service protections
  - o Firewall functionality
  - o Secure booting
  - o Cable diagnostics
  - o Access control

ORDERING INFORMATION

PART NUMBER	CF-02WA00-19X

DIMENSIONAL INFORMATION



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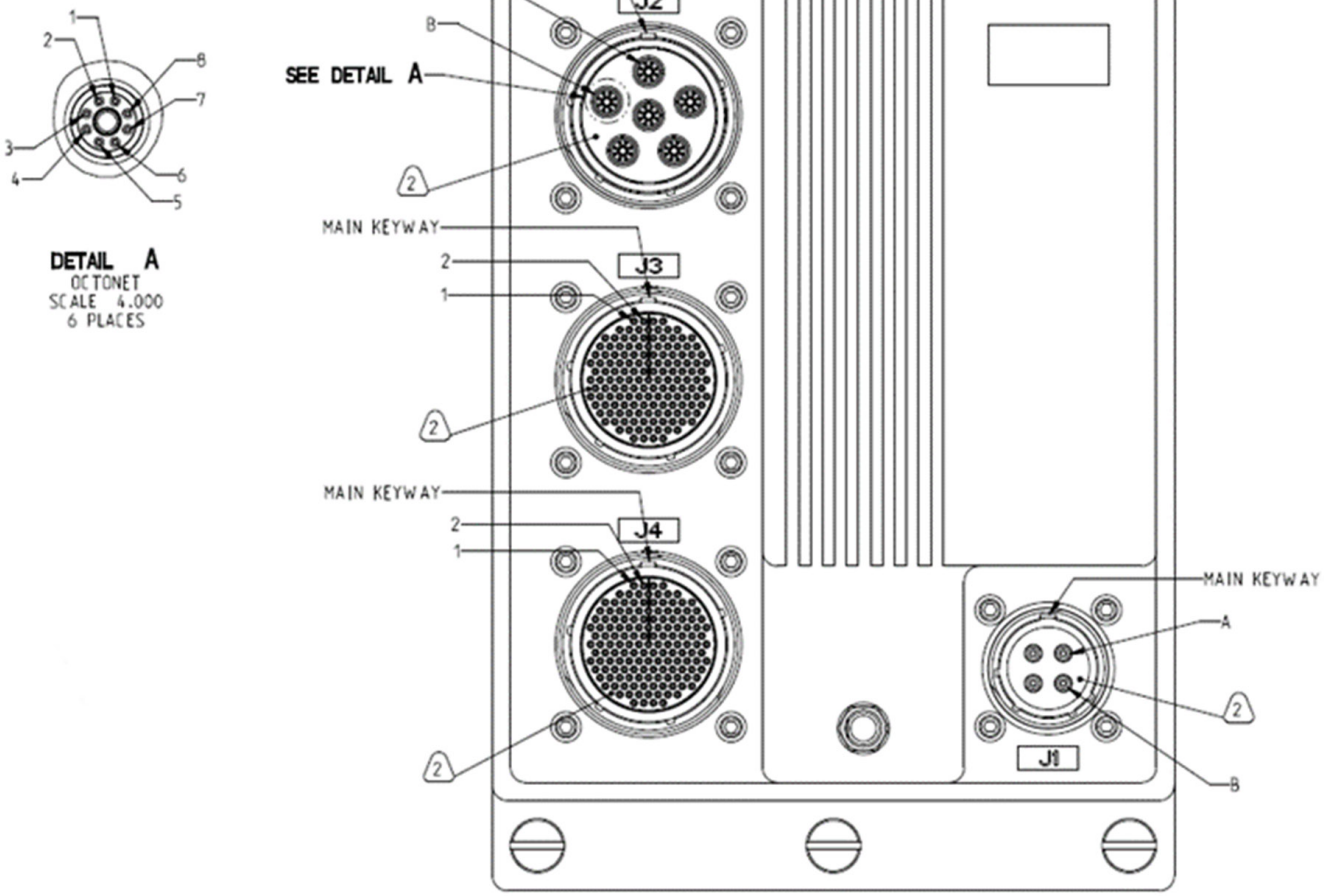

I/O CHART

I/O CHART

CONNECTOR	PIN ID	DATA DIRECTION	SIGNAL NAME
J1 POWER 15-4P	A	IN	28VDC_IN
	B	OUT	28VDC_RTN
	C	--	SAFETY GROUND CHASSIS
	D	--	NOT CONNECTED
	SHELL	--	CHASSIS

I/O CHART

CONNECTOR	PIN ID	DATA DIRECTION	PORT NO	SIGNAL NAME
J2 10GBASE-T 23-6S	A-1	BI	1	10GBase-T_DA+
	A-2			10GBase-T_DA-
	A-3			10GBase-T_DB+
	A-4			10GBase-T_DB-
	A-5			10GBase-T_DC+
	A-6			10GBase-T_DC-
	A-7			10GBase-T_DD+
	A-8			10GBase-T_DD-
	A-OUTER	--	--	CHASSIS
	A-CENTER	--	--	CHASSIS
	B-1	BI	2	10GBase-T_DA+
	B-2			10GBase-T_DA-
	B-3			10GBase-T_DB+
	B-4			10GBase-T_DB-
	B-5			10GBase-T_DC+
	B-6			10GBase-T_DC-
	B-7			10GBase-T_DD+
	B-8			10GBase-T_DD-
	B-OUTER	--	--	CHASSIS
	B-CENTER	--	--	CHASSIS
	C-1	BI	3	10GBase-T_DA+
	C-2			10GBase-T_DA-
	C-3			10GBase-T_DB+
	C-4			10GBase-T_DB-
	C-5			10GBase-T_DC+
	C-6			10GBase-T_DC-
	C-7			10GBase-T_DD+
	C-8			10GBase-T_DD-
	C-OUTER	--	--	CHASSIS
	C-CENTER	--	--	CHASSIS

I/O CHART

CONNECTOR	PIN ID	DATA DIRECTION	PORT NO	SIGNAL NAME
J2 10GBASE-T 23-6S	D-1	BI	4	10GBase-T_DA+
	D-2			10GBase-T_DA-
	D-3			10GBase-T_DB+
	D-4			10GBase-T_DB-
	D-5			10GBase-T_DC+
	D-6			10GBase-T_DC-
	D-7			10GBase-T_DD+
	D-8			10GBase-T_DD-
	D-OUTER	--	--	CHASSIS
	D-CENTER	--	--	CHASSIS
	E-1	BI	5	10GBase-T_DA+
	E-2			10GBase-T_DA-
	E-3			10GBase-T_DB+
	E-4			10GBase-T_DB-
	E-5			10GBase-T_DC+
	E-6			10GBase-T_DC-
	E-7			10GBase-T_DD+
	E-8			10GBase-T_DD-
	E-OUTER	--	--	CHASSIS
	E-CENTER	--	--	CHASSIS
	F-1	BI	6	10GBase-T_DA+
	F-2			10GBase-T_DA-
	F-3			10GBase-T_DB+
	F-4			10GBase-T_DB-
	F-5			10GBase-T_DC+
	F-6			10GBase-T_DC-
	F-7			10GBase-T_DD+
	F-8			10GBase-T_DD-
	F-OUTER	--	--	CHASSIS
	F-CENTER	--	--	CHASSIS

I/O CHART

CONNECTOR	PIN ID	DATA DIRECTION	PORT NO	SIGNAL NAME
J4 1GBase-T 23-15P	1	BI	21	1GBase-T_DA+
	2			1GBase-T_DA-
	6			1GBase-T_DB+
	7			1GBase-T_DB-
	13			1GBase-T_DC+
	14			1GBase-T_DC-
	15			1GBase-T_DD+
	16			1GBase-T_DD-
	3	BI	22	1GBase-T_DA+
	4			1GBase-T_DA-
	9			1GBase-T_DB+
	10			1GBase-T_DB-
	17			1GBase-T_DC+
	18			1GBase-T_DC-
	19			1GBase-T_DD+
	20			1GBase-T_DD-
	23	BI	23	1GBase-T_DA+
	24			1GBase-T_DA-
	25			1GBase-T_DB+
	26			1GBase-T_DB-
	34			1GBase-T_DC+
	35			1GBase-T_DC-
	36			1GBase-T_DD+
	37			1GBase-T_DD-
	28	BI	24	1GBase-T_DA+
	29			1GBase-T_DA-
	30			1GBase-T_DB+
	31			1GBase-T_DB-
	40			1GBase-T_DC+
	41			1GBase-T_DC-
	42			1GBase-T_DD+
	43			1GBase-T_DD-
	ALL OTHER PINS	--	--	NO CONNECT

SEE SHEET 2

I/O CHART

CONNECTOR	PIN ID	DATA DIRECTION	PORT NO	SIGNAL NAME
J4 1GBase-T 23-15P	45	BI	25	1GBase-T_DA+
	46			1GBase-T_DA-
	47			1GBase-T_DB+
	48			1GBase-T_DB-
	58			1GBase-T_DC+
	59			1GBase-T_DC-
	60			1GBase-T_DD+
	61			1GBase-T_DD-
	49	BI	26	1GBase-T_DA+
	50			1GBase-T_DA-
	52			1GBase-T_DB+
	53			1GBase-T_DB-
	62			1GBase-T_DC+
	63			1GBase-T_DC-
	64			1GBase-T_DD+
	65			1GBase-T_DD-
	54	BI	27	1GBase-T_DA+
	55			1GBase-T_DA-
	56			1GBase-T_DB+
	57			1GBase-T_DB-
	66			1GBase-T_DC+
	67			1GBase-T_DC-
	68			1GBase-T_DD+
	69			1GBase-T_DD-
	83	BI	28	1GBase-T_DA+
	84			1GBase-T_DA-
	85			1GBase-T_DB+
	86			1GBase-T_DB-
	95			1GBase-T_DC+
	96			1GBase-T_DC-
	97			1GBase-T_DD+
	98			1GBase-T_DD-
	87	BI	29	1GBase-T_DA+
	88			1GBase-T_DA-
	89			1GBase-T_DB+
	90			1GBase-T_DB-
	99			1GBase-T_DC+
	100			1GBase-T_DC-
	102			1GBase-T_DD+
	103			1GBase-T_DD-

I/O CHART

CONNECTOR	PIN ID	DATA DIRECTION	PORT NO	SIGNAL NAME
J4 1GBase-T 23-15P	91	BI	30	1GBase-T_DA+
	92			1GBase-T_DA-
	93			1GBase-T_DB+
	94			1GBase-T_DB-
	104			1GBase-T_DC+
	105			1GBase-T_DC-
	106			1GBase-T_DD+
	107			1GBase-T_DD-
	109	BI	31	1GBase-T_DA+
	110			1GBase-T_DA-
	111			1GBase-T_DB+
	112			1GBase-T_DB-
	121			1GBase-T_DC+
	122			1GBase-T_DC-
	123			1GBase-T_DD+
	124			1GBase-T_DD-
	115	BI	32	1GBase-T_DA+
	116			1GBase-T_DA-
	117			1GBase-T_DB+
	118			1GBase-T_DB-
	126			1GBase-T_DC+
	127			1GBase-T_DC-
	128			1GBase-T_DD+
	129			1GBase-T_DD-
	132	BI	33	1GBase-T_DA+
	133			1GBase-T_DA-
	134			1GBase-T_DB+
	135			1GBase-T_DB-
	142			1GBase-T_DC+
	143			1GBase-T_DC-
	148			1GBase-T_DD+
	149			1GBase-T_DD-
	136	BI	34	1GBase-T_DA+
	137			1GBase-T_DA-
	138			1GBase-T_DB+
	139			1GBase-T_DB-
	145			1GBase-T_DC+
	146			1GBase-T_DC-
	150			1GBase-T_DD+
	151			1GBase-T_DD-

QUALIFICATION STANDARDS

Parameter	Detail	Requirement	Test Method
Low Pressure (Altitude)	Storage	Sea level to 50,000 ft @ -57°C	MIL-STD-810G Method 500.5 Procedure I
	Operational	Sea level to 40,000 ft @ -54°C	MIL-STD-810G Method 500.5 Procedure II
	Explosive Decompression	8,000 ft to 23,100 feet in 8ms	MIL-STD-810G Method 500.5 Procedure IV
High Temperature extremes	Storage, cyclic	+95°C	MIL-STD-810G Method 501.5 Procedure I
	Operational, cyclic	+55°C	MIL-STD-810G Method 501.5 Procedure II
	Operational, constant	+71°C for 30 Minutes	MIL-STD-810G Method 501.5 Procedure II
Low Temperature extremes	Storage, cyclic	-57°C	MIL-STD-810G Method 502.5 Procedure I
	Operational, cyclic	-40°C	MIL-STD-810G Method 502.5 Procedure II
	Operational, sea level, constant	-65°C for 120 Minutes	MIL-STD-810G Method 502.5 Procedure II, as per F-16
Temperature	Shock, from constant	-54°C to +71°C at 125°C/Minute	MIL-STD-810G Method 503.5 Procedure I-B
Combined temperature-altitude-humidity	Operational, 10 cycles	-40°C to +71°C, Sea level to 60,000 ft	MIL-STD-810G Method 520.3 Procedure III
Humidity	Operational and Non-Operational, aggravated cycle	95% ± 4% Humidity, +30°C to +60°C, 10 cycles	MIL-STD-810F Method 507.5 Procedure II
Sand and Dust	Operational and Non-Operational, blowing	< 150um dust, 150um to 850um sand	MIL-STD-810G Method 510.5 Procedure I (Dust) Procedure II (Sand)
Rain	Operational, Dripping	7 gal/ft2/hr, 40 mph for 30 minutes	MIL-STD-810G Method 506.5 Procedure III
Fungus	Non-Operational	7-day growth	MIL-STD-810G Method 508.6
Salt Fog	Operational and Non-Operational, exposure	Four 24-hour wet/dry cycles	MIL-STD-810G Method 509.5
Explosive Atmosphere	Operational	At site and 40,000 ft altitudes	MIL-STD-810G Method 511.5 Procedure I
Acceleration, structural	Limit Loads	Performance at ±10.0g applied individually along all 3 axes	MIL-STD-810G Method 513.6 Procedure I

QUALIFICATION STANDARDS CONT.

	Ultimate Loads	Withstand without structural failure ±15.0g applied individually along all 3 axes	MIL-STD-810F Method 513.6 Procedure II
	Crash Landing	Remain captive, 40g fore, 20g aft and down, 10g up, 18g left and right	MIL-STD-810F Method 513.6 Procedure III
Shock – Functional	Operational	20g, 11ms nominal, 3 blows each direction, each axis (18 total), terminal peak sawtooth	MIL-STD-810G Method 516.6 Procedure I
Shock – Crash Hazard	Non-Operational	40g, 11ms nominal, 2 blows each direction, each axis (12 total)	MIL-STD-810G Method 516.6, Procedure V
Shock – Bench Handling	Non-Operational	4” drop, 1 drop per edge per face (24 total)	MIL-STD-810G Method 516.6, Procedure VI
Vibration	Operational, Performance, Jet aircraft	30 mins, 0.02 g2/Hz to 0.04 g2/Hz, 15 - 2000 Hz, Overall 4.4Grms	MIL-STD-810G Method 514.6, Procedure I, Category 12, Annex D, Fig 514.6D-I
	Non-Operational, Endurance, Jet aircraft	60 mins, 0.04 g2/Hz to 0.06 g2/Hz, 15 - 2000 Hz, Overall 9.2Grms	MIL-STD-810G Method 514.6, Procedure I, Category 12, Annex D, Fig 514.6D-I
	Operational, Gunfire Shock	7.5 min sweeps, 5 to 15 g, 66 to 856 Hz	MIL-STD-810G Method 519.6, Procedure III
	Operational, UH-60 Main Rotor speeds and blade numbers	4 hours, 0.001g2/Hz to 0.01g2/Hz, 3 to 500 Hz	MIL-STD-810G Method 514.6, Procedure I, Category 14, Annex A & Annex D, Table 514.6D-III
Acoustic Noise	Operational	30 mins, 140 dB overall, 50 to 10000 Hz	MIL-STD-810G Method 515.6 Procedure I
Conducted Emissions	Operational	Power Leads, 30 Hz to 10 kHz	MIL-STD-461G CE101 Par 5.4, CE101-4 Curve #2
	Operational	Power Leads, 10 kHz to 10MHz	MIL-STD-461G CE102 Par 5.5, Fig CE102-1 Basic Curve
Conducted Susceptibility	Operational	Power leads, 30Hz to 150 kHz	MIL-STD-461G CS101 Par 5.7, Fig CS101-1 Curve #2
	Operational	Bulk cable injection, 10 kHz to 200MHz	MIL-STD-461G CS114 Par 5.12, Fig CS114-1 Curve #5
	Operational	Bulk cable injection, impulse excitation, 30Hz for one minute	MIL-STD-461G CS115 Par 5.13, Fig CS115-1

QUALIFICATION STANDARDS CONT.

	Operational	Damped sinusoidal transients, cables and power leads, 10kHz to 100MHz, 5 minutes	MIL-STD-461G CS116 Par 5.14, Fig CS116-1 and CS116-2
Radiated Emissions	Operational	Magnetic field, 30Hz to 100kHz	MIL-STD-461G RE101 Par 5.17, Fig RE101-1 and Fig RE101-2
	Operational	Electric field, 10kHz to 18GHz	MIL-STD-461G RE102 Par 5.18, Fig RE102-3 Fixed wing external and Fixed wing internal < 25m
Radiated Susceptibility	Operational	Magnetic field, 30 Hz to 100 kHz	MIL-STD-461G RS101 Par 5.20 Fig RS101-2 Army
	Operational	Electric field, 2 MHz to 18 GHz	MIL-STD-461G RS103 Par 5.21, Table XI, Aircraft Internal Army
Power Supply	Operational, normal condition	Load measurements, ask for info	MIL-STD-704F Chg1 MIL-HDBK-704-8 LDC-101
	Operational, normal condition	Steady state limits, 22 Vdc to 29 Vdc	MIL-STD-704F Chg1 MIL-HDBK-704-8 LDC-102 Tests A, B, C
	Operational, normal condition	Voltage distortion spectrum	MIL-STD-704F Chg1 Fig 15 MIL-HDBK-704-8 LDC-103 Tests A thru K
	Operational, normal condition	Total ripple	MIL-STD-704F Chg1 Fig 15 MIL-HDBK-704-8 LDC-104, Table LDC104-II
	Operational, normal condition	Normal voltage transients, 18Vdc to 29Vdc	MIL-STD-704F Chg1 Fig 13 MIL-HDBK-704-8 LDC-105 Tests AA thru RR
	Operational, transfer interrupt	Power interrupt, 50ms, 22Vdc to 29Vdc	MIL-STD-704F Chg1 MIL-HDBK-704-8 LDC-201
	Operational, abnormal condition	Steady state limits, 20.0 Vdc and 31.5Vdc, 30 minutes	MIL-STD-704F Chg1 MIL-HDBK-704-8 LDC-301 Tests A and B
	Operational, abnormal condition	Abnormal voltage transients, abnormal condition	MIL-STD-704F Chg1 Fig 14 MIL-HDBK-704-8 LDC-302, Tests AAA thru NNN, 7 to 50V
	Operational, emergency condition	Steady state limits, 18 Vdc to 29 Vdc	MIL-STD-704F Chg1 MIL-HDBK-704-8 LDC-401

QUALIFICATION STANDARDS CONT.

Power Supply (cont.)	Operational, starting	Starting voltage transients, 12 Vdc to 29 Vdc	MIL-STD-704F Chg1 MIL-HDBK-704-8 LDC-501, Table LDC501-IV
	Operational, power failure and automatic recovery	Power failure, from 100ms to 7 seconds	MIL-STD-704F Chg1 MIL-HDBK-704-8 LDC-601 Tests A thru D
	Operational, power failure	Phase reversal protection/ prevention	MIL-STD-704F Chg1 MIL-HDBK-704-8 LDC-602
Chassis Grounding	Operating	Allow for proper electrical bonding through designated external stub and dedicated pins on connectors	SAE-AS-50881H
Electrical Bonding	Operating	Primary Chassis ground connection for electrical bonding provided by designated external stub	MIL-STD-464C, Paragraph 5.11.3
Mounting	For vibration tolerance	4x 10-32 captive screws	