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

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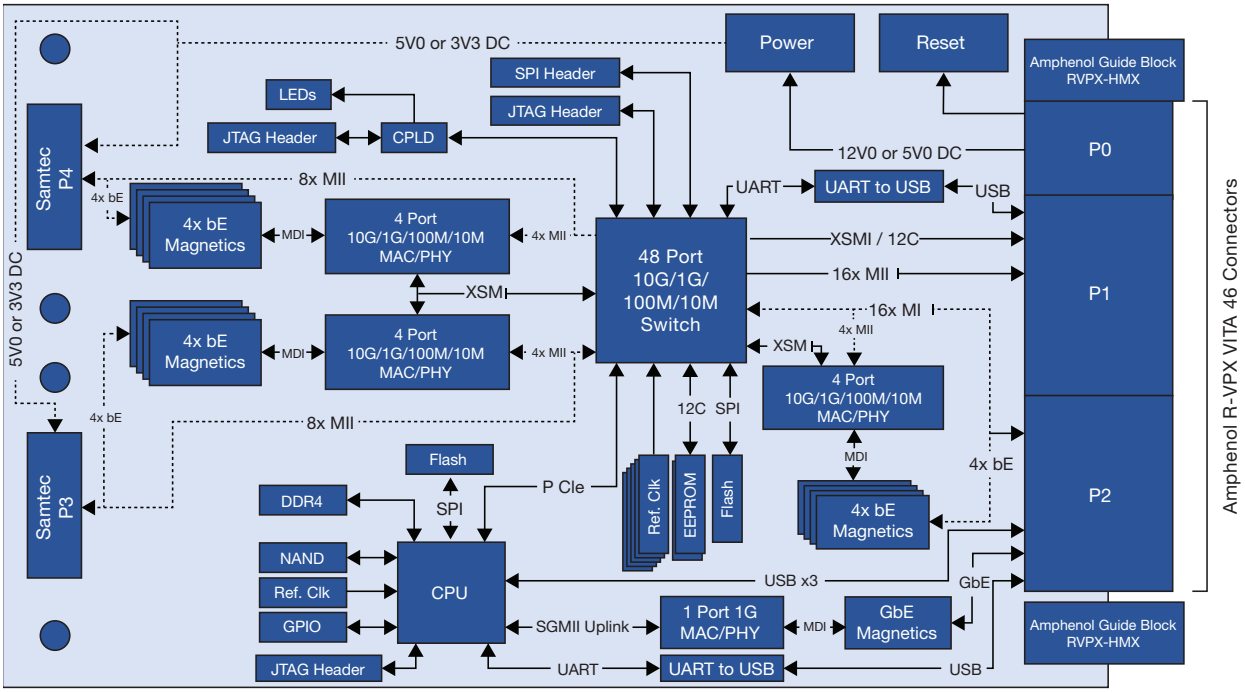
BLOCK DIAGRAM



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

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TECHNICAL SPECIFICATIONS

Amphenol Aerospace

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.

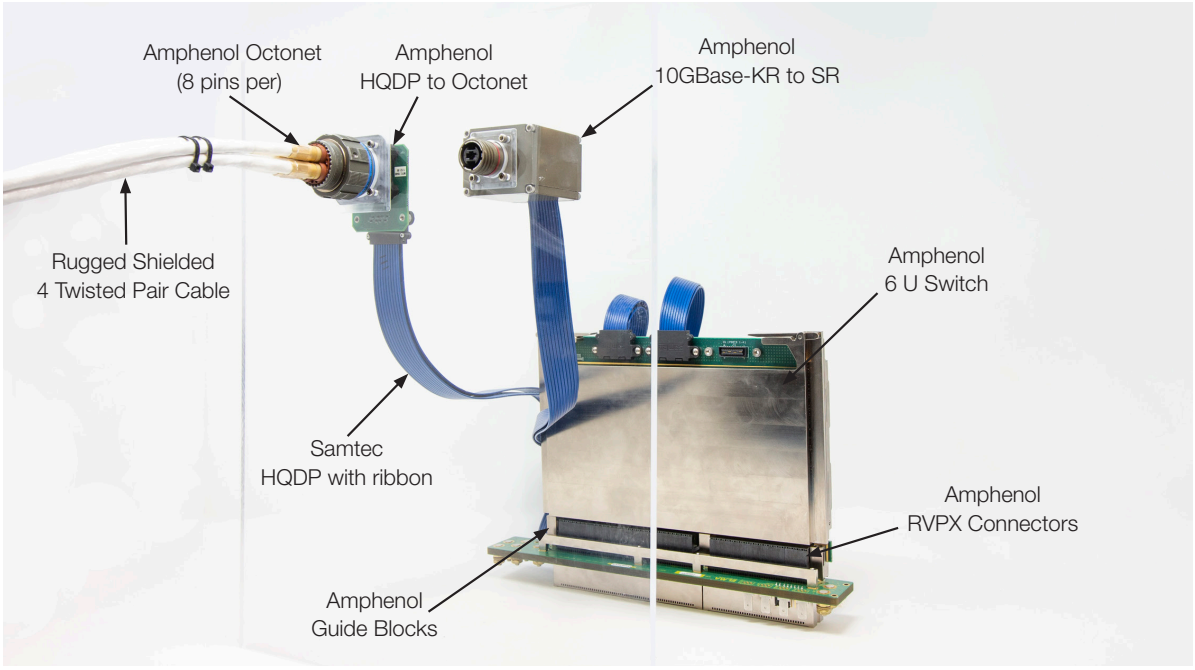
EXAMPLES

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



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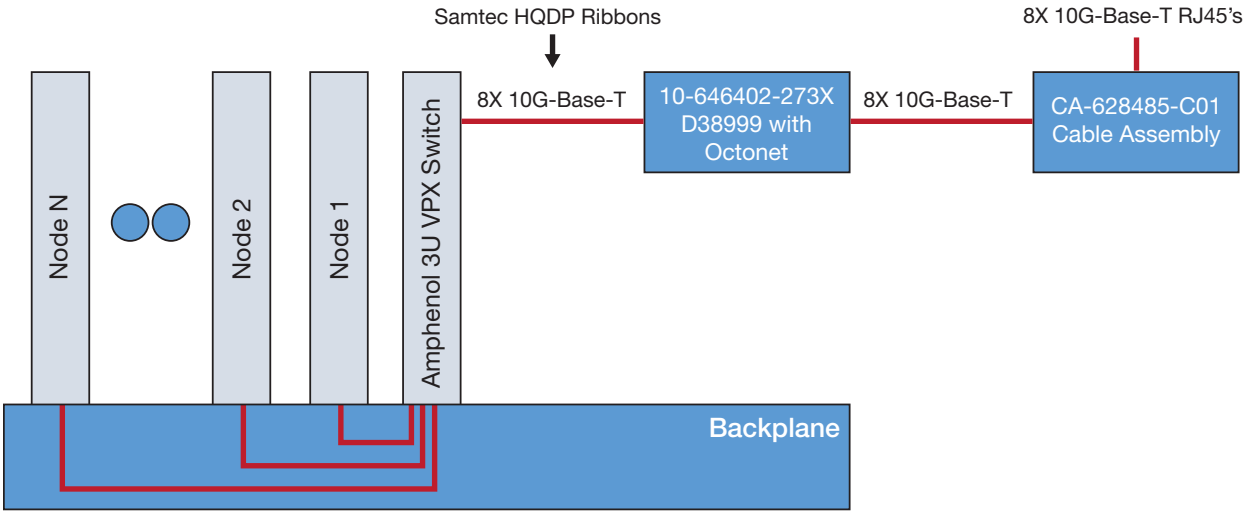
APPLICATION EXAMPLES

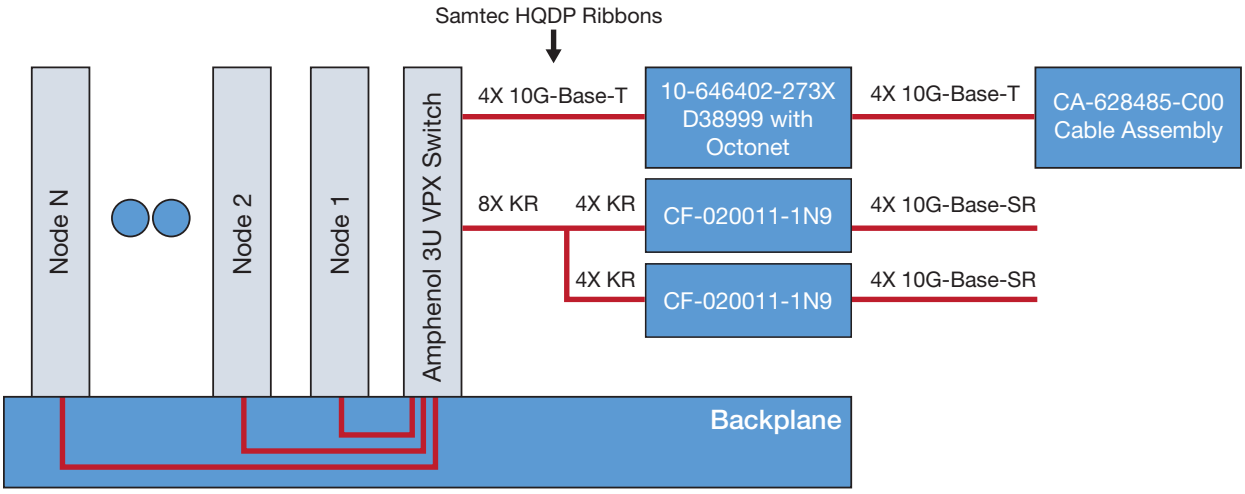
Example 1

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.



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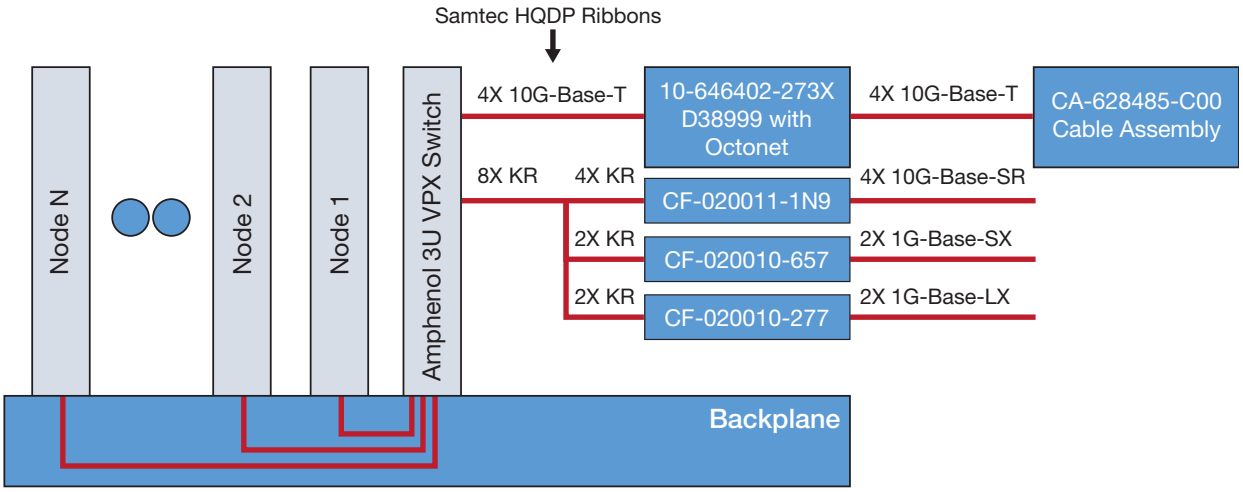
APPLICATION EXAMPLES

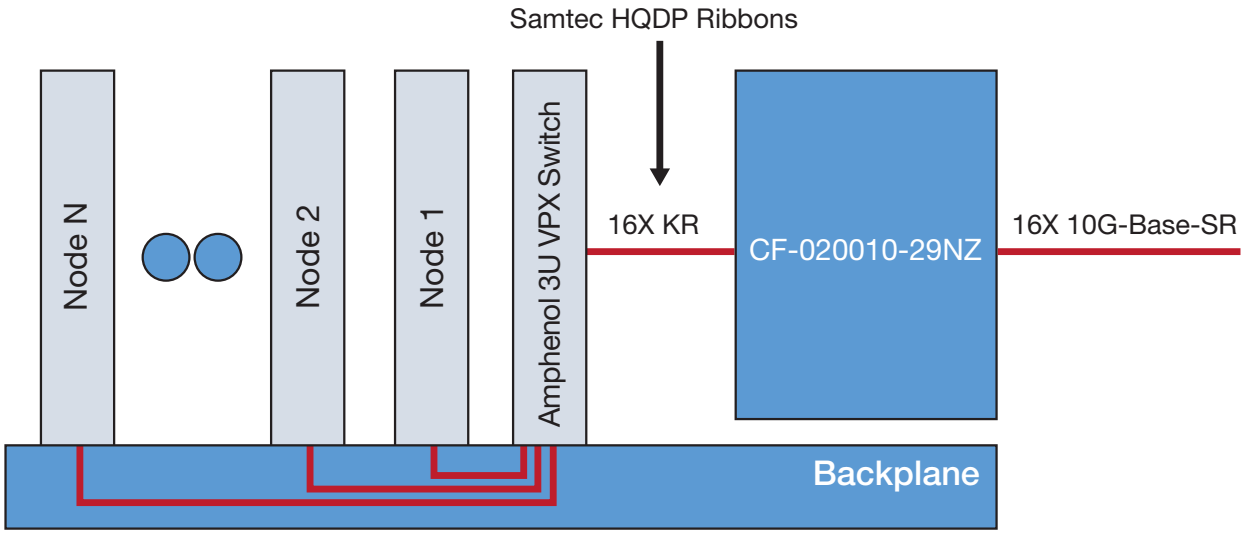
Example 3

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.



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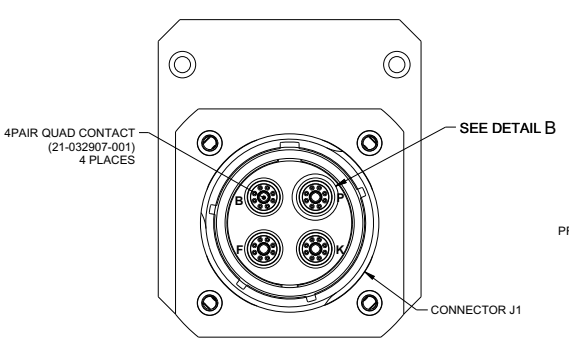
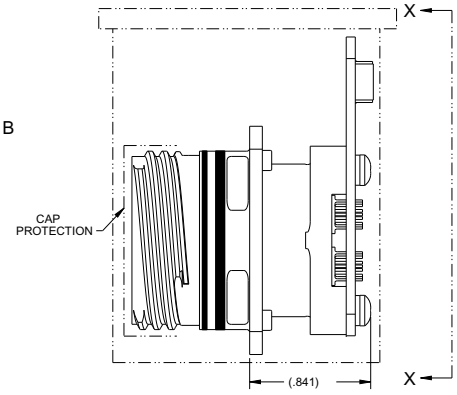
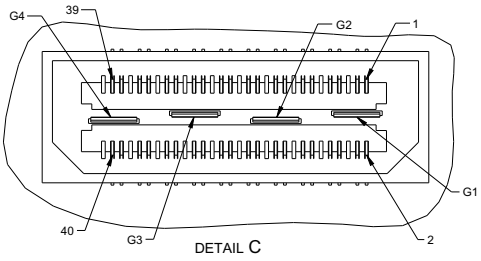
10-646402-272X: CONNECTOR DETAILS

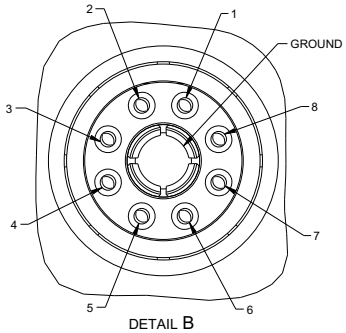
Receptacle Connector; TV40GQDZ-19-ABS; Ground Plane; 4-pair Quad Contact



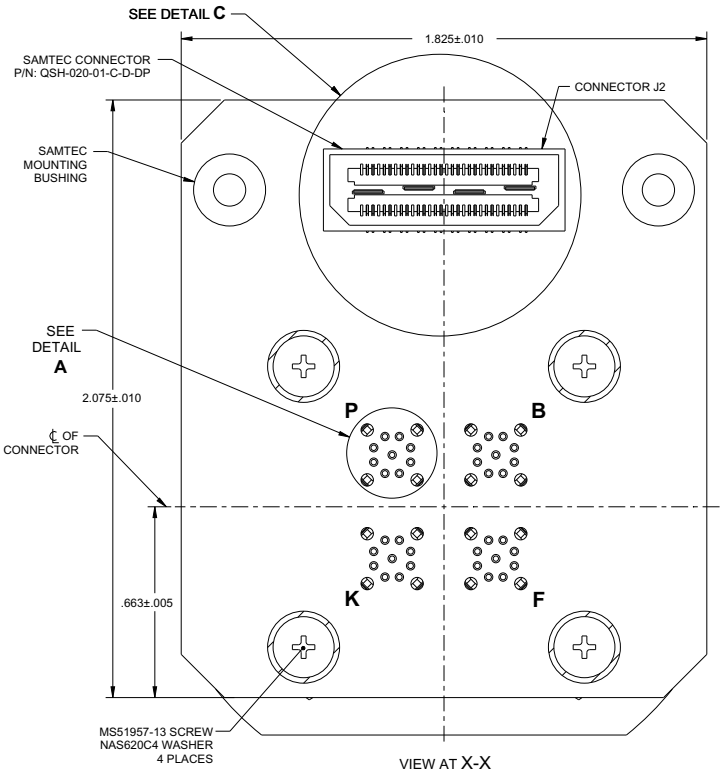




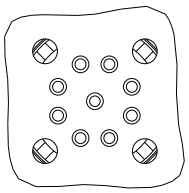
DETAIL C



DETAIL B



VIEW AT X-X


DETAIL A

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

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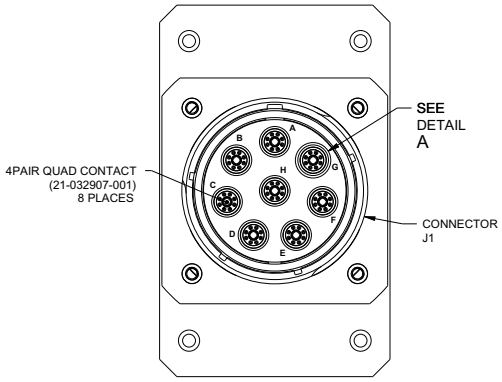
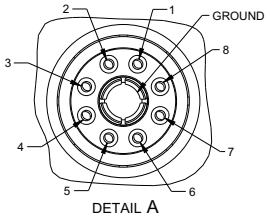
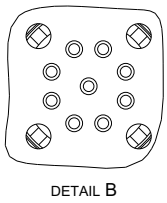
10-646402-273X: CONNECTOR DETAILS

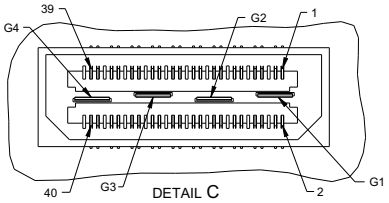
Amphenol Aerospace

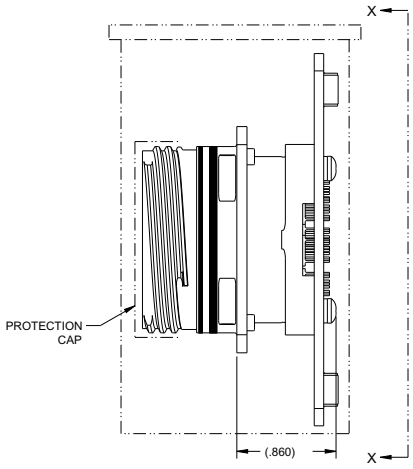
Receptacle Connector; TV40GQDZ-25-8S; Ground Plane; 4-pair Quad Contact

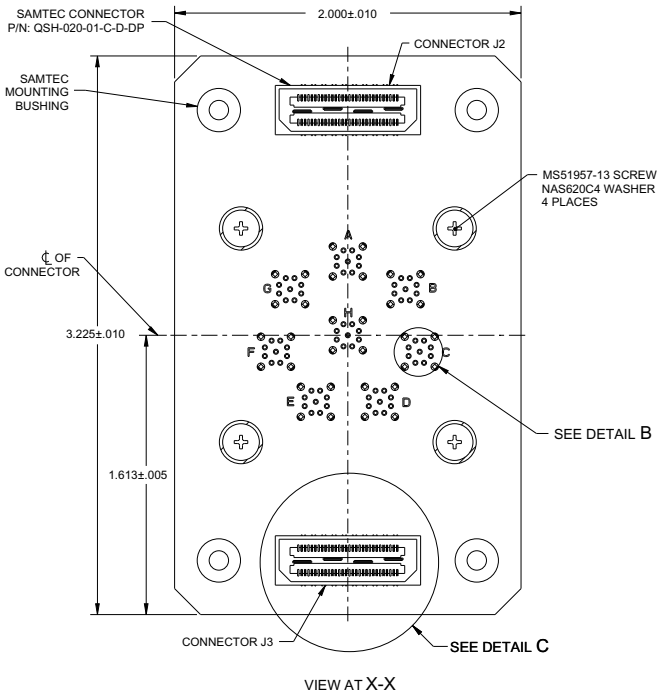












VIEW AT X-X

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

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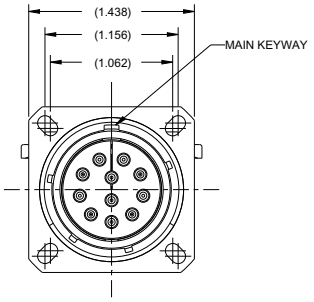
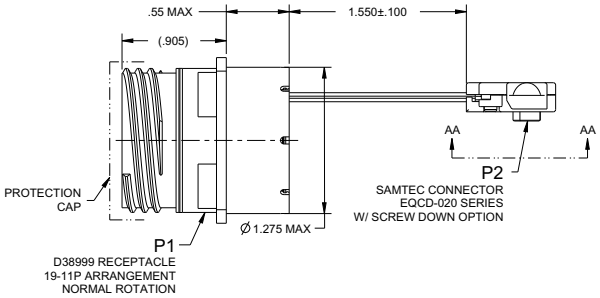
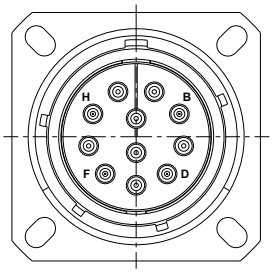
CF-020010-277: FIBER OPTIC TRANSCEIVER DETAILS

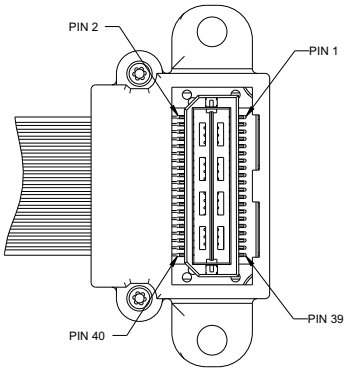
Fiber Optic, Single Mode, 19-11P, Optoelectronic Transceiver; OD-CAD, ESD Sensitive Components







CONTACT CAVITY LOCATIONS



VIEW AT AA-AA

P1 I/0 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/0		
PIN Number	Signal Name	Description
1	FI-LOS	Loss of Signal Channel I_ROSA
2	GND	GROUND
3	ETHI-SIN-N	Channel I Receive Negative
4	NOT CONNECTED	
5	ETHI-SIN-P	Channel I Recieve Positive
6	FI-TXDIS	Channel I TOSA Disable
7	ETHI-SOUT-N	Channel I Transmit Negative
8	3.3V-RX1	3.3V
9	ETHI-SOUT-P	Channel I 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	

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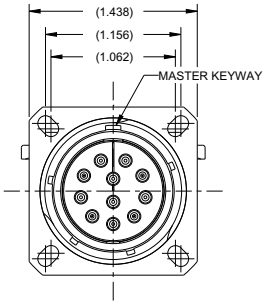
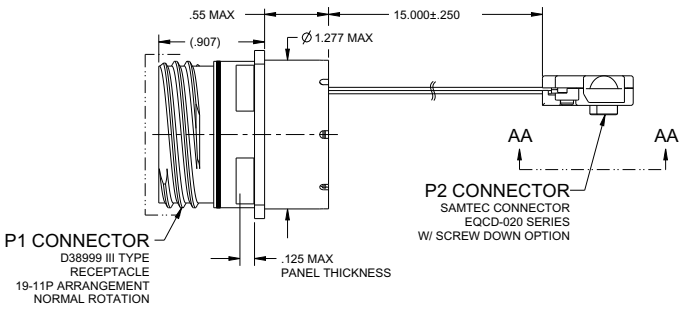
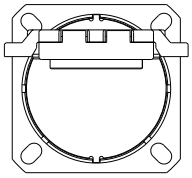
CF-020010-657: FIBER OPTIC TRANSCEIVER DETAILS

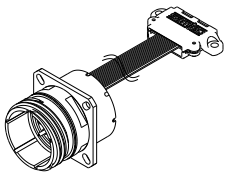
Amphenol Aerospace

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

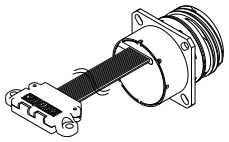




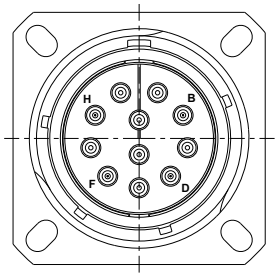




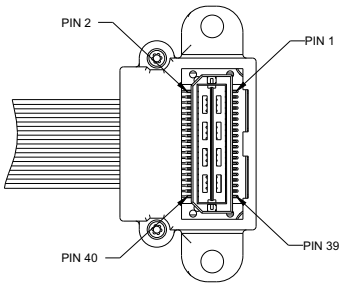
FRONT ISOMETRIC VIEW



REAR ISOMETRIC VIEW



CONTACT CAVITY LOCATIONS
P1 CONNECTOR



VIEW AT AA-AA
P2 CONNECTOR

P1 I/0 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

P2 I/0 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

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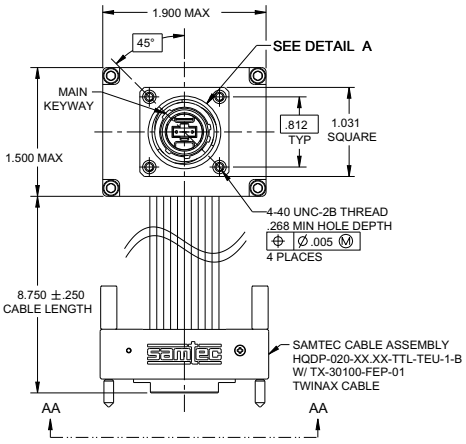
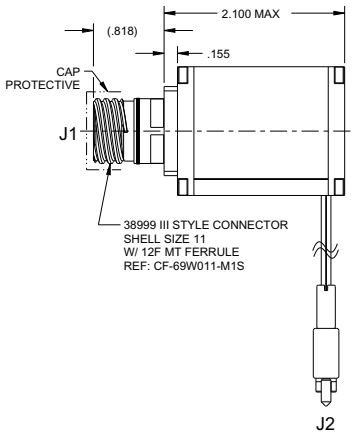
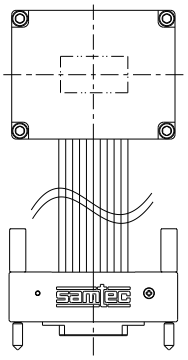
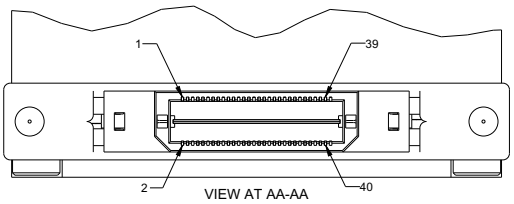
CF-020011-1XX CONVERTER DETAILS

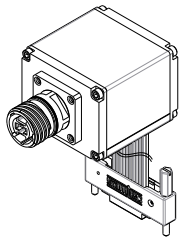
Converter 10G-BASE-KR / 10G-BASE-SR; 4 Channels



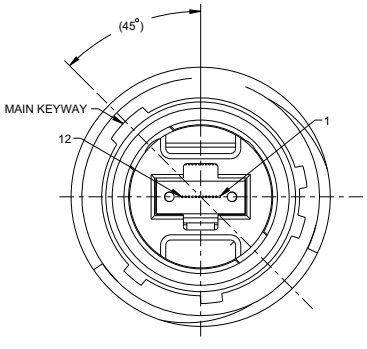




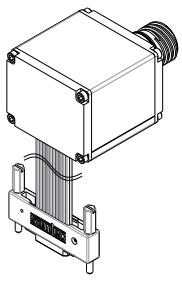




FRONT ISO VIEW



DETAIL A



REAR ISO VIEW

J1 I/0	
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

J2 I/0			
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

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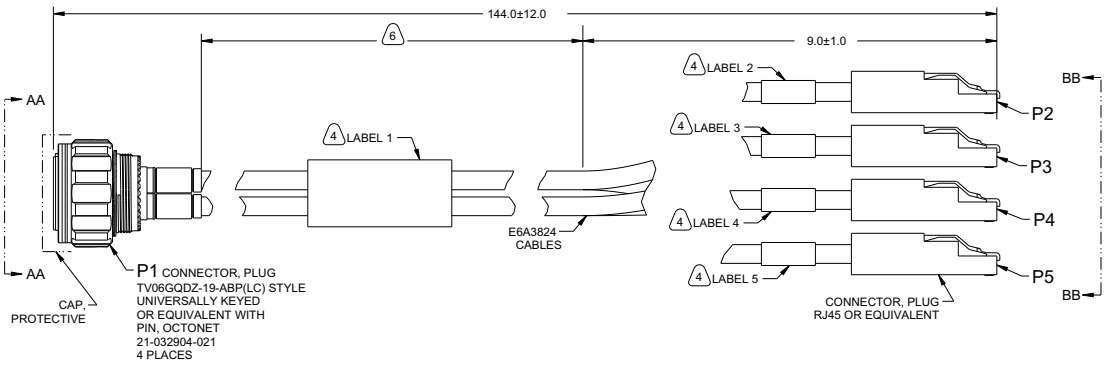
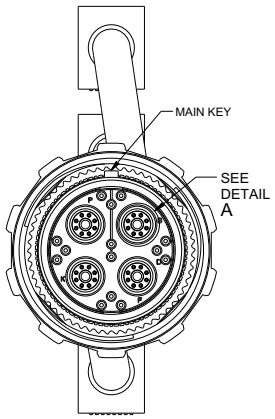
CA-628485-C00: TEST CABLE DETAILS

Amphenol Aerospace

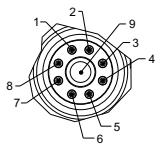
Universally Keyed; TV06GQDZ-19-ABP to RJ45; Zinc Nickel Plated; 12 ft.



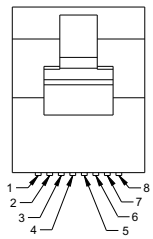
Marking Table	
Label ID	Marking
Label 1	AMPHENOL CA-6284850-C00 DATE CODE PER 9-9172-3 & LOT NO.
Label 2	B
Label 3	F
Label 4	K
Label 5	P



VIEW AT AA-AA



DETAIL A
CONTACT ID'S



PARTIAL VIEW AT BB-BB

Wiring Table		
P1 Connector Cavity ID	P2 Connector PIN ID	P3 Connector PIN ID
B : 1	1	-
B : 2	2	-
B : 3	3	-
B : 4	6	-
B : 5	4	-
B : 6	5	-
B : 7	7	-
B : 8	8	-
F : 1	-	1
F : 2	-	2
F : 3	-	3
F : 4	-	4
F : 5	-	5
F : 6	-	6
F : 7	-	7
F : 8	-	8
B : 9 B : Outer	Outer	-
F : 9 F : Outer	-	Outer

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

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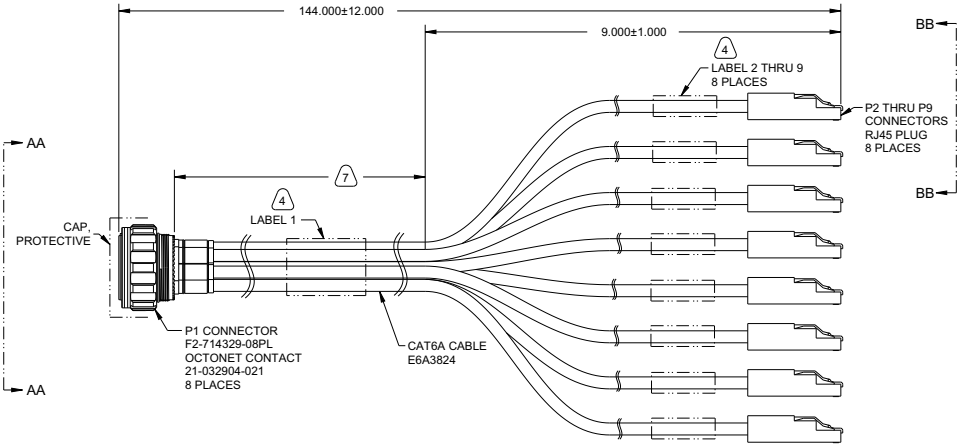
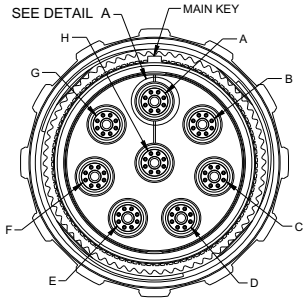
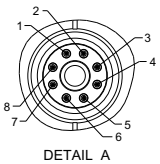
CA-628485-C01: TEST CABLE DETAILS

Cable Assembly; Octonet Test; Universal Key

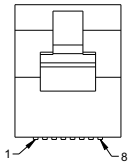




VIEW AT AA-AA



DETAIL A



VIEW AT BB-BB

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

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