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INTRODUCTION

Description

Amphenol OCuLink is a high speed connector and cable assembly solution that can be used in PCle Gen3/Gen4, SAS3.0/SAS4.0 and other potential applications. The solution can support wire to board application in system.

OCuLink cable assemblies can be provided with 30AWG~34AWG discrete pairs and flat ribbon cable. The OCuLink connector design is scalable to 12 channels and is available in straight, right angle, right side-exit and left side-exit plug configurations to mate with board mount connectors.

OCuLink cables are designed for applications in the data center and networking markets that use SAS, PCIe and other signal protocols. OCuLink cables and connectors support many interconnection configurations including backplane to motherboard, backplane to add-in card and card to motherboard.

Features and Benefits

- · Support cable to board application
- Multiple channels are optional: 4X/6X(42pos),8X/12X(80pos)
- Small size design: pitch 0.5mm connector
- Excellent SI performance: signal rates up to PCle4 16GT/s and SAS 4.0 24Gbps
- Straight, right angle, side exit and customization cable plug are optional
- Supports 85 ohm impedance applications, 100 ohm is available on request
- 30-34AWG cables are available for both discrete and ribbon cable
- RoHS compliant. Halogen free is available on request

Product Applications

- Servers and storage devices
- High performance computing
- · Data center & networking equipment

Industry Standards

- SAS 3.0 / 4.0
- PCle Gen 3 / Gen 4

Technical Documents

Product Specification: PS-AST-0868 and PS-AST-917 OCuLink Cable Assembly





Plug Part Numbers

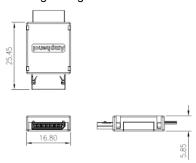
Table 1. Cable Connector Part Number Selection Guide

		42position	80position
Part Description	Bulk Cable	Plug Part Number	
Straight Plug with Passive Latch	Discrete pairs or Ribbon Cable	OCL42-0001	OCL80-0001
Straight Plug with Active Latch	Discrete pairs or Ribbon Cable	OCL42-0003	OCL80-0002
Straight Plug with Reverse Active Latch	Discrete pairs or Ribbon Cable	OCL42-0008	NA
Right Angle Plug with Passive Latch	Discrete pairs or Ribbon Cable	OCL42-0005	OCL80-0003
Right Angle Plug with Active Latch	Discrete pairs or Ribbon Cable	OCL42-0007	OCL80-0004
Right Side Exit Plug with Active Latch	Discrete pairs or Ribbon Cable	OCL42-0006	OCL80-0006
Left Side Exit Plug with Active Latch	Discrete pairs or Ribbon Cable	OCL42-0009	OCL80-0005

These plugs can be combined each other, please contact Amphenol for customized cable assembly

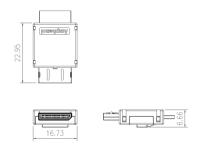
OCL42-0001

42pos Straight Plug with Passive Latch



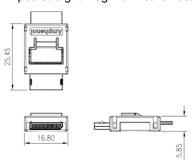
OCL42-0008

42pos Straight Plug with Reverse Active Latch



OCL42-0003

42pos Straight Plug with Active Latch



OCL42-0005

42pos Right Angle Plug with Passive Latch



Note: the above dimensions proportion is off.



Mini Cool Edge IO (MCIO) Cable Assemblies

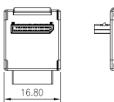
Part Numbers

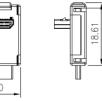
Cable Connector Part Number Selection Guide

OCL42-0007

42pos Right Angle Plug with Active Latch

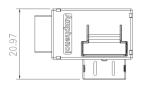


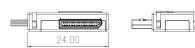




OCL42-0009

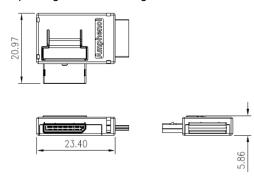
42pos Left Side Exit Plug with Active Latch





OCL42-0006

42pos Right Side Exit Plug with Active Latch



OCL80-0001

80pos Straight Plug with Passive Latch





OCL80-0002

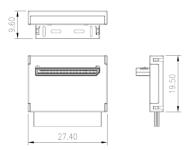
80pos Straight Plug with Active Latch



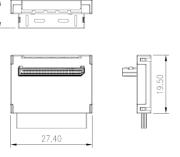


OCL80-0003

80pos Right Angle Plug with Passive Latch



OCL80-0004 80pos Right Angle Plug with Active Latch



Note: the above dimensions proportion is off.



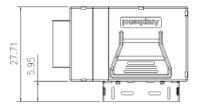
Mini Cool Edge IO (MCIO) Cable Assemblies

Part Numbers

Cable Connector Part Number Selection Guide

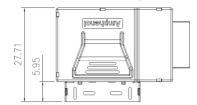
OCL80-0005

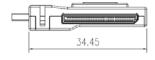
80pos Left Side Exit Plug with Active Latch



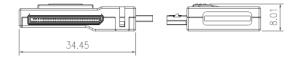
OCL80-0006

80pos Right Side Exit Plug with Active Latch











Product Specifications

Table 2. Material Specifications

Contact	30µin min hard Gold plated contact pads	
Connector housing	Thermoplastic UL94V-0	
Active latch	Stainless steel	
Raw Cable (30-34AWG)	Silver plated copper conductor	
	Fluoropolymer dielectric	
	Tinned copper drain wire	
	Metallic tape pair shield	
	Polyester tape jacket	

Table 3. Electrical/Mechanical Specifications

Impedance	85Ω, optional 100Ω
Data Rate	24Gbps per channel
Within Pair Skew	Max. 10 ps/m
Rated Voltage	30V
Rated Current	0.5A per pin
Durability	250 mating cycles
Mating force	Connector W/Active latch: 8~40N Connector W/Passive latch: 10~40N
Un-Mating force	8~25N
Wrenching test	Max 10N for each axis direction

Table 4. Environmental Specifications

Storage Temperature	-20° to 80°C
Operating Temperature	0° to 80°C
Flammability Rating	VW-1
Safety Certificates	RoHS compliant, HF optional



Table 5. Typical Cable Specifications





30AWG 85Ω Cable Bend Radius	1.95mm (good way bend)	
Cabla Dimanaiana	Thickness =0.78 mm	
Cable Dimensions	Width per pair = 1.80 mm	
31AWG 85Ω Cable Bend Radius	1.8mm (good way bend)	
Cable Dimensions	Thickness = 0.72mm	
Cable Differsions	Width per pair = 1.70 mm	
32AWG 85Ω Cable Bend Radius	1.6mm (good way bend)	
Cabla Dimanaiana	Thickness =0.65 mm	
Cable Dimensions	Width per pair = 1.56 mm	
34AWG 85Ω Cable Bend Radius	1.4 mm (good way bend)	
Cable Dimensions	Thickness =0.55 mm	
	Width per pair = 1.25 mm	

30AWG 85Ω Cable Bend Radius	2.1mm (good way bend)	
Cable Dimensions	Thickness =0.85 mm	
Cable Dimensions	Width/12 pairs = 27.30 mm	
31AWG 85Ω Cable Bend Radius	1.95mm (good way bend)	
Cable Dimensions	Thickness = 0.78mm	
Cable Dimensions	Width/12 pairs = 25.90 mm	
32AWG 85Ω Cable Bend Radius	1.8mm (good way bend)	
Cable Dimensions	Thickness =0.71 mm	
Cable Dimensions	Width/6 pairs = 13.80 mm	
34AWG 85Ω Cable Bend Radius	1.5mm (good way bend)	
Cable Dimensions	Thickness =0.60 mm	
	Width/6 pairs = 12.0 mm	

30AWG 850 Cable Attenuation	4.5GHz = 4.5 dB/m	
	9.0 GHz = 8.8 dB/m	
, ,	12.0 GHz = 10.7 dB/m	
	4.5GHz = 5.0 dB/m	
31AWG 85Ω Cable Attenuation (max)	9.0 GHz = 8.8 dB/m	
	12.0 GHz = 10.7 dB/m	
	4.5GHz = 5.8 dB/m	
32AWG 85Ω Cable Attenuation (max)	9.0 GHz = 10.5 dB/m	
	12.0 GHz = 14.0 dB/m	
	4.5GHz = 4.8 dB/0.7m	
34AWG 85Ω Cable Attenuation (max)	9.0 GHz = 9.8 dB/0.7m	
	12.0 GHz = 12.8 dB/0.7m	

Note:

Conductor is solid copper for discrete and ribbon cable.

For more details, please contact local Amphenol sales person or visit www.amphenol-ast.com.



Pin Configurations

OCuLink 42 Position

	P1			P2
A1	RESERVED		B1	RESERVED
A2	GROUND	<u> </u>	B2	GROUND
A3	PERp0	$\vdash \land$	В3	PETp0
A4	PERn0	\vdash	B4	PETn0
A5	GROUND	⊢ X —	B5	GROUND
A6	PERp1	-A	В6	PETp1
Α7	PERn1	\vdash	В7	PETn1
A8	GROUND	- X	B8	GROUND
A9	BP TYPE	$\vdash \cap$	В9	BP TYPE
A10	CWAKE#	\vdash	B10	CWAKE#
A11	GROUND	$\vdash X -$	B11	GROUND
A12	VSP	$\vdash \vdash \vdash$	B12	VSP
A13	VSP	\vdash	B13	VSP
A14	GROUND	$\vdash X -$	B14	GROUND
A15	PERp2	$\vdash \sqcap$	B15	PETp2
A16	PERn2	-	B16	PETn2
A17	GROUND	\longrightarrow	B17	GROUND
A18	PERp3	-	B18	PETp3
A19	PERn3	+	B19	PETn3
A20	GROUND	V	B20	GROUND
A21	RESERVED		B21	RESERVED

	P1			P2
В1	RESERVED		A1	RESERVED
B2	GROUND		A2	GROUND
В3	PETp0	-A	А3	PERp0
B4	PETn0	\vdash	A4	PERn0
B5	GROUND	 X	A5	GROUND
B6	PETp1	-	A6	PERp1
В7	PETn1	\vdash	A7	PERn1
B8	GROUND		A8	GROUND
В9	2-WIRE CLOCK	-A	A9	2-WIRE CLOCK
B10	2-WIRE DATA		A10	2-WIRE DATA
B11	GROUND	- X	A11	GROUND
B12	PERST#	H - / \	A12	PERST#
B13	CPRSNT#	\vdash	A13	CPRSNT#
B14	GROUND		A14	GROUND
B15	PETp2	-	A15	PERp2
B16	PETn2		A16	PERn2
B17	GROUND	 X 	A17	GROUND
B18	PETp3	- / /	A18	PERp3
B19	PETn3	\vdash	A19	PERn3
B20	GROUND	<u> </u>	A20	GROUND
B21	RESERVED		A21	RESERVED

OCuLink 80 Position

P1 P2 P1 P2

		_		
A1	GROUND		B1	GROUND
A2	PERp0	\perp	B2	PETp0
А3	PERn0		B3	PETn0
A4	GROUND	\longrightarrow X—	B4	GROUND
A5	PERp1	\top	B5	PETp1
A6	PERn1	$\overline{}$	В6	PETn1
Α7	GROUND	\longrightarrow	В7	GROUND
A8	BP TYPE	$\overline{}$	B8	BP TYPE
A9	CWAKE#	$\overline{}$	B9	CWAKE#
A10	GROUND	1 X -	B10	GROUND
A11	VSP	\top	B11	VSP
A12	VSP	\vdash	B12	VSP
A13	GROUND	$\longrightarrow \!$	B13	GROUND
A14	PERp2	\vdash	B14	PETp2
A15	PERn2	$\overline{}$	B15	PETn2
A16	GROUND	\longrightarrow	B16	GROUND
A17	PERp3	-	B17	PETp3
A18	PERn3	\bot	B18	PETn3
A19	GROUND	-	B19	GROUND
A20	RESERVED		B20	RESERVED
A21	RESERVED		B21	RESERVED
A22	GROUND		B22	GROUND
A23	PERp4	\rightarrow	B23	PETp4
A24	PERn4		B24	PETn4
A25	GROUND	7—X—	B25	GROUND
A26	PERp5		B26	PETp5
A27	PERn5	$\overline{}$	B27	PETn5
A28	GROUND	\longrightarrow	B28	GROUND
A29	2-WIRE CLOCK	- / 	B29	2-WIRE CLOCK
A30	2-WIRE DATA	$\overline{}$	B30	2-WIRE DATA
A31	GROUND	$\longrightarrow\!$	B31	GROUND
A32	PERST#	$\overline{}$	B32	PERST#
A33	CPRSNT#	\longrightarrow	B33	CPRSNT#
A34	GROUND	7—X—	B34	GROUND
A35	PERp6	\rightarrow	B35	PETp6
A36	PERn6	$\rightarrow \leftarrow$	B36	PETn6
A37	GROUND	$\longrightarrow \!$	B37	GROUND
A38	PERp7	\rightarrow	B38	PETp7
A39	PERn7	\rightarrow	B39	PETn7
A40	GROUND	\perp	B40	GROUND

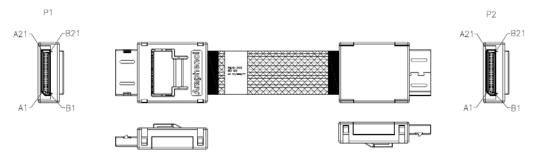
B1	GROUND		A1	GROUND
B2	PETp0	-	A2	PERp0
В3	PETn0	\vdash	A3	PERn0
B4	GROUND	$\longrightarrow\!$	A4	GROUND
B5	PETp1	+	A5	PERp1
B6	PETn1	\vdash	A6	PERn1
В7	GROUND	\longrightarrow	A7	GROUND
B8	BP TYPE	+	A8	BP TYPE
B9	CWAKE#	\vdash	A9	CWAKE#
B10	GROUND	\longrightarrow	A10	GROUND
B11	VSP	-	A11	VSP
B12	VSP	\vdash	A12	VSP
B13	GROUND	$\longrightarrow\!$	A13	GROUND
B14	PETp2	-	A14	PERp2
B15	PETn2	\vdash	A15	PERn2
B16	GROUND	\longrightarrow	A16	GROUND
B17	PETp3	+	A17	PERp3
B18	PETn3		A18	PERn3
B19	GROUND	$\vdash \lor \vdash$	A19	GROUND
B20	RESERVED		A20	RESERVED
B21	RESERVED		A21	RESERVED
B22	GROUND		A22	GROUND
B23	PETp4	 	A23	PERp4
B24	PETn4	$\overline{}$	A24	PERn4
B25	GROUND	\longrightarrow	A25	GROUND
B26	PETp5	- 	A26	PERp5
B27	PETn5	\vdash	A27	PERn5
B28	GROUND	$\longrightarrow\!$	A28	GROUND
B29	2-WIRE CLOCK	-	A29	2-WIRE CLOCK
B30	2-WIRE DATA	\vdash	A30	2-WIRE DATA
B31	GROUND	\longrightarrow	A31	GROUND
B32	PERST#	-	A32	PERST#
B33	CPRSNT#	\vdash	A33	CPRSNT#
B34	GROUND	$\vdash X -$	A34	GROUND
B35	PETp6	+	A35	PERp6
B36	PETn6		A36	PERn6
B37	GROUND	$\vdash X -$	A37	GROUND
B38	РЕТр7	\vdash	A38	PERp7
B39	PETn7		A39	PERn7
B40	GROUND	$\vdash \lor \vdash$	A40	GROUND

Note: P1 and P2 are connectors on both ends of cable assembly.

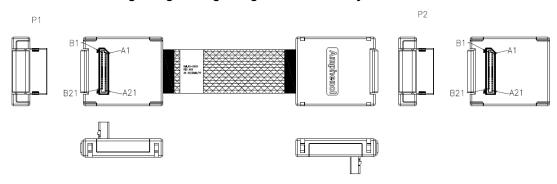


OCULINK CABLE ASSEMBLY MECHANICAL SCHEMATICS

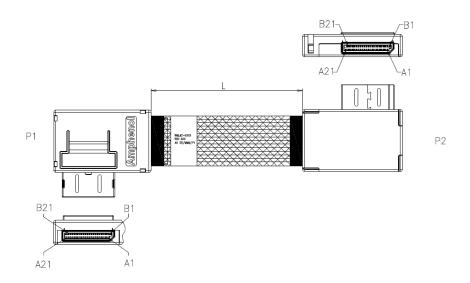
OCuLink 42 Position Straight to Straight Cable Assembly



OCuLink 42 Position Right Angle to Right Angle Cable Assembly

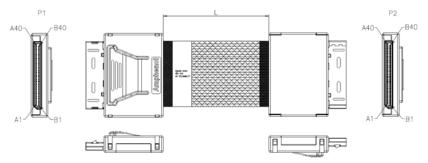


OCuLink 42 Position Right Side Exit to Left Side Exit Cable Assembly

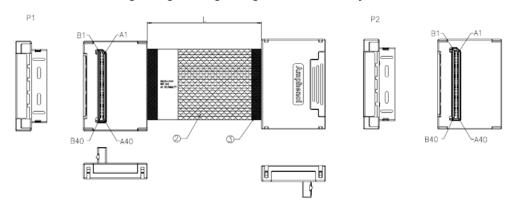




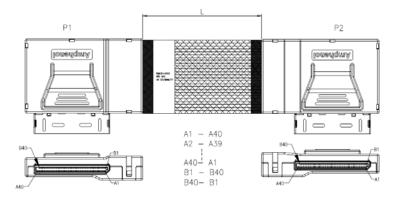
OCuLink 80 Position Straight to Straight Cable Assembly



OCuLink 80 Position Right Angle to Right Angle Cable Assembly



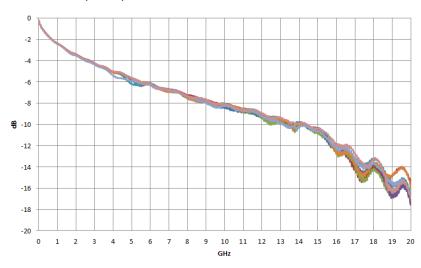
OCuLink 80 Position Right Side Exit to Left side Exit Cable Assembly



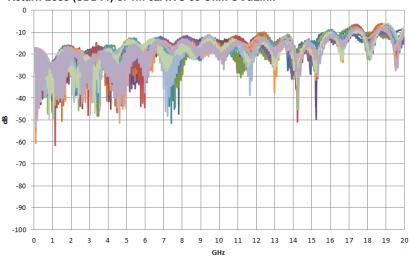


Signal Integrity Performance

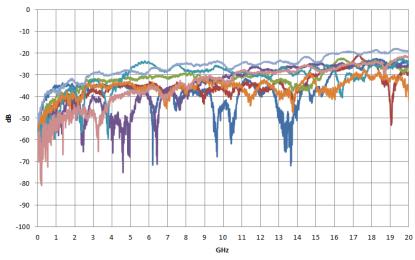
Insertion Loss (SDD21) of 1m 32AWG 85 Ohm OCuLink



Return Loss (SDD11) of 1m 32AWG 85 Ohm OCuLink

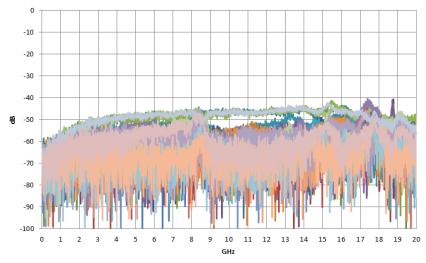


SCD21-SDD21 of 1m 32AWG 85 Ohm OCuLink

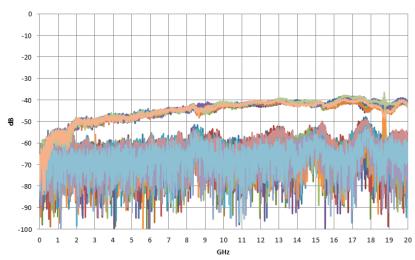




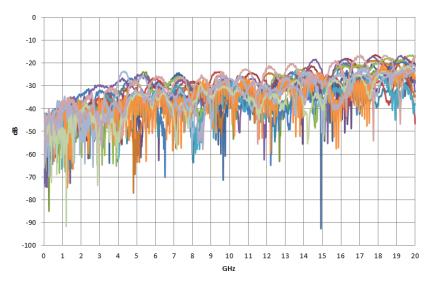
NEXT of 1m 32AWG 85 Ohm OCuLink



FEXT of 1m 32AWG 85 Ohm OCuLink

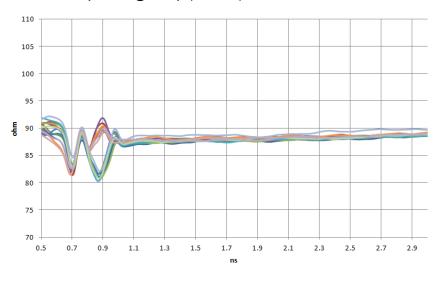


SCD21 of 1m 32AWG 85 Ohm OCuLink





Differential Impedance @ Tr=40ps(20%-80%) of 1m 32AWG 85 Ohm OCuLink



Note:

1. Please visit our website http://www.amphenol-ast.com/V3/en/product.aspx?classId=164 to find specific product information.

2. Any requirement, please send email to sales@amphenol-ast.com or inquire our local sales.