Product Specification

850Gb/s OSFP Active Optical Cable

P/N: NDR-OSFP-A

Features

- Hot Pluggable OSFP form factor
- Available length range 1m~50m
- Active Optical Cable
- Operating data rate 850Gbps
- Single +3.3V power supply
- Max power dissipation <18W
- 8-Channel Full-Duplex Passive Copper Cable
- Commercial temperature range 0°C to 70°C

Compliance

- Compliant with OSFP MSA
- Compliant with CMIS 5.1
- RoHS

Applications

- Support 800Gb InfiniBand NDR Systems
- Cloud Services
- Data Center Interconnect
- Data center Enterprise networking
- Switches with OSFP ports

Description

The NDR-OSFP-A is an active optical cable (AOC) designed to support InfiniBand NDR 800G data transmission. Encased in the OSFP module, this cable offers a high-performance solution for data centers, high-performance computing (HPC), and supercomputing environments where low-latency and high-bandwidth interconnections are critical. Its AOC design ensures superior signal integrity over longer distances, providing optimal performance while consuming less power.

Ideal for connecting InfiniBand switches and network adapters, the NDR-OSFP-A cable delivers efficient, high-speed data transfer with minimal latency. This cable is particularly suited for applications in artificial intelligence, big data analytics, and cloud computing, where large-scale data processing and fast communication are essential. The AOC design reduces energy consumption and extends the reach of high-speed data networks, making it an ideal solution for modern data-intensive applications that demand reliability, speed, and efficiency.

Product performance Specifications

1. Basic Product Characteristics

Parameter	Symbol	Min	Typ.	Max	Unit
Storage Temperature	Ts	-40	-	+85	°C
Supply Voltage	Vcc	-0.3	3.3	3.6	V
Relative Humidity	RH	5	-	85	%
Operating Case Temperature	TC	0	-	70	°C
Data Rate	DR	-	850	-	Gbps
Bit Error Rate	BER			2.4x10-4	

2. Product Optical and Electrical Characteristics

Parameter	Symbol	Min	Typ.	Max	Unit
Transmitter					
Differential input impedance	Zin	90	100	110	Ω
Differential input voltage amplitude	Vin	400		900	mVp-p
Input Logic Level High	V_{IH}	2.0		Vcc	V
Input Logic Level Low	V_{IL}	0		0.8	V
Centre Wavelength	λc	842	850	948	nm
RMS spectral width	Δλ			0.65	nm
Average launch power, each lane	Pout	-4.6		5.5	dBm
Optical Modulation Amplitude (OMAouter), each lane	OMA			4	dBm
Transmitter and dispersion eye closure for PAM4(TDECQ),each lane	TDECQ			4.4	dB
Extinction Ratio	ER	2.5			dB
Average launch power of OFF transmitter, each lane				-30	dB
Receiver					
Differential Output impedance	Zout	90	100	110	Ω
Differential output voltage amplitude	e ΔVout			850	mVp-p
Output Logic Level High	V_{OH}	Vcc-0.5		Vcc	V
Output Logic Level Low	V_{OL}	0		0.4	V
Centre Wavelength	λc	842	850	948	nm
Receiver Sensitivity in OMAout	RXsen			max (-4.4,TECQ-6.2)	dBm
Stressed Receiver Sensitivity in OMAout	SRS			-1.8	dBm
Maximum Average power at receiver, each lane input, each lane				5.5	dBm
Minimum Average power at receiver, each lane		-6.3			dBm
Receiver Reflectance				-15	dB
LOS Assert	LOSA	-15		-8.5	dBm
LOS De-Assert	LOSD			-6.5	dBm
LOS Hysteresis	LOSH	0.5			dB

Recommended Host Board Power Supply Circuit

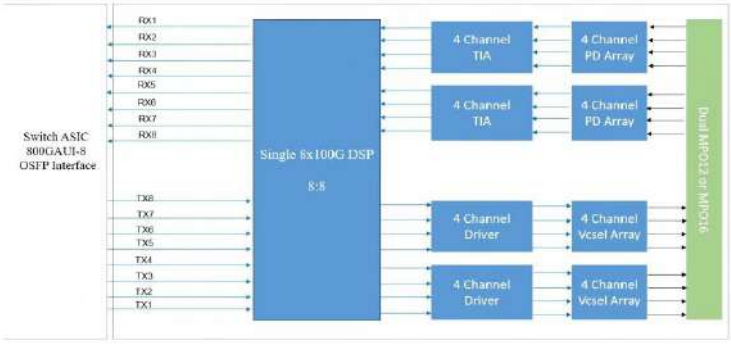


Figure 1: Module Block Diagram

Recommended Interface Circuit

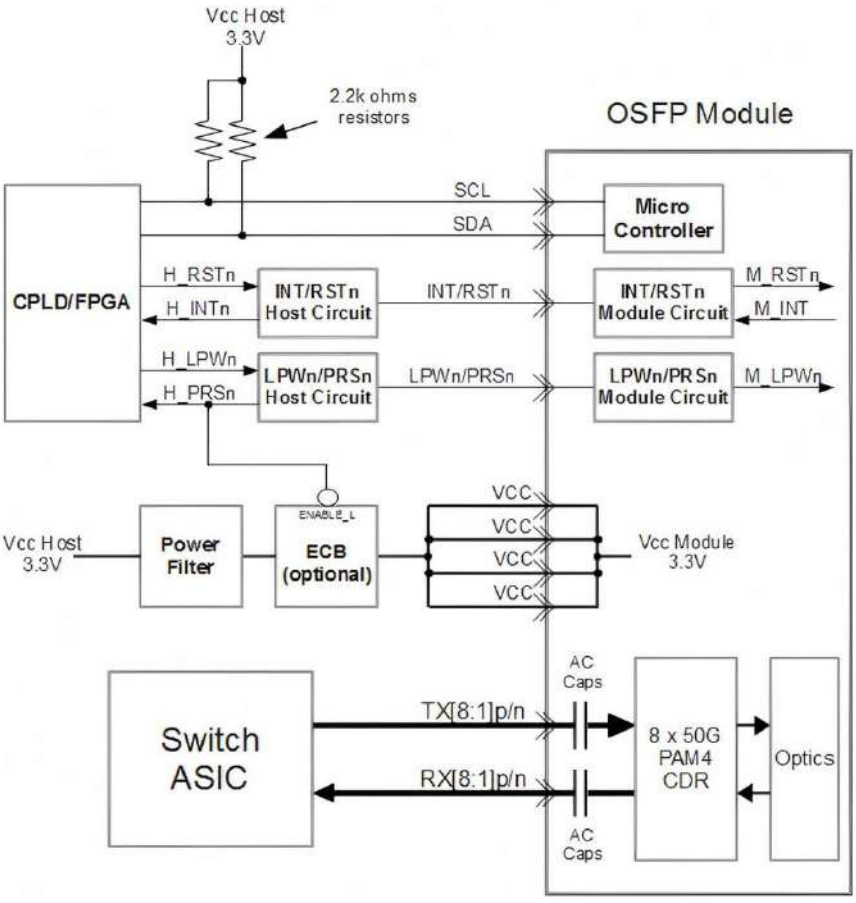


Figure2: Recommended Interface Circuit

Pin-out Definition

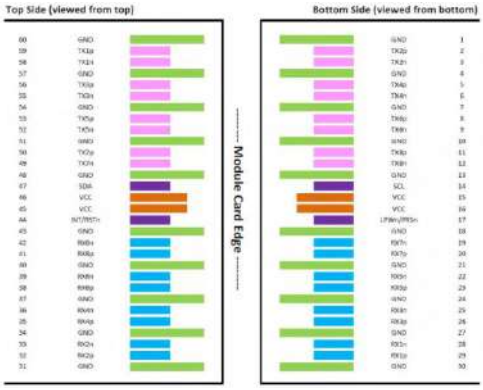


Figure3: Pin view

Pin Function Definitions

Pin	Logic	Symbol	Description	Note
1		GND	Ground	
2	CML-I	TX2p	Transmitter Data Non-Inverted	
3	CML-I	TX2n	Transmitter Data Inverted	
4		GND	Ground	
5	CML-I	TX4p	Transmitter Data Non-Inverted	
6	CML-I	TX4n	Transmitter Data Inverted	
7		GND	Ground	
8	CML-I	TX6p	Transmitter Data Non-Inverted	
9	CML-I	TX6n	Transmitter Data Inverted	
10		GND	Ground	
11	CML-I	TX8p	Transmitter Data Non-Inverted	
12	CML-I	TX8n	Transmitter Data Inverted	
13		GND	Ground	
14	LVCMOS-I/O	SCL	2-wire Serial interface clock	1
15		VCC	+3.3V Power	
16		VCC	+3.3V Power	
17	Multi-Level	LPWn/PRSn	Low-Power Mode / Module Present	2
18		GND	Ground	
19	CML-O	RX7n	Receiver Data Inverted	
20	CML-O	RX7p	Receiver Data Non-Inverted	
21		GND	Ground	
22	CML-O	RX5n	Receiver Data Inverted	
23	CML-O	RX5p	Receiver Data Non-Inverted	

24		GND	Ground	
25	CML-O	RX3n	Receiver Data Inverted	
26	CML-O	RX3p	Receiver Data Non-Inverted	
27		GND	Ground	
28	CML-O	RX1n	Receiver Data Inverted	
29	CML-O	RX1p	Receiver Data Non-Inverted	
30		GND	Ground	
31		GND	Ground	
32	CML-O	RX2p	Receiver Data Non-Inverted	
33	CML-O	RX2n	Receiver Data Inverted	
34		GND	Ground	
35	CML-O	RX4p	Receiver Data Non-Inverted	
36	CML-O	RX4n	Receiver Data Inverted	
37		GND	Ground	
38	CML-O	RX6p	Receiver Data Non-Inverted	
39	CML-O	RX6n	Receiver Data Inverted	
40		GND	Ground	
41	CML-O	RX8p	Receiver Data Non-Inverted	
42	CML-O	RX8n	Receiver Data Inverted	
43		GND	Ground	
44	Multi-Level	INT/RSTn	Module Interrupt / Module Reset	2
45		VCC	+3.3V Power	
46		VCC	+3.3V Power	
47	LVCMOS-I/O	SDA	2-wire Serial interface data	1
48		GND	Ground	
49	CML-I	TX7n	Transmitter Data Inverted	
50	CML-I	TX7p	Transmitter Data Non-Inverted	
51		GND	Ground	
52	CML-I	TX5n	Transmitter Data Inverted	
53	CML-I	TX5p	Transmitter Data Non-Inverted	
54		GND	Ground	
55	CML-I	TX3n	Transmitter Data Inverted	
56	CML-I	TX3p	Transmitter Data Non-Inverted	
57		GND	Ground	
58	CML-I	TX1n	Transmitter Data Inverted	
59	CML-I	TX1p	Transmitter Data Non-Inverted	
60		GND	Ground	

Note1: Open-Drain with pull up resistor on Host.

Note2: See pin description for required circuit.

Monitoring Specification

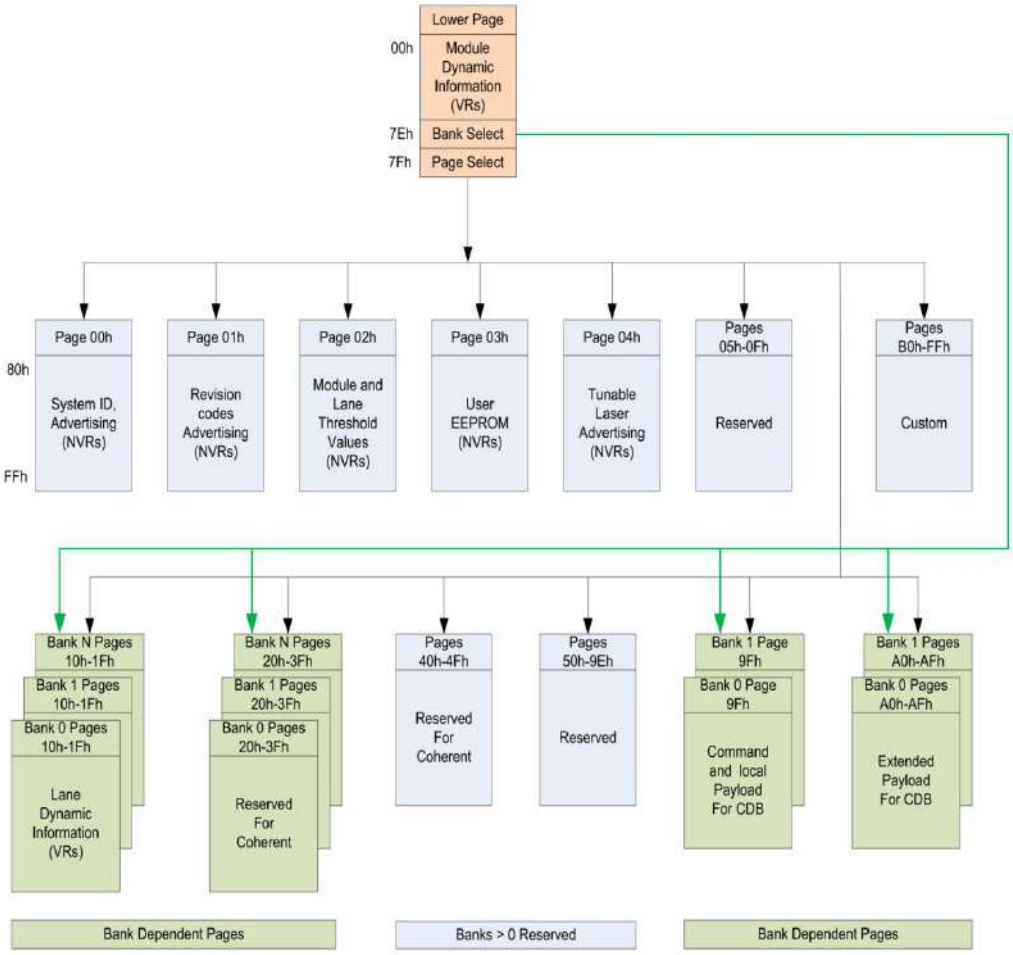


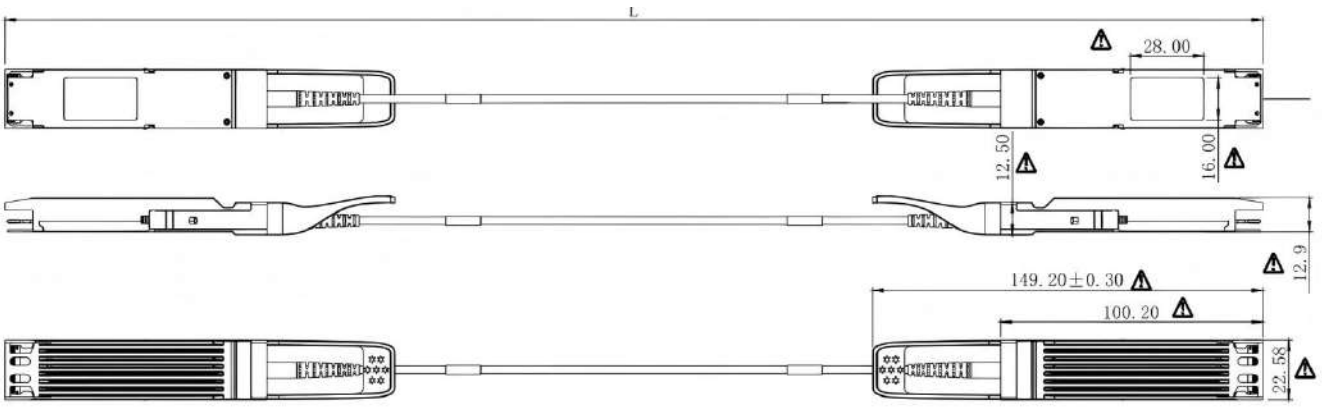
Figure4: Memory map

Memory map Table

Byte	Unit	Name	Description
Lower Page 00h			
0	1	Identifier	Identifier - Type of Serial Module - See SFF-8024.
1	1	Revision Compliance	Identifier – CMIS revision; the upper nibble is the whole number part and the lower nibble is the decimal part. Example: 01h indicates version 0.1, 21h indicates version 2.1.
2-3	2	ID and Status Area	Flat mem indication, CLEI present indicator, Maximum TWI speed, Current state of Module, Current state of the Interrupt signal.
4-7	4	Lane Flag Summary	Flag summary of all lane flags on pages 10h-1Fh.
8-13	6	Module-Level Flags	All flags that are not lane or data path specific.
14-25	12	Module-Level Monitors	Monitors that are not lane or data path specific.

26-30	5	Module Global Controls	Controls applicable to the module as a whole
31-36	6	Module-Level Flag Masks	Masking bits for the Module-Level flags
37-38	2	CDB Status Area	Status of most recent CDB command
39-40	2	Module Firmware Version	Module Firmware Version.
41-63	23	Reserved Area	Reserved for future standardization
64-82	19	Custom Area	Vendor or module type specific use
83-84	2	Inactive Firmware Version	Version Number of Inactive Firmware. Values of 00h indicates module supports only a single image.
85-117	33	Application Advertising	Combinations of host and media interfaces that are supported by module data path(s)
118-125	8	Password Entry and Change	Password Entry and Change
126	1	Bank Select Byte	Bank address of currently visible Page
127	1	Page Select Byte	Page address of currently visible Page
Upper Page 00h			
128	1	Identifier	Identifier - Type of Serial Module - See SFF-8024.
129-144	16	Vendor name	Vendor name (ASCII)
145-147	2	Vendor OUI	Vendor IEEE company ID
148-163	16	Vendor PN	Part number provided by vendor (ASCII)
164-165	8	Vendor rev	Revision level for part number provided by vendor (ASCII)
166-181	10	Vendor SN	Vendor Serial Number (ASCII)
182-183	2	Date code year	ASCII code, two low order digits of year (00=2000)
184-185	2	Date code month	ASCII code digits of month (01=Jan through 12=Dec)
186-187	2	Date code day of month	ASCII code day of month (01-31)
188-189	2	Lot code	ASCII code, custom lot code, may be blank
190-199	10	CLEI code	Common Language Equipment Identification code
200-201	2	Module power characteristics	Module power characteristics
202	1	Cable assembly length	Cable assembly length
203	1	Media Connector Type	Media Connector Type
204	1	5 GHz attenuation	Passive copper cable attenuation at 5 GHz in 1 dB increments
205	1	7 GHz attenuation	Passive copper cable attenuation at 7 GHz in 1 dB increments
206	1	12.9 GHz attenuation	Passive copper cable attenuation at 12.9 GHz in 1 dB increments
207	1	25.8 GHz attenuation	Passive copper cable attenuation at 25.8 GHz in 1 dB increments
208-209	2	Reserved	Reserved
210-211	2	Cable Assembly Lane Information	Cable Assembly Lane Information
212	1	Media Interface Technology	Media Interface Technology
213-220	8	Reserved	Reserved
221	1	Custom	Custom
222	1	Checksum	Includes bytes 128-221
223-255	33	Custom Info NV	Custom Info NV

Mechanical Dimension



Note:

- Diameter: 3mm
- Minimum bend radius:30mm
- Cable color:Orange(OM2),Aqua(OM3),Magenta(OM4)
- When L≤1m, the tolerance is +5cm
- When 1m≤L≤4.5m, the tolerance is +15cm
- When 5m≤L≤14.5m, the tolerance is +30cm
- When L≥15m, the tolerance is +2%m

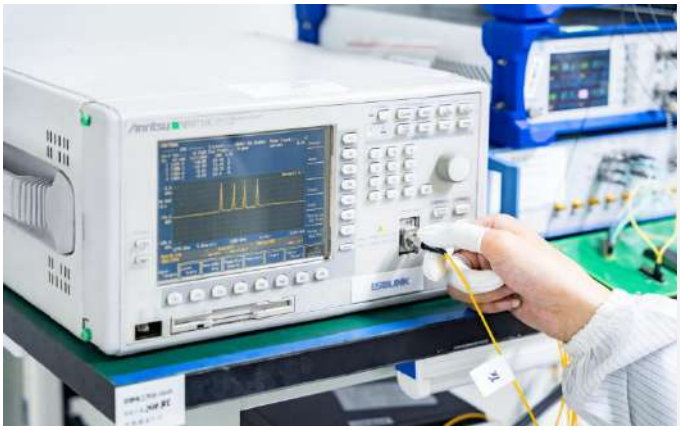
Waring:

- The transceiver optics is supplied with a dust cover. This plug protects the transceiver optics during standard manufacturing processes by preventing contamination from air borne particles.It is recommended that the dust cover remain in the transceiver whenever an optical fiber connector is not inserted.
- Handling Precautions: This device is susceptible to damage as a result of electrostatic discharge (ESD). A static free environment is highly recommended. Follow guidelines according to proper ESD procedures.
- Laser Safety: Radiation emitted by laser devices can be dangerous to human eyes. Avoid eye exposure to direct or indirect radiation.

Test Center

1. Performance Testing

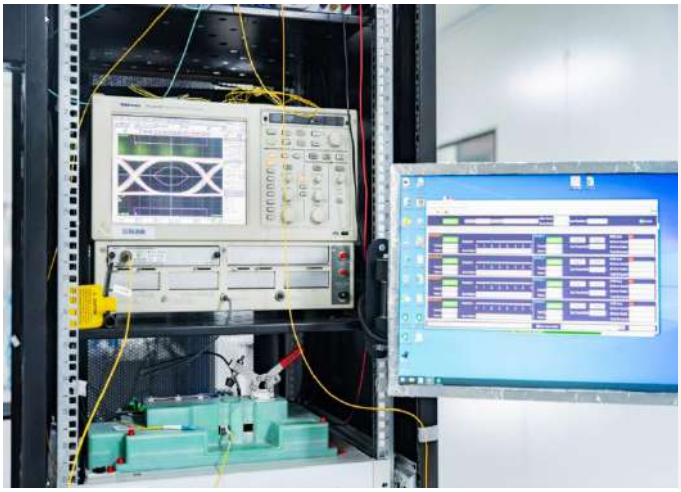
Every fiber optic transceiver is thoroughly tested by the LSOLINK Assurance Program, which is equipped with the world's most advanced analytical equipment to ensure that our transceivers meet the industry's international public protocol standards while still functioning flawlessly in your facility.



Optical Spectrum Inspection

Using the industry's leading optical spectrum analyser to check in real time that the parameters of the optical transceiver's laser comply with industry standards.

- **Peak:** Peak wavelength and peak level
- **2nd Peak:** Side-mode wavelength and level
- **Mean WI:** Center wavelength
- **Total Power:** Total power of spectrum
- **SMSR:** Side-Mode Suppression Ratio



Optical Signal Quality Inspection

Using highly efficient sampling oscilloscopes and BERT testers, equipped with an automated test platform to accurately test the signal quality of the transceiver, test records are kept for up to 5 years to ensure the traceability of each transceiver.

- **Eye Mask Margin(NRZ)**
- **TDECQ(PAM4):**transmitter dispersion eye closure
- **OMA:** Optical modulation amplitude
- **BER:** Bit error rate
- **ER:** Extinction Ratio

Flow Pressure Test

Using multi-protocol network traffic analyser with various brands of switches to test the transceiver's ability to transmit at full speed.

- **Bandwidth:** Actual transceiver bandwidth on the port
- **Packet Loss**
- **Packet Errors:**CRC Errors/PCS Errors/Symbol Errors
- **LinkDown Counts**
- **latency**

Aboveis part of our test bed network equipment. For more information, Please click download for optical transceiver performance test report.

2. Quality Control

We adopt advanced quality management solutions. Each transceiver is self-inspected, including:20x microscope inspection, 200x microscope inspection, and QC process inspection.

visual inspection

Microscopic inspection: 20X

Microscopic inspection: 200X

Reliability Verification

Optical endface inspection

OQC Inspection

Order Information

Part Number	Length(m)	Connector Type	Cable Type	Cable Jacket
NDR-OSFP-A1	1	OSFP to OSFP	Active Optical	OFNP
NDR-OSFP-A3	3	OSFP to OSFP	Active Optical	OFNP
NDR-OSFP-A5	5	OSFP to OSFP	Active Optical	OFNP
NDR-OSFP-A7	7	OSFP to OSFP	Active Optical	OFNP
NDR-OSFP-A10	10	OSFP to OSFP	Active Optical	OFNP
NDR-OSFP-A15	15	OSFP to OSFP	Active Optical	OFNP

Further Information

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Disclaimer

1. We are committed to continuous product improvement and feature upgrades, and the contents con t ained in this manual are subject to change without notice.
2. Nothing herein should be construed as constituting an additional warranty.
3. LSOLINK assumes no responsibility for the use or reliability of equipment or software not provided by LSOLINK.