OSFP 800G SR8 100 m

Datasheet

Issue	**1.1**
Date	**2025-11-12**

Contents

1 Features and Applications

Features

- OSFP MSA rev5.0 compliant
- OSFP CMIS 5.2 Management interface compliant
- IEEE 802.3df 800GBASE-SR8 standard compliant
- IEEE 802.3ck 800GAUI-8 standard compliant
- OIF-CEI-112G-VSR-PAM4 standard compliant
- Digital diagnostic functions
- 8 channels full-duplex transceiver module
- 850 Gbps aggregate bit rate
- Maximum link length of 60 m OM3, 100 m OM4 with FEC
- Single MPO-16/APC receptacle
- Maximum power dissipation ≤ 15.5 W
- Operating case temperature range 0°C to 70°C
- Single 3.3 V power supply
- RoHS 2 compliant

Applications

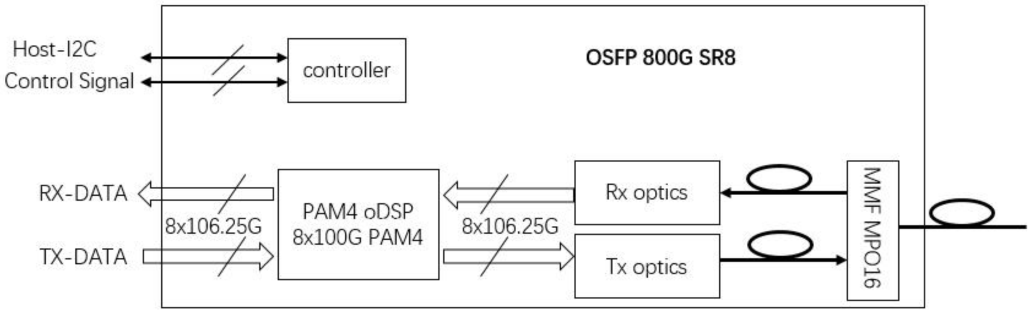
- 800G Ethernet
- Data center network

2 Function Descriptions

The OSFP 800G SR8 100 m module is a parallel 800G Octal Small Form-Factor Pluggable (OSFP) SR8 optical module designed for optical communication applications. The optical module uses a 4-level pulse amplitude modulation (PAM4) format. The optical module provides point-to-point 800 Gigabit Ethernet links over eight pairs of multimode fiber, with a reach of up to 100 m for OM4 (MMF) and 60 m for OM3 (MMF).

It is compliant with OSFP MSA standard and IEEE 802.3df 800GBASE-SR8 standard and IEEE 802.3ck 800GAUI-8 standard. Digital diagnostics functions are available via the I2C interface, as specified by the OSFP MSA.

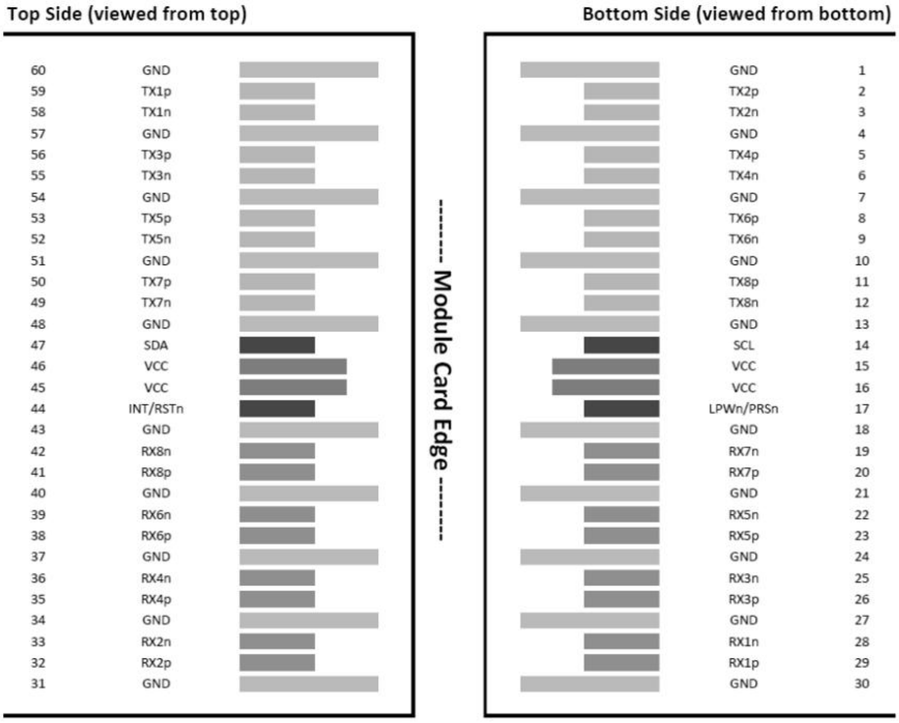
Figure 2-1 Transceiver block diagram



3 Pin Descriptions

The OSFP SR8 module edge connector consists of a single paddle card with 30 pads on the top and 30 pads on the bottom for a total of 60 pads.

Figure 3-1 OSFP MSA-compliant connector



Pin	Logic	Symbol	Description	Plug Sequence	Note
1	-	GND	Ground	1	1
2	CML-I	TX2p	Transmitter Data Non-Inverted	3	-
3	CML-I	TX2n	Transmitter Data Inverted	3	-

Pin	Logic	Symbol	Description	Plug Sequence	Note
4	-	GND	Ground	1	-
5	CML-I	Tx4p	Transmitter Data Non-Inverted	3	-
6	CML-I	Tx4n	Transmitter Data Inverted	3	-
7	-	GND	Ground	1	-
8	CML-I	TX6p	Transmitter Data Non-Inverted	3	-
9	CML-I	TX6n	Transmitter Data Inverted	3	-
10	-	GND	Ground	1	-
11	CML-I	TX8p	Transmitter Data Non-Inverted	3	-
12	CML-I	TX8n	Transmitter Data Inverted	3	-
13	-	GND	Ground	1	-
14	LVCMOS-I/O	SCL	2-wire Serial Interface Clock	3	2
15	-	VCC	+3.3 V Power	2	3
16	-	VCC	+3.3 V Power	2	-
17	Multi-Level	LPWn/PRSn	Low-Power Mode/Module Present	3	4
18	-	GND	Ground	1	-
19	CML-O	RX7n	Receiver Data Inverted	3	-
20	CML-O	RX7p	Receiver Data Non-Inverted	3	-
21	-	GND	Ground	1	-
22	CML-O	RX5n	Receiver Data Inverted	3	-
23	CML-O	RX5p	Receiver Data Non-Inverted	3	-
24	-	GND	Ground	1	-
25	CML-O	RX3n	Receiver Data Inverted	3	-
26	CML-O	RX3p	Receiver Data Non-Inverted	3	-
27	-	GND	Ground	1	-

Pin	Logic	Symbol	Description	Plug Sequence	Note
28	CML-O	RX1n	Receiver Data Inverted	3	-
29	CML-O	RX1p	Receiver Data Non-Inverted	3	-
30	-	GND	Ground	1	-
31	-	GND	Ground	1	-
32	CML-O	RX2p	Receiver Data Non-Inverted	3	-
33	CML-O	RX2n	Receiver Data Inverted	3	-
34	-	GND	Ground	1	-
35	CML-O	RX4p	Receiver Data Non-Inverted	3	-
36	CML-O	RX4n	Receiver Data Inverted	3	-
37	-	GND	Ground	1	-
38	CML-O	RX6p	Receiver Data Non-Inverted	3	-
39	CML-O	RX6n	Receiver Data Inverted	3	-
40	-	GND	Ground	1	-
41	CML-O	RX8p	Receiver Data Non-Inverted	3	-
42	CML-O	RX8n	Receiver Data Inverted	3	-
43	-	GND	Ground	1	-
44	Multi-Level	INT/RSTn	Module Interrupt/Module Reset	3	4
45	-	VCC	+3.3 V Power	2	-
46	-	VCC	+3.3 V Power	2	-
47	LVCMOS-I/O	SDA	2-wire Serial Interface Data	3	-
48	-	GND	Ground	1	-
49	CML-I	TX7n	Transmitter Data Inverted	3	-
50	CML-I	TX7p	Transmitter Data Non-Inverted	3	-
51	-	GND	Ground	1	-
52	CML-I	TX5n	Transmitter Data	3	-

Pin	Logic	Symbol	Description	Plug Sequence	Note
			Inverted		
53	CML-I	TX5p	Transmitter Data Non-Inverted	3	-
54	-	GND	Ground	1	-
55	CML-I	TX3n	Transmitter Data Inverted	3	-
56	CML-I	TX3p	Transmitter Data Non-Inverted	3	-
57	-	GND	Ground	1	-
58	CML-I	TX1n	Transmitter Data Inverted	3	-
59	CML-I	TX1p	Transmitter Data Non-Inverted	3	-
60	-	GND	Ground	1	-

NOTE

1. OSFP uses common ground (GND) for all signals and supply (power). All are common within the OSFP module and all module voltages are referred to this potential unless otherwise noted. Connect these directly to the host board signal-common ground plane.
2. Open-Drain with pull-up resistor on Host.
3. +3.3 V power is delivered to the module via 4 power pins (VCC). These 4 power pins shall be connected together on the module and also together on the host. Each power pin allows up to 2.5 Amps for a total of 10.0 Amps.
4. See pin description for required circuit.

4 Absolute Maximum Ratings

It has to be noted that the operation in excess of any individual absolute maximum ratings might cause permanent damage to this module.

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Maximum supply voltage	Vcc	–0.3	3.3	3.6	V	-
Storage temperature	Ts	–40	-	85	°C	-
Relative humidity	RH	15	-	85	%	Non-condensing
Damage threshold, each lane	THd	5	-	-	dBm	-

5 Operating Environments

Electrical and optical characteristics below are defined under this operating environment, unless otherwise specified.

Parameter	Symbol	Min.	Typ.	Max.	Unit
Supply voltage	Vcc	3.135	3.3	3.465	V
Case temperature	Tc	0	-	70	°C
Data rate, each lane	-	-	53.125	-	GBd
Data rate accuracy	-	–50	-	50	ppm
Modulation format	-	PAM4			-
Link distance with OM3 MMF	-	-	-	60	m
Link distance with OM4 MMF	-	-	-	100	m
Link distance with OM5 MMF	-	-	-	100	m

NOTE

Initialization Flows: The Host Initialization Flows of CMIS Rev5.2 Standard Appendix C are recommended.

6 Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Power dissipation	-	-	-	15.5	W	-
Steady state current	Icc	-	-	4944	mA	1
Instantaneous peak current	-	-	-	5162	mA	-
Sustained peak current	-	-	-	6200	mA	-
Module-to-Host electrical specifications at TP4 (module output)						
Differential voltage pk-pk	Vpp	-	-	860	mV	-
Common mode voltage	Vcm	–350	-	2850	mV	-
Common-mode noise (RMS)	-	-	-	17.5	mV	-
Differential termination resistance mismatch	-	-	-	10	%	-
Common mode to differential mode conversion (SDC22)	-	-	-	Equation (25-2)	dB	OIF-CEI-05.1
Effective return loss (ERL)	ERL	9.0	-	-	dB	-
Common mode return loss (SCC22)	-	-	-	–2 –1.6 – 0.1*f –8.5 + 0.13*f	dB	OIF-CEI-05.1
Transition time	Trise/Tf	8.0	-	-	ps	OIF-CEI-05.

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
	all					1
Near-end vertical eye closure over ±50 mUI	-	-	-	12	dB	OIF-CEI-05.1
Near-end eye height over ±50 mUI	-	20	-	-	mV	-
Far-end vertical eye closure over ±50 mUI	-	-	-	12	dB	-
Far-end eye height over ±50 mUI	-	15	-	-	mV	-
Host-to-Module electrical specifications (module input)						
Differential termination resistance mismatch	-	-	-	10	%	At 1 MHz
Overload differential voltage pk-pk	Vpp	900	-	-	mV	TP1a
DC common mode voltage	Vcm	–350	-	2850	mV	TP1
Single-ended voltage tolerance	-	–0.4	-	3.3	V	TP1a
Differential mode to common mode conversion (SCD11)	-	-	-	Equation (25-1)	dB	TP1 OIF-CEI-05.1
Effective return loss (ERL)	-	9	-	-	dB	TP1
Stressed input test	-	See Section 25.3.11.3			dB	TP1 OIF-CEI-05.1

NOTE

1. The module must stay within its declared power class.

7 Optical Characteristics

Parameters	**Symbol**	**Min.**	**Typ.**	**Max.**	**Unit**
Center wavelength	λ_c	844	-	863	nm
Transmitter					
RMS spectral width	-	-	-	0.6	nm
Average launch power, each lane	P_{AVG}	–4.6	-	4	dBm
Outer optical modulation amplitude (OMA_{outer}), each lane	P_{OMA}	–2.6	-	3.5	dBm
Optical modulation amplitude each lane for max (TECQ, TDECQ) ≤ 1.8 dB	-	–4.4 + max (TECQ, TDECQ)	-	3.5	dBm
Transmitter and dispersion eye closure for PAM4, each lane	TDECQ	-	-	4.4	dB
Extinction ratio, each lane	ER	2.5	-	-	dB
Transmitter power excursion, each lane	-	-	-	2.3	dB
Tx eye overshoot/undershoot	-	-	-	29	%
Transmitter transition time	-	-	-	17	ps

Parameters	Symbol	Min.	Typ.	Max.	Unit
Average launch power of OFF transmitter, each lane	P_{OFF}	-	-	–30	dBm
$RIN_{14}OMA$	-	-	-	–132	dB/Hz
Optical return loss tolerance	-	-	-	14	dB
Encircled flux	-	≥ 86% at 19 μm ≤ 30% at 4.5 μm			-
Receiver					
Average receiver power, each lane	-	–6.4	-	4	dBm
Receiver power, each lane (OMA)	-	-	-	3.5	dBm
Damage threshold, each lane	THd	5	-	-	dBm
Receiver reflectance	-	-	-	–15	dB
LOS assert	LosA	–20	-	-	dBm
LOS de-assert	LosD	-	-	–8.2	dBm
LOS hysteresis	LosH	0.5	-	-	dB
Receiver sensitivity (OMAouter), each lane (max) for TECQ < 1.8 dB	-	-	-	–4.6	dBm
Receiver sensitivity (OMAouter), each lane (max) for 1.8 dB < TECQ < 4.4 dB	Sen	-	-	–6.4 + TECQ	dBm
Stressed receiver sensitivity (OMA), each lane	SRS	-	-	–2.0	dBm
Conditions of stressed receiver sensitivity test					
Stressed eye closure for PAM4, lane under test	SECQ	-	-	4.4	dB

Parameters	Symbol	Min.	Typ.	Max.	Unit
OMA_{outer} of each aggressor lane	-	-	-	3.5	dBm

8 EEPROM Definitions

Refer to CMIS Rev5.2 used for OSFP.

9 Digital Diagnostic Monitoring Functions

Digital diagnostic management interface (DDMI) is realized by I2C interface in compliance with CMIS 5.2. Diagnostic management functions and the data addresses are listed in the form below.

Performance Item	Related Bytes	Monitor Error	Notes
Module temperature	Lower Page (14 to 15)	≤ ± 3°C	1, 2
Module voltage	Lower Page (16 to 17)	≤ ± 5%	2
Transmitter optical power	Upper Page11h (154 to 169)	≤ ±3 dB	2
Bias current	Upper Page11h (170 to 185)	≤ ± 10%	2
Receiver optical power	Upper Page11h (186 to 201)	≤ ±3 dB	2

NOTE

1. Actual temperature test point is fixed on module case around laser array.
2. Full operating temperature range.

10

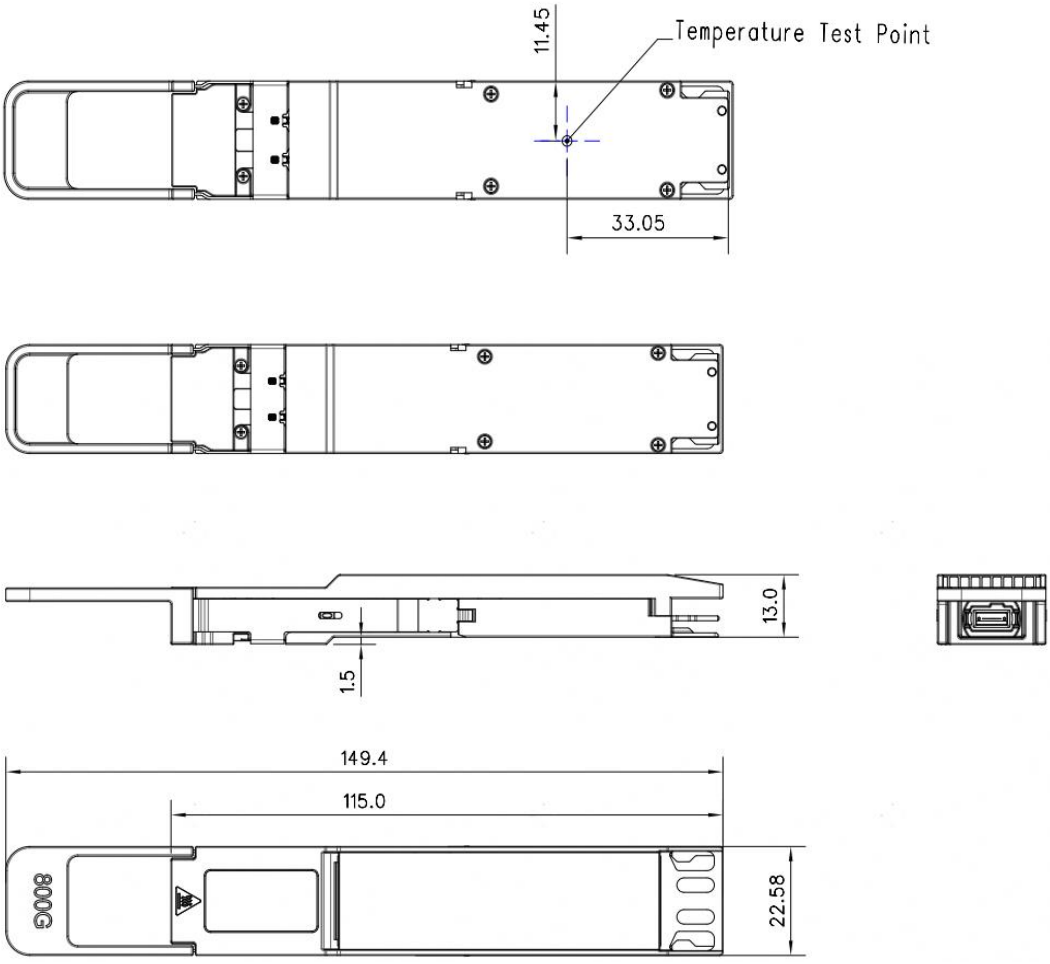
Alarm and Warning Thresholds

The OSFP 800G SR8 100 m module supports alarms function, indicating the values of the preceding basic performance are lower or higher than the thresholds.

Performance Item	Alarm Threshold Bytes (Page02h Memory)	Unit	Low Threshold	High Threshold
Temperature warning	132 to 135	°C	–3	73
Voltage warning	140 to 143	V	3.135	3.465
Ibias warning	188 to 191	mA	6	11
Tx power warning	180 to 183	dBm	–4.6	4.0
Rx power warning	196 to 199	dBm	–6.3	4.0
Temperature alarm	128 to 131	°C	–5	75
Voltage alarm	136 to 139	V	2.97	3.63
Ibias alarm	184 to 187	mA	4	13
Tx power alarm	176 to 179	dBm	–6.6	5
Rx power alarm	192 to 195	dBm	–8.3	5

11 Mechanical Specifications

Figure 11-1 The OSFP 800G SR8 100 m module mechanical dimensions



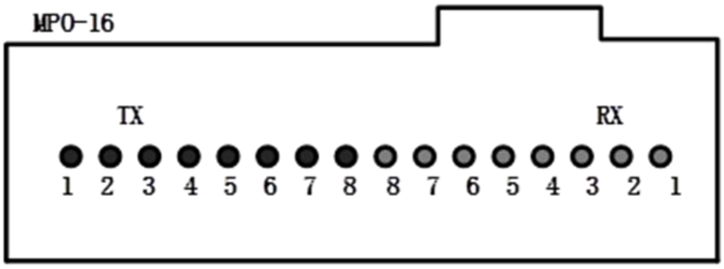
The thermally conductive area in Figure 11-1 meet the following requirements (The thermally conductive area reference OSFP Module Specification Rev 5.22):

1. Surface Flatness: 0.12 mm or better;
2. Surface Roughness: Ra 1.6 μm or better.

12 Optical Interface

The OSFP 800G SR8 optical interface port shall be a male MPO-16 APC receptacle. The recommended location and numbering of the optical ports for each of the Media Dependent Interfaces is shown in Figure 12-1. The transmitter and receiver optical lanes shall occupy the positions depicted in when looking into the MDI receptacle with the connector keyway feature on top.

Figure 12-1 Optical media dependent interface port assignments



NOTE

The module uses MPO-16 APC receptacle. It may need every optical connector of the transmission link with APC interface for lower optical reflectance.

13 Regulatory Compliance

Feature	Category	Standard	Performance
Safety	NRTL	UL 62368-1 CAN/CSA C22.2 No. 62368-1 IEC 60825-1:2014 IEC 60825-2	NRTL recognized component for US and CAN
	TUV	EN 62368-1 EN 60825-1:2014+A11:2021 EN 60825-2	TUV certificate
	FDA	U.S. 21 CFR 1040.10 & 1040.11, Notice 56	FDA/CDRH certified with accession number according to Laser Notice 56
Electromagnetic Compatibility	Radiated emissions	EN 55032 CISPR 32 ICES-003 VCCI-CISPR 32 AS/NZS CISPR 32	Class B digital device with a minimum –6 dB margin to the limit when tested with a metal enclosure. Final margin may vary depending on system application, good system EMI design practice, ie: suitable metal enclosure and well-bonding, is required to achieve Class B margins at the system level. Tested frequency range: 30 MHz to 40 GHz or 5th harmonic (5 times the highest

Feature	Category	Standard	Performance
			frequency), whichever is less.
	ESD	EN 55035 CISPR 35	Withstands discharges of ±8 kV contact, ±15 kV air.
	Radiated immunity	EN 55035 CISPR 35	Field strength of 10 V/m from 80 MHz to 6 GHz.
Restriction of Hazardous Substances	RoHS	EN IEC 63000:2018 & BS EN IEC 63000:2018	CE certificate

China RoHS hazardous substance table

产品满足中国 RoHS 的要求：

部件名称 **Part Descriptions**	**有害物质** **Hazardous Substances**					
	镉 **Cd**	**铅** **Pb**	**汞** **Hg**	**六价铬** **Cr (VI)**	**多溴联苯** **PBB**	**多溴二苯醚** **PBDE**
印制电路板组件 PCBA	○	×	○	○	○	○
金属部件 Metal Part	○	×	○	○	○	○
聚合物部件 Polymeric Part	○	○	○	○	○	○

备注：本表格依据 SJ/T 11364 的规定编制。

Remark: The table is prepared in accordance with SJ/T 11364.

○: 表示该有害物质在该部件所有均质材料中的含量均在 GB/T 26572 规定的限量要求以下。

It means that the content of the restricted substances in all materials of part is less than the limit defined in GB/T 26572 and other similar directives in other countries.

×: 表示该有害物质至少在该部件的某一均质材料中的含量超出 GB/T 26572 规定的限量要求。

It means that the content of the restricted substances in at least one homogenous material of part is not less than the limit defined in GB/T 26572 and other similar directives in other countries.

上表中的“╳”表示这些部件适用一项或多项欧盟 RoHS 豁免。

The "╳" in the above table indicates that one or more EU RoHS exemptions are applied in these parts.

14

ESD Design

Normal ESD precautions are required during the handling of this module. This transceiver is shipped in ESD protective packaging. It should be removed from the packaging and otherwise handled in an ESD protected environment utilizing standard grounded benches, floor mats, and wrist straps.

Parameter	**Value**	**Notes**
ESD of all the OSFP module pins	1 kV	Human body model
Air discharge during operation	15 kV	-
Direct contact discharges to the case	8 kV	-

15 Safety Specification Design

⚠ CAUTION

Do not look into fiber end faces without eye protection using an optical meter (such as magnifier and microscope) within 100 mm, unless you ensure that the laser output is disabled. When operating an optical meter, observe the operation requirements.

CAUTION–Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

Attention–L'utilisation des commandes ou réglages ou l'exécution des procédures autres que celles spécifiées dans les présentes exigences peuvent être la cause d'une exposition à un rayonnement dangereux.

16 Ordering Information

Number	Description
1	OSFP 800G SR8 100 m OM4 & 60 m OM3