

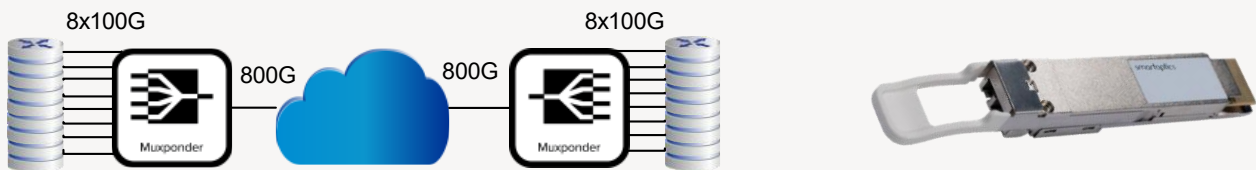
# TD8010-TUNC-SO

QSFP-DD800 800G OpenROADM/OIF 800ZR Coh Tunable Flexgrid CMIS5.3 LC

## OVERVIEW

The TD8010-TUNC-SO is an QSFP-DD form-factor (type 2a) DWDM transceiver conforming to the OpenROADM and OIF 800ZR MSA, for 800Gbps Ethernet applications. The transceiver also supports 400-600Gbps rates with different modulation formats, with proprietary probabilistic constellation shaping (PCS) modulations, resulting in an optimized OSNR performance for the application needs with different channel widths.

The transceiver provides a flexible solution for operators having routers that not yet have migrated to 800G services. The TD8010-TUNC-SO can as an example be used to combine up to 8x100G/4x200G/2x400G flows to a 800G signal to be transported over an optical network.



The table below lists the Host and NTKW modes supported by TD8010-TUNC-SO.

Host framing <sup>3)</sup>	Network Frame Format	Payload	Modulation	Line Symbol Baud Rate	Channel spacing	Media code <sup>1)</sup>	MSA format	NTWK Mode description
800GAUI-8-S/L 400GAUI-4-x 200GAUI-2-x 100GAUI-1-x	OIF 800ZR	800G	DP-16QAM	118.2GBd	150GHz	0x6C	ZR800-16QAM-OS-A	800ZR Power class A
400GAUI-4-x 200GAUI-2-x 100GAUI-1-x	FlexO-6(e)	600G	PCS-118	118.7GBd	150 GHz	0x6A	FlexO-6e-MPCS118-OS-OR	OpenROADM FlexO-6e-DPO
400GAUI-4-x 200GAUI-2-x 100GAUI-1-x	FlexO-6(e)	600G	PCS-118	118.5GBd	150 GHz	0xF2	FlexO-6e-MPCS118-OS-E <sup>2)</sup>	OpenROADM FlexO-6e-DPO, Enhanced
400GAUI-8 200GAUI-4 100GAUI-2 400GAUI-4-x 200GAUI-2-x 100GAUI-1-x	FlexO-4(e)	400G	PCS-118	118.2GBd	150GHz	0x64	FlexO-4e-QPSK-OS-OR	OpenROADM FlexO-4e-DO
400GAUI-8 200GAUI-4 100GAUI-2 400GAUI-4-x 200GAUI-2-x 100GAUI-1-x	400ZR+	400G	DP-16QAM	60.1GBd	75GHz	0x36	OpenZR400-16QAM-OS-HB	OpenZR+ ZR400-OFEC-16QAMHB
800GAUI-8-x 400GAUI-4-x 200GAUI-2-x 100GAUI-1-x	FlexO-8(e)	800G	PCS-131	131.3GBd	150GHz	0x68	FlexO-8e-MPCS131-OS-OR	OpenROADM FlexO-8e-DPO
800GAUI-8-x 400GAUI-4-x 200GAUI-2-x 100GAUI-1-x	FlexO-8(e)	800G	PCS-131	131.3GBd	150GHz	0xF7	FlexO-8e-MPCS131-OS-E <sup>2)</sup>	OpenROADM FlexO-8e-DPO, Enhanced
FOIC1.1-RS	FlexO-8	800G	PCS-131	131.4GBd	150GHz	0xF8	FlexO-8-MPCS131-OS-E <sup>2)</sup>	OpenROADM FlexO-8e-DPO, Enhanced (OTN)
400GAUI-4-x 200GAUI-2-x 100GAUI-1-x	FlexO-6(e)	600G	PCS-131	131.2GBd	150GHz	0xF5	FlexO-6e-MPCS131-OS-E <sup>2)</sup>	600G-PCS-131Gb
FOIC1.1-RS	FlexO-6	600G	PCS-131	131.0GBd	150GHz	0xF6	FlexO-6-MPCS131-OS-E <sup>2)</sup>	600G PCS-131 GBd (OTN)
400GAUI-8 200GAUI-4 100GAUI-2 400GAUI-4-x 200GAUI-2-x 100GAUI-1-x	FlexO-4(e)	400G	PCS-131	131.3GBd	150GHz	0xEC	FlexO-4e-MPCS131-OS <sup>2)</sup>	400G PCS-131Gb

Subject to change without notice.

For more information visit [smaroptics.com](http://smaroptics.com).

400GAUI-8 200GAUI-4 100GAUI-2 400GAUI-4-x 200GAUI-2-x 100GAUI-1-x	FlexO-4(e)	400G	PCS-66	65.7GBd	75GHz	0xC0	FlexO-4e-MPCS066-OS <sup>2)</sup>	400G PCS-66Gbd
400GAUI-8 200GAUI-4 100GAUI-2 400GAUI-4-x 200GAUI-2-x 100GAUI-1-x	FlexO-4(e)	400G	PCS-75	75.0GBd	87.5GHz	0xC2	FlexO-4e-MPCS075-OS <sup>2)</sup>	400G PCS-75Gbd
400GAUI-8 200GAUI-4 100GAUI-2 400GAUI-4-x 200GAUI-2-x 100GAUI-1-x	FlexO-4(e)	400G	PCS-87	87.4GBd	100GHz	0xC9	FlexO-4e-MPCS087-OS <sup>2)</sup>	400G PCS-87Gbd
400GAUI-8 200GAUI-4 100GAUI-2 400GAUI-4-x 200GAUI-2-x 100GAUI-1-x	FlexO-4(e)	400G	PCS-98	97.9GBd	112.5GHz	0xD8	FlexO-4e-MPCS098-OS <sup>2)</sup>	400G PCS-98Gbd
400GAUI-8 200GAUI-4 100GAUI-2 400GAUI-4-x 200GAUI-2-x 100GAUI-1-x	FlexO-4(e)	400G	PCS-108	108.5GBd	125GHz	0xE5	FlexO-4e-MPCS108-OS <sup>2)</sup>	400G PCS-108Gbd
FOIC1.1-RS FOIC1.2-MFI	FlexO-4	400G	PCS-132	131.7GBd	150GHz	0xED	FlexO-4-MPCS132-OS <sup>2)</sup>	400G PCS-132Gbd (OTN)
FOIC1.1-RS FOIC1.2-MFI	FlexO-4	400G	PCS-79	78.9GBd	87.5GHz	0xC4	FlexO-4-MPCS079-OS <sup>2)</sup>	400G PCS-79Gbd (OTN)
FOIC1.1-RS FOIC1.2-MFI	FlexO-4	400G	PCS-69	69.1GBd	75GHz	0xC1	FlexO-4-MPCS069-OS <sup>2)</sup>	400G PCS-69Gbd (OTN)
FOIC1.1-RS FOIC1.2-MFI	FlexO-4	400G	PCS-87	87.3GBd	100GHz	0xCA	FlexO-4-MPCS087-OS <sup>2)</sup>	400G PCS-87Gbd (OTN)
FOIC1.1-RS FOIC1.2-MFI	FlexO-4	400G	PCS-98	98.6GBd	112.5GHz	0xD9	FlexO-4-MPCS098-OS <sup>2)</sup>	400G PCS-98Gbd (OTN)
FOIC1.1-RS FOIC1.2-MFI	FlexO-4	400G	PCS-111	111.3GBd	125GHz	0xE9	FlexO-4-MPCS111-OS <sup>2)</sup>	400G PCS-111Gbd (OTN)

1) The media code is defined through the reference code tables listed in SFF-8024.

2) Non-MSA compliant code.

3) "-x" is defined S or L

TD8010-TUNC-SO will automatically configure the above via the Host and NTKW modes. For 800G applications, the TD8010-TUNC-SO asynchronously (GMP) maps an Ethernet or OTN signal from a switch/router to an intermediate FlexO frame structure, then adapts the frame structure to the selected FEC engine. The encoded signal is subsequently DSP framed and modulated for transmission as a coherent Dual Polarity signal.

## TECHNICAL DATA

The optical characteristics are into Generic and Application code sections. The *Generic* section defines the common characteristics, independent of the selected application modes. The *NTWK/Media* code section defines application code based optical characteristics.

The performance is compliant with the respective specifications but can exceed the minimum requirements on some parameters.

## GENERIC

Parameter	Value
Technology	DWDM QSFP-DD800 type 2a
Transmission media	SM (2x LC)
Nominal wavelengths	191.25 - 196.1THz (tunable) 6.25GHz Grid
Interface standards	400-800G OpenROADM & OIF 800ZR
Operating temperature	+15°C to +75°C <sup>1)</sup>
Storage temperature	-40°C to +85°C
DDM functions	Total received power
	Coherent channel power
	OSNR, eSNR, PDL, dispersion, DGD
	Case temperature

Parameter	Value
MSA	OSFP800 MSA's, CMIS5.3
Misc	Sync-E support, LLDP, RMON
Power consumption, EOL	See Section below.
Tx Power	Min 1dBm <sup>2)</sup>
Tx In-band OSNR	37dB
Tx Out-Of-Band OSNR	36dB
Receiver Acquisition Time	Max 10s from warm start
Receiver turn-up, cold start	Max 200s from cold start
Absolute max conditions	Rx signal input power: +1dBm
	Rx total input power: +15dBm

<sup>1)</sup> The module will turn up from cold start at ambient temperature as low as -5C and will reach specifications after self-heating up to min temperature.

<sup>2)</sup> The module transmit power can be provisioned up to the maximum available TX power. If the TX power is not provisioned by the host, the module TX power will default to the maximum available power. The provisional Tx power range of the module is 10dB.

### Safety/regulatory compliance:

TUV/UL/FDA (contact Smartoptics for latest certification information)

RoHS compliance

## OPTICAL SPECIFICATION – NTKW/MEDIA CODES

The table below lists the primary optical parameters for each supported application code.

Media code	Line rate	Network frame	Modulation	Tx Power <sup>1)</sup>	Rx sens @ OSNR > 36dB	Rx @ OSNR <sup>2)</sup>	Rx OSNR @1dB penalty <sup>2)</sup>	Default CDC range [ps/nm]	Maximum CDC search range [ps/nm] <sup>3)</sup>
0x6C	800G	OIF 800ZR	DP-16QAM	1dBm	-18.5dBm	26.4dB@ -9dBm	27.4dB@ -13dBm	3 000	58 000
0x6A	600G	FlexO-6(e)	PCS-118	1dBm	-23.5dBm	22.8dB@ -9dBm	23.8dB@ -14dBm	29 000	58 000
0xF2	600G	FlexO-6(e)	PCS-118	1dBm	-23.5dBm	21.6dB@ -9dBm	22.6dB@ -14dBm	29 000	58 000
0x64	400G	FlexO-4(e)	PCS-118	1dBm	-27.0dBm	17.9dB@ -12dBm	18.9dB@ -18dBm	58 000	58 000
0x36	400G	400ZR+	DP-16QAM	1dBm	-22.5dBm	23.1dB@ -12dBm	24.1dB@ -18dBm	23 000	175 000
0x68	800G	FlexO-8(e)	PCS-131	1dBm	-20.5dBm	25.0dB@ -9dBm	26.0dB@ -13dBm	24 000	47 000
0xF7	800G	FlexO-8(e)	PCS-131	1dBm	-20.5dBm	24.7dB@ -9dBm	25.7dB@ -13dBm	24 000	47 000
0xF8	800G	FlexO-8	PCS-131	1dBm	-20.0dBm	26.4dB@ -14dBm	27.4dB@ -18dBm	24 000	47 000
0xF5	600G	FlexO-6(e)	PCS-131	1dBm	-24.0dBm	21.3dB@ -9dBm	22.3dB@ -14dBm	24 000	47 000
0xF6	600G	FlexO-6	PCS-131	1dBm	-23.5dBm	22.0dB@ -14dBm	23.0dB@ -19dBm	24 000	47 000
0xEC	400G	FlexO-4(e)	PCS-131	1dBm	-27.0dBm	18.0dB@ -12dBm	19.0dB@ -18dBm	24 000	47 000
0xC0	400G	FlexO-4(e)	PCS-66	1dBm	-24.5dBm	21.2dB@ -12dBm	22.2dB@ -18dBm	75 000	150 000
0xC2	400G	FlexO-4(e)	PCS-75	1dBm	-24.0dBm	20.6dB@ -12dBm	21.6dB@ -18dBm	66 000	125 000
0xC9	400G	FlexO-4(e)	PCS-87	1dBm	-26.0dBm	19.5dB@ -12dBm	20.5dB@ -18dBm	47 000	94 000
0xD8	400G	FlexO-4	PCS-98	1dBm	-26.5dBm	19.2dB@ -12dBm	20.2dB@ -18dBm	42 000	84 000
0xE5	400G	FlexO-4(e)	PCS-108	1dBm	-26.5dBm	18.7dB@ -12dBm	19.7dB@ -18dBm	29 000	57 000
0xED	400G	FlexO-4	PCS-132	1dBm	-26.5dBm	18.5dB@ -14dBm	19.5dB@ -20dBm	24 000	47 000
0xC4	400G	FlexO-4	PCS-79	1dBm	-25.0dBm	20.5dB@ -14dBm	21.5dB@ -20dBm	63 000	125 000
0xC1	400G	FlexO-4	PCS-69	1dBm	-24.0dBm	21.5dB@ -14dBm	22.5dB@ -20dBm	72 000	125 000
0xCA	400G	FlexO-4	PCS-87	1dBm	-25.5dBm	20.1dB@ -14dBm	21.1dB@ -20dBm	47 000	94 000
0xD9	400G	FlexO-4	PCS-98	1dBm	-26.0dBm	19.7dB@ -14dBm	20.7dB@ -20dBm	42 000	84 000
0xE9	400G	FlexO-4	PCS-111	1dBm	-26.5dBm	19.1dB@ -14dBm	20.1dB@ -20dBm	28 000	56 000

- 1) Minimum Tx power without attenuation. The module Tx power can be attenuated with 10dB from the maximum available Tx power. If the Tx power is not provisioned by the host, the module Tx power will default to the maximum available power.
- 2) Specified as [Min OSNR Value @ Min Rx power for the OSNR value].
- 3) maximum provisionable CD search range. Increasing the search range will increase the power consumption of the transceiver.

## ELECTICAL CHARACTERISTICS

The table below lists the worst-case power consumption for each media code, under the default CD range and worst-case client mapping mode, operating at the FEC threshold.

Media code	Line rate	Network frame	Modulation	Worst case power consumption
0x6C	800G	OIF 800ZR	DP-16QAM	28.0W
0x6A	600G	FlexO-6(e)	PCS-118	28.0W
0xF2	600G	FlexO-6(e)	PCS-118	28.0W
0x64	400G	FlexO-4(e)	PCS-118	25.0W
0x36	400G	400ZR+	DP-16QAM	23.5W
0x68	800G	FlexO-8(e)	PCS-131	30.0W
0xF7	800G	FlexO-8(e)	PCS-131	30.0W
0xF8	800G	FlexO-8	PCS-131	30.0W
0xF5	600G	FlexO-6(e)	PCS-131	29.5W
0xF6	600G	FlexO-6	PCS-131	29.5W
0xEC	400G	FlexO-4(e)	PCS-131	28.5W
0xC0	400G	FlexO-4(e)	PCS-66	26.0W
0xC2	400G	FlexO-4(e)	PCS-75	26.5W
0xC9	400G	FlexO-4(e)	PCS-87	27.5W
0xD8	400G	FlexO-4	PCS-98	28.0W
0xE5	400G	FlexO-4(e)	PCS-108	28.5W
0xED	400G	FlexO-4	PCS-132	29.5W
0xC4	400G	FlexO-4	PCS-79	26.5W
0xC1	400G	FlexO-4	PCS-69	26.5W
0xCA	400G	FlexO-4	PCS-87	27.5W
0xD9	400G	FlexO-4	PCS-98	28.0W
0xE9	400G	FlexO-4	PCS-111	28.5W

## APPLICATION SELECT TABLE - NORMALIZED APPLICATION DESCRIPTORS

NAD	App code	Host code	Host MSA code	Media code	Media MSA description
NAD_1:Bank_0	1	0x51	800GAUI-8 S C2M (Annex 120G)	0x6C	800ZR Power class A
NAD_2:Bank_0	2	0x52	800GAUI-8 L C2M (Annex 120G)	0x6C	800ZR Power class A
NAD_3: Bank_0	3	0x4F	400GAUI-4-SC2M (Annex 120G)	0x6C	800ZR Power class A
NAD_4:Bank_0	4	0x50	400GAUI-4-LC2M (Annex 120G)	0x6C	800ZR Power class A
NAD_5:Bank_0	5	0x4D	200GAUI-2-SC2M (Annex 120G)	0x6C	800ZR Power class A
NAD_6:Bank_0	6	0x4E	200GAUI-2-LC2M (Annex 120G)	0x6C	800ZR Power class A
NAD_7:Bank_0	7	0x4B	100GAUI-1-SC2M (Annex 120G)	0x6C	800ZR Power class A
NAD_8:Bank_0	8	0x4C	100GAUI-1-LC2M (Annex 120G)	0x6C	800ZR Power class A
NAD_9:Bank_0	9	0x4F	400GAUI-4-SC2M (Annex 120G)	0x6A	OpenROADM FlexO-6e-DPO
NAD_10:Bank_0	10	0x50	400GAUI-4-LC2M (Annex 120G)	0x6A	OpenROADM FlexO-6e-DPO
NAD_11:Bank_0	11	0x4D	200GAUI-2-SC2M (Annex 120G)	0x6A	OpenROADM FlexO-6e-DPO
NAD_12:Bank_0	12	0x4E	200GAUI-2-LC2M (Annex 120G)	0x6A	OpenROADM FlexO-6e-DPO
NAD_13:Bank_0	13	0x4B	100GAUI-1-SC2M (Annex 120G)	0x6A	OpenROADM FlexO-6e-DPO
NAD_14:Bank_0	14	0x4C	100GAUI-1-LC2M (Annex 120G)	0x6A	OpenROADM FlexO-6e-DPO
NAD_15:Bank_0	15	0x4F	400GAUI-4-SC2M (Annex 120G)	0xF2	OpenROADM FlexO-6e-DPO, Enhanced
NAD_1:Bank_1	16	0x50	400GAUI-4-LC2M (Annex 120G)	0xF2	OpenROADM FlexO-6e-DPO, Enhanced
NAD_2:Bank_1	17	0x4D	200GAUI-2-SC2M (Annex 120G)	0xF2	OpenROADM FlexO-6e-DPO, Enhanced
NAD_3: Bank_1	18	0x4E	200GAUI-2-LC2M (Annex 120G)	0xF2	OpenROADM FlexO-6e-DPO, Enhanced
NAD_4:Bank_1	19	0x4B	100GAUI-1-SC2M (Annex 120G)	0xF2	OpenROADM FlexO-6e-DPO, Enhanced
NAD_5:Bank_1	20	0x4C	100GAUI-1-LC2M (Annex 120G)	0xF2	OpenROADM FlexO-6e-DPO, Enhanced
NAD_6:Bank_1	21	0x4F	400GAUI-4-SC2M (Annex 120G)	0x64	OpenROADM FlexO-4e-DO
NAD_7:Bank_1	22	0x50	400GAUI-4-LC2M (Annex 120G)	0x64	OpenROADM FlexO-4e-DO
NAD_8:Bank_1	23	0x4D	200GAUI-2-SC2M (Annex 120G)	0x64	OpenROADM FlexO-4e-DO
NAD_9:Bank_1	24	0x4E	200GAUI-2-LC2M (Annex 120G)	0x64	OpenROADM FlexO-4e-DO
NAD_10:Bank_1	25	0x4B	100GAUI-1-SC2M (Annex 120G)	0x64	OpenROADM FlexO-4e-DO
NAD_11:Bank_1	26	0x4C	100GAUI-1-LC2M (Annex 120G)	0x64	OpenROADM FlexO-4e-DO
NAD_12:Bank_1	27	0x11	400GAUI-8 C2M (Annex 120E)	0x64	OpenROADM FlexO-4e-DO
NAD_13:Bank_1	28	0xF	200GAUI-4 C2M (Annex 120E)	0x64	OpenROADM FlexO-4e-DO
NAD_14:Bank_1	29	0xD	100GAUI-2 C2M (Annex 135G)	0x64	OpenROADM FlexO-4e-DO
NAD_15:Bank_1	30	0x4E	200GAUI-2-LC2M (Annex 120G)	0x36	OpenZR+ ZR400-OFEC-16QAMHB
NAD_1:Bank_2	31	0x4D	200GAUI-2-SC2M (Annex 120G)	0x36	OpenZR+ ZR400-OFEC-16QAMHB
NAD_2:Bank_2	32	0x4C	100GAUI-1-LC2M (Annex 120G)	0x36	OpenZR+ ZR400-OFEC-16QAMHB
NAD_3:Bank_2	33	0x4B	100GAUI-1-SC2M (Annex 120G)	0x36	OpenZR+ ZR400-OFEC-16QAMHB
NAD_4:Bank_2	34	0xF	200GAUI-4 C2M (Annex 120E)	0x36	OpenZR+ ZR400-OFEC-16QAMHB
NAD_5:Bank_2	35	0x11	400GAUI-8 C2M (Annex 120E)	0x36	OpenZR+ ZR400-OFEC-16QAMHB
NAD_6:Bank_2	36	0xD	100GAUI-2 C2M (Annex 135G)	0x36	OpenZR+ ZR400-OFEC-16QAMHB
NAD_7:Bank_2	37	0x4F	400GAUI-4-SC2M (Annex 120G)	0x36	OpenZR+ ZR400-OFEC-16QAMHB
NAD_8:Bank_2	38	0x50	400GAUI-4-LC2M (Annex 120G)	0x36	OpenZR+ ZR400-OFEC-16QAMHB
NAD_9:Bank_2	39	0x51	800GAUI-8 S C2M (Annex 120G)	0x68	OpenROADM FlexO-8e-DPO
NAD_10:Bank_2	40	0x52	800GAUI-8 L C2M (Annex 120G)	0x68	OpenROADM FlexO-8e-DPO
NAD_11:Bank_2	41	0x4F	400GAUI-4-SC2M (Annex 120G)	0x68	OpenROADM FlexO-8e-DPO
NAD_12:Bank_2	42	0x50	400GAUI-4-LC2M (Annex 120G)	0x68	OpenROADM FlexO-8e-DPO

NAD_13:Bank_2	43	0x4D	200GAUI-2-SC2M (Annex 120G)	0x68	OpenROADM FlexO-8e-DPO
NAD_14:Bank_2	44	0x4E	200GAUI-2-LC2M (Annex 120G)	0x68	OpenROADM FlexO-8e-DPO
NAD_15:Bank_2	45	0x4B	100GAUI-1-SC2M (Annex 120G)	0x68	OpenROADM FlexO-8e-DPO
NAD_1:Bank_3	46	0x4C	100GAUI-1-LC2M (Annex 120G)	0x68	OpenROADM FlexO-8e-DPO
NAD_2:Bank_3	47	0x51	800GAUI-8 S C2M (Annex 120G)	0xF7	OpenROADM FlexO-8e-DPO, Enhanced
NAD_3:Bank_3	48	0x52	800GAUI-8 L C2M (Annex 120G)	0xF7	OpenROADM FlexO-8e-DPO, Enhanced
NAD_4:Bank_3	49	0x4F	400GAUI-4-SC2M (Annex 120G)	0xF7	OpenROADM FlexO-8e-DPO, Enhanced
NAD_5:Bank_3	50	0x50	400GAUI-4-LC2M (Annex 120G)	0xF7	OpenROADM FlexO-8e-DPO, Enhanced
NAD_6:Bank_3	51	0x4D	200GAUI-2-SC2M (Annex 120G)	0xF7	OpenROADM FlexO-8e-DPO, Enhanced
NAD_7:Bank_3	52	0x4E	200GAUI-2-LC2M (Annex 120G)	0xF7	OpenROADM FlexO-8e-DPO, Enhanced
NAD_8:Bank_3	53	0x4B	100GAUI-1-SC2M (Annex 120G)	0xF7	OpenROADM FlexO-8e-DPO, Enhanced
NAD_9:Bank_3	54	0x4C	100GAUI-1-LC2M (Annex 120G)	0xF7	OpenROADM FlexO-8e-DPO, Enhanced
NAD_10:Bank_3	55	0x4F	400GAUI-4-SC2M (Annex 120G)	0xF5	600G-PCS-131Gbd
NAD_11:Bank_3	56	0x50	400GAUI-4-LC2M (Annex 120G)	0xF5	600G-PCS-131Gbd
NAD_12:Bank_3	57	0x4D	200GAUI-2-SC2M (Annex 120G)	0xF5	600G-PCS-131Gbd
NAD_13:Bank_3	58	0x4E	200GAUI-2-LC2M (Annex 120G)	0xF5	600G-PCS-131Gbd
NAD_14:Bank_3	59	0x4B	100GAUI-1-SC2M (Annex 120G)	0xF5	600G-PCS-131Gbd
NAD_15:Bank_3	60	0x4C	100GAUI-1-LC2M (Annex 120G)	0xF5	600G-PCS-131Gbd
NAD_1:Bank_4	61	0x4F	400GAUI-4-SC2M (Annex 120G)	0xEC	400G PCS-131Gbd
NAD_2:Bank_4	62	0x50	400GAUI-4-LC2M (Annex 120G)	0xEC	400G PCS-131Gbd
NAD_3:Bank_4	63	0x4D	200GAUI-2-SC2M (Annex 120G)	0xEC	400G PCS-131Gbd
NAD_4:Bank_4	64	0x4E	200GAUI-2-LC2M (Annex 120G)	0xEC	400G PCS-131Gbd
NAD_5:Bank_4	65	0x4B	100GAUI-1-SC2M (Annex 120G)	0xEC	400G PCS-131Gbd
NAD_6:Bank_4	66	0x4C	100GAUI-1-LC2M (Annex 120G)	0xEC	400G PCS-131Gbd
NAD_7:Bank_4	67	0x11	400GAUI-8 C2M (Annex 120E)	0xEC	400G PCS-131Gbd
NAD_8:Bank_4	68	0x50	400GAUI-4-LC2M (Annex 120G)	0xC0	400G PCS-66Gbd
NAD_9:Bank_4	69	0x50	400GAUI-4-LC2M (Annex 120G)	0xC2	400G PCS-75Gbd
NAD_10:Bank_4	70	0x50	400GAUI-4-LC2M (Annex 120G)	0xC9	400G PCS-87Gbd
NAD_11:Bank_4	71	0x50	400GAUI-4-LC2M (Annex 120G)	0xD8	400G PCS-98Gbd
NAD_12:Bank_4	72	0x50	400GAUI-4-LC2M (Annex 120G)	0xE5	400G PCS-108Gbd
NAD_13:Bank_4	73	0x4F	400GAUI-4-SC2M (Annex 120G)	0xC0	400G PCS-66Gbd
NAD_14:Bank_4	74	0x4F	400GAUI-4-SC2M (Annex 120G)	0xC2	400G PCS-75Gbd
NAD_15:Bank_4	75	0x4F	400GAUI-4-SC2M (Annex 120G)	0xC9	400G PCS-87Gbd
NAD_1:Bank_5	76	0x4F	400GAUI-4-SC2M (Annex 120G)	0xD8	400G PCS-98Gbd
NAD_2:Bank_5	77	0x4F	400GAUI-4-SC2M (Annex 120G)	0xE5	400G PCS-108Gbd
NAD_3:Bank_5	78	0x4E	200GAUI-2-LC2M (Annex 120G)	0xC0	400G PCS-66Gbd
NAD_4:Bank_5	79	0x4E	200GAUI-2-LC2M (Annex 120G)	0xC2	400G PCS-75Gbd
NAD_5:Bank_5	80	0x4E	200GAUI-2-LC2M (Annex 120G)	0xC9	400G PCS-87Gbd
NAD_6:Bank_5	81	0x4E	200GAUI-2-LC2M (Annex 120G)	0xD8	400G PCS-98Gbd
NAD_7:Bank_5	82	0x4E	200GAUI-2-LC2M (Annex 120G)	0xE5	400G PCS-108Gbd
NAD_8:Bank_5	83	0x4D	200GAUI-2-SC2M (Annex 120G)	0xC0	400G PCS-66Gbd
NAD_9:Bank_5	84	0x4D	200GAUI-2-SC2M (Annex 120G)	0xC2	400G PCS-75Gbd
NAD_10:Bank_5	85	0x4D	200GAUI-2-SC2M (Annex 120G)	0xC9	400G PCS-87Gbd
NAD_11:Bank_5	86	0x4D	200GAUI-2-SC2M (Annex 120G)	0xD8	400G PCS-98Gbd
NAD_12:Bank_5	87	0x4D	200GAUI-2-SC2M (Annex 120G)	0xE5	400G PCS-108Gbd
NAD_13:Bank_5	88	0x4C	100GAUI-1-LC2M (Annex 120G)	0xC0	400G PCS-66Gbd

NAD_14:Bank_5	89	0x4C	100GAUI-1-LC2M (Annex 120G)	0xC2	400G PCS-75Gbd
NAD_15:Bank_5	90	0x4C	100GAUI-1-LC2M (Annex 120G)	0xC9	400G PCS-87Gbd
NAD_1:Bank_6	91	0x4C	100GAUI-1-LC2M (Annex 120G)	0xD8	400G PCS-98Gbd
NAD_2:Bank_6	92	0x4C	100GAUI-1-LC2M (Annex 120G)	0xE5	400G PCS-108Gbd
NAD_3:Bank_6	93	0x4B	100GAUI-1-SC2M (Annex 120G)	0xC0	400G PCS-66Gbd
NAD_4:Bank_6	94	0x4B	100GAUI-1-SC2M (Annex 120G)	0xC2	400G PCS-75Gbd
NAD_5:Bank_6	95	0x4B	100GAUI-1-SC2M (Annex 120G)	0xC9	400G PCS-87Gbd
NAD_6:Bank_6	96	0x4B	100GAUI-1-SC2M (Annex 120G)	0xD8	400G PCS-98Gbd
NAD_7:Bank_6	97	0x4B	100GAUI-1-SC2M (Annex 120G)	0xE5	400G PCS-108Gbd
NAD_8:Bank_6	98	0x11	400GAUI-8 C2M (Annex 120E)	0xC0	400G PCS-66Gbd
NAD_9:Bank_6	99	0x11	400GAUI-8 C2M (Annex 120E)	0xC2	400G PCS-75Gbd
NAD_10:Bank_6	100	0x11	400GAUI-8 C2M (Annex 120E)	0xC9	400G PCS-87Gbd
NAD_11:Bank_6	101	0x11	400GAUI-8 C2M (Annex 120E)	0xD8	400G PCS-98Gbd
NAD_12:Bank_6	102	0xF	200GAUI-4 C2M (Annex 120E)	0xEC	400G PCS-108Gbd
NAD_13:Bank_6	103	0xF	200GAUI-4 C2M (Annex 120E)	0xC0	400G PCS-66Gbd
NAD_14:Bank_6	104	0xF	200GAUI-4 C2M (Annex 120E)	0xC2	400G PCS-75Gbd
NAD_15:Bank_6	105	0xF	200GAUI-4 C2M (Annex 120E)	0xC9	400G PCS-87Gbd
NAD_1:Bank_7	106	0xF	200GAUI-4 C2M (Annex 120E)	0xD8	400G PCS-98Gbd
NAD_2:Bank_7	107	0xD	100GAUI-2 C2M (Annex 135G)	0xEC	400G PCS-108Gbd
NAD_3:Bank_7	108	0xD	100GAUI-2 C2M (Annex 135G)	0xC0	400G PCS-66Gbd
NAD_4:Bank_7	109	0xD	100GAUI-2 C2M (Annex 135G)	0xC2	400G PCS-75Gbd
NAD_5:Bank_7	110	0xD	100GAUI-2 C2M (Annex 135G)	0xC9	400G PCS-87Gbd
NAD_6:Bank_7	111	0xD	100GAUI-2 C2M (Annex 135G)	0xD8	400G PCS-98Gbd
NAD_7:Bank_7	112	0x11	400GAUI-8 C2M (Annex 120E)	0xE5	400G PCS-108Gbd
NAD_8:Bank_7	113	0xF	200GAUI-4 C2M (Annex 120E)	0xE5	400G PCS-108Gbd
NAD_9:Bank_7	114	0xD	100GAUI-2 C2M (Annex 135G)	0xE5	400G PCS-108Gbd
NAD_10:Bank_7	115	0xC5	FOIC1.1-MFI (ITU-T G.709.5/Y.1331 G.Sup58) See CEI112G-VSR-PAM4	0xF8	OpenROADM FlexO-8e-DPO, Enhanced (OTN)
NAD_11:Bank_7	116	0xC5	FOIC1.1-MFI (ITU-T G.709.5/Y.1331 G.Sup58) See CEI112G-VSR-PAM4	0xF6	600G PCS-131 GBd (OTN)
NAD_12:Bank_7	117	0x3C	FOIC1.2-MFI (ITU-T G.709.5/Y.1331 G.Sup58) See CEI56G-VSR-PAM4	0xED	400G PCS-132Gbd (OTN)
NAD_13:Bank_7	118	0xC5	FOIC1.1-MFI (ITU-T G.709.5/Y.1331 G.Sup58) See CEI112G-VSR-PAM4	0xED	400G PCS-132Gbd (OTN)
NAD_14:Bank_7	119	0x3C	FOIC1.2-MFI (ITU-T G.709.5/Y.1331 G.Sup58) See CEI56G-VSR-PAM4	0xC4	400G PCS-79Gbd (OTN)
NAD_15:Bank_7	120	0xC5	FOIC1.1-MFI (ITU-T G.709.5/Y.1331 G.Sup58) See CEI112G-VSR-PAM4	0xC4	400G PCS-79Gbd (OTN)

## ORDERING INFORMATION

Ordering code	Item Name
TD8010-TUNC-SO	QSFP-DD800 800G OIF/OpenROADM PCS CMIS5.3

## GENERAL DEFINITIONS

Parameter	Description
Technology	Grey; Transceiver type for non-WDM applications. Electrical or optical. CWDM; Transceiver type for CWDM applications using G.694.2 channel grid. DWDM; Transceiver type for DWDM applications using G.694.1 channel grid. BiDi; Transceiver pair using two different wavelength channels operating on a single-fiber.
Transmission Media	Type of fiber, e.g. Multimode (MM) or Singlemode (SM). Number of and connector type within brackets (e.g. 2x LC, 1x MPO).
Typical reach	Nominal distance performance based on typical fiber dispersion, fiber loss and power budget properties, i.e. w/o dispersion compensation and optical amplification. Actual distance is dependent on actual optical path loss and dispersion properties.
Bit rate range	Supported bit rate range in Gigabit or Megabit per second (Gbps or Mbps).
Protocols	Protocols within supported bit rate range.
Nominal wavelength	Typical wavelength(s) from transmitter.
Interface standards	Referenced interface standards or MSA's, e.g. IEEE 802.3 standard for 10GbE services or 100G 4WDM-10 etc.
Power budget	Min and max power budget between Transmitter and Receiver w/o optical path penalties.
Dispersion tolerance/penalty	Maximum amount of tolerated dispersion and required reduction of power budget to maintain stipulated Bit Error Rate (BER) and at a given bit rate.
Temperature range	Max operating case temperature range. Standard temperature range (C-temp): 0°C to +70°C (32°F to +158°F) Extended temperature range (E-temp): typically -20°C to +75°C (-4°F to +167°F) Industrial temperature range (I-temp): -40°C to +85°C (-40°F to +185°F)
Power consumption	Worst case power consumption. Will vary over temperature.
Transmitter Output power	Average output power. Provided in min and max values.
Receiver minimum input power	Minimum average input power at specified BER, normally $1E^{-12}$ . Note that some protocols require FEC to achieve sufficient BER.
Receiver max input power	Maximum average input power giving a BER, normally $1E^{-12}$ .
DDM	Digital Diagnostic Monitoring functionality as defined in e.g. SFF-8472 MSA.

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