Updated Review of industry standard channel maps

Presenter: John DeAndrea

Affiliation: Finisar

Supporters

- Mike Sluyski, Acacia
- Matthew Schmitt, Cablelabs
- Ilya Lyubomirsky, Inphi
- David Lewis, Lumentum
- Winston Way, Neophotonics

Contents

- Update on relevant standards
- Updated table of start and stop industry frequencies
- Update on recommendation

Relevant Standards:

- ITU-T, G.698.1, (02/2009)
- ITU-T, G.698.2, , (11/2018)
- IA # OIF-400ZR-0.10 Draft
- Cablelabs, P2PCO-SP-PHYv1.0-I01-180629
- Open ROADM, Open-ROADM-MSA-specification-ver-3-00.xlsx

ITU-T G698.1, (11/2009)

- Table 8-4 “Physical layer parameters and values for class NRZ 10G, 100 GHz spaced long haul applications”

Interface at point S_S			
Maximum mean channel output power	dBm	+6	+6
Minimum mean channel output power	dBm	+3	+3
Minimum central frequency	THz	191.5 for (C) 186.0 for (L)	191.5 for (C) 186.0 for (L)
Maximum central frequency	THz	196.2 for (C) 191.5 for (L)	196.2 for (C) 191.5 for (L)

ITU-T, G.698.2, (11/2018) requirements

- Table 8-8 DP-DQPSK 100G [~80 km] applications

Table 8-8 – Physical layer parameters and values for class DP-DQPSK 100G, wide spectral excursion applications

Parameter	Units	DW50U-8A2(C)F DW50U-8A3(L)F DW50U-8A5(C)F	DW100U-8A2(C)F DW100U-8A3(L)F DW100U-8A5(C)F
Minimum central frequency	THz	191.5 for (C) 186.0 for (L)	
Maximum central frequency	THz	196.2 for (C) 191.5 for (L)	

IA # OIF-400ZR-0.10 Draft

- Table 13.1.1 Optical channel specifications

Ref.	Parameter	Default	Min	Max	Unit	Conditions/Comments
13.1.100	Channel frequency	193.7	191.3	196.1	THz	ITU-T grid

- 16 Annex A, Normative 48 x 100 GHz DWDM Application Channels,
  - 191.4 through 196.1 THz

1	191.3	25	193.7
2	191.4	26	193.8
3	191.5	27	193.9
4	191.6	28	194.0
5	191.7	29	194.1
6	191.8	30	194.2
7	191.9	31	194.3
8	192.0	32	194.4
9	192.1	33	194.5
10	192.2	34	194.6
11	192.3	35	194.7
12	192.4	36	194.8
13	192.5	37	194.9
14	192.6	38	195.0
15	192.7	39	195.1
16	192.8	40	195.2
17	192.9	41	195.3
18	193.0	42	195.4
19	193.1	43	195.5
20	193.2	44	195.6
21	193.3	45	195.7
22	193.4	46	195.8
23	193.5	47	195.9
24	193.6	48	196.0
		49	196.1

Cablelabs , P2PCO-SP-PHYv1.0-I01-180629

- Table 2, channel 13 (191.3 THz) to channel 62 (196.2 THz)

7.2.6 DWDM Frequency Grid

In order to enable interoperability between transceivers operating in Dense Wavelength Division Multiplexing (DWDM) environments, and to interoperate with existing cable operator DWDM systems and equipment, the specification has adopted a subset of the channels identified in [ITU G.694.1] using a 100 GHz spacing. Specifically, Table 2 lists the specific DWDM wavelengths, frequencies, and associated channel numbers on which compliant transceivers can operate.

In order to enable low cost implementations, transceivers are only required to support one channel from the Table 2. However, in order to support greater flexibility, devices are also permitted to support multiple channels from that list, and may comprise the entire list or just portions of it.

Summary of channel ranges:

	OIF 400ZR	ITU-T G.698.1	ITU-T G.698.2	Cablelabs	Open ROADM
Spacing (GHz)	100	100	100	100	50
min ch (THz)	191.3 (191.4)	191.5	191.5	191.3	191.35
max ch (THz)	196.1	196.2	196.2	196.2	196.1
channel count	49 (48)	48	48	50	96

Update recommendation for 100 and 400G options:

Considering the OIF range as a compromise:

- Recommend IEEE adopt start channel at 191.3 THz
- Recommend IEEE adopt end channel at 196.1 THz