Improved optical power specs for 50GBASE-FR and 100GBASE-DR

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Introduction

- dawe_3cd_05_0717 showed that there is margin to spare in the spec for 50GBASE-DR
- To a lesser extent for 100GBASE-DR also
- This wastes transmitter power and supply voltage, transistor breakdown, receiver supply voltage, overload and dynamic range
- These points are the same as dawe_3bs_05_0717, 200GBASE-DR4, 400GBASE-DR4
- The following slides document the changes for removing:
  - 1 dB of margin from 50GBASE-DR
  - 0.5 dB of margin from 100GBASE-DR
- Relates to comments 40, 42, and D2.0 comments 152 and 128

Table 139–4—SIGNAL_DETECT value definition

Receive conditions	**SIGNAL_DETECT value**
Average optical power at TP3 <= **–16** dBm	FAIL
...	

This follows the OFF power for 50GBASE-LR, so not changed

The next two tables are based on the sensitivity for 200GBASE-DR4 proposed to P802.3bs (1 dB better than D3.3, 0.2 dB better than 50GBASE-FR D2.1)

Table 139–6—50GBASE-FR transmit characteristics

Description	50GBASE-FR	50GBASE-LR	Unit
...			
Total A average launch power (max)	3 2.8	4.2	dBm
Average launch power[a] (min)	–3.6 –3.8	–4	dBm
Outer Optical Modulation Amplitude (OMAouter) (max)	2.8 2.6	4	dBm
Outer Optical Modulation Amplitude (OMAouter) (min)[b]	–2 –2.2	–1	dBm
Launch power in OMAouter minus TDECQ (min)	–3.9 –4.1	–2.9	dBm
...			
Average launch power of OFF transmitter (max)	–16		dBm
...			
b Even if the TDECQ < 1.9 dB, the OMAouter (min) must exceed this value.			

Table 139–7—50GBASE-FR receive characteristics

Description	50GBASE-FR	50GBASE-LR	Unit
...			
Damage threshold[a]	5.2 4.2	5.2	dBm
Average receive power (max)	3 2.8	4.2	dBm
Average receive power[b] (min)	–7.6 –7.8	–10.3	dBm
Receive power (OMAouter) (max)	2.8 2.6	4	dBm
...			
Receiver sensitivity (OMAouter)[c] (max)	–7.4 –7.6	–8.9	dBm
Stressed receiver sensitivity (OMAouter)[d] (max)	–5.1 –5.3	–6.4	dBm
...			

a The receiver shall be able to tolerate, without damage, continuous exposure to an optical input signal having this average power level. The receiver does not have to operate correctly at this input power. *Extra sentence for consistency with Clause 124*

Table 140–4—SIGNAL_DETECT value definition

Receive conditions	**SIGNAL_DETECT value**
Average optical power at TP3 <= –15 –15.5 dBm	FAIL
...	

Table 140–6—100GBASE-DR transmit characteristics

Description	Value	Unit
...		
Average launch power (max)	4 3.5	dBm
Average launch power[a] (min)	–2.4 –2.9	dBm
Outer Optical Modulation Amplitude (OMAouter) (max)	4.2 3.7	dBm
Outer Optical Modulation Amplitude (OMAouter) (min)[b]	–0.3 –0.8	dBm
Launch power in OMAouter minus TDECQ (min): for extinction ratio ≥ 5 dB for extinction ratio < 5 dB	 –2.2 –2.7 –1.9 –2.4	 dBm dBm
...		
Average launch power of OFF transmitter (max)	–15 –15.5	dBm
...		
b Even if the TDECQ < 1.9 dB, the OMAouter (min) must exceed this value.		

Table 140–7—100GBASE-DR receive characteristics

Description	Value	Unit
...		
Damage threshold[a], each lane	5 4.5	dBm
Average receive power, each lane (max)	4 3	dBm
Average receive power, each laneb (min)	–5.4 –5.9	dBm
Receive power (OMAouter), each lane (max)	4.2 3.7	dBm
...		
Receiver sensitivity (OMAouter), each lane[c] (max)	–4.4 –4.9	dBm
Stressed receiver sensitivity (OMAouter), each lane[d] (max)	–1.9 –2.4	dBm
...		

a The receiver shall be able to tolerate, without damage, continuous exposure to an optical input signal having this average power level. The receiver does not have to operate correctly at this input power.

Thanks!