Clause 95 D1p1
TBDs TBCs etc

1st August 2013

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(includes changes made during review during the 1st August MMF ad hoc)

Table 95–6—100GBASE-SR4 transmit characteristics

Description	Value	Unit
Signaling rate, each lane (range)	25.78125 ± 100 ppm	GBd
Lane wavelength (range)	840 to 860	nm
RMS spectral width[a]	0.6	nm
Average launch power, each lane (max)	2.4	dBm
Average launch power, each lane (min)	–9.1 TBC	dBm
Optical Modulation Amplitude (OMA), each lane (max)	3	dBm
Optical Modulation Amplitude (OMA), each lane (min)	–7.1 TBC	dBm
Launch power in OMA minus TDP (min)	–8 TBC	dBm
Transmitter and dispersion penalty (TDP), each lane (max)	5 TBC	dB

Average launch power (min) = OMA (min) – 2 dBm *

OMA (min) = Launch power in OMA minus TDP (min) + 0.9 dB *

Launch power in OMA minus TDP (min) = –3 – TDP dBm *

TDP = 5 dB TBC

- **Finalizing TDP will finalize all Tx values in magenta.**

** These values formulae agreed in the MMF ad hoc (Dec 13th, 2012)*

Receiver Characteristics

Table 95–7—100GBASE-SR4 receive characteristics

Description	Value	Unit
Signaling rate, each lane (range)	25.78125 ± 100 ppm	GBd
Lane wavelengths (range)	840 to 860	nm
Damage threshold[a] (min)	3.4	dBm
Average receive power, each lane (max)	2.4	dBm
Average receive power, each lane[b] (min)	–11 TBC	dBm
Receive power, each lane (OMA) (max	3	dBm
Receiver reflectance (max)	–12	dB
Stressed receiver sensitivity (OMA), each lane[c] (max)	–5.6	dBm

Average receive power (min) = average launch power (min) – channel IL dBm

= –9.1 – 1.9 = –11.2 dBm

- **Finalizing TDP will finalize the value in magenta**

Receiver jitter tolerance

Table 95–7—100GBASE-SR4 receive characteristics

Description	Value	Unit
Receiver jitter tolerance in OMA, each lane (max)[e]	TBD	dBm
Conditions of receiver jitter tolerance test:		
Jitter frequency and peak-to-peak amplitude	(190, 5)	kHz, UI
Jitter frequency and peak-to-peak amplitude	(940, 1)	kHz, UI
OMA of each aggressor lane	3	dBm

- Proposal: same value as for SRS, -5.6 dBm

  Discussed, with no objections made, during MMF ad hoc 1st August 2013.

  A comment will be needed against D1p1 to change the TBD to -5.6

Link Budget

Table 95–8—100GBASE-SR4 illustrative link power budget

Parameter	OM3	OM4	Unit
Effective modal bandwidth at 850 nm[a]	2000	4700	MHz.km
Power budget (for max TDP)	8.2 TBC		dB
Operating distance	0.5 to 70	0.5 to 100	m
Channel insertion loss[b]	1.8	1.9	dB
Allocation for penalties[c] (for max TDP)	6.3 TBC		dB
Additional insertion loss allowed	0.1	0	dB

Power Budget

(Tx_OMA @ max TDP) – (Rx sensitivity (unstressed, Q=3.89)) = –3 – (–11.2) = 8.2 dB

Allocation for penalties

(Tx_OMA @ max TDP) – (Rx sensitivity (unstressed, Q=3.89)) - (channel IL) = –3 – (–11.2) - (1.9) = 6.3 dB

- **Finalizing TDP will finalize the values in magenta.**

SRS test definition and exceptions:

95.8.8 Stressed receiver sensitivity

Stressed receiver sensitivity shall be within the limits given in Table 95–7 if measured using the method defined by 52.9.9 with the conformance test signal at TP3 and with the following exceptions:

a) The reference test procedure for a single lane is defined in 52.9.9. See 95.8.1.1 for multilane considerations.

b) The sinusoidal amplitude interferer is replaced by a Gaussian noise generator.

c) The fourth-order Bessel-Thomson filter is replaced by a low-pass filter and a limiter followed by a fourth-order Bessel-Thomson filter.

d) The sinusoidal jitter is at a fixed 100 MHz frequency and between 0 and 0.05 UI peak-to-peak amplitude.

e) The Gaussian noise generator, the amplitude of the sinusoidal jitter, and the Bessel-Thomson filter are adjusted so that the VECP, J2 Jitter and J4 Jitter specifications given in Table 95–7 are simultaneously met (the random noise effects such as RIN, random clock jitter do not need to be minimized).

Add text to introduce 'stressed receiver eye mask' test

f) The pattern for the received compliance signal is specified in Table 95–10.

g) The interface BER of the PMD receiver is the average of the BER of all receive lanes while stressed and at the specified receive OMA.

- Need text here which introduces the use of the stressed receiver eye mask, and reference a test method.
  - Editors were given editorial license to add the SRS test source eye mask coordinates and reference text. Proposed text for review on next slide.

Proposed text to introduce stressed receiver eye mask test

- Modify note ‘e’ to:
- The Gaussian noise generator, the amplitude of the sinusoidal jitter, and the Bessel-Thomson filter are adjusted so that the VECP, J2 Jitter and J4 Jitter specifications given in Table 95–7 are simultaneously met while also passing the stressed receiver eye mask in Table 95-7 according to the methods specified in 95.8.7 (the random noise effects such as RIN, random clock jitter do not need to be minimized).

The proposed text above was reviewed, edited and agreed in the MMF ad hoc, 1st August 2013 .

Receive jitter tolerance

- A comment to D1p1 will be needed to modify item ‘h’ so it refers to the BER defined in 95.1.1:

h The interface BER of the PMD receiver is the average of the BER of all receive lanes when stressed and complies with 95.1.1.

Or words to that effect….

Table 95-6

- A comment is needed to add a note to Table 95-6 which says the min OMA must be respected even if TDP is <0.9 dB