

40GBASE-LR4/ER4 inter-working and XLPPI for ER4

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40GBASE-LR4/ER4 inter-working

Comment #76 against D1.0 is:

CI 87 SC 87.7 P 70 L 20 # 76

Comment Type T

The editor's note:

[Editor's note (to be removed prior to publication) - conditions for inter-working between LR4 and ER4 to be added here.] should be replaced by appropriate text.

SuggestedRemedy

Add text to describe the requirements for interworking between 40GBASE-LR4 and 40GBASE-ER4.

See associated presentation from the SMF Ad Hoc

LR4 Tx to ER4 Rx

Assuming the proposals in comment #80 are accepted, then for this direction we have:

Item	LR4 Tx	ER4 Rx	Channel
Ave power max (dBm)	2.3	-4.5	Loss > 6.8 dB
OMA max (dBm)	3.5	-4	Loss > 7.5 dB
OMA min (dBm)	-4	-19	
TDP min (dB)	0.8		Loss < 14.2 dB
Positive dispersion max (ps/nm)			33.5
Negative dispersion min (ps/nm)			-59.5
DGD_max (ps)	10	12	10

ER4 Tx to LR4 Rx

In the opposite direction we have:

Item	ER4 Tx	LR4 Rx	Channel
Ave power max (dBm)	4.5	2.3	Loss > 2.2 dB
OMA max (dBm)	5	3.5	Loss > 1.5 dB
OMA min (dBm)	0.3	-11.5	
TDP min (dB)	0.8		Loss < 11 dB
Positive dispersion max (ps/nm)			134
Negative dispersion min (ps/nm)			-238
DGD_max (ps)	12	10	10

Inter-working requirements

From the previous two slides, the reach of a link with 40GBASE-LR4 at one end and 40GBASE-ER4 at the other will be limited to 10 km by the dispersion limits imposed by the LR4 transmitter TDP test. The max and min channel losses from the previous slides are:

Direction	Min loss (dB)	Max loss (dB)
LR4 Tx to ER4 Rx	7.5	14.2
ER4 Tx to LR4 Rx	2.2	11

The losses for the individual PMDs are (assuming acceptance of comment #80) are:

PMD	Min loss (dB)	Max loss (dB)
40GBASE-LR4	0	6.7
40GBASE-ER4	9	18.5

Interworking conclusion

There is some overlap between the allowable loss ranges for the two directions of interworking (7.5 to 11 dB).

This means that if an interworking specification is added, it will have to define the min and max losses for each direction of transmission. Subclause 87.7 isn't a good place for this as it comes before the Tx and Rx specification tables.

A better solution would be to add text in 87.7 to say that the channel requirements for interworking are in a new section 87.12. This would say that the requirements are as for 40GBASE-LR4 with the exception of the channel insertion losses max and min which would be in a new table.

XLPPPI for 40GBASE-ER4

Comment #166 against D1.0 is:

CI 87 SC 87.1 P 67 L 34 # 166

Comment Type T

XLPPPI should be optional for 40GBASE-ER4. It certainly isn't required and there is no reason that it would not be optional.

SuggestedRemedy

Replace the "TBD" with "Optional"

XLPP1 for 40GBASE-ER4 discussion

Replacing the "TBD" with "Optional", implies that the group considers that it would be reasonable for the transmitter to be able to meet the optical requirements of 40GBASE-ER4 at TP2 when being driven with a signal according to Table 86A-2 at TP1 and also for the receiver to be able to meet the requirements of Table 86A-3 at TP4 when driven with an optical signal according to 40GBASE-ER4 at TP3.

The alternative choice to "Optional" would be "Not applicable" which would be appropriate if the group considers that meeting the above requirements is not reasonable (even in the future).

Thanks!