

40GBase ER4 Spec Proposal

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Link power Budget

Item	Specification		Unit
	40GBASE-LR4	40GBASE-ER4	
Power budget for max TDP	9.3	21.6	dB
Operating Distance	10	40	dB
Channel Insertion loss (max)	6.7	19	dB
Channel Insertion loss (min)	0	7	dB
Additional Insertion loss	0	0	dB

Transmit Characteristics

Item	Specification		Unit
	40GBASE-LR4	40GBASE-ER4	
Signaling rate, each lane (range)	10.3125±100 ppm		GBd
Lane wavelengths (range)	1264.5 to 1277.5		nm
	1284.5 to 1297.5		
	1304.5 to 1317.5		
	1324.5 to 1337.5		
Side-mode suppression ratio (SMSR), (min)	30		dB
Total average launch power (max)	8.3	10.5	dBm
Average launch power,each lane (max)	2.3	4.5	dBm
Average launch power,each lane (min)	-7	-2.2	dBm
Optical Modulation Amplitude(OMA), each lane (max)	3.5	5.5	dBm
Optical Modulation Amplitude(OMA), each lane (min)	-4	0.8	dBm
Difference in launch power between any two lanes(OMA) (max)	6.5	4.7	dB
Launch power in OMA minus TDP, each lane (min)	-4.8	0	dBm
Transmitter and dispersion penalty (TDP), each lane (max)	2.6		dB
Average launch power of OFF transmitter,each lane(max)	-30		dBm
Extinction ratio (min)	3.5	5.5	dB
Optical return loss tolerance (max)	20		dB
Transmitter reflectancec (max)	-12		dB
Transmitter eye mask definition {X1,X2,X3,Y1,Y2,Y3}	{0.25,0.4,0.45,0.25,0.28,0.4}		

Receive Characteristics

Item	Specification		Unit
	40GBASE-LR4	40GBASE-ER4	
Signaling rate, each lane (range)	10.3125±100 ppm		GBd
Lane wavelengths (range)	1264.5 to 1277.5		nm
	1284.5 to 1297.5		
	1304.5 to 1317.5		
	1324.5 to 1337.5		
Damage threshold	3.3	3.8	dBm
Average receive power, each lane (max)	2.3	-1.5	dBm
Average receive power, each lane (min)	-13.7	-21.2	dBm
Receive power, each lane (OMA) (max)	3.5	-1	dBm
Difference in receive power between any two lanes (OMA) (max)	7.5	7	dB
Receiver reflectance (max)	-26		dB
Receiver sensitivity (OMA), each lane (max)	-11.5	-19	dBm
Receiver 3 db electrical upper cutoff frequency, each lane (max)	12.3		GHz
Stressed receiver sensitivity (OMA), each lane (max)	-9.6	-16.8	dBm
Conditions of stressed receiver sensitivity test:			
Vertical eye closure penalty, each lane	1.9	2.2	dB
Stressed eye J2 Jitter, each lane	0.3		UI
Stressed eye J9 Jitter, each lane	0.47		UI

Thank You