Chromatic dispersion specifications for 100GBASE-BRx

(D1.1 comment #6)

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P802.3dk TF January 2025

Introduction

Table 168–11—Transmitter compliance channel specifications

PMD type	Dispersion[a] (ps/nm)		Insertion loss[b]	Optical return loss[c] (dB)	Max mean DGD (ps)
	Minimum	Maximum			
100GBASE-BR10	$0.23 \times \lambda \times [1 - (1324 / \lambda)^4]$	$0.23 \times \lambda \times [1 - (1300 / \lambda)^4]$	Minimum	15.6	0.8
100GBASE-BR20	$0.46 \times \lambda \times [1 - (1324 / \lambda)^4]$	$0.46 \times \lambda \times [1 - (1300 / \lambda)^4]$	Minimum	15	0.8
100GBASE-BR40	$0.92 \times \lambda \times [1 - (1324 / \lambda)^4]$	$0.92 \times \lambda \times [1 - (1300 / \lambda)^4]$	Minimum	15	0.8

3dk_Jackson_202407_1b,
consistent with 802.3cu, 100GBASE-LR1

3dk_tan_2312_1

Table 168–12—Fiber optic cabling (channel) characteristics

Description	100GBASE-BR10	100GBASE-BR20	100GBASE-BR40	Unit
Operating distance (max)	10	20	40	km
Channel insertion loss[a, b] (max)	6.3	10	18	dB
Channel insertion loss (min)	0	0	10	dB
Positive dispersion[b] (max)	9.2	18.4	37	ps/nm
Negative dispersion[b] (min)	–19.2	–38.4	–77	ps/nm
DGD_max[c]	3.1	3.9	5.0	ps
Optical return loss (min)	22	22	19	dB

3dk_Jackson_202407_1b 3dk_tan_2407_1a 3dk_takahara_2403_1b

Chromatic dispersion of 800G-LR4 in 802.3dj

Table I.4 – Example fitting coefficients for Eq. (I-5) and maximum approximation errors for the statistical chromatic dispersion coefficients in the O-band for M = 4, 8, 12 and 16

		Example fitting coefficients											
Number of concatenated cables M		$M = 4$			$M = 8$			$M = 12$			$M = 16$		
Probability level Q		10^{-4}	10^{-3}	10^{-2}	10^{-4}	10^{-3}	10^{-2}	10^{-4}	10^{-3}	10^{-2}	10^{-4}	10^{-3}	10^{-2}
Upper boundary	λ_0	1304.9	1307.0	1308.5	1307.7	1308.8	1309.7	1308.6	1309.4	1309.9	1309.4	1309.7	1310.1
	S_0 ($\lambda < \lambda_0$)	0.089	0.087	0.086	0.088	0.086	0.086	0.086	0.086	0.087	0.086	0.086	0.087
	S_0 ($\lambda > \lambda_0$)	0.089	0.087	0.087	0.088	0.087	0.088	0.087	0.088	0.088	0.088	0.088	0.088
Lower boundary	λ_0	1324.0	1321.1	1320.3	1321.4	1320.1	1319.5	1320.1	1319.7	1319.2	1319.7	1319.4	1319.0
	S_0 ($\lambda < \lambda_0$)	0.086	0.090	0.090	0.088	0.090	0.090	0.090	0.090	0.090	0.090	0.090	0.090
	S_0 ($\lambda > \lambda_0$)	0.083	0.089	0.089	0.085	0.089	0.089	0.086	0.089	0.089	0.087	0.089	0.089
Maximum approximation error (ps/(nm × km))		0.039	0.035	0.037	0.055	0.038	0.015	0.031	0.022	0.014	0.025	0.013	0.016
NOTE – λ_0 in nm and S_0 in ps/(nm² × km)													

- Yellow highlighted fitting coefficients are used for 800G-LR4 (johnson_3dj_01_2409)
- Related fitting coefficients for 100GBASE-BRx at a confidence level of 99.9% and 99.99% are marked by red boxes.

Chromatic dispersion of 100G-BRx

Q=99.9%

PMD type	Dispersion (ps/nm)	
	Minimum	Maximum
100GBASE-BR10	$0.225\times\lambda\times[1-(1321.1/\lambda)^4]$	$0.2175\times\lambda\times[1-(1307/\lambda)^4]$
100GBASE-BR20	$0.45\times\lambda\times[1-(1320.1/\lambda)^4]$	$0.435\times\lambda\times[1-(1308.8/\lambda)^4]$
100GBASE-BR40	$0.9\times\lambda\times[1-(1319.4/\lambda)^4]$	$0.88\times\lambda\times[1-(1309.7/\lambda)^4]$

	100GBASE-BR10	100GBASE-BR20	100GBASE-BR40	Unit
Positive dispersion (max)	2.7	2.3	1.4	ps/nm
Negative dispersion (min)	-16.1	-30.3	-57.9	ps/nm

Q=99.99%

PMD type	Dispersion (ps/nm)	
	Minimum	Maximum
100GBASE-BR10	$0.215\times\lambda\times[1-(1324/\lambda)^4]$	$0.2225\times\lambda\times[1-(1304.9/\lambda)^4]$
100GBASE-BR20	$0.44\times\lambda\times[1-(1321.4/\lambda)^4]$	$0.44\times\lambda\times[1-(1307.7/\lambda)^4]$
100GBASE-BR40	$0.9\times\lambda\times[1-(1319.7/\lambda)^4]$	$0.88\times\lambda\times[1-(1309.4/\lambda)^4]$

	100GBASE-BR10	100GBASE-BR20	100GBASE-BR40	Unit
Positive dispersion (max)	4.6	4.2	2.5	ps/nm
Negative dispersion (min)	-18	-32	-59	ps/nm

Thank you

Any questions?