Optical Cable Skew for Parallel SM 2km

Angela Lambert, Corning

IEEE P802.3df Architecture and logic ad hoc

April 26, 2023

References

Fiber characteristic tools adopted by IEEE

https://www.ieee802.org/3/ba/public/tools/index.html

MS Excel spreadsheet to calculate G.652 and G.655 fiber dispersion and relative delay characteristics

http://www.ieee802.org/3/ba/public/tools/Fibre_characteristics_V_3_0.xls

Calculated worst-case skew for parallel multimode transmission on OM3 at ~850 nm

http://www.ieee802.org/3/ba/public/may08/kolesar_02_0508.xls

Contributions:

100G Parallel SMF Skew from John Petrilla

https://www.ieee802.org/3/bm/public/may13/petrilla_01_0513_optx.pdf

Propagation Delay Skew in Multimode Channels from Paul Kolesar and Pete Anslow

https://www.ieee802.org/3/ba/public/may08/kolesar_01_0508.pdf

Supporters

Rick Pimpinella, Panduit

Objective: Update SM Cabled fiber skew for 2km length

Initial calculated single-mode fiber cable skew contributors				Skew (ps/m)	Skew @ 2km (ns)
	EIOR Range				
Effective Index of Refraction (EIOR) variatio	**1.4666-1.4686**			6.67	13.34
	Differential length factor	Propagation Delay (ps/m)			
Fiber length difference within a cable	**0.0025**	**5000**		12.5	25
	Stress, max (kpsi)	Stress, min (kpsi)	stress-refraction coef (kpsi-1)		
Cabling stress difference*	**33**	**0**	**2.61E-05**	2.9	5.7
Total Maximum Skew at 1310 nm				**22.05**	**44.09**

Skew for Skew Points SP3 to SP4, relevant to optical interfaces.

*Cable stress contributes to skew variation.

Thank you!