100GE 10km SMF Power Budgets

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Chris Cole

Bernd Huebner

chris.cole@finisar.com

bernd.huebner@finisar.com

Finisar

10km SMF Propagation Properties

10km G.652 A&B SMF Max dispersion and fiber loss

- LAN WDM (4nm spacing) (1306 – 1318nm DML or EML grid)
  - λ = 1318nm (worst case LAN WDM DML or EML λ)
  - Max Dispersion (1319nm) = 18ps/nm
  - Max Loss (1319nm) = 4.2dB
- CWDM (20nm spacing) (1271 – 1331nm only feasible DML grid)
  - λ = 1331nm (worst case CWDM DML λ)
  - Max Dispersion (1336nm) = 33ps/nm
  - Max Loss (1336nm) = 4.3dB
- For DML, LAN WDM has 55% CD and 0.1dB lower loss then CWDM
- CWDM (20nm spacing) (same grid has to be used for EML and DML)
  - λ = 1271nm (worst case CWDM EML λ)
  - Max Dispersion (1266nm) = -58ps/nm
  - Max Loss (1266nm) = 4.7dB
- For EML, LAN WDM has 32% CD and 0.5dB lower loss then CWDM

10km SMF Link Budgets

10km SMF 25G TP2 → TP3 Entries in dB	CWDM Cooled EML λ = 1271nm ER = 7dB	LAN WDM Cooled EML λ = 1318nm ER = 7dB	CWDM Uncooled DML λ = 1331nm ER = 3.5dB	LAN WDM Cooled DML λ = 1318nm ER = 4.5dB
Fiber Loss (G.652 A&B)	4.7	4.2	4.3	4.2
ER penalty (vs. ER=10dB)	1.0	1.0	3.5	2.5
CD	1.3 [1]	0.4 [2]	3.5 [3]	1.6 [4]
Connector & other losses	3.0	3.0	3.0	3.0
Total budget	10.0 Δ=1.4dB	8.6	14.3 Δ=3.0dB	11.3

- [1] traverso_01_0907, EML: λ = 1264.5nm, ά = -1.0, 10km (p10)
- [2] traverso_01_0907, EML: λ = 1319.0nm, ά = 1.0, 10km (p10)
- [3] traverso_01_0907, DML: λ = 1337.5nm, ά = 4.0, 10km (p11)
- [4] traverso_01_0907, DML: λ = 1357.5nm, ά = 4.0, 4km (p13)

10km SMF Power Budgets

10km SMF 25G λs Power in dBm (Average)	CWDM Cooled EML λ = 1271nm [1] ER = 7dB	LAN WDM Cooled EML λ = 1318nm ER = 7dB	CWDM Uncooled DML [2] λ = 1331nm ER = 3.5dB	LAN WDM Cooled DML λ = 1318nm ER = 4.5dB
TX Min / Max	1.5 / 4.5	0.1 / 3.1	5.8 / 8.8	2.8 / 5.8
TP2 TX Min 2.5dB Mux loss	-1.0 ⟷ Δ=1.4dB [1]	-2.4	3.3 ⟷ Δ=3.0dB [2]	0.3
TP2 4λ TX Max (TX Min + 9dB)	8.0	6.6	12.3 (>12.0)	9.3
Link Budget (dB)	10.0	8.6	14.3	11.3
TP3 RX Min 2.5dB DeMux loss	-11	-11	-11	-11
RX Min / Max (ER = 10dB)	-13.5 / -16.5	-13.5 / -16.5	-13.5 / -16.5	-13.5 / -16.5

- [1] EML on CWDM grid only feasible for EML use has Δ=1.1dB for λ = 1351nm
- [2] Cooled DML has Δ = 2.0dB for λ = 1331nm