

100Gb/s SMF PMDs

40Gb/s and 100Gb/s Fiber Optic Task Force
SMF Ad-Hoc
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Outline

- Total Link Cost Ratio Scenarios (previous)
- OFC/NFOEC 2013 Operating LR4 Modules
- PMD Relative Cost
- LR4/PSM4 Total Link Cost Ratio Comparisons

Total Link Cost Ratio Scenarios

- Direct Module and External Cabling (2f/8f)

http://www.ieee802.org/3/bm/public/mar13/cole_01_0313_optx.pdf#page=8

- Direct Module and Internal Cabling (2f/8f)

http://www.ieee802.org/3/bm/public/mar13/cole_01_0313_optx.pdf#page=9

- Initial Distributor Module and External Cabling (2f/8f/12f)

(Initial Distributor Modules are <1% of 100GbE volume)

http://www.ieee802.org/3/bm/public/mar13/kolesar_01a_0313_optx.pdf#page=13

(right hand side graph)

- Mature Distributor Module and External Cabling (2f/8f & 12f)

http://www.ieee802.org/3/bm/public/smfadhoc/meetings/apr2_13/cole_01b_0413_smf.pdf

(page 9 and 10)

OFC/NFOEC 2013 Operating LR4 Modules

During OFC/NFOEC, Mar. 2013, Anaheim, CA, the following 100GbE-LR4 modules were publically operating:

- Cisco
- Finisar¹
- Fujitsu¹
- JDSU
- Oclaro¹
- Neophotonics

¹ Interoperating in Ethernet Alliance and OIF booths

PMD Relative Cost

SR10 CXP = 1 (cole_01_0313)	SR4	PSM4	LR4 Gen1	LR4 Gen2	LR4 Gen3
Form-factor	CFP4/ QSFP28	CFP4/ QSFP28	CFP	CFP2	CFP4/ QSFP28
petrilla_02a_0112	1.2	3 to 4			
nicholl_01_0112		4*	14*	6.5*	
cole_02a_0312	1.2*	3* to 4	16*	8*	5* to 6
anderson_01_0113	<4	4*		9.3*	
petrilla_03a_0113	1.1*	4*		12	
welch_01a_0113		0.82*			3.5*
* AVERAGE	1.15	3.2	15	7.9	4.2
Lightcounting: 40GE	0.45				2.1

LR4/PSM4 Total 300m Link Cost Ratios

- LR4 & PSM4 module cost: Direct & Mature Distributor
- LR4 cabling cost: Internal & External 300m DL 2f OS2 SMF
- PSM4 cabling cost: Internal & External 300m DL 8f/12f OS2

SCENARIO (SR10 CXP = 1)		LR4 Relative Cost	PSM4 Relative Cost	LR4/PSM4 Total 300m SMF Link Cost Ratio	
				Direct & Internal	Distributor & External
S1	Near Term LR4 CFP2	7.9	3.2	1.4	1.5
		page 5 average	page 5 average		
S2	Long Term LR4 CFP4/QSFP28	3.5	0.82	1.1	1.3
		welch_01a_0113	welch_01a_0113		
S3	Long Term LR4 CFP4/QSFP28	2.1	0.45	0.8	0.9
		L.C. 40GE-LR4	L.C. 40GE-SR4		

LR4/PSM4 Total 150m Link Cost Ratios

- LR4 & PSM4 module cost: Direct & Mature Distributor
- LR4 cabling cost: Internal & External 150m DL 2f OS2 SMF
- PSM4 cabling cost: Internal & External 150m DL 8f/12f OS2

SCENARIO (SR10 CXP = 1)		LR4 Relative Cost	PSM4 Relative Cost	LR4/PSM4 Total 150m SMF Link Cost Ratio	
				Direct & Internal	Distributor & External
S1	Near Term LR4 CFP2	7.9	3.2	1.6	1.6
		page 5 average	page 5 average		
S2	Long Term LR4 CFP4/QSFP28	3.5	0.82	1.3	1.4
		welch_01a_0113	welch_01a_0113		
S3	Long Term LR4 CFP4/QSFP28	2.1	0.45	1.0	1.1
		L.C. 40GE-LR4	L.C. 40GE-SR4		