Mux/Demux specifications for Annex 156A

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Overview

An Informative Annex 156A is intended to provide information compliant DWDM Black Links

Comment #367 was submitted requesting that Annex 156A provide additional specifications for Mux and Deuxes that will meet the optical specifications in Table 156-8:

Channel Passband

Adjacent Channel Crosstalk

Cl **156** *SC* **156.A.1** *P* **104** *L* **45** # 367

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Comment Type **T** *Comment Status* **D**

Black Link examples should be expanded to include some specifications for Mux and Demux devices that would satisfy the black-link transfer funtion

SuggestedRemedy

Add a table to 156.A.1 including Mux and Demux example specifications. For example see https://www.ieee802.org/3/cw/public/22_0523/maniloff_3cw_01_220523.pdf#page=5

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Review supporting presentation, for comment resolution group (CRG) consideration.

References

The methodology and spectral properties captured in 802.3cwD2.0 were presented in the following contributions:

https://www.ieee802.org/3/cw/public/adhoc/21_0212/maniloff_3cw_01_210212.pdf

https://www.ieee802.org/3/cw/public/adhoc/21_0312/maniloff_3cw_01a_210312.pdf

https://www.ieee802.org/3/cw/public/22_0523/maniloff_3cw_01_220523.pdf

Parameters

Parameter	Min	Max	Unit	Note
Mux 3dB BW	70	76	GHz	Full width at 3dB loss relative to central frequency
DeMux 3dB BW	70	76	GHz	Full width at 3dB loss relative to central frequency
Mux 10dB BW	85	94	GHz	Full width at 10 dB loss relative to central frequency
Demux 10dB BW	85	94	GHz	Full width at 10 dB loss relative to central frequency
Mux Insertion Loss Variation		1.5	dB	Maximum insertion loss variation between ports at TP2
Demux Insertion Loss Variation		1.5	dB	Maximum insertion loss variation between ports at TP3
Mux Adjacent Channel Isolation	30		dB	With respect to center frequency on adjacent channel
Demux Adjacent Channel Isolation	30		dB	With respect to center frequency on adjacent channel
Mux Frequency Shift	-4	4	GHz	Spectral offset from target frequency
Demux Frequency Shift	-4	4	GHz	Spectral offset from target frequency

The table summarizes parameters that will meet the DWDM black link spectral transfer function

Mux Demux Filter Shapes

A 3rd order super-Gaussian filter shape was used to model the passband, adjacent channel crosstalk, and spectral isolation

Although no filter will perfectly match the theoretical filter profile, this is useful for modeling worst case spectral properties

The form of the filters is:

$$T(f) = \exp[-\ln(2) \times (\frac{2(f - f_0)}{B})^6]$$

T = the transmission

f = frequency

f_0= center frequency

B = Filter Bandwidth

Summary

The specifications on slide 4 and definitions from slide 5 are intended to be added to Annex156A

This will provide practical information on examples of filter characteristics that will meet the normative spectral properties in Table 156-8

Thanks!