VOA/MULTIPLEXER MODULE (APVMX)

Enablence offers PLC-based VOA/Multiplexer (VMUX) modules. High performance VOA arrays are integrated with high performance AWG chips to yield low loss VMUX devices with high attenuation accuracy and tuning range, and low polarization dependency. Integrated taps and detectors are available for power monitoring. The AWG chips are fabricated using Enablence' patented CVD glass deposition system. The chips are packaged using automated multi-fiber attachment systems and are qualified to Telcordia GR-1221-Core standards.
The VMUX is used in demanding DWDM long-haul and metro transmission systems.

BENEFITS

- 16~40 DWDM Channels
- Channel Spacing: 200, 100, or 50GHz
- RS-232, I2C, or DPRAM interface
- Standard ITU or Custom

FEATURES

- Low Power Consumption, Insertion Loss, Cross-Talk, and Polarization Dependence
- 20dB Attenuation Range
- Fast warm-up and response time

APPLICATIONS

- DWDM Metro and Long- Haul Core
  - Per Channel Power Balancing
  - Band Power Balancing
- ROADM Add/Drop Nodes
  - Wavelength Grooming
  - Signal Equalization at the Add side

DATA SHEET

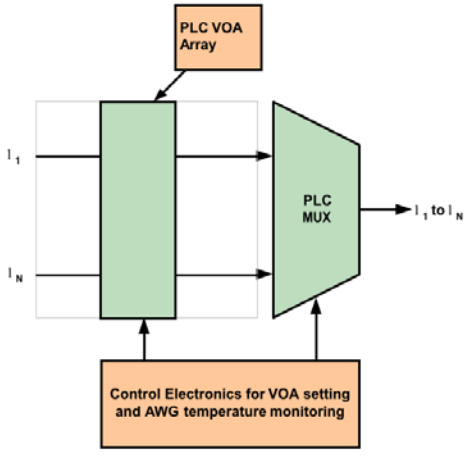
FLAT TOP VMUX. C-BAND WITH LC/APC CONNECTORS SPECIFICATION

Parameters	Specifications	Units	Comments
Channels	40		16, 20 or 32 Channels Optional
Channel Spacing	100	GHz	
3dB Center Wavelengths Wavelength calibrated in vacuum	1529.55 ~ 1560.61	nm	Corresponding to optical frequency 196.0 ~ 192.1THz with a channel spacing of 100GHz
ITU Passband	±100	pm	
1dB Bandwidth	≥ 0.40	nm	Each channel
3dB Bandwidth	≥ 0.60	nm	Each channel
Channel Wavelength Accuracy	≤ ±0.05	nm	
Optical Insertion Loss	≤ 7.40	dB	Worst case including connector loss
Insertion Loss Uniformity	≤ 1.00	dB	Over all channels
Cross-talk, Adjacent Channel	≥ 23	dB	
Cross-talk, Non-Adjacent Channel	≥ 35	dB	
Cross-talk, Total	≥ 22	dB	
Optical Return Loss	≥ 40	dB	Including attenuators
Directivity	≥ 55	dB	
Polarization Dependent Loss	≤ 0.7 : 0-10 dB attenuation ≤ 0.8 : 10-20 dB attenuation	dB	
Temperature Stability	≤ ±0.50	dB	Over full operating temperature range
Temperature Control	Integrated controller		Maximum 10 min warm-up time

VARIABLE OPTICAL ATTENUATOR ARRAY (VOA) SPECIFICATION

Parameters	Specifications	Units	Comments
Attenuation Range	0 ~ 20	dB	
Attenuation Resolution	0.10	dB	
Attenuation Accuracy	≤ ±0.75	dB	
Attenuation Full-Range Scan Time	< 10	ms	Between 10% and 90% of the full range

OPEN-LOOPED FUNCTIONAL BLOCK



FLAT TOP VMUX. C-BAND WITH TAP, POWER MONITOR AND LC/APC CONNECTORS

Parameters	Specifications	Units	Comments
Channels	40		16, 20 or 32 Channels optional
Channel Spacing	100	GHz	
3dB Center Wavelengths Wavelength calibrated in vacuum	1529.55 ~ 1560.61	nm	Corresponding to optical frequency 196.0 ~ 192.1THz with a channel spacing of 100GHz
ITU Passband	±100	pm	
1dB Bandwidth	≥ 0.40	nm	Each channel
3dB Bandwidth	≥ 0.60	nm	Each channel
Channel Wavelength Accuracy	≤ ±0.05	nm	
Optical Insertion Loss	≤ 8.80	dB	Worst case including connector loss
Insertion Loss Uniformity	≤ 1.00	dB	Over all channels
Cross-talk, Adjacent Channel	≥ 23	dB	
Cross-talk, Non-Adjacent Channel	≥ 35	dB	
Cross-talk, Total	≥ 22	dB	
Optical Return Loss	≥ 40	dB	Including attenuators
Directivity	≥ 55	dB	
Polarization Dependent Loss	≤ 0.85 : 0-10dB attenuation ≤ 0.95 : 10-20dB attenuation	dB	
Temperature Stability	≤ ±0.50	dB	Over full operating temperature range
Temperature Control	Integrated controller		Maximum 10 min warm-up time
Input Power Level	-22 ~ +11	dBm	
Output Power Level	-10 ~ +16	dBm	

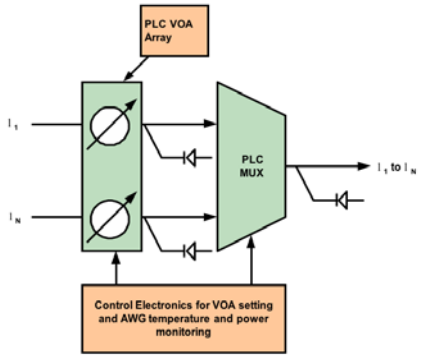
VARIABLE OPTICAL ATTENUATOR ARRAY (VOA) SPECIFICATION

Parameters	Specifications	Units	Comments
Attenuation Range	0 ~ 20	dB	
Attenuation Resolution	0.10	dB	
Attenuation Accuracy	≤ ±0.75	dB	
Attenuation Full-Range Scan Time	< 10	ms	Between 10% and 90% of the full range

TAP & PHOTODETECTORS (TAPPD) SPECIFICATION

Parameters	Specifications	Units
VOA Tap Ratio	5	%
Line Tap ratio power monitoring	2	%
PDL of tap signal	0.30	dB
Input PD Monitor Accuracy per channel	≤ ± 0.5 for +11 to -9 dBm ≤ ± 1.0 for -9 to -22 dBm	dB
Output PD Monitor Accuracy	≤ ± 0.5 for +16 to -4 dBm ≤ ± 1.0 for -4 to -10 dBm	dB
Line Monitor response	~ 100	V/W
Monitor response bandwidth (from DC)	1	MHz

CLOSE-LOOPED FUNCTIONAL BLOCK



ELECTRICAL, PACKAGING AND ENVIRONMENTAL REQUIREMENTS SPECIFICATION

Parameters	Specifications	Units	Comments
Power Requirements	12 W at Steady State 26 W at cold start	W	
Power Supplies(1)	To Be Specified	V	Specify Where Used
Power Supplies(2)	To Be Specified	V	Specify Where Used
Tolerance	≤ ±0.75	dB	
Type Current	3,000	mA	
Volt Ripple	100 Max	mV	
Baud Rate	19200	bps	
Operating Temperature	-5 ~ 70	°C	
Case Size	To Be Specified	mm	Including printed circuit board
Pigtail Length	To Be Specified	mm	Input
	To Be Specified	mm	Output
Connector Type	To Be Specified		

Physical and Mechanical Dimensions and VMUX Interface Connector Definitions

This specification will be defined with customer.

Communication Protocol

Specifications defining all communication protocol, detailed command structure and reporting messages will be determined with customer. The subjects included are:

1. Data Format
2. “Set” and “Query” commands
3. General Message Structure

For more information
visit www.enablence.com