

40-Channel 100GHz Athermal AWG Mux/Demux Module

1. Product Overview

This document presents the generic specification for the 40-channel 100GHz MUX/DEMUX component supplied for use in DWDM system.

Dense Wavelength Division Mux/Demultiplexer Modules are part of a series of high performance products based on silica-on-silicon planar technology and a unique athermal packaging design requiring no electrical power, software or temperature control for a completely passive DWDM solution. This product range offers a combination of very low loss and high channel isolation along with long term reliability and low cost per channel for 40 channel, 100GHz solutions. Each module can perform Mux and Demux functions. Both C- and L-band devices are available with Broad Gaussian spectral response. Custom frequency grids, fiber types and connectorisation options are also available.

Different input and output fibers, such as SM fibers, MM fibers and PM fiber can be selected to meet different applications. The component is designed for minimum roll-off over the $\pm 80\text{pm}$ clear bandwidth whilst not exceeding the maximum insertion loss of 6.0 dB.

Issue V0 released to reflect standard 100GHz AWG specifications, and can be modified according to customer requirement.



The label is only for spec review and can be no label or customer label on the device on delivered samples and products

2. Absolute Maximum Ratings (unless otherwise specified)

Parameters	Conditions	Specifications		Units
		Min.	Max.	
Operating Temperature	Operating	-5	65	°C
Operating Humidity	Operating	5	95	%RH
Storage Temperature	Non_Operating	-40	+85	°C
Storage Humidity	Non_Operating	5	95	%RH

3. Optical Specification

Parameters	Condition	Specs			Units
		Min	Typ	Max	
Number of Channels			40		
Number Channel Spacing	100GHz		100		GHz
Cha. Center Wavelength	ITU frequency.		C -band		nm
Clear Channel Passband			± 12.5		GHz
Wavelength Stability	Maximum range of the wavelength error of all channels and temperatures in average polarization.		± 0.05		nm
-1 dB /-1 dB Channel Bandwidth	Clear channel bandwidth defined by passband shape. For each channel	0.24			nm

-3 dB /-3 dB Channel Bandwidth	Clear channel bandwidth defined by passband shape. For each channel	0.43			nm
Optical Insertion Loss at ITU grid	Defined as the minimum transmission at ITU wavelength for all channels. For each channel, at all temperatures and polarizations.		4.5	6.0	dB
Adjacent Channel Isolation	Insertion loss difference from the mean transmission at the ITU grid wavelength to the highest power, all polarizations, within the ITU band of the adjacent channels.	25			dB
Non-Adjacent, Channel Isolation	Insertion loss difference from the mean transmission at the ITU grid wavelength to the highest power, all polarizations, within the ITU band of the nonadjacent channels.	29			dB
Total Channel Isolation	Total cumulative insertion loss difference from the mean transmission at the ITU grid wavelength to the highest power, all polarizations, within the ITU band of all other channels, including adjacent channels.	22			dB
Insertion Loss Uniformity	Maximum range of the insertion loss variation within ITU across all channels, polarizations and temperatures.			1.5	dB
Directivity(Mux Only)	Ratio of reflected power out of any channel(other than channel n)to power in from the input channel n	40			dB
Insertion Loss Ripple	Any maxima and any minima of optical loss across ITU band, excluding boundary points, for each channel at each port			1.5	dB
Optical Return loss	Input & output ports	40			dB
PDL/Polarization Dependent Loss in Clear Channel Band	Worst-case value measured in ITU band		0.3	0.5	dB
Polarization Mode Dispersion				0.5	ps
Maximum Optical Power				24	dBm
MUX/DEMUX input/ output Monitoring range		-35		+23	dBm

1. IL Represents the worst case over a +/-0.08nm window around the ITU wavelength ;
2. PDL was measured on average polarization over a +/- 0.08nm window around the ITU wavelength.

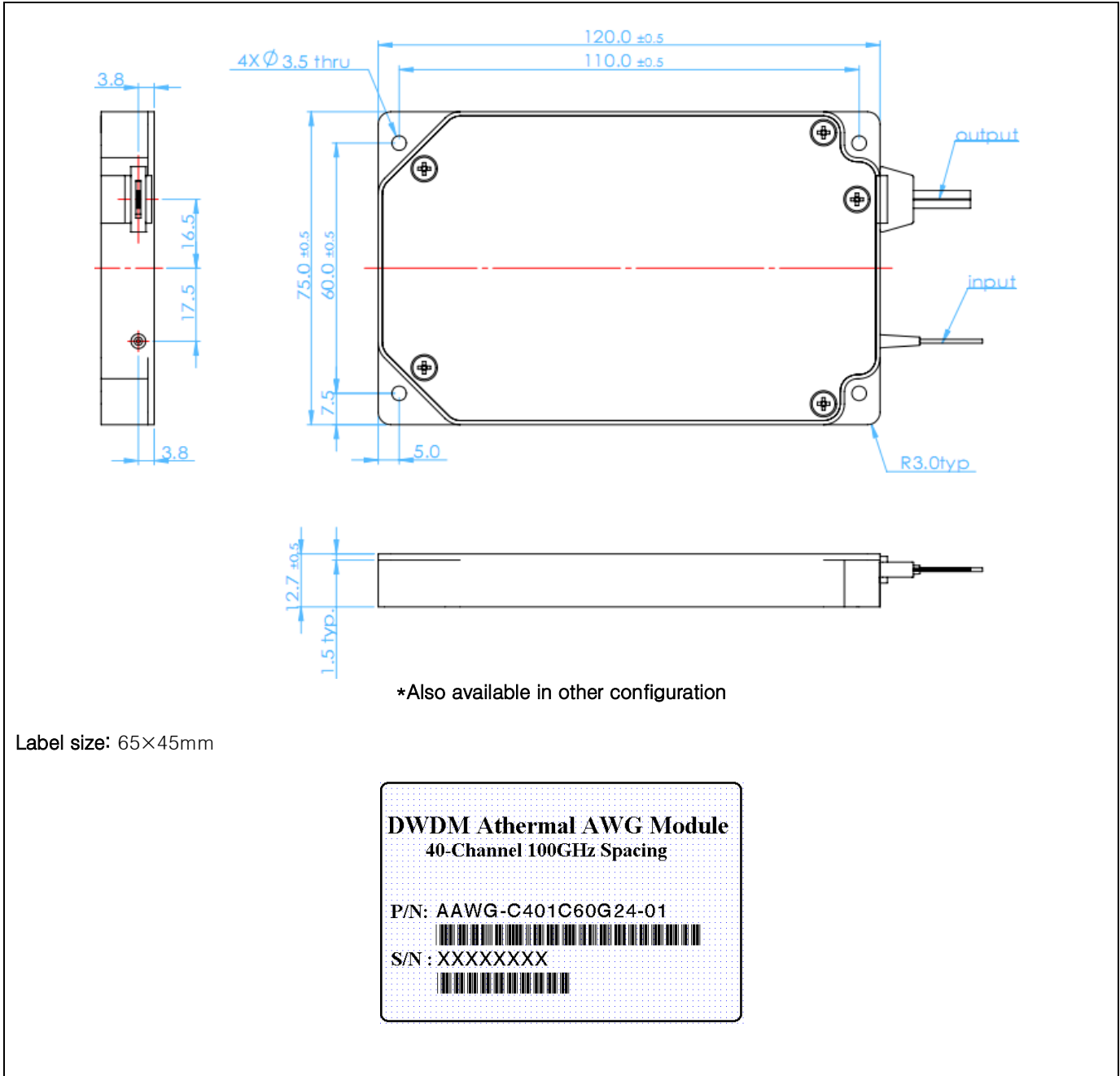
4. Mechanical Schematic and Dimensions

Dimensions	120 x 75 x 12.7	mm
Space between space between screws	110×60	mm



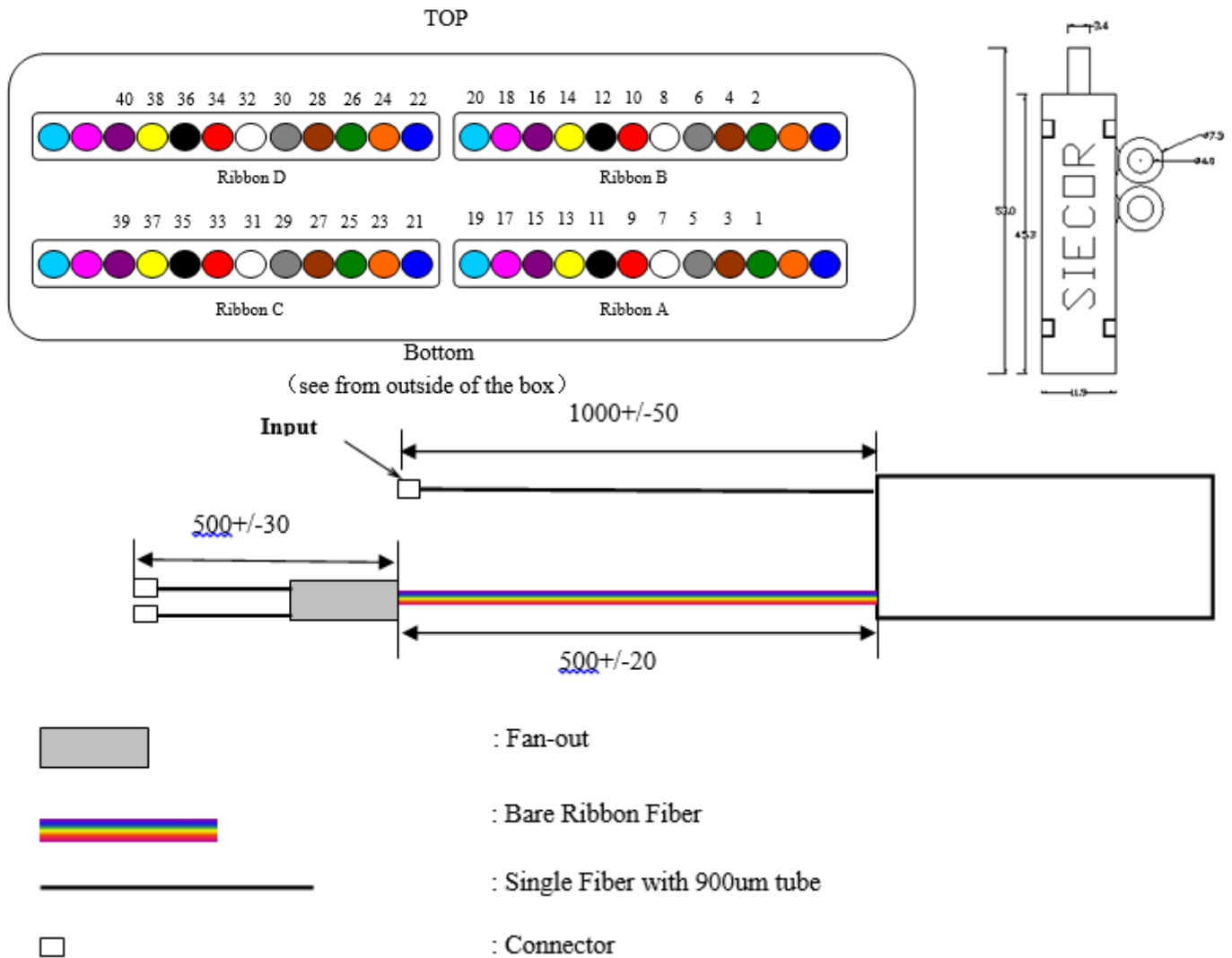
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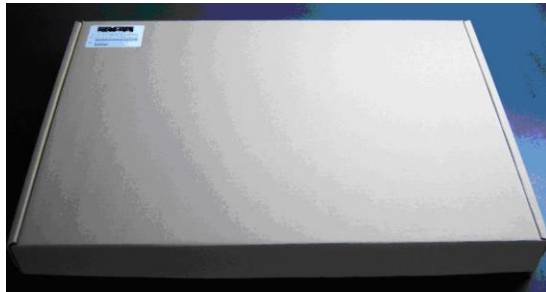
5. Fiber Coding and Connector Specifications

Fiber Type	Common G657A fiber with 900µm loose tube, Channels SMF_28e.											
Fiber Format	4x 12-fiber ribbons											
Fiber Length	Common	1000mm ± 50mm with 900um loose tube										
	Channels	Ribbon 500mm ± 20 mm and Fan out 500mm ± 30mm with 900um loose tube										
Common	Color	white										
Ribbon Identification	Label with ribbon number to be placed midway between ribbon end-points											
Connector Options	Common	FC/APC										
	Channels	FC/APC										
Fiber Identification in Ribbon	1	Blue	2	Orange	3	Green	4	Brown	5	Grey	6	White
	7	Red	8	Black	9	Yellow	10	Purple	11	Pink	12	Aqua



6. Shipment Packaging

standard shipment packaging will be employed for the discrete devices in addition to the external packaging.



7. Test Report

The test report should be provided when the products are delivered. The following characteristic test data should be included.

- **Insertion loss (room temperature)**
Represents the worst case over $\pm 0.10\text{nm}$ around the ITU wavelength without connector.
- **PDL (room temperature)**
Measured on average polarization over $\pm 0.10\text{nm}$ around the ITU wavelength without connector.
- **Fiber length, Fiber type and Pigtail type etc**
- **PN, SN bar code**

8. Reliability Specifications



The planar DWDM components described within this datasheet are currently under development. Whilst the design, material selection and manufacturing processes have been chosen for high reliability the devices have not been submitted to an extensive reliability assurance program. It is our aim to qualify these planar DWDM devices to the Telcordia reliability assurance practices and requirements for fiber optic and opto-electronic components (GR-1221-CORE, Generic Reliability Assurance Requirements for Fiber Optic Branching Components, and Telcordia TR-NWT-000468, Reliability Assurance Practices for Opto-electronic Devices in Interoffice Applications).

9. Wavelength plan

ITU wavelength or Customize

Ch. No.	Freq (THz)	WL (nm)	Ch. No.	Freq (THz)	WL (nm)
1	196.00	1529.553	21	194.00	1545.322
2	195.90	1530.334	22	193.90	1546.119
3	195.80	1531.116	23	193.80	1546.917
4	195.70	1531.898	24	193.70	1547.715
5	195.60	1532.681	25	193.60	1548.515
6	195.50	1533.465	26	193.50	1549.315
7	195.40	1534.250	27	193.40	1550.116
8	195.30	1535.036	28	193.30	1550.918
9	195.20	1535.822	29	193.20	1551.721
10	195.10	1536.609	30	193.10	1552.524
11	195.00	1537.397	31	193.00	1553.329
12	194.90	1538.186	32	192.90	1554.134
13	194.80	1538.976	33	192.80	1554.940
14	194.70	1539.766	34	192.70	1555.747
15	194.60	1540.557	35	192.60	1556.555
16	194.50	1541.349	36	192.50	1557.363
17	194.40	1542.142	37	192.40	1558.173
18	194.30	1542.936	38	192.30	1558.983
19	194.20	1543.730	39	192.20	1559.794
20	194.10	1544.526	40	192.10	1560.606