

DWDM Mux / Demux device **without** the need of temperature control

# AAWG

# ATHERMAL ARRAYED WAVEGUIDE GRATING

**AWG** (Arrayed Waveguide Gratings) multi/de-multiplexer combines and splits optical signals of different wavelengths, commonly used in WDM system.

Temperature insensitive  
**-40°C ~ +85°C**



Senko offers **Athermal AWG (AAWG)**. It is the integrated Optical circuit built by Polymer approach (Silica on Silicon substrate), providing more stable reliability performance.



**FEATURES**

- Excellent Optical Performance
- High Channel Counts (**Up to 48Ch**)
- Temperature insensitive (**-40°C ~ +85°C**)
- High Reliability



As the 5G rollout begins, there will be a huge increase in demand of fibers and/or wavelengths to support front haul CPRI traffic.

Maintaining current C-RAN (Centralized-Remote Access Network) topology, it is the simplest way to upgrade the front haul network by adding more wavelengths.

The fiber distance of a front haul from BBU to RRH is typically < 20km. The more complicated the network becomes, the more challenging it becomes to meet loss budget with 20km fiber reach, compensating losses from WDM filters, switches, fibers and connectors, etc. Especially loss from WDM trunk becomes critical as it affects multiple 5G Cells significantly.

#### Future path

Existing DWDM filter technology does not satisfy upcoming 5G front haul demand for 2 reasons. High losses and narrow operating temperature range. On the other hands, Athermal AWG resolves the issues.

Gaussian 40Ch AAWG saves at least 6dB in link budget for a pair of MUX/DEMUX and has wider operating temperature range -40°C ~ +85°C .

### Specifications of 16-48ch Gaussian Athermal AWG Module *(Gaussian, C-Band, 100GHz)*

Parameters	Notes	Specifications		Units
		Min	Max	
<b>Channels</b>		16-48		Ch
<b>Channels Spacing</b>		100		GHz
<b>Reference Pass-band</b>	Relative to ITU Grid	± 0.1		nm
<b>ITU Frequency</b>	First Channel 196.00 / Last channel 191.30			THz
<b>ITU Wavelength</b>	First Channel 1529.55 / Last channel 1567.13			nm
<b>0-5 dB Bandwidth</b>	0.5 dB from Min Insertion Loss, full width, worst case polarization	0.1		nm
<b>1dB Bandwidth</b>	1dB from Min Insertion Loss, full width, worst case polarization	0.22		nm
<b>3dB Bandwidth</b>	3dB from Min Insertion Loss, full width, worst case polarization	0.38		nm
<b>20dB Bandwidth</b>	20dB from Min Insertion Loss, full width, worst case polarization		1.2	dB
<b>Insertion Loss</b>	Maximum of the Insertion Loss across the ITU pass-band over all channels		4.5	dB
<b>Ripple</b>	Maximum of the Insertion Loss across the ITU pass-band over all channels		1.9	dB
<b>Insertion Loss Uniformity</b>	Maximum of the Insertion Loss across the ITU pass-band over all channels		1.2	dB
<b>Adjacent Channel Isolation</b>	Ratio of peak transmission to the maximum transmission over both adjacent pass-bands	22		dB
<b>Non-Adjacent Channel Isolation</b>	Ratio of peak transmission in channel pass-bands to maximum transmission over all non-adjacent pass-bands	30		dB
<b>Total Crosstalk</b>	Ratio of power in channel to power in all other pass-bands	20		dB
<b>Polarization Dependent Loss</b>	Maximum ratio of transmissions over all polarization states, over the ITU pass-bands		0.7	dB
<b>Return Loss</b>		40		dB
<b>Polarization Mode delay (PMD)</b>	In reference pass-band over all channels		0.5	ps
<b>Chromatic Dispersion</b>	In reference pass-band over all channels	-20	20	ps/nm

Parameters	Notes	Specifications			Units
		Min	Typ	Max	
<b>Operating Temperature</b>		-40		+85	°C
<b>Storage Temperature</b>		-40		+85	°C
<b>Relative Umidity</b>		5		95	%

*\*Custom configuration available upon request*

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