SENKO
SENKO GROUP® Advanced Components

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

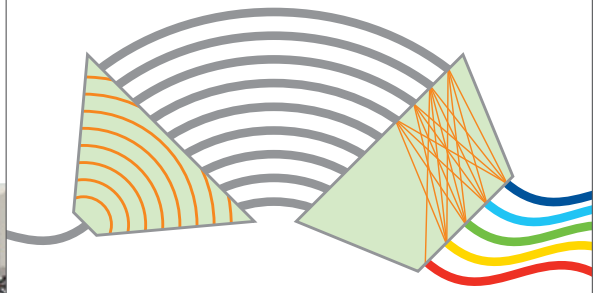
AAWG

ATHERMAL ARRAYED WAVEGUIDE GRATING

Temperature insensitive
-40°C ~ +85°C

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

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

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

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

**Custom configuration available upon request*

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