



40-Channel 100GHz C+L-band Athermal AWG for WDM-PON

The **KAIAM** athermal AWG is a fully passive device. It has no control electronics and consumes no electrical power. The rugged design contains no moving parts, and the optical performance is guaranteed from -5°C to 70°C for Central Office (CO) and -40°C to 70°C for Remote Node (RN) applications.

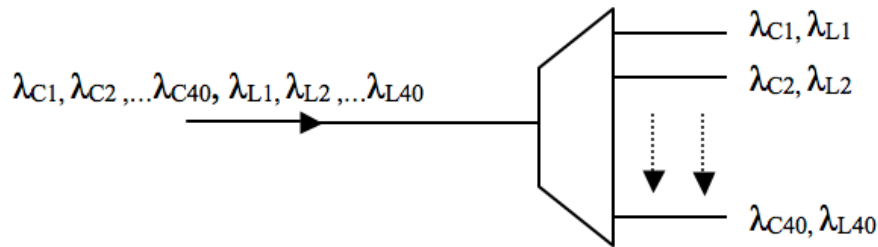
Optimized for WDM-PON applications, this AAWG is configured for dual band operation. 40 C-band channels and 40 L-band channels are supported simultaneously, as illustrated in the schematic below. In the 'downstream' direction the device will spatially separate a stream of channels from a single mode input fiber into 40 different output fibers each corresponding to an individual channel in one of the specified wavelength bands. In the 'upstream' direction the reverse process will occur simultaneously for channels in the second wavelength band.

KEY FEATURES

- 40 Channels x 100GHz Mux/Demux
- Cyclic in C&L Bands
- Broadened Gaussian Passband
- ITU-T698.3 Compliant Wavelength Plan
- Fully Passive Module
- Wide Operating Temperature Range
- Low Insertion Loss & PDL
- Low Crosstalk
- High Uniformity
- No Electronics Required
- Compact Footprint
- Telcordia GR-1209/GR-1221 Qualified



FUNCTIONAL SCHEMATIC DIAGRAM



CHANNEL PLAN

channel#	Channel frequency, C-band, THz	Channel wavelength, C-band, nm	Channel frequency, L-band, THz	Channel wavelength, L-band, nm
1	195.900	1530.334	190.4176	1574.395
2	195.800	1531.116	190.3205	1575.198
3	195.700	1531.898	190.2233	1576.003
4	195.600	1532.681	190.1262	1576.808
5	195.500	1533.465	190.0290	1577.614
6	195.400	1534.250	189.9319	1578.421
7	195.300	1535.036	189.8347	1579.229
8	195.200	1535.822	189.7376	1580.038
9	195.100	1536.609	189.6404	1580.847
10	195.000	1537.397	189.5433	1581.657
11	194.900	1538.186	189.4461	1582.468
12	194.800	1538.976	189.3490	1583.280
13	194.700	1539.766	189.2518	1584.093
14	194.600	1540.557	189.1547	1584.907
15	194.500	1541.349	189.0575	1585.721
16	194.400	1542.142	188.9604	1586.536
17	194.300	1542.936	188.8632	1587.352
18	194.200	1543.730	188.7661	1588.169
19	194.100	1544.526	188.6689	1588.987
20	194.000	1545.322	188.5718	1589.806
21	193.900	1546.119	188.4746	1590.625
22	193.800	1546.917	188.3775	1591.446
23	193.700	1547.715	188.2803	1592.267
24	193.600	1548.515	188.1832	1593.089
25	193.500	1549.315	188.0860	1593.912
26	193.400	1550.116	187.9889	1594.735
27	193.300	1550.918	187.8917	1595.560
28	193.200	1551.721	187.7946	1596.385
29	193.100	1552.524	187.6974	1597.212
30	193.000	1553.329	187.6003	1598.039
31	192.900	1554.134	187.5031	1598.867
32	192.800	1554.940	187.4060	1599.696
33	192.700	1555.747	187.3088	1600.525
34	192.600	1556.555	187.2117	1601.356
35	192.500	1557.363	187.1145	1602.187
36	192.400	1558.173	187.0174	1603.019
37	192.300	1558.983	186.9202	1603.853
38	192.200	1559.794	186.8231	1604.687
39	192.100	1560.606	186.7259	1605.522
40	192.000	1561.419	186.6288	1606.357

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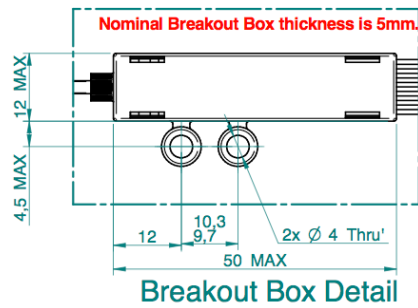
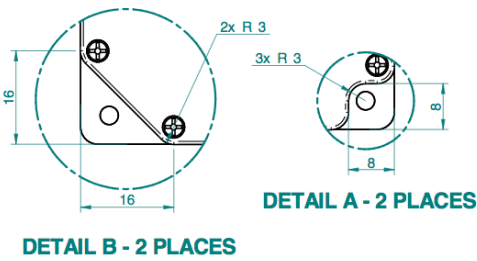
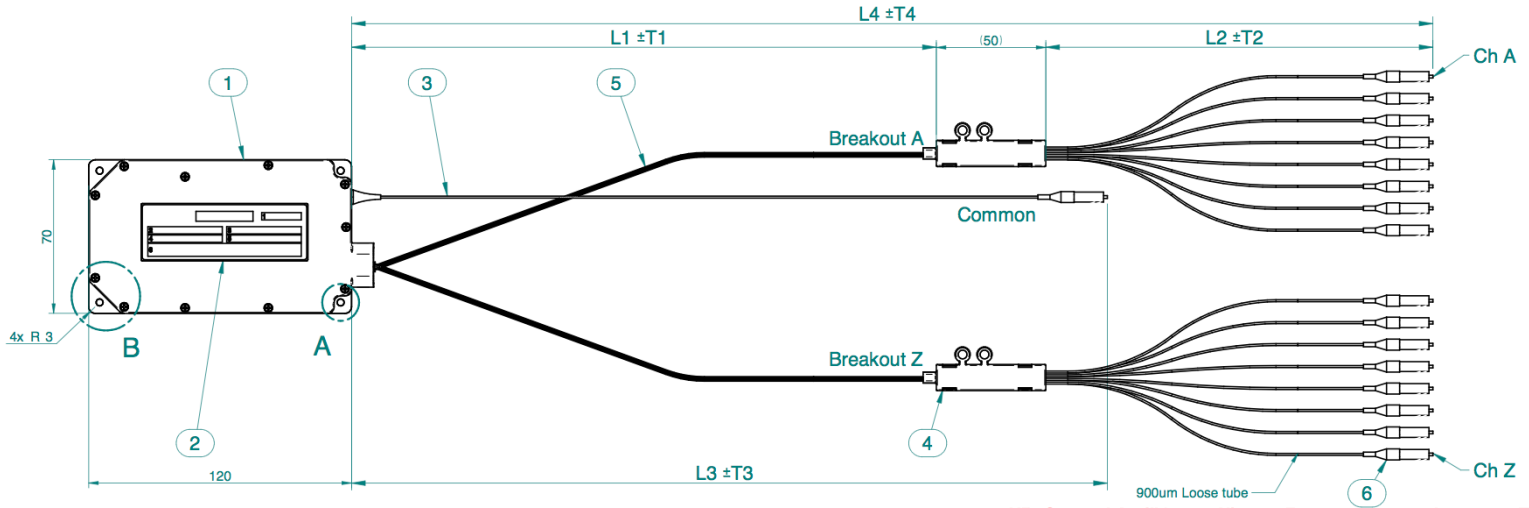
OPTICAL SPECIFICATIONS

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
Number of channels			40		channels
Operating bands		Cyclic in C and L-bands			
Channel Spacing in C-band			100		GHz
Channel center frequencies	C-Band L-Band	192.00 186.6288	See Channel Plan table	195.90 190.4176	THz
Clear Passband (CPB)	Relative to wavelength plan	-0.100		0.100	nm
Operating Temperature Range (OTR)	Central Office (CO)	-5		70	°C
	Remote Node (RN)	-40		70	
3-dB Center Frequency Accuracy	Average SOP*	-6.5 (CO) -10.0 (RN)		+6.5 (CO) +10.0 (RN)	GHz
Filter Bandwidth @ -1.0dB	Average SOP	0.3			nm
Filter Bandwidth @ -3.0dB	Average SOP	0.48			nm
Insertion Loss	Over CPB (Over OTR and all SOP) Including one connector	2.5		5.0 (CO) 6.0 (RN)	dB
Insertion Loss Uniformity	At ITU (Over OTR and all SOP)			1.5	dB
Polarization Dependent Loss	Over CPB (Over OTR)			0.5 (CO) 0.7 (RN)	dB
Polarization Mode Dispersion	Over CPB (Over OTR)			1.0	ps
Chromatic dispersion	Over CPB (Over OTR and avg SOP)	-15	0	+15	ps/nm
Adjacent Channel Crosstalk	Over CPB (Over OTR and all SOP)			-24 (CO) -22 (RN)	dB
Non-Adjacent Channel Crosstalk	Over CPB (Over OTR and all SOP)			-30	dB
Total integrated Crosstalk	Over CPB (Over OTR and all SOP)			-21 (CO) -20 (RN)	dB
Directivity	Over CPB (Over OTR and avg SOP)	-45			dB
Return Loss	Over CPB (Over OTR and avg SOP)	-40			dB

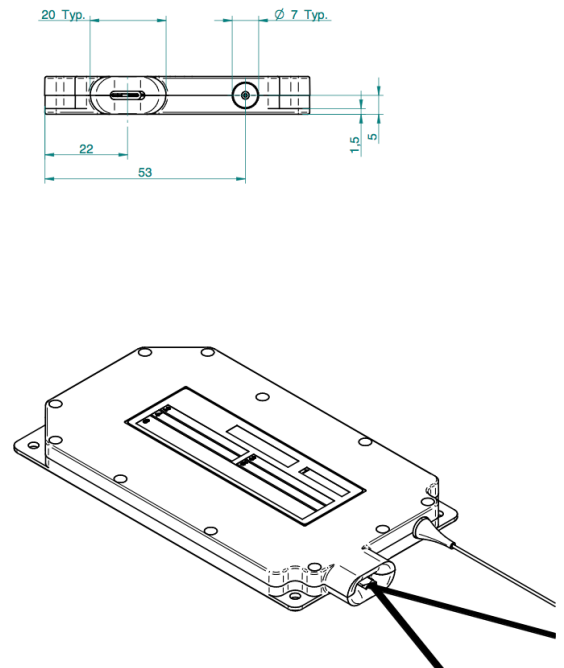
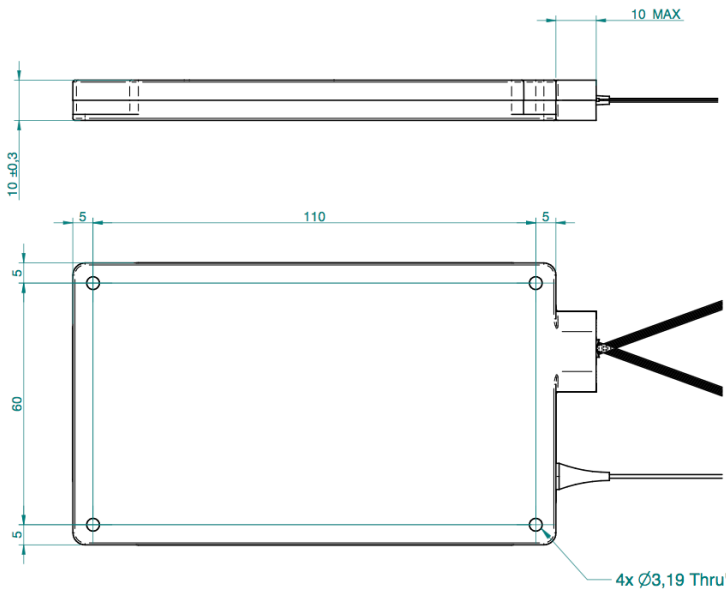
* SOP = States of Polarization

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MECHANICAL DRAWINGS



Configuration Table		
Identifier	Value	Tolerance
L1 (Ribbon Length)	1000 mm	T1 ± 50 mm
L2 (Fibre Length)	500 mm	T2 ± 50 mm
L3 (Common Fibre Length)	1500 mm	T3 ± 100 mm
L4 (Total length) (Optional)		
No. of Output Channels	40	
No. of Breakouts	4	
Connector Label Ch A (Usually Ch 1)	01	
Connector Label Ch Z	40	
Connector Type and Finish	Common LC/UPC	Output LC/UPC
No. of Fibres per Breakout	Breakout A - 8, B - 8, C - 12, Z - 12.	



OPERATING CONDITIONS

PARAMETER	CONDITIONS	MIN		MAX	UNIT
Temperature	Central Office	-5		70	°C
Temperature	Remote Node	-40		70	°C
Humidity	non-condensing	0		90	% R.H.

STORAGE CONDITIONS

PARAMETER	CONDITIONS	MIN		MAX	UNIT
Temperature		-40		85	°C
Humidity	non-condensing	0		90	% R.H.

ABSOLUTE MAXIMUM RATINGS

PARAMETER		MIN		MAX	UNIT
Optical Power	at common port			27	dBm

40CH 100GHZ C+L-BAND ATHERMAL AWG FOR WDM-PON PART NUMBER

MUX-W40-HH0-WD1

Note: all connectors LC/UPC