CWDM Single Fiber series

**passive optical components**

Features:

- Optimized for single fiber applications
- Simplified component interconnection system using standard dual patch cords eliminates most interconnection errors
- Up to 9 bidirectional channels using all 18 standard CWDM wavelengths
- Very low inter-channel attenuation ripple
- Modular design enables later expansion
- Lower attenuation models available on request
- Standard versions available from stock

Typical Applications or Product Overview:

- Optimization of fiber use in fiber based data transfer
- Concurrent transmission of different data formats   i.e. Ethernet, Fiber Channel, TDM
- Out of band monitoring, fiber integrity and performance monitoring
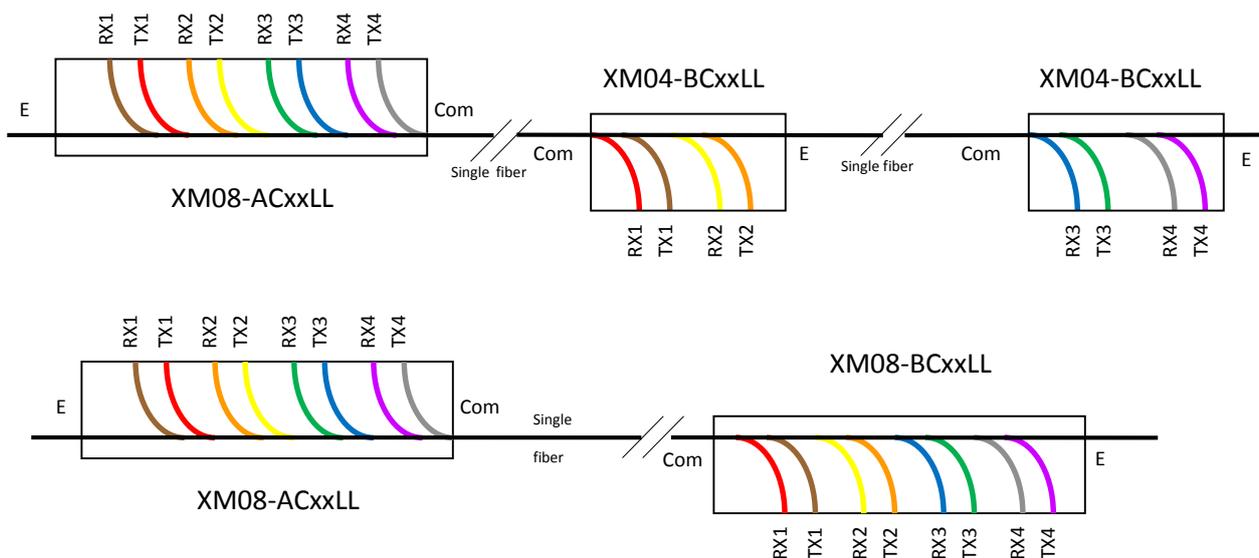
Description:

CWDM single fiber series is a series of passive optical components optimized for use in single fiber CWDM transmission systems. Depending on fiber characterics it enables transfer of up to 9 bidirectional channels over a single fiber strand using low cost CWDM transponders. Standard single

mode fiber G.652, that exhibits watermark peak attenuation, still allows transfer of at least 6 bidirectional channels and even more on shorter distances. All components are add/drop type (OADM) so they can be daisy-chained. System using multiple wavelength ranges can be easily integrated using standard components. Each bidirectional data channel consists of two consecutive wavelengths, each transferring data in one direction.

Terminal connections are designed so that standard dual SM patch cords can be used to connect to standard transponder equipment (i.e. SFP). Each type of optical component is available in two versions (A and B). Use of both versions – one at each side – ensures that wavelengths on channel connectors are swapped, so that standard patch cables can be used, and that attenuation between different channels is balanced.

Devices are installed in standard LGX module that snaps into 1U rack mount bracket. Up to three LGX modules can be inserted in single 1U rack mount bracket. There is also a selection of unmanaged transponder modules that can be installed in place of LGX module. Managed transponders must be installed in separate rack mount enclosure.

Ordering:	
XM02-ACxxLL XM02-BCxxLL	2 wavelengths (single channel single fiber) OADM
XM04-ACxxLL XM04-BCxxLL	4 wavelengths (dual channel single fiber) OADM
XM08-ACxxLL XM08-BCxxLL	8 wavelengths (quad channel single fiber) OADM
If wavelengths are all sequential, **xx** is replaced by middle two digits of lowest wavelength of component. If wavelengths are not sequential, **xx** is replaced with list of middle digits of all wavelengths separated by »/« (see detailed description on page 4).	

Any combination of standard CWDM (*ITU-T G.694.2*) wavelengths combinations can be ordered with delivery time of up to 6 weeks (4 weeks typical).
Following versions are usually available from stock:

XM10-A(B)43LL	10 wavelengths (5 channel) OADM 1431 to 1611
XM08-A(B)27LL	8 wavelengths (quad channel) OADM 1271 to 1411
XM08-A(B)47LL	8 wavelengths (quad channel) OADM 1471 to 1611
XM04-A(B)47LL	4 wavelengths (quad channel) OADM 1471 to 1531
XM04-A(B)55LL	4 wavelengths (quad channel) OADM 1531 to 1611
XM04-A(B)27LL	4 wavelengths (quad channel) OADM 1271 to 1331
XM02-A(B)59LL	2 wavelengths (quad channel) OADM 1591, 1611
XM02-A(B)55LL	2 wavelengths (quad channel) OADM 1551, 1571
XM02-A(B)51LL	2 wavelengths (quad channel) OADM 1511, 1531
XM02-A(B)47LL	2 wavelengths (quad channel) OADM 1471, 1491
XM02-A(B)31LL	2 wavelengths (quad channel) OADM 1311, 1331

Technical Specifications

Parameter	Thin film CWDM OADM					Unit
	2 ch	4 ch	6ch	8 ch	10 ch	
Express Channel pass band	1331 to 1611					nm
Add Drop Channel	1271 to1661 nm					nm
Bandwidth @ -0.5dB	≥ 15					nm
IL @ Express Channel	≤ 1.1	≤ 1.8	≤ 2.4	≤ 3.1	≤ 3.6	dB
Express Channel Isolation	≥ 15					dB
ILmax @ Add/Drop (A & B component pair)	≤1.8	≤ 2.5	≤ 3.3	≤4.1	≤4.5	dB
ILmax @ Add/Drop (single component)	≤ 1.2	≤ 2.0	≤ 2.7	≤ 3.4	≤ 3.9	dB
Add-Drop Channel Ripple (A/B component pair)	≤ 0.4					dB
Polarization Dependent Loss (dB)	≤0.10					dB
Add Drop Channel Isolation (Adjacent)	≥ 30					dB
Add Drop Channel Isolation (Non Adjacent)	≥ 40					dB
Return Loss	≥ 45					dB
Directivity	≥ 50					dB
Optical Power Handling	≥ 500					mW
Operating Temperature	0 to +70					ºC
Storage Temperature	≤ 1.1					ºC
Connector Type	LC-PC					
Packaging Dimension	LGX Box (130mm x 127mm x 30mm)					mm

Different packing and lower Insertion loss versions are available on request.

Typical connections layouts:

Single fiber Single side OADM examples:
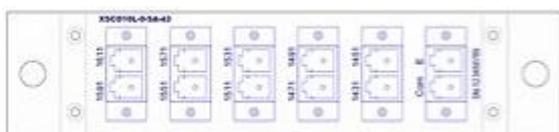
Figure 1 XM10-AC43LL - Single fiber Single side 10 wavelengths CWDM OADM version A
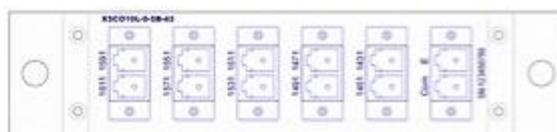
Figure 2 XM10-BC43LL - Single fiber Single side 10 wavelengths CWDM OADM version B
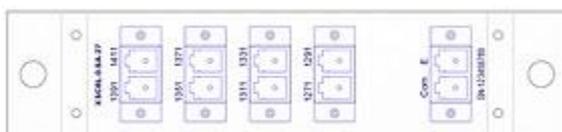
Figure 3 XM08-AC27LL - Single fiber Single side 8 wavelengths CWDM OADM version A

Figure 4 XM04-BC55LL - Single fiber Single side 4 wavelengths CWDM OADM version B

Single fiber Dual side OADM examples:
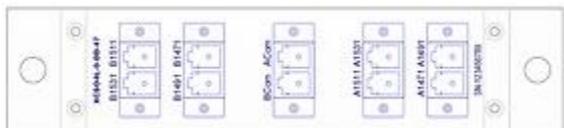
Figure 5   XM04-?C47LL   - Single fiber Dual side 4 wavelengths CWDM OADM (1471 to 1531nm)
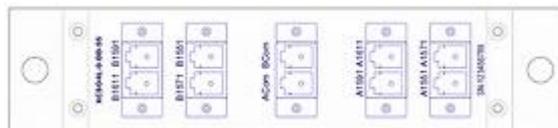
Figure 6   XM04-?C55LL   - Single fiber Dual side 4 wavelengths CWDM OADM (1551 to 1611nm)

Designation

1	2	3,4		5	6	7,8	9	10	11	12	13	
X	M	n	–	A B E F G	C D F L H	n	L S	9 L M P R	–	–	–	

1	**X**enOpt
2	Passive modules (OADM, MUX, …)
3,4	Number of ports/channels in packing
5	Module type (A- OADM single fiber, type A; B - OADM single fiber, type B, E - OADM dual fiber, AWG; F - OADM dual fiber, type A (obsolete) G - OADM dual fiber, type B (obsolete))
6	WDM type (CWDM, DWDM, FWDM, DWDM L band, Hybrid)
7,8	Middle numbers of lowest wavelength for sequential wavelengths or List of middle numbers of all wavelengths separated with "/".If total length of designation exceeds 18 characters, this part of designation is shortened to 3 characters starting with Letter **X** that acts as index that points to detailed description in Common Log. For each such device a separate datasheet is issued.
9	Connector type: LC, SC
10	Package and temperature range: 9 – 19" box, commercial temperature range L – LGX box, commercial temperature range M – LGX box, industrial temperature range P – Small package, commercial temperature range R – Small package, industrial temperature range
11	Reserved
12	Reserved
13	Reserved

CWDM Single Fiber Series

Optional accessories

XMR1   19" rack mounting bracket accommodates up to 3 LGX modules in 1U height

XMR1R   19" rack mounting bracket accommodates up to 3 LGX modules in 2U height, recessed

XMR2R   19" rack mounting bracket accommodates up to 6 LGX1 modules or 3 LGX2 modules in 2U height, recessed

XMR1B   blank panel for 19" rack mounting bracket

XMR1G1   Cable guide bracket enables guiding and fixing of all optical cables when installed with rack mount bracket

Optional Services

- Optical fiber measurements and qualification
- Design and integration of complete system including active equipment
- Custom configurations and OEM production is possible for orders with typically at least 10 equal components.

To find out more, please contact:

Xen⊙pt