

XDD Dual Fiber DWDM series of passive optical components

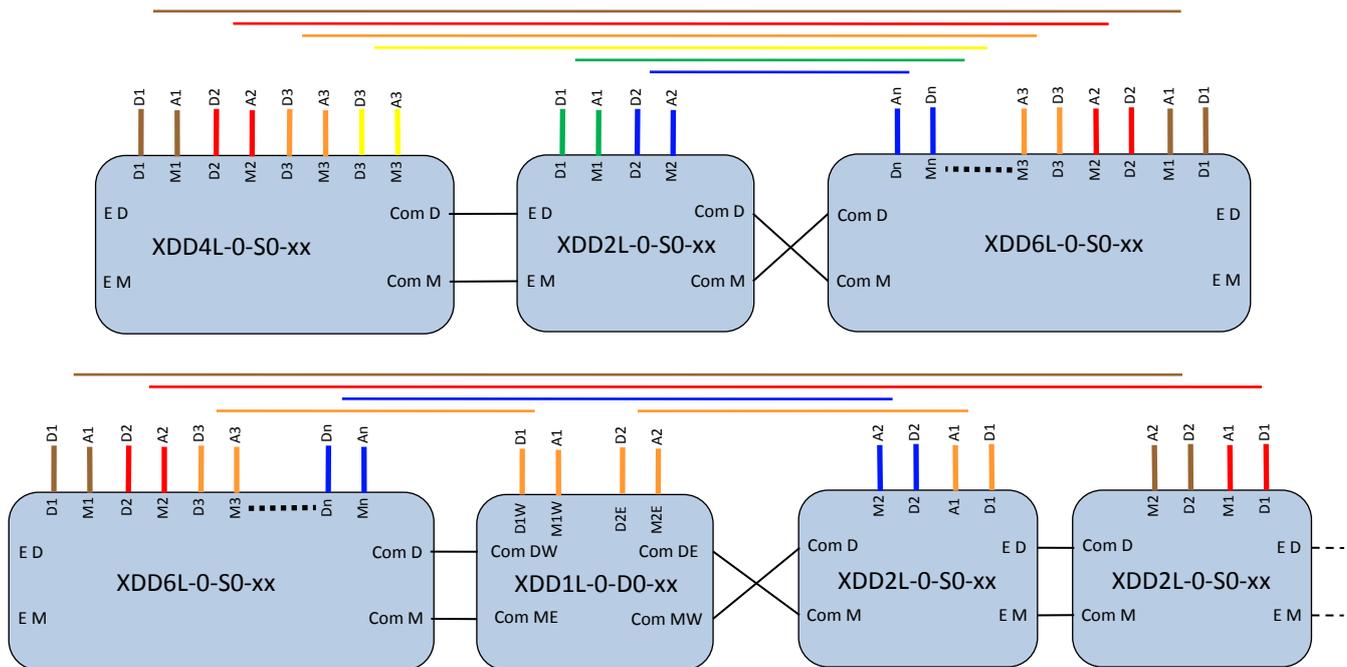


Features:

- Optimized for dual fiber applications
- Simplified component interconnection system using standard dual patch cords eliminates most interconnection errors
- High number of connections over fiber pair. Limited only by system power budget.
- Very low inter-channel attenuation ripple
- Modular design enables later expansion without interrupting established links
- Lower attenuation models available on request (for specific channel configurations)
- Standard versions available from stock

Typical Applications:

- 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:

XDD is a series of passive optical components optimized for use in dual fiber DWDM transmission systems. All standard ITU C band 100GHz filters from CH 10 to Ch 66 are available filters Ch 17 to Ch 59 are usually on stock. Any channel combination can be implemented. Channel combinations with at least 4 sequential channels are available also as low attenuation models on request. Number of bidirectional channels concurrently transferred over standard single mode fiber G.652 is limited only by overall system power budget.

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 uses a same wavelength on both fibers, each transferring data in one direction. Standard components that are typically available from stock provide 2, 4 and 6 standard consecutive CWDM channels packed in 1U LGX box or 8 to 12 channels in 2U LGX box or 1U rack mountable enclosure.

Filter construction is such that it balances the attenuation on all used wavelength, so that very little attenuation ripple between channels is present (typ. <0.3dB). Wavelengths exhibiting higher attenuations are in standard versions typically packed separately, so that easier optimization of total system attenuation is possible.

In custom versions any combination of wavelengths is possible. In addition to standard DWDM filters, wideband filters that support concurrent transmission of (existing) non DWDM optical signals or multi channel DWDM signals are also available. See more about these versions in separate document “*WDM components for mobile backhaul applications*”. Additional 1625nm or 1650nm test channel that enables OTDR testing of optical line while it is being used for data transmission is also available.

Terminal connections in standard products are designed so that standard dual LC SM patch cords can be used to connect to standard transponder equipment (i.e. SFP).

Devices are installed in standard LGX module that snaps into 1U or 2U 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:

XDDOnb-dp-cxx

n	number of add/drop channels
b	type of enclosure (L – LGX, R – 1U rack mountable box)
d	direction of filters (S - single side (east or west) , D – dual side (east-west))
P	Connector & filter placement version designation, starts with A,B , ...

XDDO2L-DA-cxx	2 wavelengths dual fiber OADM, east-west, 1U LGX box
XDDO3L-DA-cxx	3 wavelengths dual fiber OADM, east-west, 1U LGX box
XDCO4L-SA-cxx	4 wavelengths dual fiber OADM, single direction, 1U LGX box
XDCO8L-SA-cxx	8 wavelengths dual fiber OADM, single direction in 2U LGX
XDCO8R-SA-cxx	8 wavelengths dual fiber OADM, single direction in 1U rack mountable box
If wavelengths are all sequential, marking “xx” is replaced by channel number of lowest channel ,	

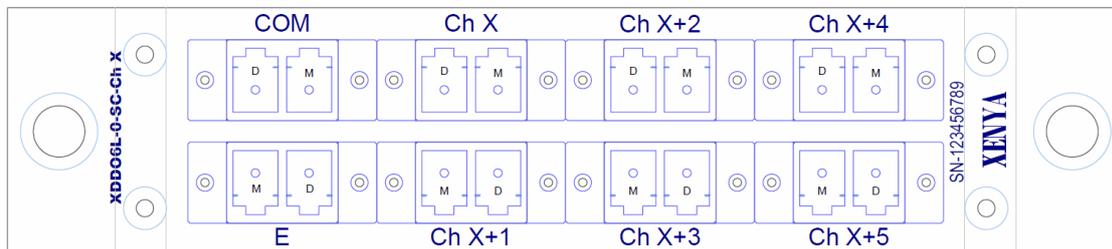
preceded by channel bandwidth marking “c” : **A**- for 50GHz, **B** for 100GHz, **C** for 200GHz channels. If wavelengths are not sequential **xx** is replaced with two character index marking to description of list of channels specified in separate document, preceded by marking **X**.

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) for standard DWDM channels and up to 8 weeks for combinations with custom wideband filters.

Here are some examples of typical devices:

XDDO8R-SA-B20	8 wavelengths OADM from ITU channel 20 to 28 in 1U rack mount box
XDDO6L-SA-B17	6 wavelengths , ITU channel 17 to 22, 100GHz in 1U LGX box1U
XDDO4L-SA-B21	4 wavelengths, ITU channel 21 to 24, 100GHz in 1U LGXU
XDDO4L-SA-B32	4 wavelengths , ITU channel 32 to 35, 100GHz in 1U LGX1U
XDDO2L-DA-B33	2 x 2 wavelengths west-east, ITU channels 33 to 34, 100GHz in 1U LGX1U
XDDO2L-DA-B40	2 x 2 wavelengths west-east ITU channels 40 to 41,100GHz in 1U LGX box
XDDO2L-SA-B50	2 wavelengths, single side, channels 50 & 51 100GHz in 1U LGX box
XDDO2L-SA-A51	2 wavelengths , single side, ch. 51 & 51, 50GHz in 1U LGX box
XDDO2L-SA-C55	2 wavelengths, single side, ch. 55 & 56, 200GHz in 1U LGX box

Typical connections layouts:



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.

Technical Specifications

Parameters	XDD Dual fiber 100GHz thin film DWDM OADM							Unit
	1 A/D	2 A/D	3 A/D	4 A/D	6 A/D	8 A/D	10 A/D	
Wavelength	ITU G.671 100G C20~C60							nm
Channel Spacing	100							GHz
Channel Passband	$L_c \pm 0.11$ (min)							nm
Passband Ripple	≤ 0.45							dB
Com to E band	C-Band except A/D channels							nm
Insertion Loss - Com to A/D	< 1	< 1.9	< 2.4	< 2.9	< 3.8	< 4.8	< 5.7	dB
Insertion Loss - Com to E	< 0.9	< 1.5	< 2	< 2.5	< 3.4	< 4.4	< 5.3	dB
Com to E for A/D signals	> 13.2	> 13.6	> 14.1	> 14.6	> 15.5	> 16.5	> 17.4	dB
Isolation adjacent channel	≥ 24							dB
Isolation non adjacent channel	≥ 40							dB
Insertion Loss Temperature Sensitivity	≤ 0.01							dB/°C
Polarization Dependent Loss	≤ 0.25							dB
Polarization Mode Dispersion	≤ 0.15							ps
Return Loss	≥ 50							dB
Directivity	≥ 50							dB
Maximum Power Handling	≥ 300							mW
Operating Temperature	-5 to 70							°C
Storage Temperature	-40 to 85							°C
Operating Humidity	5~95 non condensing							%
Storage Humidity	5~95 non condensing							%
Termination	LC connector							
Package Dimension	1U LGX (130mm x 127mm x30mm)							

Note:

1. IL and all PDL within Operating Temperature and with connectors.
2. Components used are complaint to Telecordia GR1209 & GR-1221.

NOTES:

IL and PMD includes connector loss.

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

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