WaveReady ® Fiber Bragg Grating Dispersion Compensation Modules

WRDCMG-20/30/40/50/60/80/100/120 and 80/160/240/400 TW

Applications

- Provides dispersion compensation for extended reach applications
- Provides pre- and post-compensation
- Provides single- or multi-channel dispersion compensation

Compliance

- NEBS 3
- GR-1221-Core UL
- RoHS (exemptions 7b, 8a)

Key Benefits

- Enables 2.5, 10, 40, and 100 G C-band DWDM applications
- Compensates 9/125 G.652 (NDSF) and G.655 (NZDSF) single-mode optical fiber at wide ranging compensation lengths
- Enables per-channel dispersion compensation with integrated circulator
- Improves deployment flexibility with low end-to-end insertion loss
- Simplifies mounting with compact LGX or single WaveReady slot-mounting options
- Reduces power requirements: passive optics require no power

The WaveReady Fiber Bragg Grating Dispersion Compensation Modules (WRDCMG) provide negative dispersion for dense wavelength division multiplexing (DWDM) transmission systems. They can be used to compensate dispersion on standard single-mode G.652 (NDSF) and G.655 (NZ-DSF) optical fiber (SMF) across the entire C band.

The single-slot LGX or WaveReady shelf form factor of the WRDCMG enables extended DWDM transmission in a very small footprint. When combined with WaveReady transponders and amplifiers, the WRDCMG provides a simple, reliable, and cost-effective DWDM transport solution.

The WRDCMG-20 and -40 are specifically targeted for link pre-compensation and may be used before a booster amplifier. All models may be used for inline compensation or for post-preamp applications.

The WRDCMG can support single- or multi-channel (C-band) applications at 2.5, 10, 40, and 100 G line rates.

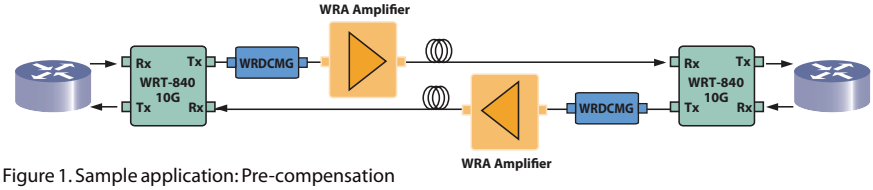

Figure 1. Sample application: Pre-compensation

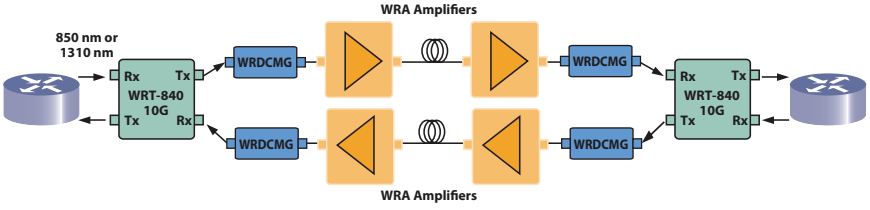

Figure 2. Sample application: Pre- and post-compensation

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Specifications[1]

Optical Parameter (Ports A/B)	WRDCMG-20LGX	WRDCMG-30LGX	WRDCMG-40LGX	WRDCMG-50LGX	WRDCM-60LGX	WRDCMG-80 and WRDCMG-80LGX	WRDCMG-100 and WRDCMG-100LGX	WRDCMG-120 and WRDCMG-120LGX
Compensated length	20 km	30 km	40 km	50 km	60 km	80 km	100 km	120 km
Input wavelengths	1527.22 – 1567.13 nm (193.3 – 191.3 THz)							
OSC passthrough wavelength	1510 nm (1503 – 1518 nm)							
Channel spacing	100 GHz							
Passband width	ITU ±17.5 GHz							
Passband flatness (insertion loss ripple)	<0.7 dB	<0.7 dB	<0.7 dB	<0.7 dB	<0.7 dB	< 0.7 dB	< 0.7 dB	< 1.0 dB
Interchannel insertion loss uniformity	<0.6 dB	<0.6 dB	<0.6 dB	<0.6 dB	<0.6 dB	<0.6 dB	<0.6 dB	<1.0 dB
Insertion loss, maximum	≤3.5 dB	≤3.5 dB	≤3.5 dB	≤3.5 dB	≤3.5 dB	≤3.5 dB	≤3.5 dB	≤3.5 dB
Dispersion, first channel (1527.22 nm)	–310 ps/nm	–464 ps/nm	–619 ps/nm	–774 ps/nm	–929 ps/nm	–1238 ps/nm	–1548 ps/nm	–1857 ps/nm
Dispersion, last channel (1567.13 nm)	–356 ps/nm	–534 ps/nm	–712 ps/nm	–890 ps/nm	–1068 ps/nm	–1423 ps/nm	–1779 ps/nm	–2135 ps/nm
Dispersion tolerance	<5 %	<5 %	<3 %	<3 %	<3 %	<3 %	<3 %	<3 %
Phase ripple standard deviation	≤0.05 rad	≤0.05 rad	≤0.05 rad	≤0.05 rad	≤0.05 rad	≤0.05 rad	≤0.05 rad	≤0.05 rad
Polarization dependent loss	<0.3 dB	<0.3 dB	<0.3 dB	<0.3 dB	<0.3 dB	<0.3 dB	<0.3 dB	<0.3 dB
Polarization mode dispersion	≤0.5 ps	≤0.5 ps	≤0.5 ps	≤0.5 ps	≤0.5 ps	≤0.7 ps	≤0.7 ps	≤0.7 ps
Return loss	<40 dB	<40 dB	<40 dB	<40 dB	<40 dB	<40 dB	<40 dB	<40 dB
Fiber type	9/125 G.652 SMF (NDSF)							

Optical Parameter (Ports A/B)	WRDCMG-80LGXTW and WRDCMG-80TW	WRDCMG-160LGXTW and WRDCMG-160TW	WRDCMG-240LGXTW and WRDCMG-240TW	WRDCMG-400LGXTW and WRDCMG-400TW
Compensated length	80 km	160 km	240 km	400 km
Input wavelengths	1528.77 – 1563.86 nm			
OSC passthrough wavelength	1510 nm (1503 – 1518 nm)			
Channel spacing	100 GHz			
Passband width	ITU ±17.5 GHz			
Passband flatness (insertion loss ripple)	≤1.0 dB	≤1.0 dB	≤1.0 dB	≤1.5 dB
Interchannel insertion loss uniformity	≤1.0 dB	≤1.0 dB	≤1.0 dB	≤1.5 dB
Insertion loss, maximum	≤3.5	≤3.5	≤3.5	≤5.5
Dispersion, first channel (1527.22 nm)	–276 ps/nm	–551 ps/nm	–827 ps/nm	–1378 ps/nm
Dispersion, last channel (1567.13 nm)	–402 ps/nm	–804 ps/nm	–1206 ps/nm	–2010 ps/nm
Dispersion tolerance	≤12 %	≤8 %	≤8 %	≤8 %
Phase ripple standard deviation	≤0.06 rad	≤0.06 rad	≤0.06 rad	≤0.08 rad
Polarization dependent loss	≤0.3 dB	≤0.3 dB	≤0.3 dB	≤0.3 dB
Polarization mode dispersion	≤0.7 ps	≤0.7 ps	≤0.7 ps	≤1.0 ps
Return loss	≤40 dB	≤40 dB	≤40 dB	≤40 dB
Fiber type	9/125 G.655 SMF (NZ-DSF)			

1. Unless otherwise noted all specifications are guaranteed over the life, operating temperatures, channel passband, and wavelength range specified.

Specifications (continued)

OSC Channel Optical Parameters

Characteristic	Minimum	Typical	Maximum
OSC BW	1503 nm	—	1518 nm
Insertion loss	0.5 dB	—	3.5 dB
Dispersion	–50 ps/nm	—	50 ps/nm
Return loss	—	>35dB	—
PDL	—	<0.3 dB	—
PMD	—	<0.2 ps	—

Environmental

Characteristic	Minimum	Typical	Maximum
Operating ambient temperature	–5°C	—	+70°C
Storage temperature	–40°C	—	+85°C
Relative humidity (noncondensing)	5%	—	95%

Physical

Characteristic	
Material specifications	Black anodized aluminum
Module width	1 LGX slot width per cassette
Size (H x W x L)	100 x 29 x 204 mm (3.94 x 1.14 x 8.03 in)
Optical connector type	Duplex LC/PC
Weight (approximate)	0.45 kg (1 lb)

Ordering Information

For more information on this or other products and their availability, please contact your local JDSU account manager or JDSU directly at 1-800-498-JDSU (5378) in North America and +800-5378-JDSU worldwide or via e-mail at sales@jdsu.com.

Description	Product Number
Single LGX slot, G.652, 20 km dispersion compensation module (= –325 ps/nm), 100 GHz channel spacing, 1510 nm OSC	WRDCMG-20LGX
Single LGX slot, G.652, 30 km dispersion compensation module (= –487 ps/nm), 100 GHz channel spacing, 1510 nm OSC	WRDCMG-30LGX
Single LGX slot, G.652, 50 km dispersion compensation module (= –812 ps/nm), 100 GHz channel spacing, 1510 nm OSC	WRDCMG-50LGX
Single LGX slot, G.652, 60 km dispersion compensation module (= –974 ps/nm), 100 GHz channel spacing, 1510 nm OSC	WRDCMG-60LGX
Single WaveReady slot, G.652, 80 km dispersion compensation module (= –1330 ps/nm), 100 GHz channel spacing, 1510 nm OSC	WRDCMG-80
Single LGX slot, G.652, 80 km dispersion compensation module (=–1330 ps/nm), 100 GHz channel spacing, 1510 nm OSC	WRDCMG-80LGX
Single WaveReady slot, G.652, 100 km dispersion compensation module (= –1660 ps/nm), 100 GHz channel spacing, 1510 nm OSC	WRDCMG-100
Single LGX slot, G.652, 100 km dispersion compensation module (=–1660 ps/nm), 100 GHz channel spacing, 1510 nm OSC	WRDCMG-100LGX
Single WaveReady slot, G.652, 120 km dispersion compensation module (= –1990 ps/nm), 100 GHz channel spacing, 1510 nm OSC	WRDCMG-120
Single LGX slot, G.652, 120 km dispersion compensation module (= –1990 ps/nm), 100 GHz channel spacing, 1510 nm OSC	WRDCMG-120LGX
Single LGX slot, G.655 NZ-DSF, 80 km dispersion compensation module (= –330 ps/nm), 100 GHz channel spacing, 1510 nm OSC	WRDCMG-80LGXTW
Single WaveReady slot, G.655 NZ-DSF, 80 km dispersion compensation module (= –330 ps/nm), 100 GHz channel spacing, 1510 nm OSC	WRDCMG-80TW
Single LGX slot, G.655 NZ-DSF, 160 km dispersion compensation module (= –675 ps/nm), 100 GHz channel spacing, 1510 nm OSC	WRDCMG-160LGXTW
Single WaveReady slot, G.655 NZ-DSF, 160 km dispersion compensation module (= –675 ps/nm), 100 GHz channel spacing, 1510 nm OSC	WRDCMG-160TW
Single LGX slot, G.655 NZ-DSF, 240 km dispersion compensation module (= –1015 ps/nm), 100 GHz channel spacing, 1510 nm OSC	WRDCMG-240LGXTW
Single WaveReady slot, G.655 NZ-DSF, 240 km dispersion compensation module (= –1015 ps/nm), 100 GHz channel spacing, 1510 nm OSC	WRDCMG-240TW
Single LGX slot, G.655 NZ-DSF, 400 km dispersion compensation module (= –1705 ps/nm), 100 GHz channel spacing, 1510 nm OSC	WRDCMG-400LGXTW
Single WaveReady slot, G.655 NZ-DSF, 400 km dispersion compensation module (= –1705 ps/nm), 100 GHz channel spacing, 1510 nm OSC	WRDCMG-400TW

LGX Rack-mount Shelves

Description	Product Number
1RU, 2-slot LGX-compatible rack-mount shelf	MDX-MN0102
2RU, 4-slot LGX-compatible rack-mount shelf	MDX-MN0204
4RU, 12-slot LGX-compatible rack-mount shelf	MDX-MN0412