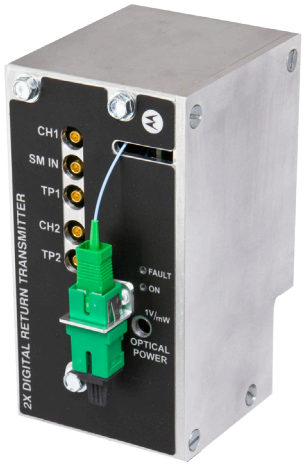
DATA SHEET



Motorola Digital Return System

STARLINE® MBN-DRT-2X Transmitter

OmniStar® GX2-DRR-2X Receiver

With the implementation of time division multiplexing, Motorola's 2X digital return simplifies segmentation in the Starline MBN and BTN.

MBN-DRT-2X

The MBN-DRT-2X uses 10-bit A/D technology to double the return bandwidth capacity and allows system operators to segment Starline® MBN and BTN node locations. The 2X Time Domain Multiplexing (TDM) system enables you to split the node return path traffic in half, treating each half as a separate return path stream. Both streams are combined on a single transmitter for optimum utilization of fiber.

The MBN-DRT-2X transmitter module uses a state-of-the-art isolated, cooled, Distributed Feedback (DFB) laser for improved link performance. These transmitters use lasers based on the International Telecommunications Union (ITU) frequency grid plan spaced at 100 GHz. The system is completely scalable and can be expanded from a single transmitter/receiver to groups of 4, 8, 16, or 32 wavelengths over a single fiber with the use of muxing and demuxing equipment. The system is compatible with Motorola low noise optical amplifiers (EDFAs), allowing network designs that cover large geographical areas. Without amplification, the Motorola 2X DWDM digital return system is capable of achieving a link loss budget of 26 dB.

The MBN-DRT-2X is also available in 16 CWDM wavelengths and a broad range 1310 nm model. These models can achieve link budgets of 21 dB. Both models incorporate an uncooled DFB laser.

Each module accepts two unique 5-65 MHz return signals at its input. Each input is digitized with a high-speed A/D converter and then multiplexed into a 3.1Gbps TDM data stream that drives the laser.

The optical detector, together with the demultiplexer, decoder, and amplifier are contained in the Omnistar® GX2-DRR-2X digital return receiver.

The MBN-DRT-2X features a fault LED to report local status information. An integrated optical bulkhead connector provides simple, quick-connect module installation and facilitates easy connector cleaning. All necessary cables required to install the MBN-DRT-2X in MBN and BTN nodes are included with every transmitter.

To facilitate easy upgrades, the MBN-DRT-2X has the same set-up levels as the analog return transmitters. The double-wide module occupies the same locations as two analog transmitters in the node lid.

BENEFITS INCLUDE:

- 5-65 MHz Return Path Operation
- 40 wavelengths ITU +8 dBm
- 16 wavelengths CDWM +3dBm
- Low cost 1310 nm solution +3dBm
- Excellent noise power ratio (NPR) 40/15
- Easy upgrade path for node segmentation
- Monitored via NODE-DOCSIS transponder
- Plug-n-Play installation and operation

GX2-DRR-2X

At the receive location, the optical signal is converted back to the TDM data stream, then demultiplexed and decoded, resulting in the two unique 5-65 MHz RF output signals.

The GX2-DRR-2X, digital return path receiver module occupies a single slot in the OmniStar GX2 optical broadband transmission platform. Available with SC/APC optical connector, the GX2-DRR-2X receiver also features convenient front panel RF test points. The receiver has a dynamic input range of 0 to -18 dBm and an RF output level capable of +50 dBmV.

Several communication methods are available for real-time monitoring and control. A tri-colored LED on each module indicates the general operating status. The optional shelf door unit with display provides monitoring and local control with an alphanumeric display and simple push button navigation.

By navigating through the GX2-DRR-2X menus, you can view status and alarms pertaining to various optical, RF, and electrical parameters. You can also make changes to selected operating parameters to customize the link. Additionally, a PC interface is available through an Ethernet port on the front panel of the GX2-CM100B control module. Using a standard Web browser, the Graphical User Interface (GUI) provides a point-and-click method of configuring modules in the OmniStar GX2 chassis.

For higher-level management, you can easily connect the OmniStar GX2 to a remote Element Management System (EMS) or Network Management System (NMS) using the standard Simple Network Management Protocol (SNMP) interface provided through an Ethernet port on the rear panel of the GX2-CM100B control module.

The GX2 Digital Return Receiver offers performance and reliability in a high-density package.

MBN-DRT-2X Digital Transmitter Modules For MBN and BTN Node

Part Number	Model Name	ITU Channel	Wavelength (nm)
575169-020-00	MBN-DRT-2X-CH20	20	1561.42
575169-021-00	MBN-DRT-2X-CH21	21	1560.61
575169-022-00	MBN-DRT-2X-CH22	22	1559.79
575169-023-00	MBN-DRT-2X-CH23	23	1558.98
575169-024-00	MBN-DRT-2X-CH24	24	1558.17
575169-025-00	MBN-DRT-2X-CH25	25	1557.36
575169-026-00	MBN-DRT-2X-CH26	26	1556.56
575169-027-00	MBN-DRT-2X-CH27	27	1555.75
575169-028-00	MBN-DRT-2X-CH28	28	1554.94
575169-029-00	MBN-DRT-2X-CH29	29	1554.13
575169-030-00	MBN-DRT-2X-CH30	30	1553.33
575169-031-00	MBN-DRT-2X-CH31	31	1552.52
575169-032-00	MBN-DRT-2X-CH32	32	1551.72
575169-033-00	MBN-DRT-2X-CH33	33	1550.92
575169-034-00	MBN-DRT-2X-CH34	34	1550.12
575169-035-00	MBN-DRT-2X-CH35	35	1549.32
575169-036-00	MBN-DRT-2X-CH36	36	1548.52
575169-037-00	MBN-DRT-2X-CH37	37	1547.72
575169-038-00	MBN-DRT-2X-CH38	38	1546.92
575169-039-00	MBN-DRT-2X-CH39	39	1546.12
575169-040-00	MBN-DRT-2X-CH40	40	1545.33
575169-041-00	MBN-DRT-2X-CH41	41	1544.53
575169-042-00	MBN-DRT-2X-CH42	42	1543.73
575169-043-00	MBN-DRT-2X-CH43	43	1542.94
575169-044-00	MBN-DRT-2X-CH44	44	1542.14
575169-045-00	MBN-DRT-2X-CH45	45	1541.35
575169-046-00	MBN-DRT-2X-CH46	46	1540.56
575169-047-00	MBN-DRT-2X-CH47	47	1539.77
575169-048-00	MBN-DRT-2X-CH48	48	1538.98
575169-049-00	MBN-DRT-2X-CH49	49	1538.19
575169-050-00	MBN-DRT-2X-CH50	50	1537.4
575169-051-00	MBN-DRT-2X-CH51	51	1536.61
575169-052-00	MBN-DRT-2X-CH52	52	1535.82
575169-053-00	MBN-DRT-2X-CH53	53	1535.04
575169-054-00	MBN-DRT-2X-CH54	54	1534.25
575169-055-00	MBN-DRT-2X-CH55	55	1533.47
575169-056-00	MBN-DRT-2X-CH56	56	1532.68
575169-057-00	MBN-DRT-2X-CH57	57	1531.9
575169-058-00	MBN-DRT-2X-CH58	58	1531.12
575169-059-00	MBN-DRT-2X-CH59	59	1530.33

2X Digital Transmitter Modules for MBN and BTN Node

Part Number	Model Name	Wavelength (nm)
575300-001-00	MBN-DRT-2X-1270nm-CWDM-R	1271
575300-002-00	MBN-DRT-2X-1290nm-CWDM-R	1291
575300-003-00	MBN-DRT-2X-1310nm-CWDM-R	1311
575300-004-00	MBN-DRT-2X-1330nm-CWDM-R	1331
575300-005-00	MBN-DRT-2X-1350nm-CWDM-R	1351
575300-006-00	MBN-DRT-2X-1370nm-CWDM-R	1371
575300-007-00	MBN-DRT-2X-1430nm-CWDM-R	1431
575300-008-00	MBN-DRT-2X-1450nm-CWDM-R	1451
575300-009-00	MBN-DRT-2X-1470nm-CWDM-R	1471
575300-010-00	MBN-DRT-2X-1490nm-CWDM-R	1491
575300-011-00	MBN-DRT-2X-1510nm-CWDM-R	1511
575300-012-00	MBN-DRT-2X-1530nm-CWDM-R	1531
575300-013-00	MBN-DRT-2X-1550nm-CWDM-R	1551
575300-014-00	MBN-DRT-2X-1570nm-CWDM-R	1571
575300-015-00	MBN-DRT-2X-1590nm-CWDM-R	1591
575300-016-00	MBN-DRT-2X-1610nm-CWDM-R	1611

2X Digital Transmitter Modules for MBN and BTN Node

Part Number	Model Name	Wavelength (nm)
575299-001-00	MBN-DRT-2X-1310-R	1310

GX2-DRR-2X Digital Receiver Module

Part Number	Model Name
528784-001-00	GX2-DRR-2X-R

Module Specifications

MBN-DRT-2X TRANSMITTER

OPTICAL	
Optical Wavelength	See previous tables
Wavelength Stability (ITU)	+/- 0.1 nm Max.
Wavelength Stability (CWDM)	+/- 7.5 nm
Optical Output Power (ITU)	+8 dBm
Optical Output Power (CWDM)	+3 dBm
Optical Power Test Point Scale	1 V/mW
Optical Connector Type	SC/APC
Optical Output Return Loss	–40 dB Min.

RF	
Operational Bandwidth	5 - 65 MHz
Recommended RF Input Level	19.5 dBmV, Total power per RF input [3]
Number of Input Channels	2
RF Input Connectors	2 top-side SMB
RF Input Return Loss	16 dB Min.
RF Input Impedance	75 Ohms

GENERAL	
Dimensions	3.375 in D x 2.45 in W x 4.625 in L (8.59 cm x 6.22 cm x 11.76 cm)
Weight	1.06 lbs. (0.58 kgs)
Node Operating Temperature Range	–40° C to +60° C (–40° F to +140° F)
Power Consumption	12 W Max.
Visual Interface	Module Status LEDs

GX2-DRR-2X RECEIVER

OPTICAL	
Optical Input Range	–18 to 0 dBm [4]
Optical Connector Type	SC/APC
Optical Input Return Loss	–40 dB Min.

RF	
Operational Bandwidth	5 - 65 MHz
Output Level	+50 dBmV Max.
Number of Output Channels	2
Output Return Loss	16 dB Min.
Output Impedance	75 Ohms
RF Output Test Point	–20 +/- 0.5 dB
Gain Attenuator Range	20 dB
RF Connector Types	
Output	F-type (using G-to-F adaptor on chassis)
Test Points	F-type

GENERAL	
Dimensions	5.9in H x 1.0 in W x 15 in D (15 cm x 2.5 cm x 38 cm)
Mounting Shelf	GX2-HSG*
Operating Temperature Range	–20°C to +55° C (–4° F to +131° F)
Weight	2.0 lbs. (0.91 kgs)
Power Consumption	17 W Max.
Visual Interface	Module Status LED

Link Specifications

Noise Power Ratio (NPR)[1]	40 dB over 15 dB dynamic range
RF gain variation over temperature	+/- 1.0 dB
Group Delay[2]	
5 to 9 MHz	30 ns
9 to 61 MHz	15 ns
61 to 65 MHz	30 ns

Notes:
All parameters meet the specified requirements over the entire operating temperature range unless otherwise noted.

1. 37 MHz Loading. Measured with GX2-DRR-2X receiver. Required input level to the Tx is +22.5 dBmV to achieve the link NPR curve peak. Tested with 100 km of fiber. For ITU models only.
2. In any 4 MHz band within the specified bandwidth.
3. All MBN transmitters operate with a nominal 28 dBmV total power at the node housing input.
4. Range includes 2 dB QAM dispersion penalty and connector loss for DWDM and 2.5 dB QAM dispersion penalty and connector loss for CWDM.

Specifications are subject to change without notice.

MOTOROLA

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