WaveReady® WRT-780

Dual Multirate WDM Transponder (125 Mbps–4.25 Gbps)

Key Features

- Provides automatic rate detection (125 Mbps–4.25 Gbps)
- Supports flexible, pluggable SFP interfaces on both line and client interfaces
- Supports both CWDM and DWDM line side optics
- Supports diagnostic loopback on all ports
- Provides 3R Regeneration on all ports
- Supports Dual transponder or Quad regenerator modes

Applications

- Enables high-density DWDM and CWDM transport networks
- Offers a cost-effective Ethernet over WDM solution
- Extends the reach of SANs and Gigabit Ethernet (GigE)
- Provides wavelength services and metro optical access overlay
- Uncompressed video transport

Compliance

- Telcordia GR-253
- NEBS 3
- FCC Part 15, Class A device
- UL 60950-1 first edition
- Class 1 laser safety
- RoHS (exemptions 7b, 8a)

IBM System Storage Proven™

Brocade Data Center Ready

Flexible WDM Transport Solution

The JDSU WaveReady WRT-780 is a dual multirate transponder that can support an extended number of services for both coarse (CWDM) and dense wavelength division multiplexing (DWDM) transport applications. Due to its high flexibility and density, the WRT-780 is the ideal transport solution for access and metro wavelength division multiplexing (WDM) networks.

The module has two independent transponders that can transport traffic running at different rates. The WRT-780 can also be used as a bidirectional four-port regenerator. Its flexible pluggable (SFP) interfaces support a variety of trans-ceivers on both client and line interfaces (Copper, 850, 1310, and 1550 nm; DWDM; and CWDM).

Automatic Rate Detection

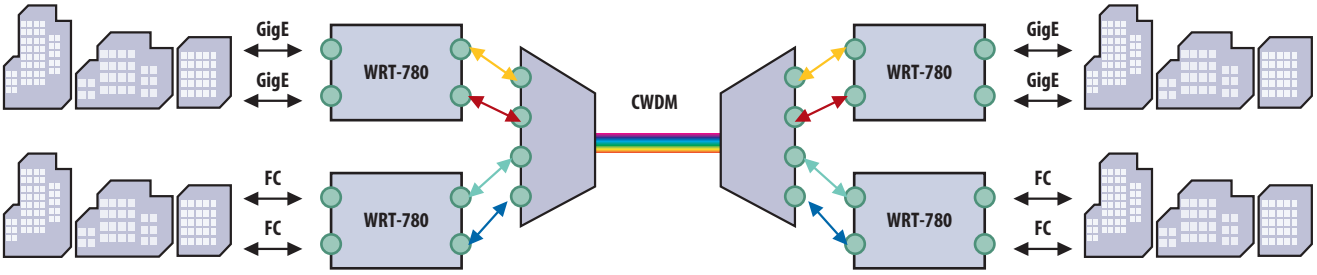
The WRT-780 automatically detects incoming data rates so end-user provisioning is not required. The WRT-780 supports 3R operation (reshape, retime, and regenerate) at all supported rates between 125 Mbps and 4.25 Gbps.

Simple and Easy to Manage

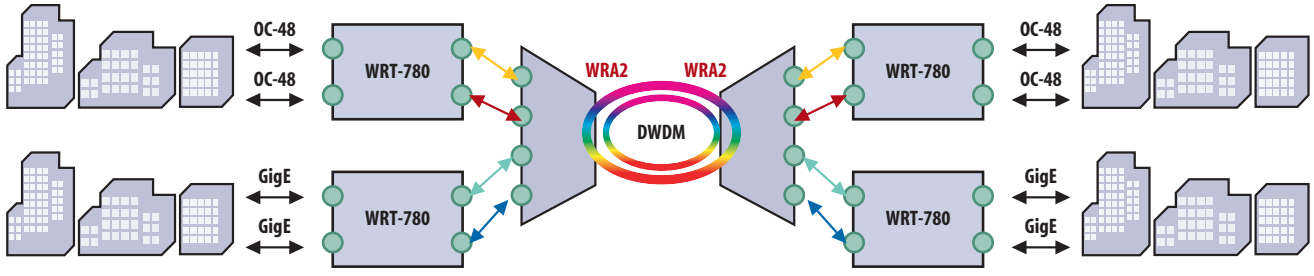
The WRT-780 can be managed using TL-1, simple network management protocol (SNMP), or by using the WaveReady Node Manager graphical user interface. The dual-transponder also supports manual data-rate provisioning, diagnostic loopback for testing, optical power monitoring, and other features. These functions facilitate fault location and correction and simplify operations required by service management and service level agreements.

WRT-780 Dual Multirate WDM Transponder

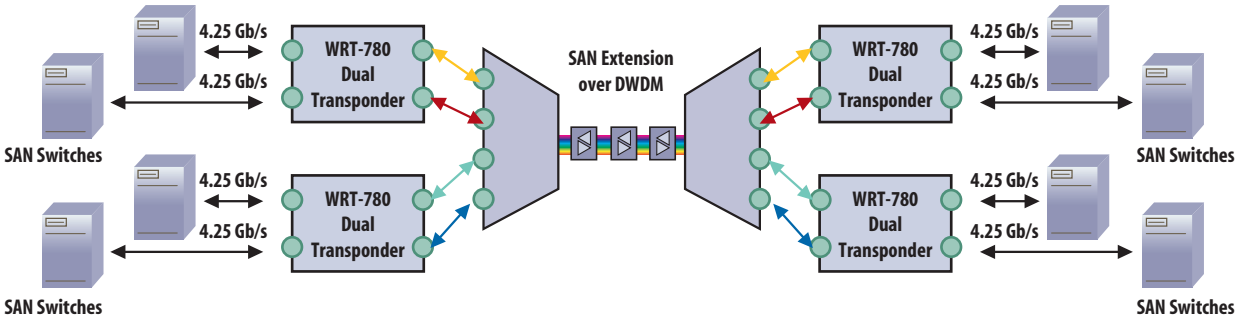
Because of its high density and flexibility, the WRT-780 enables reliable, scalable and cost-effective transport solutions for both CWDM and/or DWDM networks. The easy-to-use WRT-780 transponder combined with the plug-and-play features of the WaveReady platform makes the turn-up of new services easy and simplifies equipment management.



Where extended reach is required, the WRT-780 can be combined with WaveReady DWDM amplifiers and dispersion compensation modules to provide a dense and compact DWDM transport solution.



With the growing need to have storage area networks (SANs) extended over long distances to support enterprise connectivity or disaster and recovery solutions, the WRT-780 can be combined with the WaveReady WDM platform to offer a simple, reliable, and cost-effective SAN transport solution.



The following table lists data rates that the WRT-780 supports:

Protocol	Bit Rate (Mbps)	WRT-780DT000B
Fast Ethernet	125	√
SONET OC-3/SDH STM-1	155.52	√
ESCON	200	√
Ficon/Fibre Channel 25FC	265.63	√
Ficon/Fibre Channel FC50	531.25	√
SONET OC-12/SDH STM-4	622.08	√
Ficon/Fibre Channel FC100	1062.5	√
Gigabit Ethernet	1250	√
HD-SDI SMPTE 292M	1485	√
Ficon/Fibre Channel FC200	2125	√
SONET OC-48/SDH STM-16	2488.32	√
SONET OC-48 FEC (G.709 OTU1)	2666.06	√
IEEE802.3 10GBaseLX4	3125	√
Ficon/Fibre Channel FC400	4250	√
SD-SDI Video Signal	270	√
HD-SDI Video Signal NTSC	1483	√
HD-SDI Video Signal PAL	1485	√
CPRI1	614.1	√
CPRI2	1228.8	√
CPRI3	2456.6	√
CPRI4	3072	√

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Specifications[1]

Electrical

Parameter	Minimum	Typical	Maximum
DC supply voltage	—	–48 V	—
Power dissipation	—	10 W	16 W[2]
Alarm relay signals		Dry contact major and minor alarms. Relay open under normal operation. Relay closed when power is off.	

Physical

Parameter	Minimum	Typical	Maximum
Size (H x W x L)		17.5 x 2.5 x 22.3 cm (6.8 x 1 x 8.8 in)	
Weight (approximate)		1.4 kg (3.1 lbs)	

Parameter

Parameter	Minimum	Typical	Maximum
Normal operating temperature	0°C	—	40°C
Extended operating temperature	–5°C	—	55°C
Storage temperature	–40°C	—	85°C
Relative humidity (noncondensing)	5%	—	90%

Interface

Interface	Description
Optical	LC/PC on all ports
Craft	Requires WaveReady 3100 or 3500F series shelf and a WaveReady COM200 communications module. Craft access through RS-232/DB-9 connector on front panel of COM200 module.
TL1/SNMP	Requires WaveReady 3500F series shelf and a WaveReady COM200 communications module. TL1/SNMP interfaces via the 10/100BaseT Ethernet/RJ45 connector on the front panel of a COM200.
Front panel	Seven LEDs: **CARD** (power); **MAJ/CRIT** (major/critical alarm); **MIN** (minor alarm); **PORT 1-1** (port status); **PORT 1-2** (port status); **PORT 2-1** (port status); **PORT 2-2** (port status)

1. Electrical specifications assume installation in a WaveReady 3500F shelf (DMS-3500FSE03).
2. Assumes 4 DWDM SFPs are installed in the WRT-780.

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Supported SFPs

Client SFPs

Description	Part Number	Bit-Rate (Mbps)	Launch Power (dBm)	Reach	Receiver Sensitivity[3] (dBm)
SFP Transceiver, Dual speed (10/100/1000BaseT) Copper, 100 m	WRT-SFPBT1000SC	12.5, 125, 1250	N/A	100 m	N/A
SFP Transceiver, Multirate (155–2700 Mbps) with DDM, 1310 nm, 5–10 km	WRT-SFPS24SC1310	155–2667	–9.5	10 km 5 km	–22 (GigE) –18 (OC-48)
SFP Transceiver, Multirate (155–2700 Mbps) with DDM, 1310 nm, 20–30 km	WRT-SFPS24SCIR1	155–2667	–5	30 km 20 km	–22 (GigE) –18 (OC-48)
SFP Transceiver, Dual rate (1062, 1250 Mbps) with DDM, 1310 nm, 10 km	WRT-SFPS10SC1310	1062–1250	–9.5	10 km	–19 (GigE) –21 (1 Gbps)
SFP Transceiver, Tri rate (1062, 2125, 4250 Mbps) with DDM, 1310 nm, 20 km	WRT-SFPS42SC1310	1062–4250	–8.4	28 km 20 km	–19 (1 Gbps) –16.2 (4.25 Gbps)
SFP Transceiver, Tri rate (1062, 1250, 2125 Mbps) with DDM, 850 nm Multimode	WRT-SFPM20SC0850	1062–2125	–9.5	0.5–500 m[4]	–17 (1Gbps) –15.0 (2 Gbps)
SFP Transceiver, Tri rate (1062, 2125, 4250 Mbps) SFP with DDM, 850 nm Multimode	WRT-SFPM42SC0850	1062–4250	–9	0.5–500 m	–17 (1Gbps) –14 (4.25 Gbps)

Video Copper SFPs

Description	Part Number	Bit-Rate	Launch Power	Reach (m)	Receiver Sensitivity
SFP, Video BNC RX PAL	WRT-SFPBV1485SBRXP	270 Mbps,1.485 Gbps	N/A	140	N/A
SFP, Video BNC RX NTSC	WRT-SFPBV1485SBRXN	270 Mbps+1.485/1.001 Gbps	N/A	140	N/A
SFP, Video BNC TX PAL	WRT-SFPBV1485SBTXP	270 Mbps,1.485 Gbps	N/A	140	N/A
SFP, Video BNC TX NTSC	WRT-SFPBV1485SBTXN	270Mbps+1.485/1.001 Gbps	N/A	140	N/A

CWDM SFPs

Description	Part Number	Bit-Rate (Mbps)	Launch Power	Reach	Receiver Sensitivity
SFP Transceiver, Multirate (125–2700 Mbps) with DDM, CWDM, 80 km (See CWDM table for wavelength)	WRT-SFPL3C24SC-0YY[6]	125–2667	0	80	–285
SFP Transceiver, Tri-rate (1062, 2125, 4250 Mbps) with DDM, CWDM, 30–50 km (See CWDM table for wavelength)	WRT-SFPI3C42SC-0YY[6]	1062–4250	1	50 50 30	–16.5 (1.06 Gbps)[7] –17.6 (2.125 Gbps) –14.7 (4.25 Gbps)
SFP Transceiver, Single-rate (1250 Mbps) with DDM, CWDM, 120 km (See CWDM table for wavelength)	WRT-SFPL3C10SC-0YY[6]	1250	0	120	–32
SFP Transceiver, SONET OC-3/SDH STM-1, 1510nm CWDM, for OSC Application 180 km	WRT-SFPL3C03SC510	125–155	0	180	–44

3. Values quoted are for worst-case extinction ratio and BER of 1 x 10^{-10}.
4. Depends on the fiber type and data rate.
5. Dispersion penalty of 2.5 dB.
6. YY indicate the CWDM Channel as per CWDM Channel table.
7. Dispersion penalty of 2 dB (2 Gbps) and 3 dB (4.25 Gbps).

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Specifications

DWDM SFPs

Description	Part Number	Bit-Rate (Mbps)	Launch Power	Reach [8]	Receiver Sensitivity
SFP Transceiver, Multirate (125–2700 Mbps) with DDM, DWDM, 120 km (See DWDM table for wavelength)	WRT-SFPL3T24SC-0XX	125–2667	0	120	–28[9]
SFP Transceiver, Tri rate (1062, 2125, 4250 Mbps) with DDM, DWDM, 80–90 km	WRT-SFPL3T42SC-0XX[10]	1062–4250	3 80	90 –24 (4.25 G FC)	–28 (1.06 / 2.125 Gbps)[11] (See DWDM table for wavelength)

CWDM SFPs support the following wavelengths (λ). The channel number is used in the part number suffix YY. For example, a 2.5 Gbps CWDM SFP using wavelength 1590 nm would be WRT-SFPL3C24SC-059.

Channel	Wavelength Number λ (nm)
47	1470
49	1490
51	1510
53	1530
55	1550
57	1570
59	1590
61	1610

DWDM SFPs support the following ITU frequencies and wavelengths (λ). The ITU channel number is used in the part number suffix XX. For example, the part number for a 2.5 Gbps DWDM SFP using wavelength 1529.55 nm is WRT-SFPL3T24SC-060.

ITU Number	Frequency (THz)	Wavelength λ (nm)	ITU Number	Frequency (THz)	Wavelength λ (nm)	ITU Number	Frequency (THz)	Wavelength λ (nm)
60	196.00	1529.55	45	194.50	1541.35	30	193.00	1553.33
59	195.90	1530.33	44	194.40	1542.14	29	192.90	1554.13
58	195.80	1531.12	43	194.30	1542.94	28	192.80	1554.94
57	195.70	1531.90	42	194.20	1543.73	27	192.70	1555.75
56	195.60	1532.68	41	194.10	1544.53	26	192.60	1556.55
55	195.50	1533.47	40	194.00	1545.32	25	192.50	1557.36
54	195.40	1534.25	39	193.90	1546.12	24	192.40	1558.17
53	195.30	1535.04	38	193.80	1547.92	23	192.30	1558.98
52	195.20	1535.82	37	193.70	1547.72	22	192.20	1559.79
51	195.10	1536.61	36	193.60	1548.51	21	192.10	1560.61
50	195.00	1537.40	35	193.50	1549.32	20	192.00	1561.42
49	194.90	1538.19	34	193.40	1550.12	19	191.90	1562.23
48	194.80	1538.98	33	193.30	1550.92	18	191.80	1563.05
47	194.70	1539.77	32	193.20	1551.72			
46	194.60	1540.56	31	193.10	1552.52			

8. Reach in this case is specified as per the dispersion reach assuming a worst case of 20 ps/km.
9. Dispersion penalty of 3 dB.
10. XX indicates the DWDM Channel as per the DWDM Channel table.
11. Dispersion penalty of 3 dB.

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Ordering Information

For more information on WaveReady 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, +1 800-5378-JDSU worldwide or via e-mail at sales@jdsu.com.

Product Code	Description
WRT-780DT000B	Dual Multirate Transponder (125 Mbps–4.25 Gbps)

Associated parts

Product Code	Description
DMS-3500FSE03	WR3500F Shelf
DMS-3500FSE04	WR3500F High Power Shelf
COM-200ET003Y-M4.8	Communication Module 200 (COM-200) with WaveReady System Release 4.8 and one Multi-Node Manager license
WRA-217C0001B	Multichannel C-Band Optical Amplifier, +17 dBm
WRA-11X	Single Channel, Optical Amplifier (+10 dBm up to +19 dBm)
WRT-SFPS24SC1310	SFP Transceiver, Multirate (155–2700 Mbps) with DDM, 1310 nm, 5–10 km
WRT-SFPS24SCIR1	SFP Transceiver, Multirate (155–2700 Mbps) with DDM, 1310 nm, 20–30 km
WRT-SFPL3C24SC-0xx	SFP Transceiver, Multirate (125–2700 Mbps) with DDM, CWDM, 80 km
WRT-SFPI3C42SC-0xx	SFP Transceiver, Dual rate (2125, 4250 Mbps) with DDM, CWDM, 30–50 km
WRT-SFPL3C10SC-0YY	SFP Transceiver, Single-rate (1250 Mbps) with DDM, CWDM, 120 km
WRT-SFPBV1485SBRXP	SFP, Video BNC RX PAL
WRT-SFPBV1485SBRXN	SFP, Video BNC RX NTSC
WRT-SFPBV1485SBTXP	SFP, Video BNC TX PAL
WRT-SFPBV1485SBTXN	SFP, Video BNC TX NTSC
WRT-SFPL3C03SC510	SFP Transceiver, SONET OC-3/SDH STM-1, 1510nm CWDM, for OSC Application 180 km
WRT-SFPL3T24SC-0xx	SFP Transceiver, Multirate (125–2700 Mbps) with DDM, DWDM, 120 km
WRT-SFPL3T42SC-0xx	SFP Transceiver, Tri rate (1062, 2125, 4250 Mbps) with DDM, DWDM, 80–120 km
WRT-SFPM42SC0850	SFP Transceiver, Tri rate (1062, 2125, 4250 Mbps) SFP with DDM, 850 nm Multimode
WRT-SFPM20SC0850	SFP Transceiver, Tri rate (1062, 1250, 2125 Mbps) with DDM, 850 nm Multimode
WRT-SFPS42SC1310	SFP Transceiver, Tri rate (1062, 2125, 4250 Mbps) with DDM, 1310 nm, 20 km
WRT-SFPS10SC1310	SFP Transceiver, Dual rate (1062, 1250 Mbps) with DDM, 1310 nm, 10 km
WRT-SFPBT1000SC	SFP Transceiver, Dual speed (100/1000BaseT) Copper, 100 m

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