

WaveReady™ WRT-780

Dual Multirate WDM Transponder (125 Mb/s–4.25 Gb/s)



Key Features

- Provides automatic rate detection (125 Mb/s–4.25 Gb/s)
- 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
- Supports 3R Regeneration on all ports

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

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)



**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 transceivers on both client and line interfaces (850, 1310, and 1550 nm; DWDM; and CWDM).

Automatic Rate Detection

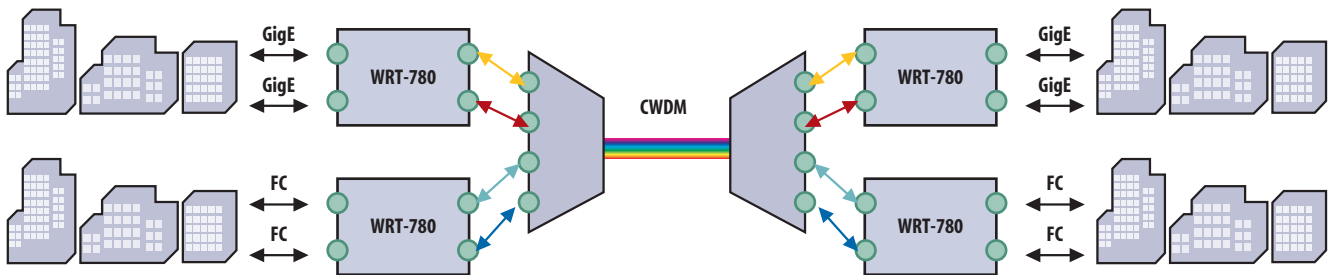
The WRT-780 automatically detects incoming data rates so end-user provisioning is not required. The WRT-780 supports 3R operation (reshape, retune, and regenerate) at all supported rates between 125 Mb/s and 4.25 Gb/s.

Simple and Easy to Manage

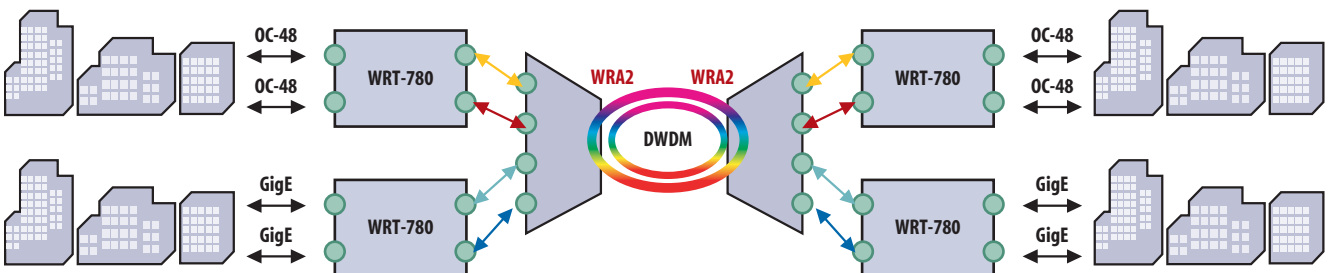
The WRT-780 can be managed using TL-1, simple network management protocol (SNMP), or by using the WaveReady Node Manager graphical user interface. The dual-transponder also supports manual data-rate provisioning, diagnostic loopback for testing, optical power monitoring, and other features. These functions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

WRT-780 Dual Multirate WDM Transponder

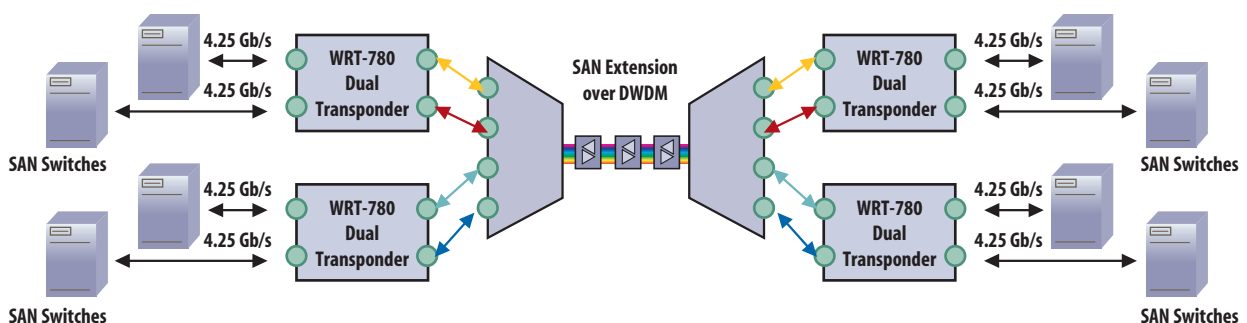
Because of its high density and flexibility, the WRT-780 enables reliable, scalable and cost-effective transport solutions for both CWDM and/or DWDM networks. The easy-to-use WRT-780 transponder combined with the plug-and-play features of the WaveReady platform makes the turn-up of new services easy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



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

Protocol	Bit Rate (Mb/s)
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

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Electrical Specifications¹

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.		

1. Electrical specifications assume installation in a WaveReady 3500F shelf (DMS-3500FSE03).

2. Assumes 4 DWDM SFPs are installed in the WRT-780.

Physical Specifications

Parameter	Typical
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)

Environmental Specifications

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 (non-condensing)	5%	—	90%

Interface Specifications

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)

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Supported Client SFPs

Description	Part Number	Bit-Rate (Mb/s)	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 Mb/s) 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 Mb/s) 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 Mb/s) with DDM, 1310 nm, 10 km	WRT-SFPS10SC1310	1062–1250	–9.5	10 km	–19 (GigE) –21 (1 Gb/s)
SFP Transceiver, Tri rate (1062, 2125, 4250 Mb/s) with DDM, 1310 nm, 20 km	WRT-SFPS42SC1310	1062–4250	–8.4	28 km 20 km	–19 (1 Gb/s) –16.2 (4.25 Gb/s)
SFP Transceiver, Tri rate (1062, 1250, 2125 Mb/s) with DDM, 850 nm Multimode	WRT-SFPM20SC0850	1062–2125	–9.5	0.5–500 m ⁴	–17 (1 Gb/s) –15.0 (2 Gb/s)
SFP Transceiver, Tri rate (1062, 2125, 4250 Mb/s) SFP with DDM, 850 nm Multimode	WRT-SFPM42SC0850	1062–4250	–9	0.5–500 m	–17 (1 Gb/s) –14 (4.25 Gb/s)

3. Values quoted are for worst-case extinction ratio and BER of 1×10^{-10} .

4. Depends on the fiber type and data rate.

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Supported CWDM SFPs

Description	Part Number	Bit-Rate (Mb/s)	Launch Power (dBm)	Reach (km)	Receiver Sensitivity (dBm)
SFP Transceiver, Multirate (125–2700 Mb/s) with DDM, CWDM, 80 km (See CWDM table for wavelength)	WRT-SFPL3C24SC-0YY	125–2667	0	80	–28 ⁵
SFP Transceiver, Tri-rate (1062, 2125, 4250 Mb/s) with DDM, CWDM, 30–50 km (See CWDM table for wavelength)	WRT-SFPI3C42SC-0YY ⁶	1062–4250	1	50 50 30	–16.5 (1 Gb/s) ⁷ –17.6 (2 Gb/s) –14.7 (4.25 Gb/s)

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 Gb/s) and 3 dB (4.25 Gb/s).

Supported DWDM SFPs

Description	Part Number	Bit-Rate (Mb/s)	Launch Power (dBm)	Reach ⁸ (km)	Receiver Sensitivity (dBm)
SFP Transceiver, Multirate (125–2700 Mb/s) 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 Mb/s) with DDM, DWDM, 80–120 km (See DWDM table for wavelength)	WRT-SFPL3T42SC-0XX ¹⁰	1062–4250	2	120 80	–28 (2 Gb/s) ¹¹ –23 (4 G FC)

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

Channel Number	Wavelength λ (nm)
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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 Gb/s 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			

Product 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 Mb/s–4.25 Gb/s)

Associated Parts

Product Code	Description
DMS-3500F5E03	WR3500F Shelf
COM-200ET003Y	COM200 Communication module
WRA-217C0001B	Multichannel C-Band Optical Amplifier, +17 dBm
WRA-11X	Single Channel, Optical Amplifier (+10 dBm up to +19 dBm)
WRT-SFPS245C1310	SFP Transceiver, Multirate (155–2700 Mb/s) with DDM, 1310 nm, 5–10 km
WRT-SFPS245CIR1	SFP Transceiver, Multirate (155–2700 Mb/s) with DDM, 1310 nm, 20–30 km
WRT-SFPL3C245C-0xx	SFP Transceiver, Multirate (125–2700 Mb/s) with DDM, CWDM, 80 km
WRT-SFPI3C425C-0xx	SFP Transceiver, Dual rate (2125, 4250 Mb/s) with DDM, CWDM, 30–50 km
WRT-SFPL3T245C-0xx	SFP Transceiver, Multirate (125–2700 Mb/s) with DDM, DWDM, 120 km
WRT-SFPL3T425C-0xx	SFP Transceiver, Tri rate (1062, 2125, 4250 Mb/s) with DDM, DWDM, 80–120 km
WRT-SFPM425C0850	SFP Transceiver, Tri rate (1062, 2125, 4250 Mb/s) SFP with DDM, 850 nm Multimode
WRT-SFPM205C0850	SFP Transceiver, Tri rate (1062, 1250, 2125 Mb/s) with DDM, 850 nm Multimode
WRT-SFPS425C1310	SFP Transceiver, Tri rate (1062, 2125, 4250 Mb/s) with DDM, 1310 nm, 20 km
WRT-SFPS105C1310	SFP Transceiver, Dual rate (1062, 1250 Mb/s) with DDM, 1310 nm, 10 km
WRT-SFPBT1000SC	SFP Transceiver, Dual speed (100/1000BaseT) Copper, 100 m