Extended Reach, Client-Side SFP, Multi-Rate, Multi-Protocol, DWDM, 3R Transponder

WaveReady™ Transponder 740 XLR

Key Features

• **Client-side SFP modules support either single-mode fiber (SMF) or multimode fiber (MMF)**

• **Automatic bit-rate detection and reporting**

• **Multiple protocols supported at discrete bit rates of 125 Mb/s to 3.125 Gb/s**

• **Network optics support 16 ITU wavelengths on a 100 GHz grid over distances up to 180 km, without dispersion compensation or amplification**

• **Facility loopback functionality on both network and client sides**

• **Remote management via SNMP traps or TL1**

• **3R functionality at all supported bit rates and protocols**

Applications

• Wavelength services
• Metro optical access overlay
• Storage area network (SAN) and GigE extension services

Compliance

• FCC Part 15 (Class A); UL 60950 3rd Edition, December 2000; CAN/CSA-C22.2 No. 950-95; NEBS Level 3; GR-63-CORE; GR-1089-CORE; GR-78-CORE; CE; IEC 60950; ETS300-386; EN 55022 (Class B); 73/23/EEC

The WaveReady Transponder 740 (WRT-740) is a multi-rate, multi-protocol, auto-lock module that translates optical signals between a variety of client-side interfaces into a long-reach, single-mode, dense wavelength division multiplexing (DWDM) interface. This module includes small form factor pluggable (SFP) modules on the client side, loopback, and 3R (reshape, retime and re-amplify/regenerate) functionality.

SFP modules optimized for a wide range of protocols are available for single-mode and multimode fiber. Supported protocols include 100Base-FX Ethernet, Gigabit Ethernet (GigE), ESCON, Fibre channel, FICON, and OC-3 to OC-48. Supported data rates range from 125 Mb/s to 3.125 Gb/s. The WRT-740's bit-rate and protocol independence gives service providers the flexibility to meet the shifting service demands of customers without changing installed equipment.

Remote management lowers operating, administration and management expenditures (OPEX). A WaveReady communications module manages the WRT-740 with TL1 and a command line or telnet interface, or with TL1 or simple network management protocol (SNMP) and the JDSU Node Manager software. An embedded supervisory channel on the network side is also available for remote management of standalone modules without the cost of extra fiber or an extra WaveReady communications module.
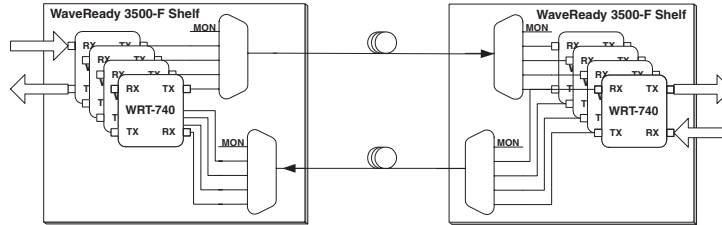
Full 3R functionality allows multiple WRT-740 modules to be deployed in series for very long reach applications. Loopback facilitates fault isolation and troubleshooting.
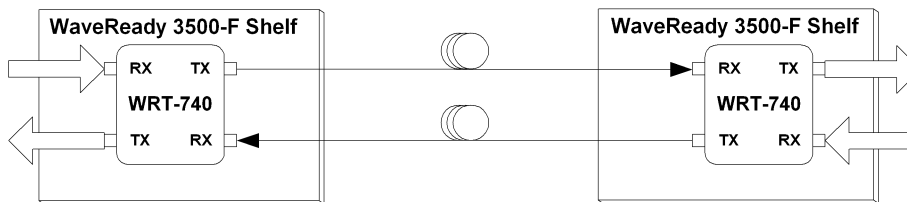
**Brocade
Data Center
Ready**

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Point-to-Point Four-Channel DWDM Link

Typical Link Budget

Data Rate	Minimum Rx Power	Total Power Budget	Maximum Distance
OC-48	-28.5 dBm	27.9 dB	111 km
Gigabit Ethernet	-30 dBm	29.4 dB	117 km

Point-to-point Single Channel DWDM Link

Typical Link Budget

Data Rate	Minimum Rx Power	Total Power Budget	Maximum Distance
OC-48	-28.5 dBm	33.5 dB	134 km
Gigabit Ethernet	-30 dBm	35 dB	140 km

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Network Optical Specifications

Parameter		Specifications
Optical Path between Transmitter and Receiver Connectors		
Dispersion at OC-48	Maximum	3240 ps/nm
Optical return loss of cable plant, including any connectors	Minimum	24 dB
Discrete reflectance between transmit and receive connectors	Maximum	27 dB
Maximum link budget at OC-48 including dispersion	Minimum	31.5 dB
	Typical	36 dB
Transmitter		
Wavelength range on ITU grid		1530 to 1561 nm
Frequency range (32 frequencies, 100 GHz spacing)		192.1 to 195.9 THz
Wavelength accuracy	Maximum	100 pm
Mean output power	Minimum	5 dBm
	Typical	7 dBm
	Maximum	10 dBm
Extinction ratio	Minimum	8.2 dB
	Typical	9.5 dB [1]
Receiver		
Sensitivity at 100BaseF to GE, BER=1×10^{-10}	Minimum	-30 dBm
Sensitivity at OC-48, BER=1×10^{-10}	Minimum	-28.5 dBm
Overload	Minimum	-8 dBm [2]
OSNR tolerance at BER=1×10^{-12}	Minimum	20 dB [3]
Optical path penalty on standard single-mode fiber	Maximum	2 dB [4]
Reflectance of receiver at receiver connector	Maximum	-27 dB
LOS activation threshold	Typical	-32 dBm
LOS deactivation threshold	Typical	-30 dBm

Note: All specifications are guaranteed over the life, operating temperatures, wavelength range, and input voltage range specified. This product should be deployed in accordance with each company's deployment directives.
1. At OC-48
2. Management communications at OC-3 require input power less than -15 dBm
3. With receive power of -27 dBm with no other signal impairments at EOL over all temperature ranges
4. Dispersion penalty only

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Other Specifications

Parameter	Condition		Specifications
Electrical			
Power consumption	Over temperature range EOL	Typical	16.5 W
		Maximum	20 W
Supply voltage[1]		Minimum	38 V
		Typical	48 V
		Maximum	60 V
Environmental			
Storage temperature			-40 to 85 °C
Ambient operating temperature	-5 to 55 °C short term, 96 hours continuous. No more than 15 days per year.		-5 to 55 °C
Humidity	Non-condensing		5 to 95%
Mechanical			
Weight (approximate)			1.4 kg (3.1 pounds)
Dimensions (WxHxD)			25.4 x 223.5 x 175 mm (1.0 x 6.89 x 8.8 inches)
Mounting options			WaveReady 3500-F or fan-equipped WaveReady 3100 shelf in standard 19- or 24-inch rack

1. The DC power supply must be -48 V SELV output and certified by a nationally recognized test laboratory (NRTL)

Interface Specifications

| Parameter	Specification
Provisioning, operations, administration, maintenance	Via the WaveReady Communication Module 200. Remote management: SNMP and TL1 command mode through JDS Uniphase Node Manager software or TL1 through telnet or command-line application or SNMP. Communication with remote modules through an embedded supervisory channel.
Front panel LEDs	CARD (power), MAJ/CRIT (major or critical alarm), MIN (minor alarm), LOS B, LOS D, LOS F (loss of lock) LOOPBK (loopback), MGT (management).
Front panel ports	Client side ports A and B single mode or multimode fiber (SMF or MMF), SFP1, SFP2, SFP3, SFP4 or SFP5. Network side ports: C and D, SMF.
Alarms	CARD (power), MAJ/CRIT (major or critical alarm), MIN (minor alarm), LOS B, LOS D (loss of lock). Alarm relay open under normal operation. Relay closed when power is off and alarm is active.

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Compatibility of Client SFPs

Protocol	Bit Rate	SFP
SMF Fiber		
100Base-FX Ethernet	125 Mb/s	SFP1 and SFP2
OC-3 IR-1/STM-1 S-1.1	155.52 Mb/s	SFP1 and SFP2
ESCON	200 Mb/s	SFP1 and SFP2
D1 video	270 Mb/s	SFP1 and SFP2
OC-12/STM-4 S-4.1	622.08 Mb/s	SFP1 and SFP2
FICON LX single mode	1.0625 Gb/s	SFP1
Fibre channel 100-SMLL-L	1.0625 Gb/s	SFP1
Gigabit Ethernet 1000Base-LX	1.250 Gb/s	SFP1
Fibre channel 200-SMLL-I	2.125 Gb/s	SFP1
OC-48/STM-16 I-16	2.48832 Gb/s	SFP1
OC-48 FEC	2.7 Gb/s	SFP1
MMF Fiber		
100Base-FX Ethernet	125 Mb/s	SFP2
ESCON	200 Mb/s	SFP2 or SFP1[1]
FICON LX	1.0625 Gb/s	SFP3 or SFP1[1]
FICON SX	1.0625 Gb/s	SFP4
Fibre channel 100-M5-SN-I	1.0625 Gb/s	SFP4
Gigabit Ethernet 1000Base-SX	1.250 Gb/s	SFP4

1. Due to the dual media (single-mode and multimode) support of this transmitter, fulfillment of this protocol requires a single-mode fiber offset launch mode conditioning patch cord. The offset launch mode conditioning cable lowers the launch power by 0.5 dB and incurs a similar penalty on the sensitivity.

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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 customer.service@jdsu.com.

Sample: WRT-740DT240B-153

WRT-740DT240B- ☐☐☐
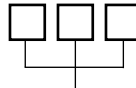
Code	ITU Channel/Frequency[1]
135	193.5 THz/1549.32 nm
137	193.7 THz/1547.72 nm
144	194.4 THz/1542.14 nm
145	194.5 THz/1541.35 nm
146	194.6 THz/1540.56 nm
147	194.7 THz/1539.77 nm
148	194.8 THz/1538.98 nm
149	194.9 THz/1538.19 nm
152	195.2 THz/1535.82 nm
153	195.3 THz/1535.04 nm
154	195.4 THz/1534.25 nm
155	195.5 THz/1533.47 nm
156	195.6 THz/1532.68 nm
157	195.7 THz/1531.90 nm
158	195.8 THz/1531.12 nm
159	195.9 THz/1530.33 nm

1. Other channels are available upon request.

SFP Sample: WRT-SFPS12SB1310

WRT-SFP ☐☐☐☐☐☐☐☐☐
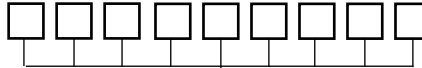
Code	Model
S24SB1310	SFP1
S12SB1310	SFP2
M20SB0850	SFP3
S20SB1310	SFP4