

Protocol Independent, Data Rate Variable, Long Reach Optical Transponder

ITU WSH 413



Key Features

- Low cost
- Compact, simple-to-install, rugged, plug-and-play module
- Convection cooled, no fans
- 100 GHz ITU spaced variants
- Low power consumption, high transmit power
- Data rate independent
- Good sensitivity
- Supports redundant -48 volt supplies through the mounting solution

Applications

- Optical protocol conversion
- Fiber exhaust
- DWDM conversion
- Reach extension

Compliance

- NEBS Level 3
- FDA Class 1 laser device
- FCC Class A device
- UL 60950 Third Edition

The WaveReady™ 3000 series ITU WSH-413 is a rugged, plug-and-play, bi-directional optical transponder.

This compact module translates optical signals between short-reach optical interfaces and long-reach DWDM interfaces. Thirteen of these modules can be used in conjunction with the 13 Channel DWDM Mux and Demux to support thirteen channels per fiber. Terminal equipment that uses protocols such as Gigabit Ethernet, ESCON, Fibre Channel, and others are easily multiplexed and transported over large distances.

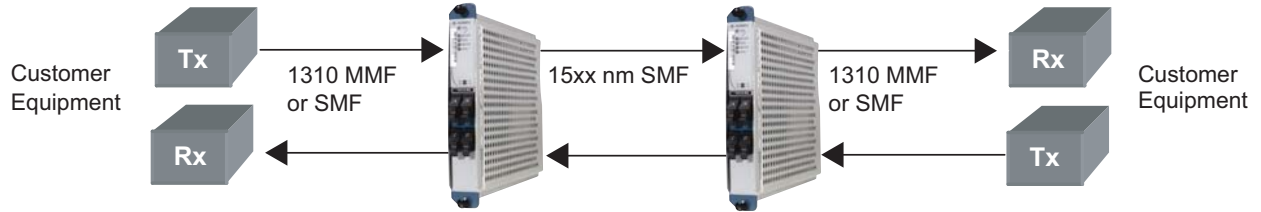
On the input client side, 1310 nm multi-mode or singlemode signals are converted to specific DWDM C-Band wavelengths and retransmitted with high launch power into single-mode fiber. On the output client side, incoming 15xx signals are converted back to 1310 nm for transport by customer equipment.

Front panel LEDs show the status of the module, while the integrated electronics provide simple alarm and control functionality. An RS-232 interface and Ethernet port, through a WaveReady™ shelf and communications module, allow for remote management.

The flexible package design allows the ITU WSH-413 to be deployed in either the WaveReady™ 3500 or 3100 systems which mount in standard 19- or 23-inch telecommunications racks.

2

Reach Extension



WaveReady™ 3500 Shelf (DenseMount) with Modules



3

Performance Specifications

Parameter ¹	Minimum	Typical	Maximum
Optical Characteristics, SMF			
Input wavelength	1260 nm	-	1580 nm
Input sensitivity at BER 10 ⁻¹² at 1250 Mb/s (1260-1335 nm)	-27.5 dBm	-30 dBm	-
Input sensitivity at BER 10 ⁻¹² at 1250 Mb/s (1500-1580 nm)	-28.5 dBm	-31 dBm	-
Input overload power at BER 10 ⁻¹⁰	-8 dBm	-7 dBm	-
Wavelength stability	-110 pm	-	110 pm
Output power level	-1.5 dBm	-	1 dBm
Dispersion penalty (100 km) at 1250 Mb/s	-	-	1 dB
Maximum input power	-	-	3 dB
Optical Characteristics of 1310 nm Client Interfaces			
Input wavelength	1260 nm	1310 nm	1360 nm
Output wavelength	1274 nm	1310 nm	1360 nm
Input sensitivity at BER 10 ⁻¹⁰ at 1250 Mb/s	-19 dBm	-	-3 dBm
Output power level	-9.5 dBm	-6 dBm	-3 dBm
Link power penalties (IEEE 802.3, 1998, Table 38-9)	-	3.48 dB	-
Link power budget range	-	0 to 6 dB	-
Maximum input power	-	-	3 dBm
Data Rate			
Input and output (PRBS 2 ⁷ - 1 pattern)	45	-	1250 Mb/s
Electrical Characteristics			
DC supply voltage	-	-48 V	-
Power dissipation	-	5 W	8.5 W
Alarm relay signals	Dry contact. Relay closed when alarm is active.		
Physical Dimensions			
Size (H x W x L)	-	6.8 x 1.0 x 8.8 inches	-
DenseMount Shelf compliant	-	(17.27 x 2.54 x 22.35 cm)	-
Weight (approximate)	-	1.5 lbs (0.68 kg)	-
Environmental Characteristics			
Operating ambient temperature	-5 °C	-	55 °C
Storage temperature	-40 °C	-	85 °C
Relative humidity (non-condensing)	5 %	-	95 %

1. Unless otherwise noted, all specifications are guaranteed over the life, operating temperatures, wavelength range, and input voltage range specified.
2. Not specifically designed for SONET rates. The unit supports OC-1, OC-3 and OC-12 but does not comply with all applicable standards.

Interface Specifications

Parameter	Specification
Optical	SC/PC bulkhead, single-mode fiber (SMF) or MMF on input A and output B, SMF on output C and input D Compatible fiber types: 9/125 (SMF), 50/125 (MMF), and 62.5/125 (MMF)
Electrical	96-pin connector (power, alarms, craft/remote interface)
Alarms	Relay, dry contact: MAJ A/B, MAJ C/D, LOS A, LOS D (major). Relay closed when alarm is active.
Craft	Menu and TL1 interfaces. Note that accessibility to craft interfaces depends on the mounting solution. See appropriate mounting solution user manual for details
Front panel	5 LEDs: Power (CARD); Major Alarm (MAJ A/B, MAJ C/D); Loss of input signal (LOS A, LOS D)

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: WSH-413DT12BA-047

Product Code	CLEI Code	ITU Channel Frequency/Wavelength
WSH-413DT12BA-023	WMR4WG0CAA	192.3 THz / 1558.98 nm
WSH-413DT12BA-025	WMR3X20CAA	192.5 THz / 1557.36 nm
WSH-413DT12BA-027	WMR3X70CAA	192.7 THz / 1555.75 nm
WSH-413DT12BA-031	WMR3X10CAA	193.1 THz / 1552.52 nm
WSH-413DT12BA-033	WMR3X30CAA	193.3 THz / 1550.92 nm
WSH-413DT12BA-035	WMR4WA0CAA	193.5 THz / 1549.32 nm
WSH-413DT12BA-037	WMR4WE0CAA	193.7 THz / 1547.72 nm
WSH-413DT12BA-045	WMR3X0NCAA	194.5 THz / 1541.35 nm
WSH-413DT12BA-047	WMR4WD0CAA	194.7 THz / 1539.77 nm
WSH-413DT12BA-049	WMR3X0MCAA	194.9 THz / 1538.19 nm
WSH-413DT12BA-053	WMR3XZ0CAA	195.3 THz / 1535.04 nm
WSH-413DT12BA-055	WMR3X50CAA	195.5 THz / 1533.47 nm
WSH-413DT12BA-059	WMR3X40CAA	195.9 THz / 1530.33 nm

Note: Available ITU channel numbers correspond to the ITU wavelengths supported by the JDSU 13 Channel DWDM Mux and Demux modules. If you require ITU wavelengths within the 1563.86 nm to 1527.99 nm range, please contact your JDSU representative.

Associated Parts

Product Code	Description
10129126	DenseMount Shelf
COM-100ET001Y	WaveReady™ 3000 Series Communication Module 100
MDX-13MX2001A	13 Channel DWDM Mux
MDX-13DX2001A	13 Channel DWDM Demux

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