DATA SHEET

Optical Node Series (NC)

OR4178H

RFPON Diplexer/Return Receiver
with 10/10, 10/1, 2/1, 1/1G EPON Insertion

FEATURES

- Enables deployments of extended reach Remote OLT RFoG plus PON (RFPON) applications
- Eight forward optical broadcast inputs from ITU 17 thru ITU 62 individually multiplexed with eight 1610 nm RF returns and eight bidirectional PON segments to a common Access Network MPO port
- O-E conversion of return paths with two passband options, 5 to 42 MHz or 5 to 85 MHz
- Supports 10/10 Gbps, 10/1 Gbps, 2/1 Gbps, or 1/1 Gbps EPON
- Compact 2-slot plug-in module for NC4000 and NC2000 series nodes and VHubs
- Compatible with CommScope RFoG ONUs with PON pass-through
- Local and remote status monitoring capability
- Hot plug-in/out

CommScope's OR4178H RFPON Diplexer/Return Receiver is a double-wide plug-in module for NC4000® and NC2000 series VHubs. MPO connectors support eight 1550 nm forward broadcast inputs that are multiplexed with eight 1490/1310 nm, 1577/1270 nm, or 1577/1310 nm EPON channels, as well as the 1610 nm RF return signals. Models support 5 to 42 MHz or 5 to 85 MHz RF return passband applications.

For the RFoG forward path, the eight 1550 nm broadcast inputs are diplexed with the EPON and passed through the device for distribution to the access network. In the return path, optical diplexers separate the eight upstream 1610 nm RF signals and integrated analog receivers perform the optical-to-electrical (O/E) conversion. Following the O/E conversion of the RF return signals, gain control of the RF signals can be manually adjusted with a built-in attenuator. The resulting RF signals from these receivers can be combined and inputted to a VT/DT4250N Universal Digital Transceiver, where the signals are converted back to optical signals for transport back to the headend.

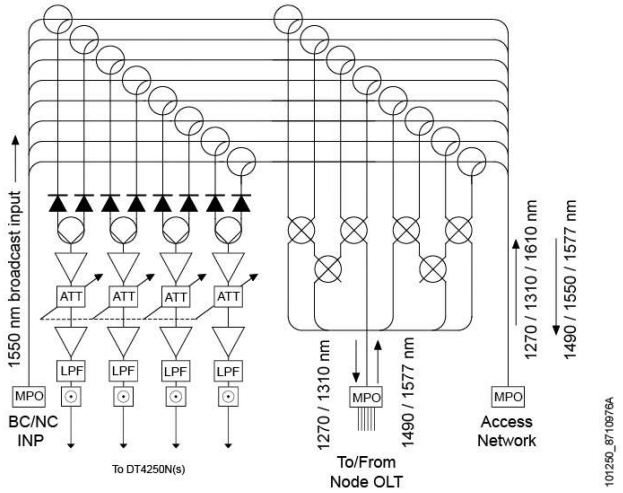
The OR4178H multiplexes and demultiplexes 10/10, 10/1, 2/1, and 10/1 Gbps EPON to and from the same access network. 1577/1270 nm (for 10/10 Gbps), 1577/1310 nm (for 10/1 Gbps), and 1490/1310 nm (for 2/1 and 1/1 Gbps) filters accommodate the EPON traffic from/to an XE4202 Node PON Remote OLT (R-OLT) module that is also housed within the NC/NH/VHub platform.

The integrated RFoG plus PON approach of the OR4178H provides FTTx solutions that leverage existing plant and equipment, minimizing hardware and cost.

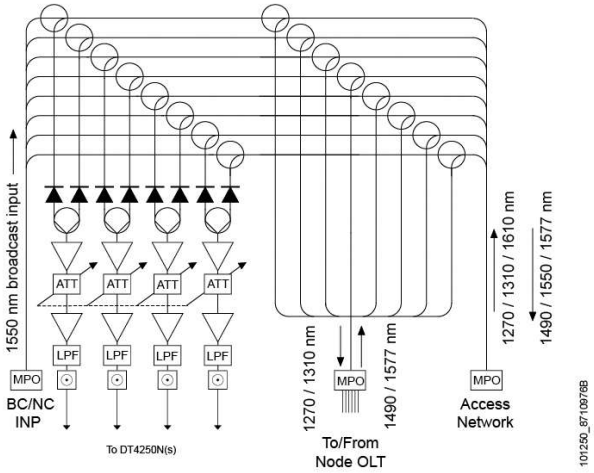
The PON feature of the OR4178H is available in two models:

- The -1 model that provides either 2:1 or 4:1 PON combining with the eight access paths.
- The -2 model that provides a 1:1 (no combining) with the eight access paths.

OR4178Hxy-z Signal Flows



2:1 or 4:1 PON Insertion (-1 model)



1:1 PON Insertion (-2 model)

SPECIFICATIONS

Characteristics	Specification	
Physical		
Dimensions	4.0” D x 4.5” H x 2.0” W (10.2 cm x 11.4 cm x 5.1 cm)	
Weight	2.0 lbs (0.91 kg)	
Environmental		
Operating Temperature Range	-40° to +65°C (-40° to 149°F)	
Storage Temperature Range	-40° to +85°C (-40° to 185°F)	
Humidity	5% to 95% non-condensing	
General		
Nominal Wavelengths	RFoG: 1550 nm downstream/1610 nm upstream 1/1 Gbps and 2/1 Gbps Turbo PON: 1490 nm downstream/1310 nm upstream 10/1 Gbps PON: 1577 nm downstream/1310 nm upstream 10/10 Gbps PON: 1577 nm downstream/1270 nm upstream	
Passband Options	5 to 42 MHz or 5 to 85 MHz	
	Hot plug-in/out	
Power Requirements		
Power Consumption	3.5 W typical @ +5 Vdc from VHub resident power supply	
Connectors		
Optical Connectors	Broadcast Input: MPO for eight forward 1550 nm signals	
	R-OLT: MPO for eight 1270/1310/1490/1577 nm connections to/from an XE4202M Node PON R-OLT module	
	Access Network: MPO for eight segments with combined broadcast, return and bidirectional PON traffic	
Return Path Connectors	RF Return Output: Four SMB connectors compatible with NC2000 and NC4000 RFoG VHubs	
Optical		
BC INP to Access Network		
Passband	1525 to 1565 nm	
Insertion Loss, max	1.9 dB	
Isolation to O/E, min	50 dB	
Isolation to PON, min	60 dB	
Access Network to RF O/E		
Passband	1610 ± 10 nm	
Optical Input Range	-9.5 to -17 dBm	
Insertion Loss, max	1.9 dB	
Isolation to BC INP, min	15 dB	
Isolation to PON, min	35 dB	
Access Network to OLT		
Passband	1270 ± 10 nm	1310 ± 50 nm
Isolation to BC INP, min	15 dB	15 dB
Isolation to O/E, min	45 dB	45 dB
OLT to Access Network		
Passband	1490 ± 10 nm	1575–1580 nm
Isolation to BC INP, min	60 dB	60 dB
Isolation to O/E, min	60 dB	60 dB
Insertion Loss, max (Common) at 1310 MHz and 1490 MHz		
1 to 2 combining/splitting	5.3 dB (-1 model)	
1 to 4 combining/splitting	8.6 dB (-1 model)	
1 to 1 combining/splitting	1.7 dB (-2 model)	
Electrical, Return RF		
Passband	5 to 42 MHz or 5 to 85 MHz	
Frequency Response (Flatness)	± 0.5 dB for 42 MHz, ± 0.75 dB for 85 MHz	
Level Stability	± 0.75 dB	
Output Level at Full Gain, typical	2.5 dBmV (with -16 dBm optical input, 1% OMI, 1310 nm)	
Gain Control	0 to 15 dB in 1 dB steps, common for all RF returns	
Path-to-path Isolation	45 dB	
Local Test indicators		
Optical Level Test Points	10 ± 1 V/mW	
Dummy Load Indicator	Green LED	

ORDERING INFORMATION

Model Name	Description
OR4178H-42-1-MP	RFPON Diplexer 5–42 MHz Return Receiver, 2:1 or 4:1 PON Insertion
OR4178H-42-2-MP	RFPON Diplexer 5–42 MHz Return Receiver, 1:1 PON Insertion
OR4178H-85-1-MP	RFPON Diplexer 5–85 MHz Return Receiver, 2:1 or 4:1 PON Insertion
OR4178H-85-2-MP	RFPON Diplexer 5–85 MHz Return Receiver, 1:1 PON Insertion

RELATED PRODUCTS

NC2000, NC4000 Nodes	XE4202M 10G EPON R-OLT
TC4108V-MP1M-US	VHub/UVHub
VT/DT4250N RF Return Transceiver	CP80/85x RFoG ONUs

Contact Customer Care for product information and sales:

- United States: 866-36-ARRIS
- International: +1-678-473-5656

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Note: Specifications are subject to change without notice.

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