DATA SHEET

CISCO ONS 15216 50/100-GHZ INTERLEAVER/DE-INTERLEAVER FOR THE CISCO ONS 15454 MULTISERVICE TRANSPORT PLATFORM

The Cisco® ONS 15216 50/100-GHz Interleaver/De-interleaver is an advanced 50/100-GHz interleaver and de-interleaver that provides service providers, system integrators, and network equipment manufacturers with one of the critical technologies needed to build next-generation 2.5-, 10-, and 40-Gbps reconfigurable optical add/drop multiplexer (ROADM)-enabled DWDM networks.

Cisco DWDM systems with a maximum of thirty-two 100-GHz spaced channels in the C-band can be expanded to 64-channel capacity using the Cisco ONS 15216 50/100-GHz Interleaver/De-interleaver. The interleaver/de-interleaver can be deployed with the initial DWDM installation to make the DWDM system compatible with future versions and to avoid downtime when the additional capacity is required. The use of 50-GHz channel spacing is a good option for increasing capacity, allowing an additional thirty-two 100-GHz spaced channels to be interleaved with the existing 32 channels. To accomplish this upgrade, a 50/100-GHz interleaver/de-interleaver is required for multiplexing and demultiplexing the additional channels. The Cisco ONS 15216 50/100-GHz Interleaver/De-interleaver incorporates a multiplexing section that interleaves two 100-GHz even and odd wavelength grids to give a composite 50-GHz signal for transmission over Cisco ONS 15454 Multiservice Transport Platform (MSTP) DWDM systems. The demultiplexer section de-interleaves the 50-GHz signal into two 100-GHz wavelength grids prior to further channel demultiplexing by the Cisco ONS 15454 MSTP ROADM.

The equipment is housed in a passive Cisco ONS 15216 FlexLayer module and mounted in the Cisco ONS 15216 FlexLayer 4-Slot 1-rack unit (RU) shelf unit. This module extracts a small part of the composite DWDM signal at the interleaver and the component DWDM signals at the de-interleaver for monitoring purposes. The module (Figure 1) is completely (optical and electrical) passive.

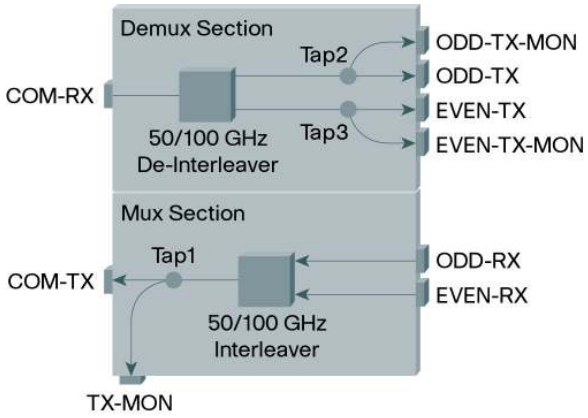
Figure 1
Cisco ONS 15216 50/100-GHz Interleaver/De-interleaver Module

Figure 2 shows the Cisco ONS 15216 50/100-GHz Interleaver/De-interleaver optical flow. The module is a bidirectional unit, in which the multiplexing function and the demultiplexing function are implemented into two different sections so that signal flowing in opposite directions can be managed separately. The demultiplexer section includes a de-interleaver to separate a signal of 50-GHz channel spacing into even and odd channels signals of 100-GHz spacing (EVEN-TX port and ODD-TX port, respectively) followed by a tap coupler on each of the two demultiplexer paths, allowing even (EVEN-MON port) and odd (ODD-MON port) channels signals spectrum monitoring.

The multiplexer section includes an interleaver, to combine even and odd channels signals at 100-GHz spacing (EVEN-RX and ODD-RX ports respectively) into a single signal of 50-GHz channel spacing. A tap coupler follows the interleaving, allowing the aggregate 50-GHz spacing transmitted optical channels spectrum monitoring at the output (TX-MON port).

Figure 2

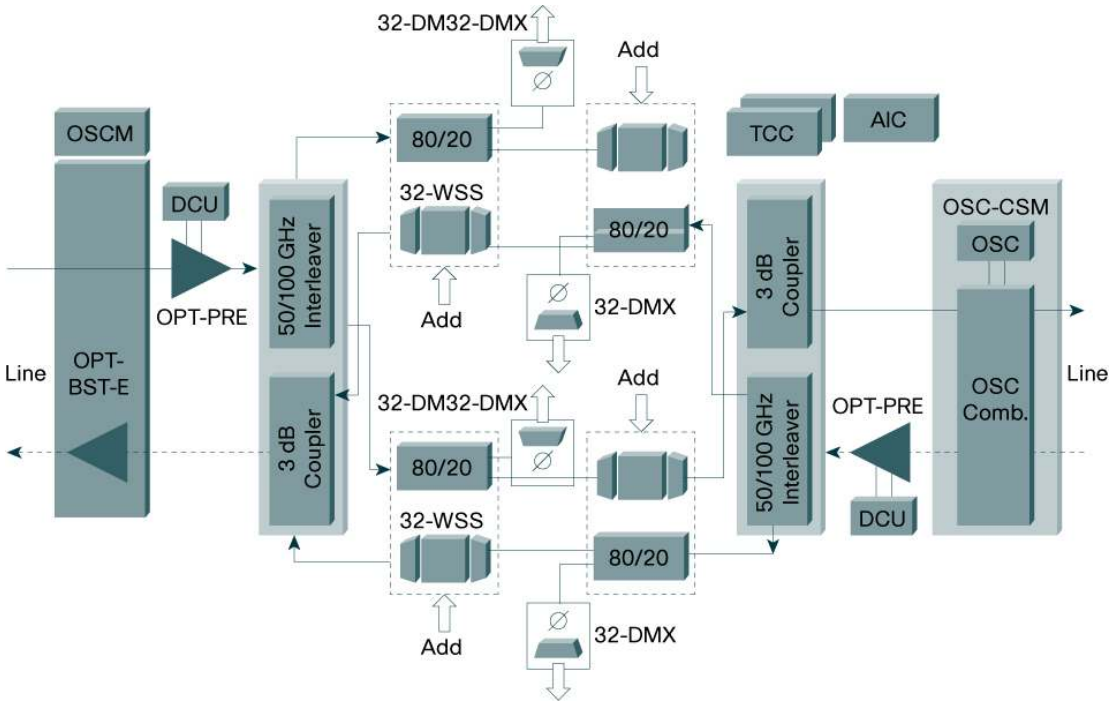
Optical Schematic for the Cisco ONS 15216 50/100-GHz Interleaver/De-interleaver



The Cisco ONS 15216 50/100-GHz Interleaver/De-interleaver is deployed with the Cisco ONS 15454 MSTP. Figure 3 shows a Cisco ONS 15216 50/100-GHz Interleaver/De-interleaver deployed in a Cisco ONS 15454 MSTP ROADM node.

Figure 3

Cisco ONS 15216 50/100-GHz Interleaver/De-interleaver Deployed in a 50-GHz ROADM Node



PRODUCT ORDERING INFORMATION

Table 1 lists the ordering information for the Cisco ONS 15216 50/100-GHz Interleaver/De-interleaver.

Table 1. Ordering Information

Product Number	Product Description
15216-ID-50=	50/100-GHz Interleaver/De-interleaver

To check prices, lead times, and order products, go to: http://www.cisco.com/en/US/ordering/index.shtml.

TECHNICAL DATA

Tables 2 and 3 list technical and environmental specifications for the Cisco ONS 15216 50/100-GHz Interleaver/De-interleaver.

Table 2. Technical Data

Parameter	Condition	Note	Min	Type	Max	Units
Wavelength Range			1530.33 to 1561.83			nm
• 0.25 dB Bandwidth		All Standard Operating Procedure (SOP) and within whole operating temperature range.	VTP	VTP		pm
• 0.5 dB Bandwidth			±80	VTP		
• 1 dB Bandwidth			VTP	VTP		
Number of Channels			80			
Insertion Loss[1] Demultiplexer	COM-RX → ODD-TX COM-RX → EVEN-TX	All SOP and within whole operating temperature range, including 2 connectors.	1.5		2.5	dB
Insertion Loss[1] Multiplexer	ODD-RX → COM-TX EVEN-RX → COM-TX		1		2	dB
MON Loss[2]	TX-MON with respect to COM-TX	All SOP and within whole operating temperature range, including 2 connectors.	18.5		21.5	dB
	ODD-TX-MON with respect to ODD-TX		24		27	dB
	EVEN-TX-MON with respect to EVEN-TX		24		27	dB
Adjacent Channel Isolation Demultiplexer	COM-RX → ODD-TX COM-RX → EVEN-TX	All SOP and within whole operating temperature range.	23			dB
Adjacent Channel Isolation Multiplexer	ODD-RX → COM-TX EVEN-RX → COM-TX	All SOP and within whole operating temperature range.	16			dB
Channels Band Ripple	Each optical path	All SOP and within whole operating temperature range.			0.3	dB
Insertion Loss Uniformity[3]	Each optical path	All SOP and within whole operating temperature range.			0.5	dB
Chromatic Dispersion[4]	Each optical path	All SOP, within whole operating temperature range and in an optical band of ±70pm centered on each ITU wavelength.	–20		+20	ps/nm
		All SOP, within whole operating temperature range and in the Operating Wavelength Bandwidth.	–35		+35	

Parameter	Condition	Note	Min	Type	Max	Units
Polarization Mode Dispersion (PMD) Demultiplexer	Each optical path	Within whole operating temperature range.			0.3	ps
PMD Multiplexer	Each optical path	Within whole operating temperature range.			0.3	ps
Polarization Dependent Loss (PDL) Demultiplexer	Each optical path	Within whole operating temperature range.			0.4	dB
PDL Multiplexer	Each optical path	Within whole operating temperature range.			0.3	dB
Return Loss		All optical ports	40			dB
Directivity		All SOP and within whole operating temperature range.	40			dB
Maximum Power Handling		Within whole operating temperature range.	500			mW

1 All the Insertion Loss values have to be measured as the maximum insertion loss inside the Operating Wavelength Bandwidth.

2 The Insertion Loss values have to be measured as the maximum insertion loss inside the range 1530.33 to 1561.83 nanometers (nm).

3 Defined as the difference between the maximum insertion loss over any two Operating Wavelength Bandwidths.

4 Chromatic Dispersion values in an optical band of ±65pm around each ITU frequency.

ENVIRONMENTAL PERFORMANCE

Table 3. Environmental Specifications

Item	Condition	Minimum	Maximum	Units
Operating Temperature		–5	65	℃
Storage Temperature		–40	85	℃
Operating Humidity		5	95	%RH
Storage Humidity		5	95	%RH

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