Data Sheet

Cisco ONS 15454 Optical Transport System OC48ELR 100GHz ITU DWDM Optics

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With the growth in deployment of high bandwidth delivery vehicles such as DSL, cable modem, fixed wireless, fiber to the building, etc., the service provider's metro transport network continues to strain under the increasing bandwidth pressures. Much of this metro transport strain is the result of the deployment of huge quantities of legacy SONET/SDH equipment. Unfortunately, for the service provider, legacy SONET/SDH equipment was not designed to scale quickly or easily. This equipment was designed when bandwidth growth could be easily forecasted, and network upgrades could be planned well in advance of the need. Legacy SONET/SDH network elements are bandwidth specific, for example, the product is an OC-3/STM-1 or OC-12/STM-4 or OC-48/STM-16 system. If additional ring bandwidth was needed, the service provider deployed an overlay ring or upgraded the existing lower speed network elements with higher speed network elements, subtending the lower speed devices to maintain the current customer interfaces and circuits. These upgrades were costly and time consuming, and with today's bandwidth growth rates, create a bottleneck to scaling the metro transport network.

The Cisco® ONS 15454 is the industry's leading metro optical transport platform, with over 700 customers and 40,000 systems deployed worldwide. The Cisco ONS 15454 combines supercharged SONET/SDH transport, integrated optical networking including ITU grid wavelengths and dense wavelength division multiplexing (DWDM), unprecedented multiservice interfaces including Ethernet, ATM, and TDM to deliver radical economic benefits to service providers. The Cisco ONS 15454 provides the functions of multiple network elements in a single platform. As part of the Cisco unrivaled IP+Optical product line, the Cisco ONS 15454 combines the capacity of optical transport with the intelligence of IP to cost effectively deliver next-generation voice and data services.

The broad Cisco ONS 15454 portfolio supports all metro topologies such as point to point, linear add/drop, rings, and Path Protected Mesh Networking (PPMN). The platform supports multiple service interfaces, including TDM (DS1, E1, DS3, DS3 transmux, EC1/STS-1), data (10/100/1000-Mbps Ethernet), and optical (OC-3/OC-3c, OC-12/OC-12c, OC-48/OC-48c, OC-192). All optical bandwidth and optical services are deployed on demand by exchanging interface cards. The Cisco ONS 15454 Metro Optical Transport Platform has changed the rules to scaling the metro transport network. The Cisco ONS 15454 delivers:

- *Supercharged SONET/SDH* – Allows the service provider to scale their network, in-service from OC-3/STM-1 to OC-192/STM-64, from a single platform.
- *Integrated Optical Networking* – Integrated DWDM optics enables the service provider to deploy more bandwidth to satisfy growing transport requirements over their fiber facilities.
- *Unprecedented Multiservice Interfaces* – Metro networks require the efficient transport of many service types. The Cisco ONS 15454 delivers a wide variety of service interfaces, including TDM, storage, and switched data, over any transport speed (from OC-3/STM-1 to OC-192/STM-64 and DWDM). This eases the service provider's concerns that their deployed transport equipment may not support the service demanded.
- *Radical Economics* – Metro networks require lower networking cost models, as the equipment is not shared among as large of customer base (versus a long haul network). Space constraints are also of a larger concern in metro networks as deployment is more often than not located in non-service provider owned facilities, such as ILEC co-location cages, MTU buildings, ISP POPs or on the customer premise. The Cisco ONS 15454 delivers an unprecedented low first cost, low operating cost and a small footprint, providing the perfect solution to meet the service provider's metro network requirements.

Cisco ONS 15454 OC48ELR Integrated DWDM Optics

The Cisco ONS 15454 delivers integrated DWDM capabilities via the OC48ELR ITU optics cards. The OC48ELR optics conform to the ITU-T 100 GHz wavelengths, enabling compatibility with most customers' channel plans. The Cisco ONS 15454 DWDM optics allow the user to scale to 80 Gbps leveraging 32 wavelengths passive optical filter solutions, such as the Cisco ONS 15216 Series Filters. The integrated filters in the Cisco ONS 15454 MSTP DWDM transport system, including a 32-channel Reconfigurable OADM (ROADM), are available.

Integrating DWDM optics within the Cisco ONS 15454 reduces the need to deploy transponder based "metro DWDM" systems for applications that require services to be multiplexed and groomed. The Cisco ONS 15454 optics enable the use of low cost passive optical terminal filters and optical add/drop filters (Cisco ONS 15216 Series) to build cost-effective metro/regional transport networks (see Figure 1). The OC48ELR optics provide extended dispersion capabilities, allowing extended reach capability leveraging optically amplified fiber spans, reducing regeneration equipment.

Figure 1

OC48ELR Applications

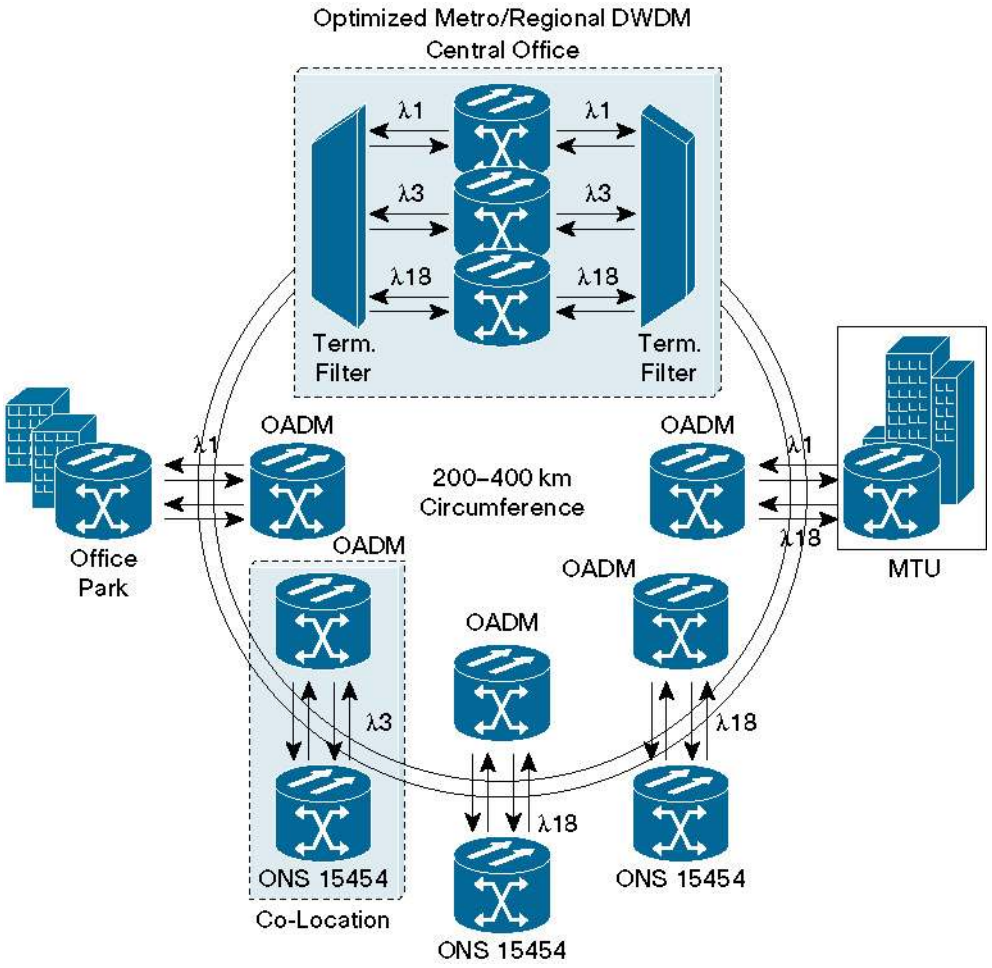
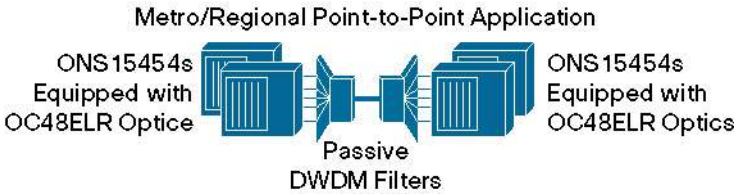


Figure 2
OC48ELR Applications



OC48ELR Features

Compact Design

OC-48 Transceiver is housed in a single width card slot design for maximum shelf utilization

Up to four OC48ELR cards per shelf assembly

Flexible Restoration Options

- Flexible system architecture allows one card type to support any restoration mechanism including:
  - UPSR
  - BLSR, two or four fiber
  - APS (1+1, uni- or bi-directional)
  - PPMN
  - Unprotected (0+1)

Specifications

Table 1. OC48ELR 100 GHz Specifications

Attribute		100 GHz ELR
System Reach (without dispersion penalty)	dB	25
Wavelength	nm	155x.xx
Spectral Range	nm	0.12
Number of Wavelengths	Qty	37
Transmitter		
Power	dBm	0 to –2
Type		DFB/EA
Receiver		
Sensitivity (@ 10E-12 BER)	dBm	–9 to –27
Type		In GaAs APD
Reflectance	dB	–27
Range	nm	1200 to 1580
Chromatic Dispersion Allowance	ps/nm	5400
Chromatic Dispersion Power Penalty		
0 to 80Km	dB	1

Attribute		100 GHz ELR
80 to 300 km (200 km maximum for 200 GHz cards)	dB	2
Bit Error Rate		10E-12
OSNR (minimum) @ 0.1 nm bandwidth resolution	dB	21
Optical Return Loss Required (minimum)	dB	24
Connector Type		SC, Dual
Power Consumption (–48 VDC)	Watts	32
Temperature		
Operating	C	0°to +55°
Storage	C	0°to +85°
Humidity		
Operating	%	5 to 95
Storage	%	5 to 95
Physical Size		One Card Slot
Shelf Assembly Slot Compatibility		High Speed
System Software Requirement		R2.1.x or later

Table 2. Wavelength Plans

nm	100 GHz
1528.77	X
1530.33	X
1531.12	X
1531.90	X
1532.68	X
1533.47	X
1534.25	X
1535.04	X
1535.82	X
1536.61	X
1538.19	X
1538.98	X
1539.77	X
1540.56	X
1541.35	X
1542.14	X
1542.94	X
1543.73	X
1544.53	X
1546.12	X
1546.92	X

nm	100 GHz
1547.72	X
1548.51	X
1549.32	X
1550.12	X
1550.92	X
1551.72	X
1552.52	X
1554.13	X
1554.94	X
1555.75	X
1556.55	X
1557.36	X
1558.17	X
1558.98	X
1559.79	X
1560.61	X
X – indicates supported wavelength	

OC48ELR System Requirements

- Cross-connect: XC, XC-VT, XC-10G, or XC-VXC-10G
- Processor: TCC, TCC+ , TCC2, or TCC2P
- Compatible Shelf Slots: 5, 6, 12, and 13

Compliance

- GR-918-CORE/G.692 compliant optical interfaces
- TR-NWT-000332, Issue 4, Method 1 calculation for 20-year MTBF

Ordering Information

Table 3. Ordering Information

nm	100 GHz Product Name
1528.77	15454-O48E-1-28.7
1530.33	15454-O48E-1-30.3
1531.12	15454-O48E-1-31.1
1531.90	15454-O48E-1-31.9
1532.68	15454-O48E-1-32.6
1533.47	15454-O48E-1-33.4
1534.25	15454-O48E-1-34.2
1535.04	15454-O48E-1-35.0
1535.82	15454-O48E-1-35.8

nm	100 GHz Product Name
1536.61	15454-O48E-1-36.6
1538.19	15454-O48E-1-38.1
1538.98	15454-O48E-1-38.9
1539.77	15454-O48E-1-39.7
1540.56	15454-O48E-1-40.5
1541.35	15454-O48E-1-41.3
1542.14	15454-O48E-1-42.1
1542.94	15454-O48E-1-42.9
1543.73	15454-O48E-1-43.7
1544.53	15454-O48E-1-44.5
1546.12	15454-O48E-1-46.1
1546.92	15454-O48E-1-46.9
1547.72	15454-O48E-1-47.7
1548.51	15454-O48E-1-48.5
1549.32	15454-O48E-1-49.3
1550.12	15454-O48E-1-50.1
1550.92	15454-O48E-1-50.9
1551.72	15454-O48E-1-51.7
1552.52	15454-O48E-1-52.5
1554.13	15454-O48E-1-54.1
1554.94	15454-O48E-1-54.9
1555.75	15454-O48E-1-55.7
1556.55	15454-O48E-1-56.5
1557.36	15454-O48E-1-57.3
1558.17	15454-O48E-1-58.1
1558.98	15454-O48E-1-58.9
1559.79	15454-O48E-1-59.7
1560.61	15454-O48E-1-60.6

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