

PRODUCT BRIEF

KEY FEATURES

- ▶ Raman gain measurement and automatic gain control (AGC)
- ▶ Class 1M* laser safety classification
- ▶ Detection of optical supervisory channel (OSC)
- ▶ Detection of open connectors and/or broken fiber up to few tens of kilometers from the pump module
- ▶ Optional high power connector cover switch safety mechanism
- ▶ Supports both co- and counter-propagating configurations
- ▶ Up to 18 dB average gain for G.652 fiber (three-pump model)
- ▶ Gain flattening optimization based on fiber type and pump power. Option for GFF
- ▶ PDG <0.3 dB (triple-pump solution), <0.6 dB (dual-pump solution)
- ▶ 1RU network-ready rack-mountable packaging
- ▶ Support for SNMP

APPLICATIONS

- ▶ Long repeaterless links (e.g. island hopping, desert ranges and oil rigs)
- ▶ Low latency links (less FEC and O-E-O conversion)
- ▶ Storage area networks (SANs), remote locations, disaster recovery
- ▶ Security-sensitive applications
- ▶ Traversing challenging spans within multi-spans links
- ▶ Improving OSNR in long-haul and ultra-long haul links
- ▶ 40 Gb/s and 100 Gb/s transmission and/or increasing channel count to 80+ WDM channels

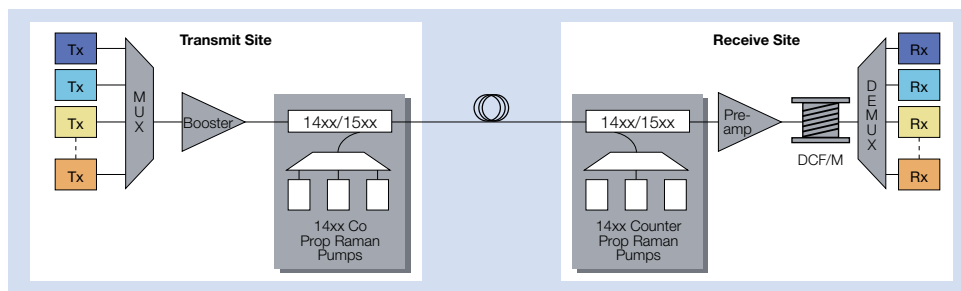
OVERVIEW

Finisar's UltraSpan™ Raman is an intelligent pump unit for distributed Raman amplification applications. The Raman is part of the UltraSpan product family, a comprehensive portfolio of amplification equipment designed to address the challenges of ultra-long repeaterless links and long spans within multi-span links. The product is packaged in a 1RU rack-mountable network-ready unit, including built-in GUI and SNMP communications, and can thus be operated as a fully independent network element.

This amplifier is comprised of an intelligent Raman pump unit containing up to three 14xx nm semiconductor diode pump lasers, and full comprehensive electronic control. The pump unit provides up to 18 dB Raman gain for G.652 fiber (SMF), allowing a repeaterless link to be extended by up to 7 dB. Using patent pending technology, the Raman pump unit can operate in full automatic gain control (AGC) mode, thus allowing the Raman gain to be set with an accuracy of +/-0.7 dB.

The UltraSpan Raman is classified as Class 1M* with respect to laser safety. The pump unit includes four parallel, nondependent eye safety mechanisms that shut down the unit in case of a fiber link disruption, including open connectors (both PC and APC) or broken fiber, even at a distance of a few tens of kilometers from the unit. This unique and comprehensive safety mechanism is extremely important due to the high pump power required for distributed Raman applications.

The Raman amplifier is also available as a module that can be integrated on a line card. Additionally, for stronger Raman requirements Finisar offers the High Power Amplification Terminal, a 3RU rack-mounted unit, capable of generating up to 2 W 14xx nm output power.



KEY OPTICAL SPECIFICATIONS

| Parameter | Specifications | | | Remarks |
|-----------------------------------|--|--------------------|------|--|
| | Min. | Max. | Unit | |
| Wavelength Range | 1529 | 1565 | nm | |
| Wavelength Range, OSC | 1500 | 1520 | nm | |
| Input Power Range | -40 | +5 | dBm | At line port with Raman off |
| Input Power Range, OSC | -50 | -10 | dBm | |
| Maximum Pump Power | | 550 850 | mW | 2 pumps 3 pumps |
| Average Gain (G.652 fiber) | | 12 18 | dB | Typical for 2 pumps Typical for 3 pumps |
| Gain Setting Accuracy in AGC Mode | | +/- 0.7 | dB | |
| Gain Flatness | | 0.9 1.2 <0.5 | dB | 2 pumps 3 pumps With GFF |
| Signal Insertion Loss | | 1.8 | dB | |
| OSC Insertion Loss | | 1.8 | dB | |
| Noise Figure | | -1 | dB | Worst case at typical gain At lower gains NF can reach 0 dB |
| PDG, PDL | | 0.3 | dB | For triple pump model For dual pump model PDG <0.6 dB |
| PMD | | 0.2 | psec | |
| OSC Drop Isolation | 30 | | dB | CDRH 1040.10, IEC 60825-1 |
| Laser Safety | Class 1M* | | | |
| Monitored Parameters | Pump power, signal power (either co- or counter-propagating), line back-reflection at 1400-1500 nm band and 1500-1520 nm band, sub modulation on OSC power | | | |

MECHANICAL, ENVIRONMENTAL, ELECTRONIC SPECIFICATIONS

| Parameter | Specifications | | | Remarks |
|-----------------------------------|---|------|------|---|
| | Min. | Max. | Unit | |
| Dimensions (WxHxD) | 430x44x280 | | mm | 1RU |
| Front Panel Connectors | Communication: RJ45, 9-Pin D Type Power: 2 x 15-Pin Type | | | Supports Ethernet, RS232, and SNMP ver 2 and 3, or web server |
| High E2000 Cover Switch | Mechanical protection for eye safety | | | Optional |
| Fans | 4 | | | Including hot-swappable backup fan |
| Alarm LEDs | Output power, eye safety, communication, fan | | | Two color LEDs are used: Green - OK Red - Fault |
| Operating Environment Temperature | -5 | +55 | °C | |
| Storage Temperature | -40 | +85 | °C | |
| Humidity | 5 | 90 | % | |
| Standards | ETSI, NEBS Level 3 | | | |
| Supply Voltage | -36 to -76 | | V | |
| Power Consumption | 55 | | W | 3 pumps |
| Supply Current @ 48 V Supply | 1.5 | | A | 3 pumps |

* Class 1M products are not hazardous under normal circumstances, but may pose an eye hazard when the laser output is viewed with certain optical instruments (for example eye loupes, magnifiers and microscopes) within a distance of 100 mm



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