OPTICAL AMPLIFIERS THAT BUILD BETTER NETWORKS

RED-C Optical Networks

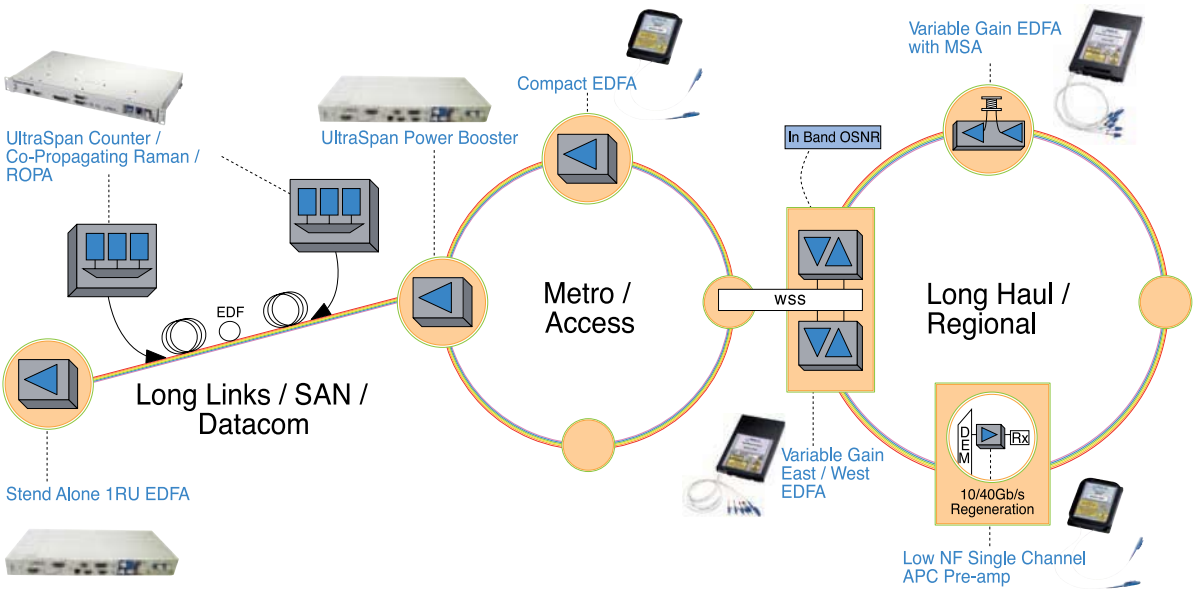
Company Profile

RED-C Optical Networks Ltd. is a leading provider of state-of-the-art EDFAs, Raman amplifiers and optical monitoring devices for all network segments (access, metro, regional and long haul) and for all network applications (telecom, cable and enterprise). RED-C offers innovative solutions for many of the industry's most pressing challenges. RED-C's product portfolio includes:

- **Hybrid Raman-EDFA Amplifier** – a tightly integrated module comprising a Raman pre-amplifier and a variable gain EDFA, with a unified full featured AGC mechanism, extremely low noise figure and excellent gain flatness. This amplifier is ideal for long-haul and ultra-long haul high capacity networks, allowing existing system designs to seamlessly address links of 3000 km and beyond without O-E-O regeneration.
- **UltraSpan product line** – designated to address very long repeaterless links (70 dB loss and beyond), comprising co- and counter-propagating Raman amplifiers, Power Booster EDFAs, Remote Optically Pumped Amplifiers (ROPA), and an ultra-high reliability (low FIT) high power amplification terminal for submarine and terrestrial applications.
- **Pre-amplifiers for 100 Gb/s and 40 Gb/s networks** – small form factor EDFAs providing excellent broadband noise performance and a specially designed power transient suppression mechanism.

RED-C is recognized for its technological expertise as well as for its responsiveness and agility in tailoring customized solutions. RED-C products are available as modules, line cards or network interfaced rack units, and are widely deployed worldwide by leading tier one and emerging system vendors. All RED-C products are certified to relevant standards, including: NEBS, TUV, CE, and Telecordia. RED-C's high volume production sites and advanced quality practices guarantee utmost reliability and meet the most demanding customer requirements.

All products for Telecom applications are classified as Class 1M products, regardless of output power, thanks to RED-C's patented laser safety technology.



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UltraSpan - Long Links and Spans

Product	Key Features	Applications
UltraSpan Raman	Rack-mountable 1RU, network-ready, SNMP support Co- and counter-propagating configurations Supports two or three Raman pumps Optionally available as module	Distributed Raman Amplification Long span masking Long repeaterless links 100 Gb/s, 40 Gb/s and/or 80-channel systems
UltraSpan Power Booster	Rack-mountable 1RU, network ready, SNMP support Up to 26 dBm output power, fixed gain 6-20 dB Optionally available as module	Boost existing EDFA output power Long span masking Long repeaterless links 100 Gb/s, 40 Gb/s and/or 80-channel systems
UltraSpan ROPA	Rack-mountable, network ready, SNMP support Up to 2 W combined Raman and 1480 nm pump power Optional optimized remote passive gain unit	Remote EDF pump + distributed Raman amplification Long repeaterless links 100 Gb/s, 40 Gb/s and/or 80-channel systems
UltraSpan Submarine Terminal **UltraSpan High Power Amplification Terminal**	Extremely low FIT Up to six hot swappable pumps Can be configured as a Raman, Power Booster, or ROPA Up to 2 W combined Raman and 1480nm pump power, or 28 dBm EDFA output power	Submarine branching applications Island hopping, oil rigs Coastal sub-sea cables Remote terrestrial installations Defense applications
UltraSpan Inline Amplifier	Rack-mountable 1RU, network ready, SNMP support Supports any RED-C EDFA Module Out-of-band OSC remote management Optional integrated DCM	Medium to long links (>200 km) Datacom, enterprise. defense and utility applications Cost-effective and small foot print alternative to O-E-O repeaters High loss links where Raman amplification is impractical

EDFA - Metro, Regional, Long Haul and Ultra Long Haul

Product	Key Features	Applications
Hybrid Raman-EDFA	Extremely low effective noise figure Tightly integrated unified Raman/EDFA AGC Excellent gain flatness Variable gain operation with large dynamic gain range Supports one or two Raman pumps	LH and ULH networks 100 Gb/s and 40 Gb/s systems Coherent, non-coherent and mesh systems
Variable Gain EDFA with MSA or as East/West EDFA	Three or four stage designs for reduced noise figure Up to 23 dBm output power Up to 15 dB gain variation, 12 dB mid-stage loss	Improved link budget Dynamic networks Flexible inventory control East/West separation for ROADM applications
Compact Variable Gain EDFA	Compact 70x90 mm form factor, low power consumption Up to 21 dBm output power, 15 dB gain variation Can be configured as FG EDFA with VOA	Cost-effective, space saving Compatible to existing 70x90 mm FG EDFA line cards Modular building block for more complex amplifiers
Single Channel Micro EDFA	Micro 50x75 form factor, low power consumption Excellent noise performance Fast power transient suppression for stable output power Option for MSA for CD or PMD compensation	Pre-amp for 100 Gb/s and 40 Gb/s line cards Pre-amp for 10 Gb/s LH and ULH line cards
Fixed Gain EDFA	Compact form factor, low power consumption Up to 22 dBm output power Flat gain and low noise figure Pre-amplifier/ booster in same part number (SW configuration)	Booster, pre-amplifier, inline EDFA Reduce cost and space Metro and regional WDM networks
OSC EDFA	Compact form factor, low power consumption Up to 16 dB gain in the 1500-1520 nm band Up to 12 dBm output power	Optical supervisory channel booster Long span masking Long repeaterless links
Stand Alone 1RU EDFA	Supports any RED-C EDFA module Available as a 1RU rack-mountable unit 48 VDC or 110/220 VAC dual redundant power supply SNMP, RS232, GUI, LED alarms (LCD optional)	Defense, security, aerospace Sensor and surveillance applications RF and radio over fiber Laboratory equipment (EDFAs and ASE sources)

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