ONETTA™

# IOE 12010 C-Band Raman Amplifier

The IOE 12000 Raman Amplifier Series are dynamic subsystems that provide an unprecedented level of functionality for high capacity DWDM systems. In addition to superior optical performance, the IOE 12000 Raman Amplifier Series features automatic gain control, gain tilt control and FiberCAM™, an advanced monitoring function. FiberCAM automatically configures the IOE 12000 Raman Amplifier Series to the associated transmission fiber span and constantly monitors key optical properties of the span, without interrupting live data traffic. In comparison to simple pump blocks, the IOE 12000 Raman Amplifier Series improves network reliability and reduces the time and cost of DWDM system installation.

## SUPERIOR OPTICAL PERFORMANCE

With a minimum of 6dB of gain and better than -0.5dB effective noise figure, the IOE 12000 Raman Amplifier Series delivers optical performance that enables 40Gbps line rates and error-free transmission over long distances. Offering excellent flatness and low noise figure, the IOE 12000 Raman Amplifier Series significantly improves system OSNR budget. These improvements can be used to reduce total system cost by extending system reach.

## FIBERCAM (CHARACTERIZATION, AUTO-ADJUSTMENT, AND MONITORING)

- **Characterization**: During installation the IOE 12000 Raman Amplifier Series automatically measures all key optical properties of the fiber span needed to calibrate the pump lasers to achieve the desired Raman gain. It automatically adjusts to all leading transmission fiber types, ranging from standard SMF to TrueWave™ fiber, offering true plug-and-play capability. This leads to decreased installation time and eliminates the need for costly field calibration equipment.
- **Auto-adjustment**: To further reduce operating cost, FiberCAM enables the IOE 12000 Raman Amplifier Series to automatically adjust for user-selected parameters such as gain level and gain tilt. All of this is achieved through a high-level software interface and sophisticated control scheme, which takes into account changes due to pump aging, temperature, and changing fiber parameters.
- **Monitoring:** In order to ensure robust, error-free data transmission the IOE 12000 Raman Amplifier Series offers a unique in-service fiber plant monitoring capability. FiberCAM continuously monitors the health of the transmission fiber, connectors, splices, and other network components, giving systems the ability to detect problems before they affect service.

## ADDITIONAL FEATURES AND BENEFITS

- **Automatic Gain Control**: Through the RS-232 interface, the IOE 12000 Raman Amplifier Series can be set to the desired gain level without the need for manual pump adjustments or field calibration, ensuring robust system performance over all operating conditions.
- **Gain Tilt Control**: The IOE 12000 Raman Amplifier Series provides the ability to tilt the gain spectrum, allowing systems to compensate for tilt caused by inter-channel effects.
- **Back Reflection Monitor**: The IOE 12000 Raman Amplifier Series provides an integrated back reflection monitor and automatic shut-off circuitry to manage the safety concerns from high optical power levels in the transmission fiber.
- **In-Service Software Upgrades:** The IOE 12000 Raman Amplifier Series has advanced software functionality which enables real-time downloads of future software enhancements and upgrades without carrier service disruption.

## IOE 12010 C-BAND RAMAN AMPLIFIER OPTICAL SPECIFICATIONS

| SPECIFICATION | MINIMUM | MAXIMUM | UNITS |
|---|---|---|---|
| Bandwidth | 1530 | 1562 | nm |
| Total input power | -24 | 0 | dBm |
| Gain in single mode fiber | 6.0 | – | dB |
| Gain tilt adjustment | -2 | 2 | dB |
| Gain ripple (-5°C to 65°C) | – | 0.5 | dB |
| Effective noise figure (at 6dB Gain) | – | -0.5 | dB |
| Insertion loss | – | 1.0 | dB |
| Polarization Mode Dispersion (PMD) | – | 0.1 | ps |
| Polarization Dependent Loss (PDL) | – | 0.1 | dB |
| Physical dimensions | | 200 x 130 x 29 | mm |
| Laser classification | | | Class 3B under IEC/EN 60825-1 |

For more information on product specifications,
please contact the Onetta Sales Department at sales@onetta.com.

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