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SUPER-FAST ERBIUM DOPED FIBER AMPLIFIER

PRELIMINARY

Features

- Compact design
- Sub - μ s transient suppression time
- Undershoot/overshoot $\leq \pm 0.3$ dB
- Build-in gain flattened
- Low noise

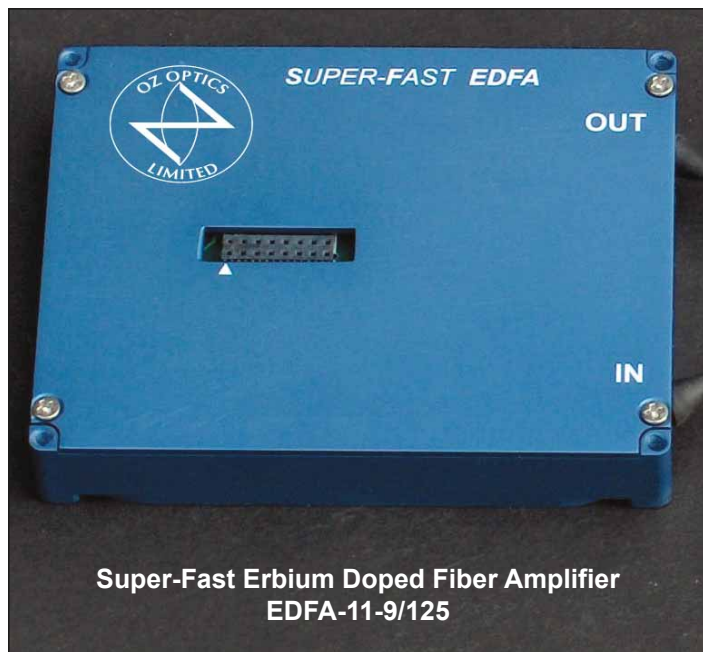
Applications

- ROADM network
- CATV/NETWORK access
- C-band channel booster

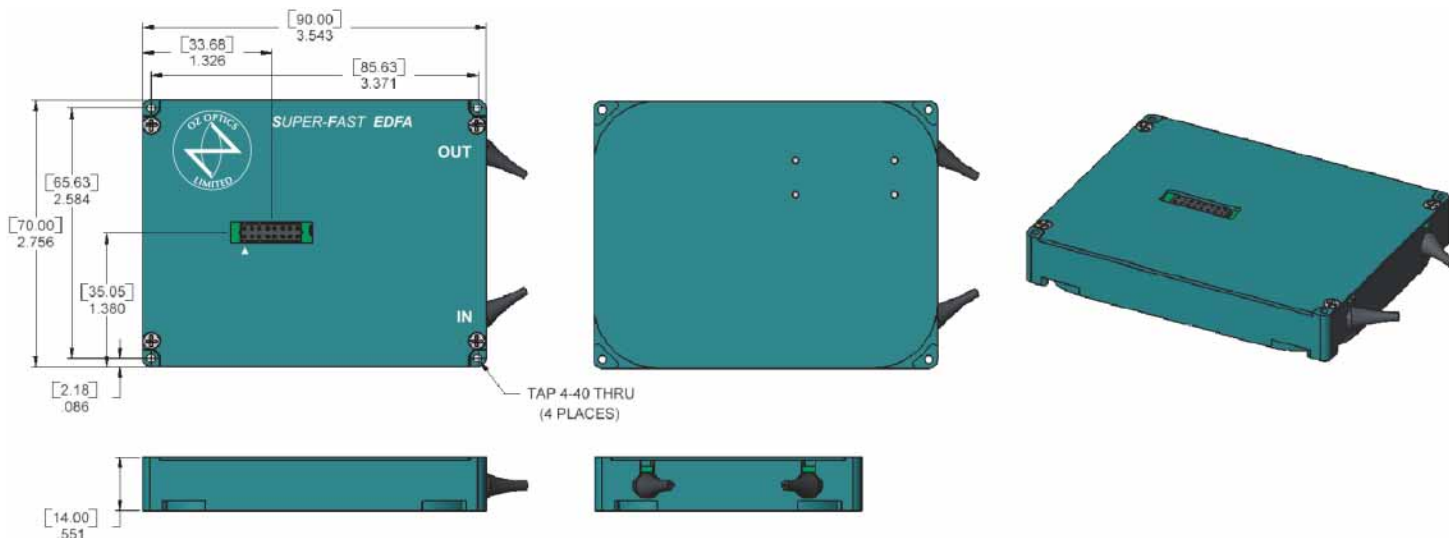
Product Description

In response to a sudden change of input power, an EDFA with its control circuit will exhibit overshoot or undershoot in its output signal. This is called the transient response. With a typical EDFA, this transient response can last on the order of 100 μ s. In a WDM transmission line, the addition or removal of channels may cause a transient, to which the EDFA must respond. The Super-Fast Erbium Doped Fiber Amplifier was developed to address these fast transient conditions, with sub- μ s suppression time.

This EDFA is designed to be used in the traditional C-band. During operation, the signal wavelengths must be confined to a 3.2 nm region for each optical amplifier, although the band may be anywhere within the C-band. The unit can work with up to 4 channels.



Due to the nature of the narrow band operation, the transient suppression of the Super Fast EDFA will be greatly improved, compared to a traditional EDFA.



Super Fast Optical Amplifier Optical Specification

| Parameter | Min | Typical | Max |
|--|--|---------|---------|
| Operation Wavelength ¹ (nm) | 1529.16 | | 1558.58 |
| Input Power ² (per channel) (dBm) | -19.00 | | -11.00 |
| Gain ³ (dB) | | 24 | |
| Output Power ³ (per channel) (dBm) | 5 | | 13 |
| Noise Figure (dB) | | 5.5 | |
| Gain Flatness (dB) within 3.2 nm band; relative to 24 dB | | ±0.3 | |
| Polarization Dependent Gain (dB) | | | 0.3 |
| Polarization Mode Dispersion (ps/√km) | | | 0.5 |
| Transient Suppression Time ⁴ (ns) | | 50 | 100 |
| Transient Over/Undershoot (dB) | ±0.1 for 3 dB add/drop within 3.2 nm band ±0.3 for 6 dB add/drop within 3.2 nm band | | |
| Input/Output Return Loss (dB) | 40 | | |
| Residual Pump Power at Output (dBm) | -25 | | |
| Dimensions (mm) | 90 x 70 x 14 | | |
| Fiber Pigtail (μm) | 9/125 | | |
| Fiber Pigtail Length (m) | 1 | | |
| Connector Type | FC/APC | | |
| Operating Temperature (°C) | 0–70 | | |
| Storage Temperature (°C) | -40–85 | | |

¹ During operation, the input signals will be confined in a 3.2 nm band. However, the band will be in the traditional C-band region as indicated here.

² -19 dBm is the minimum per channel input power. The maximum number of channel at this power level will be four. There will be only one channel allowed if the single channel input power is at -11 dBm. The unit can also work from dark.

³ Fixed gain operation, the output power follows the input power.

⁴ Measured with total output power.

Electrical Specifications

An electrical connector allows the user to apply a voltage to power the unit, as well as monitor the input and output powers and pump performance. The pin-out is shown below:

| | |
|---|----|
| 2 | 16 |
| 1 | 15 |



| Pin Number | Symbol | Function |
|------------|---------|--|
| 1 | -5 V | Input supply voltage, -5 V |
| 2 | -5 V | Input supply voltage, -5 V |
| 3 | GND | Ground |
| 4 | GND | Ground |
| 5 | +5 V | Input supply voltage, +5 V |
| 6 | +5 V | Input supply voltage, +5 V |
| 7 | Temp | Temperature |
| 8 | V_PDout | Output monitor. This will be around 1 volt when the output power is 13 dBm. |
| 9 | GND | Ground |
| 10 | V_PDin | Input power monitor. This will be around 1 volt when the input power is -11 dBm. |
| 11 | PDC | Pump monitoring photodiode (cathode) |
| 12 | PE | Pump enable (high = on, low = off) |
| 13 | PDA | Pump monitoring photodiode (anode) |
| 14 | PI | Pump current (approximately 10* I _{pump}) |
| 15 | NC | No connection |
| 16 | NC | No connection |

Ordering Information For Standard Parts

EDFA-11-9/125-1529.16:1558.58-S-24-5/13-3A-1-1