

MAFA 1014-PA Optical Preamplifier

Erbium Doped Fiber Preamplifier



DATASHEET | SEPTEMBER 2013

FIBER OPTICS



Applications

- CATV Systems
- Long Distance RF/Microwave Fiber Optic Communication Links
- Sensing and Control Systems
- High-Performance Supertrunking Links
- High Power Distribution Networks
- Redundant Ring Architectures
- FTTx Networks

Features

- Full Function Fiber Optic pre-Amplifier
- Low Noise Figure (NF Typ < 3.3 dB)
- Pin \geq -45 dBm
- Pout (saturated): \approx +14 dBm
- Small Signal Gain \geq 37 dB
- Low Electrical Power Consumption
- Output Isolation \geq 40 dB
- Polarization Dependant Gain \leq 0.1 dB
- Polarization Mode Dispersion \leq 0.2 ps
- Output Return Losses \leq -40 dB
- Output Residual Pump Power \leq -40 dBm

EMCORE's MAFA 1014-PA Optical Preamplifier Erbium Doped Fiber Gain Block Module is an ideal building block for system integrators to extend the fiber link for long-haul signal transport. The MAFA 1014-PA Optical Preamplifier series gain blocks are designed to meet the most demanding noise performance requirements of fiber optic communications and control systems and performs all the functions required of an optical preamplifier for system integration.

The MAFA 1014-PA Optical Preamplifier provides output optical isolation for stable, low noise operation. The output optical signal power level is detected for monitoring and control. The very low level input optical signal is amplified with active output power control for constant current mode operation.

The compact mechanical footprint of the MAFA 1014-PA Optical Preamplifier allows using this unit to be installed in small space environments.

General and Mechanical Specifications

| Parameter | Min | Typ | Max | Units | Comments |
|----------------------------|------|---------------|------|-------|----------------|
| Operating Wavelength | 1532 | - | 1565 | nm | Standard |
| Operating Case Temperature | 0 | - | 50 | °C | Standard* |
| Storage Temperature | -40 | - | 85 | °C | Standard |
| Operating Humidity | 20 | - | 85 | % | Non-condensing |
| Voltage Supply Range | - | +12/+5/+3.3 | - | VDC | All Versions** |
| Optical Connectors | - | SC; FC; E2000 | - | - | User Specified |
| Dimensions (mm) | - | 70 x 90 x 15 | - | Mm | All Versions |

* - Extended temperature range of - 40°C to +75°C is also possible

** Transient Pulse to +X.X VDC + 5% for < 100 msec

Electrical power must be applied to the unit only after launching input optical

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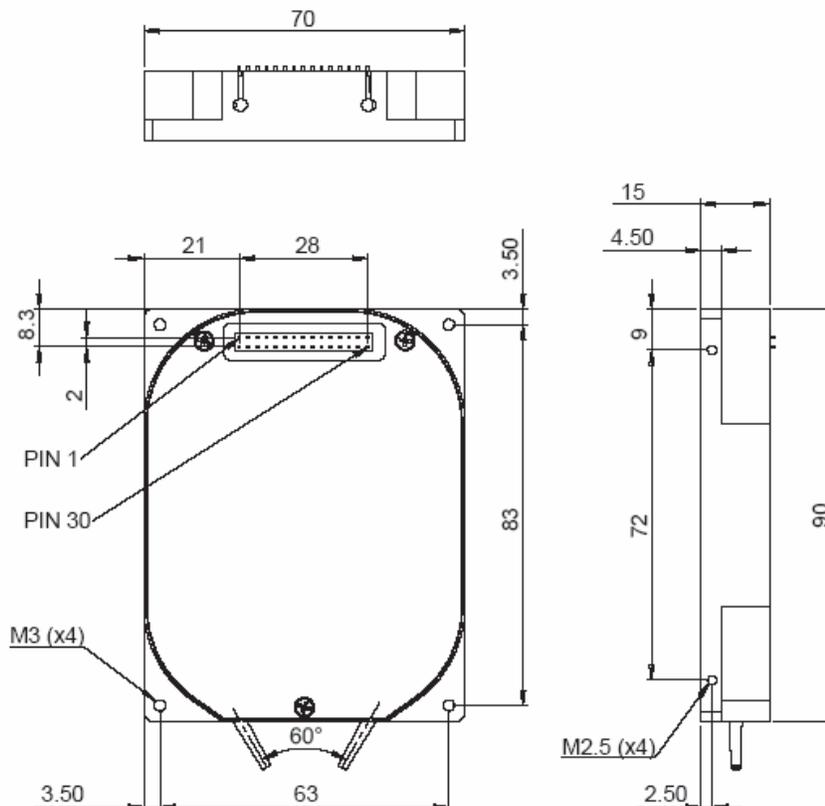
Optical/Electrical Characteristics¹

| Property | Unit | Limit | Model 1400 | Comments (Note 1) |
|----------------------------------|------------|---------|------------|-------------------|
| Operating Input Power | Pin (dBm) | Max | 0 | - |
| Operating Input Power | Pin (dBm) | Min | -45 | - |
| Saturated Output Power | Pout (dBm) | Nominal | 14 +/- .25 | (Notes 2,3) |
| Noise Figure | NF (dB) | Max | 3.3 dB | (Note 4) |
| Output Power Stability | (dB) | Max | +/- 0.1 | (Note 5) |
| Power Consumption (Steady state) | Psys(W) | Max | 2 | 70°C Case |

Notes:

1. Unless stated otherwise, all specifications apply over the full operating temperature and humidity ranges
2. Measurement variations
3. Measured @ 1550 nm and Pin = -4 dBm
4. Measure @ 1550 nm and Pin = -30 dBm
5. Over polarization and temperature

Outline Drawing (dimensions in mm)



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Compliance and Reliability Information

FCC: Subpart B. Part 15 class “A”: Unintentional Radiators

EN 55013: Sound and Television Broadcast receivers and associated equipment – Radio disturbance characteristics- limits and methods of measurements – Electric Field Radiation Emissions (2001)

Fit Rate: 90% level of confidence - 290 @ 25°C

Electrical Connector Pinout

| PIN # | Designation | PIN # | Designation |
|-------|-------------------------|-------|---------------------|
| 1 | +12 VDC/+5 VDC/+3.3 VDC | 16 | LED_Laser_ON |
| 2 | +12 VDC/+5 VDC/+3.3 VDC | 17 | N/A |
| 3 | +12 VDC/+5 VDC/+3.3 VDC | 18 | Pump_Bias_Alarm * |
| 4 | +12 VDC/+5 VDC/+3.3 VDC | 19 | Loss_Input_Power * |
| 5 | GND | 20 | Loss_Output_Power * |
| 6 | GND | 21 | N/A |
| 7 | RS232_Rx | 22 | N/A |
| 8 | RS232_Tx | 23 | N/A |
| 9 | GND | 24 | N/A |
| 10 | GND | 25 | N/A |
| 11 | LED_Comm | 26 | N/A |
| 12 | EDFA_Reset | 27 | N/A |
| 13 | EDFA_Disable | 28 | N/A |
| 14 | Pout_Mute | 29 | N/A |
| 15 | EDFA_Temp_Alarm * | 30 | N/A |

* - software adjustable parameters; logic levels (low / high) TBD

Ordering Information

MAFA-PA-1014 - - -

| Connector Option | Temp Options | Voltage Options |
|------------------|--------------|-----------------|
| SC1 - SC/APC | S – Standard | 1 - +12 VDC |
| S21 - SC/PC | E – Extended | 2 - +5 VDC |
| FC1- FC/APC | - | 3 - +3.3 VDC |
| FC2- FC/PC | - | - |
| EC1-E2000/APC | - | - |

Example:

MAFA-PA-1014-SC1-S-2: 14 dBm pre-amp gain block with SC/APC optical connectors, standard temperature range, +5 VDC power supply

Laser Safety Information

This component product does not meet the applicable requirements of 21 CFR 1010 & 1040 and is classified as a Class IIIb laser product based on the maximum optical output power defined below. During use as intended, the laser energy is fully contained within the fiber network such that there is no accessible laser radiation and would meet the requirements for a Class I laser product.

Wavelength = 1532 ~ 1565 nm (dependent on input source)

Maximum Output Power = 200 mW

