

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 ≥ -45 dBm
- Pout (saturated): $\approx +14$ dBm
- Small Signal Gain ≥ 37 dB
- Low Electrical Power Consumption
- Output Isolation ≥ 40 dB
- Polarization Dependant Gain ≤ 0.1 dB
- Polarization Mode Dispersion ≤ 0.2 ps
- Output Return Losses ≤ -40 dB
- Output Residual Pump Power ≤ -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 $+75^{\circ}\text{C}$ 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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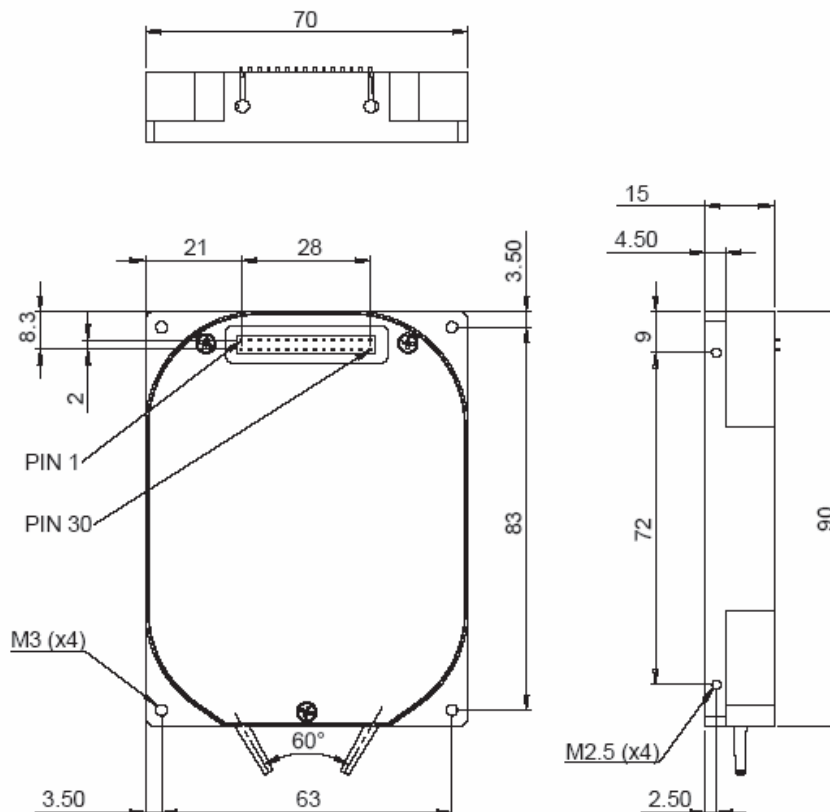
Optical/Electrical Characteristics¹

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

