



### Applications

- High Performance SuperTrunking Links
- High Power Distribution Networks
- Fiber Deep Architectures
- FTTx Networks

### Features

- Full Function High Power Fiber Optic Amplifier
- Low Noise Figure (Typ < 6 dB)
- Total Input Power Range: -10 dBm to +12 dBm
- Total Output Power: +27 dBm to +37 dBm  
(Optical Output Power Splitter is Optional for these Units)
- Standard RS-232 communications
- Standard SNMP Communication  
(coming soon)
- Low Electrical Power Consumption
- Input/Output Isolation >40/40 dB
- Polarization Dependent Gain < 0.1 dB
- Polarization Mode Dispersion < 0.5 ps

### PONA 3000 Series Erbium Doped Fiber Amplifier

The EMCORE PONA 3000 Series Fiber Optical Amplifier Module is an ideal building block for OEM system integrators. The family of PONA 3000 Optical Amplifiers is designed to meet the most demanding noise performance requirements of CATV and FTTx applications, and performs all the functions required of an optical amplifier for system integration. PONA 3000 series optical amplifiers provide optical isolation on the input and output of the gain block for stable, low noise operation. The input and output optical signal power levels are detected for monitoring and control. The input optical signal is amplified with active gain control for a constant output power level, or with active output power control for constant gain mode. The PONA 3000 series optical amplifiers also provide monitoring functions and associated alarms for all vital characteristics. The optical output of the PONA 3000 series optical amplifiers can be split into number of ports by an optional internal splitter.

PONA3000 series includes AC/DC Power Supply, Front Panel, Optical Splitters, network card and all necessary connectors.

### General and Mechanical Specifications

General Property	Requirement	Comments
Operating Wavelength	1545 ~ 1565nm	Standard
Operating Case Temperature	0°C to 50°C	Standard
Storage Temperature	-40°C to 85°C	Standard
Operating Humidity	20% to 85%	Non-condensing
Voltage Supply Range	85 VAC to 265 VAC 50/60 Hz -36 to -60 V DC	AC version DC version *(Redundant Power Supply is available by Customer request)
Optical Connectors	See ordering information	User Specified
Dimensions In Inches	19.0"W x 14.76"D x 3.44"H	19" Rack Mounted, 2 RU

**Performance Specifications<sup>1</sup>**

Property	Unit	Limit	PONA Models						Comment
			3027	3030	3032	3033	3035	3037	
Operating Input Power	Pin (dBm)	Max	+12	+12	+12	+12	+12	+12	
Operating Input Power	Pin (dBm)	Min	-10	-10	-10	-10	-10	-10	
Output Power	Po (dBm)		27.0	30.0	32.0	33.0	35.0	37.0	Nominal (note 2)
Noise Figure	NF (dB)	Typ/Max	5.5/6.0	5.5/6.0	5.5/6.0	5.5/6.0	5.5/6.0	5.5/6.0	(note 3)
Static Gain Flatness	GF (dB)	Max	+/-2.0	+/-2.0	+/-2.0	+/-2.0	+/-2.0	+/-2.0	(note 4)
Dynamic Gain Flatness	(dB)	Max	+/-2.50	+/-2.50	+/-2.50	+/-2.50	+/-3.00	+/-3.00	(note 5)
Output Power Stability	(dB)	Max	+/- 0.2	+/- 0.2	+/- 0.2	+/- 0.2	+/- 0.2	+/- 0.2	(note 6)
Power Consumption (steady state regime)	Psys (W)	Max	20 15	35 20	45 25	55 30	65 40	70 45	50°C Case (premium) 50°C Case (economy) (note7)
Remnant pump power to output	Prp (dBm)	Nom.	<-30	<-30	<-30	<-30	<-30	<-30	

Notes:

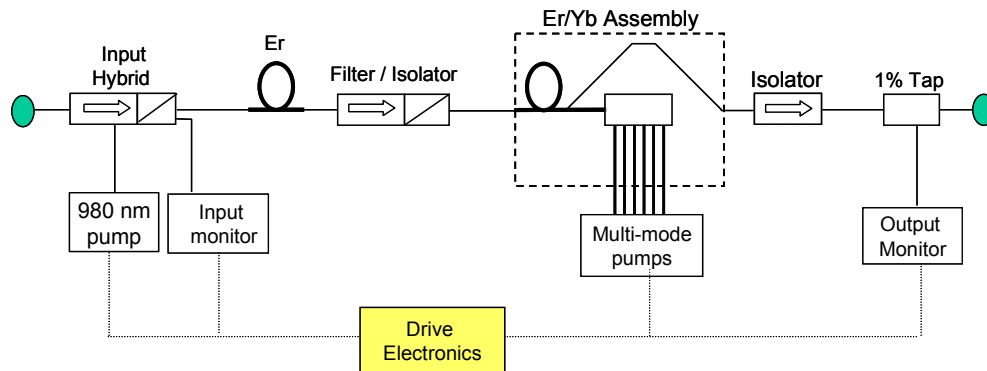
1. Unless stated otherwise all specifications apply over the full temperature range and humidity
2. Depending on the fiber optic patch cord interface the measured value can vary up to 0.5 dB less than the actual value.
3. Measured @ 25°C, ΣPin = 0 dBm. Can be measured only after splitting output power
4. Measured with a swept Probe Signal (Pp), where Pp = 0 dBm @ 25°C
5. Measured with a swept Probe Signal (Pp), and a fixed Tone Signal (Pt) @ 1553nm; (Pt = Pp+20 dB; Pt + Pp = 0 dBm) @ 25°C;
6. Stability over polarization and temperature
7. Premium version – PONA with cooled, Telecordia qualified pumps  
Economy version – PONA with uncooled pumps

**Table for Determination of Minimal Output Optical Power per Port (dBm)**

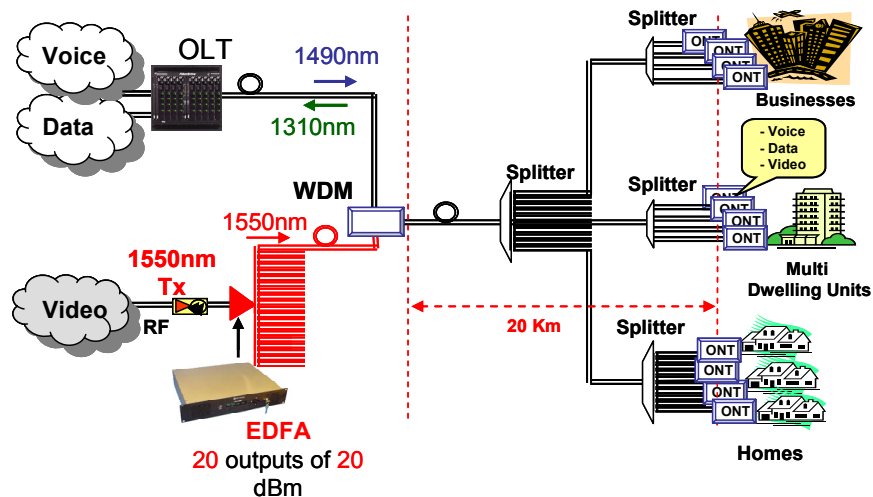
Minimum optical power per port (dBm) Number of ports	PONA Models					
	3027	3030	3032	3033	3035	3037
1	27	30	32	33	35	37
2	23.5	26.5	28.5	29.5	31.5	33.5
4	20.2	23.2	25.2	26.2	28.2	30.2
8	16.8	19.8	21.8	22.8	24.8	26.8
16	13.4	16.4	18.4	19.4	21.4	23.4
32	10.0	13.0	15.0	16.0	18.0	20.0
64	7.0	10.0	12.0	13.0	15.0	17.0

### Block Diagram: Cladding Pump Technology

Cladding pump technology uses erbium/ytterbium fiber optic assemblies (double clad fiber and multi-mode pump lasers) to produce cost effective high power optical amplification. This technology enables the development of higher power EDFAs—something that was cost inhibitor when using standard Erbium fiber and single mode pumps.

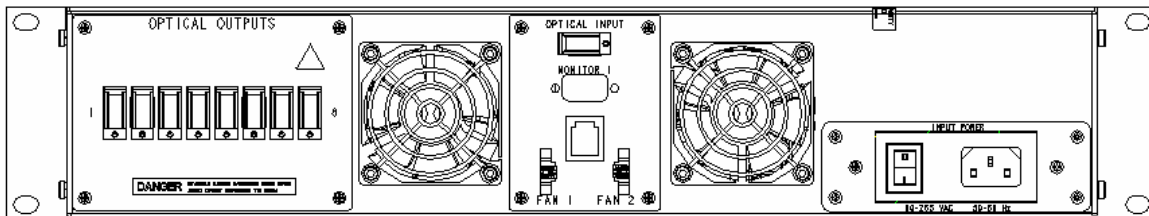


### Sample FTTx Architecture

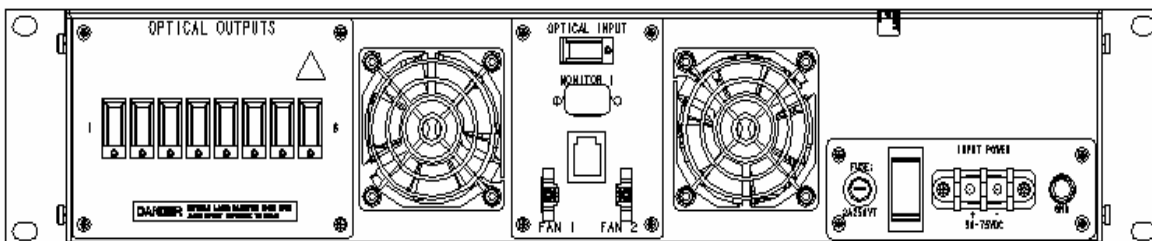


Outline Drawing

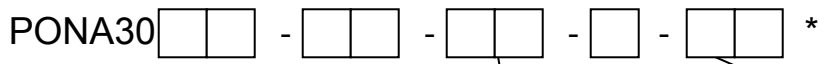
AC versions shown below with 8 optical output ports



DC versions shown below with 8 optical output ports



**Ordering Information**



Power Level	Connector Options	# of Output Ports	Class	Input Voltage
27: 27 dBm	SC: SC/APC	01: 1 port	P: Premium	AC: 90-260 VAC 50/60 Hz
30: 30 dBm	FC: FC/APC	02: 2 ports	E: Economy	DC: -48 VDC
32: 32 dBm	EC: E2000/APC	04: 4 ports		
33: 33 dBm	TC: SC/UPC	08: 8 ports		
35: 35 dBm	GC: FC/UPC	16: 16 ports		
37: 37 dBm	SCDPLX: SC/APC Duplex	20: 20 ports		
		32: 32 ports		
		64: 64 ports		

Class: Premium: Utilizes cooled pump lasers  
 Economy: Utilizes uncooled pump lasers

\* PONA 3000 series with power higher than 30 dBm per port must have special output optical connector(s) and optical bulkhead(s). Their type(s) must be verified prior to placing Purchase Order.

**Compliance Information**

FCC: Subpart B. Part 15, Class "A" Unintentional Radiators  
 CE:EN50083-2 1995 with Amendment 1, which incorporates EN 55013 Radiated and Conducted Emissions  
 EN 61000-4-3 Radiated Immunity  
 EN 55020 Conducted Immunity  
 EN 61000-3-2 Harmonics

All Components meet Telecordia GR-1312 and GR-486 Standards (Except Pumps in Economy Class)

Fit Rate: 90% Level of Confidence < 2500 @ 30°C Premium PONA 3035  
 90% Level of Confidence < 2000 @ 30°C Economy PONA 3035

### Laser Safety Information

This product meets the applicable requirements of 21 CFR 1010 & 1040 and is classified as a Class IV laser product based on the maximum optical output power shown 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. The laser product report has been submitted to the CDRH and the accession number is expected by October 2006.

Wavelength = 1545 ~ 1562 nm (dependant on input source)

Maximum Output Power = 5 W (single output, 37 dBm model)

