

Space Qualified Erbium/Ytterbium Small Signal Fiber Amplifier



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Agiltron Space Grade High Reliability Erbium/Ytterbium doped fiber amplifier provides cost-effective solutions for satellite communication amplification. It is specially built using high reliability components of semiconductor lasers, WDM, isolator, and tap monitor. The product has the advantages of high reliability, high power output, high gain and low noise. The module is specially made to be operated in vacuum environment. The compact module is suited for system integration with universal control interface. Customer configuration is available.

The EDFA has isolators on both input and output.

These Erbium-Doped Fiber Amplifiers (EDFAs) are engineered for a long operational lifespan, typically designed to function reliably for over 10 years. This durability is achieved through high-quality components and robust manufacturing processes. The design considerations include thermal management, component selection, and rigorous testing to maximize the amplifier's longevity and efficiency.

Features

- Low Noise
- High Output Up to -10dBm
- High Stability
- High Reliability
- Vacuum Operation

Applications

- Satellite Communication

Specifications

Parameter	Min	Typical	Max	Unit
Wavelength		1553.33 / 1536.61		nm
Input Power	-47		-33	dBm
Maximum Input Non-Damage Power			0	dBm
Saturated Output Power @1553.33nm			-10	dBm
Saturated Output Power @1536.61nm			-20	dBm
Output Power Control Stability (EOL to BOL)			15	%
Power Conversion Efficiency ^[2]	8		11	
Monitor Wavelengths		1553.33 and 1536.61		nm
Noise Figure			4.5	dB
Polarization Mode Dispersion ^[4]			1	ps
Input/output Isolation	35			dB
Backward ASE			-45	dBm
Adjustable Output Power		Yes		
Fiber Type		SMF-28e 9/125um NA = 0.13		
Working Temperature	-30		70	°C
Storage Temperature	-40		85	°C
Power Supply		DC +5V/GND		
Communication		RS232		

Notes:

- [1] Maximum optical output power. For Booster type only
 - [2] Define as the ratio of Electrical Input Power/Optical Output Power
 - [3] Amplification. Output power = Gain X Input power. For weak signals, buy a preamplifier
 - [4] Random polarization version only
 - [5] Polarization Maintaining only
 - [6] The regular range is -5 to 40°C, for extended range requires additional cost
- * Preamplifier output power is limited to 25dBm

Note: The specifications provided are for general applications with a cost-effective approach. If you need to narrow or expand the tolerance, coverage, limit, or qualifications, please [\[click this link\]](#):

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Mechanical Dimension (33dBm)

Package Choices



Component



Benchtop



Net-Control Rack

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Modes Description

The EDFAs have both ACC mode - automatic current control or constant current control and APC mode - automatic power control settable via GUI. In the ACC mode, the pump laser's current is set by the user and automatically locked by the EDFA to achieve a constant pumping current. The EDFA's output power is proportional to the input power and has output even though the input signal is weak. In the APC mode, the user sets the output power, and the EDFA automatically maintains the output constant in a feedback laser pump control way. When the input optical power fluctuates, the APC mode minimizes the fluctuation of the output power and is suitable for power type and line type EDFA.

Ordering Information

Prefix	Type	Wavelength Channel	Power Gain ^[1]	Pump Laser Power Extra Margin ^[2]	Polarization	Package	Cable Type	Fiber Length ^[3]	Connector ^[4]	Low Temperature	High Temperature
EDFA-		1553.33 nm = 1 1536.61 nm = 2	36dB = 3	10% = 1 20% = 2 30% = 3	Random = 1 PM = 2	Component = 1 Special = 0	Bare fiber = 1 0.9mm tube = 3 3mm cable = 5 Special = 0	0.25m = 1 0.5m = 2 1.0m = 3 Special = 0	None = 1 FC/PC = 2 FC/APC = 3 SC/PC = 4 SC/APC = 5 LC/APC = A LC/UPC = U Special = 0	-5°C = 1 -30°C = 2 Special = 0	40°C = 1 70°C = 2 Special = 0

[1]. For Booster, Power means maximum output power. For Preamp, Power means maximum amplification gain.

[2]. At 36dB full amplification power

[3]. For >1W modules, the fiber cables extrude out of the front.

[4]. Regular connector only rated to 0.5W and will burn at higher power. We make a special beam expanded connector to handle up to 5W

NOTE:

- Preamplifier output power is limited to 25dBm

Application Notes

Fiber Core Alignment

Note that the minimum attenuation for these devices depends on excellent core-to-core alignment when the connectors are mated. This is crucial for shorter wavelengths with smaller fiber core diameters that can increase the loss of many decibels above the specification if they are not perfectly aligned. Different vendors' connectors may not mate well with each other, especially for angled APC.

Fiber Cleanliness

Fibers with smaller core diameters (<5 μm) must be kept extremely clean, contamination at fiber-fiber interfaces, combined with the high optical power density, can lead to significant optical damage. This type of damage usually requires re-polishing or replacement of the connector.

Maximum Optical Input Power

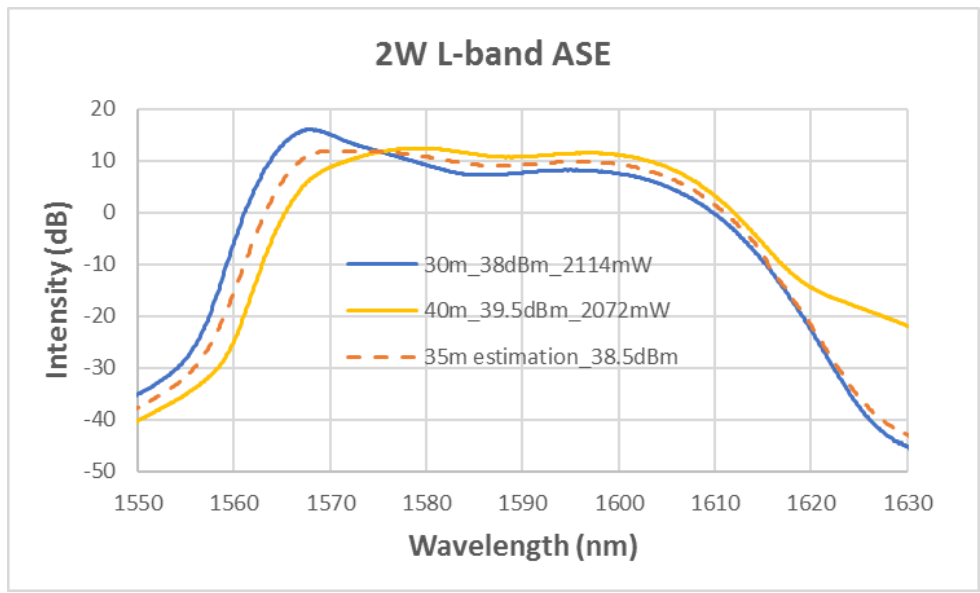
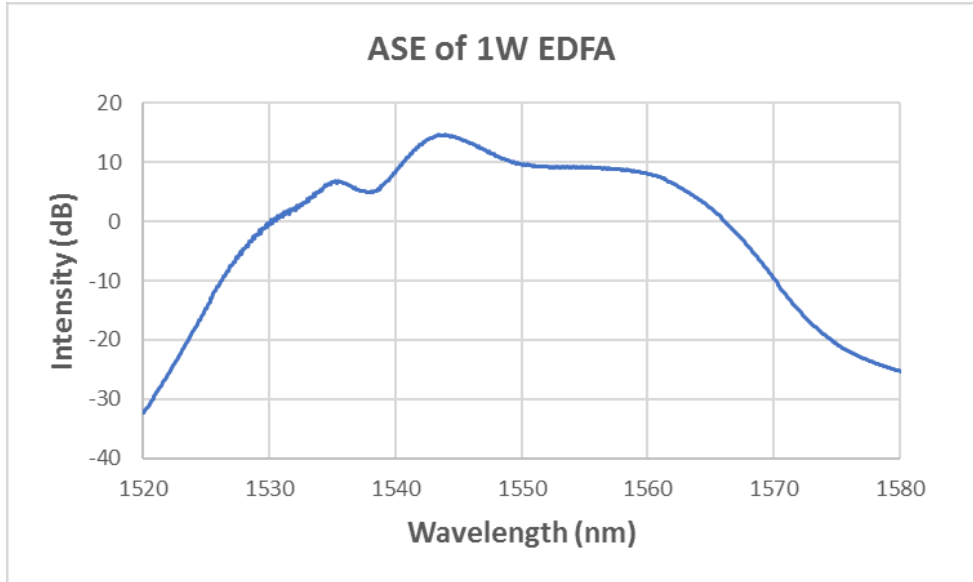
Due to their small fiber core diameters for short wavelength and high photon energies, the damage thresholds for device is substantially reduced than the common 1550nm fiber. To avoid damage to the exposed fiber end faces and internal components, the optical input power should never exceed 20 mW for wavelengths shorter 650nm. We produce a special version to increase the handling by expanding the core side at the fiber ends.

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Typical Spectrums



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Control GUI

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