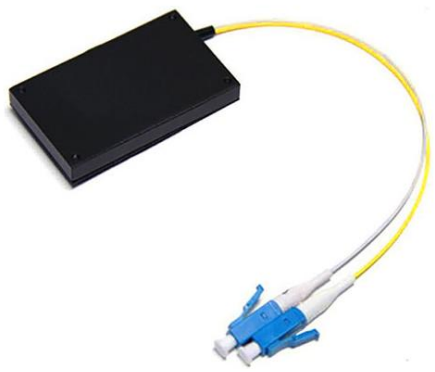
Mini Erbium Doped Fiber Amplifier

DATASHEET

BUY NOW



The Mini Erbium-doped fiber amplifier (MEDF) features a miniature size. It is built using semiconductor lasers, WDM, isolator, and erbium-doped fiber. The product has the advantages of high reliability, high gain, and low noise. It uses an uncooled pump laser to achieve low power consumption. It works up to 100GHz data rate. It can monitor and adjust the output optical power in real-time and can support real-time output LOS alarm and pump protection. An adapting PCB provides convenience to be powered and interfaced with USB with a user-friendly GUI.

The MEDFs have both ACC mode – automatic 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 output power fluctuation and is suitable for power type and line type EDFA. The default setting is APC.

The EDFA has isolators on both input and output.

Features

- Low Noise
- High Stability
- Miniature Size
- 2.5/10/100G Channel Amplification

Applications

- BOTDR
- OTDR
- LiDAR
- Fiber sensing

Specifications

Parameter	Min	Typical	Max	Unit
Wavelength	1525	1550	1565	nm
Input Power	-15	-12	5	dBm
Output Power	6		18	dBm
Gain [1]		24		dB
Noise	1		5.5	dB
Gain Flatness		3		dB
Polarization Dependent Gain			0.3	dB
Return Loss	40			dB
Polarization Mode Dispersion			0.5	ps
Input/output Isolation	35			dB
Output Stability (8hrs)			± 0.1	dB
Adjustable Output Power Accuracy			± 0.5	dB
Over Temperature Alarm Setting	25		70	°C
Fiber Type	SMF-28, 9/125um NA = 0.13			
Working Temperature	-30		55	°C
Storage Temperature	-45		85	°C
Operation Humidity	5		85	%
Module Power Supply	3.15		3.46	V
Adapt PCB Power Supply	DC +5V / GND			
Power Consumption/Dissipation	0.8			W
Size	34x22x11			mm
PCB Adaptor Communication		USB		

Notes:

[1]. @Output power=5dBm. Define as amplification: Output power = Gain X Input power.

Rev 04/15/24

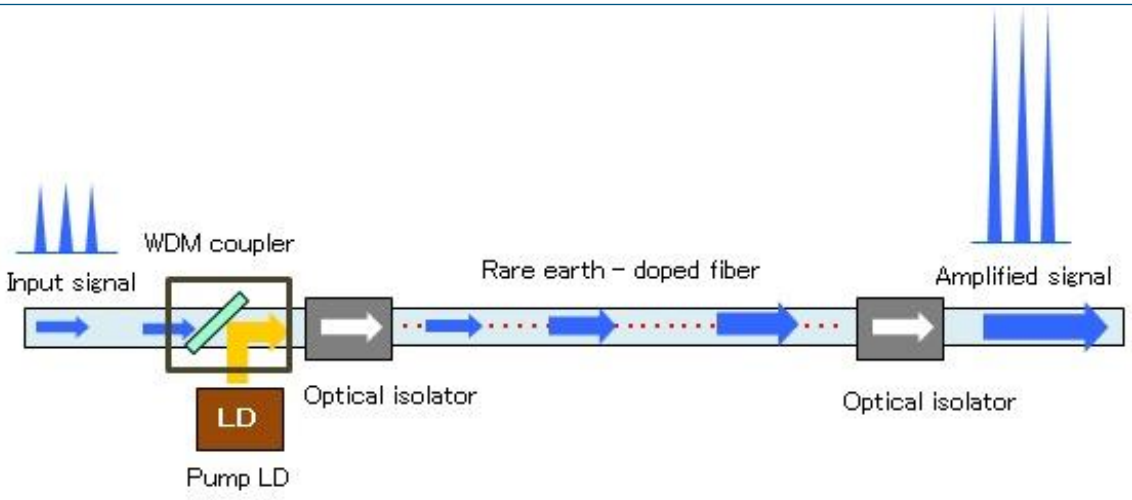
© Photonwares Corporation

P +1 781-935-1200 E sales@photonwares.com W www.agiltron.com

Mini Erbium Doped Fiber Amplifier

DATASHEET

Function Diagram



Package Choices

Component

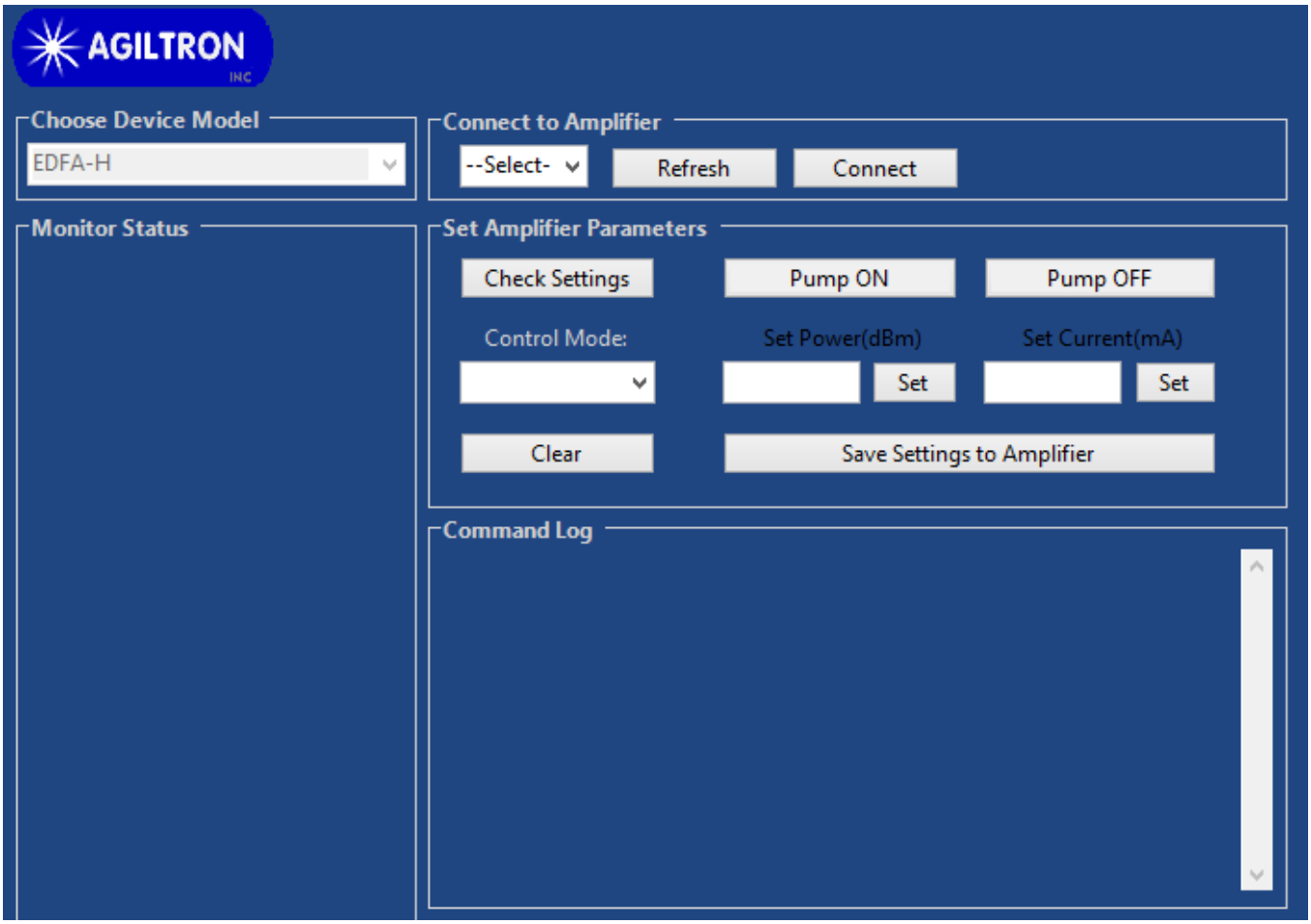
USB/GUI Adopting PCB mounted on top of the component for conveniency

P +1 781-935-1200 E sales@photonwares.com W www.agiltron.com

Mini Erbium Doped Fiber Amplifier

DATASHEET

GUI USB Interface



Operation Instruction

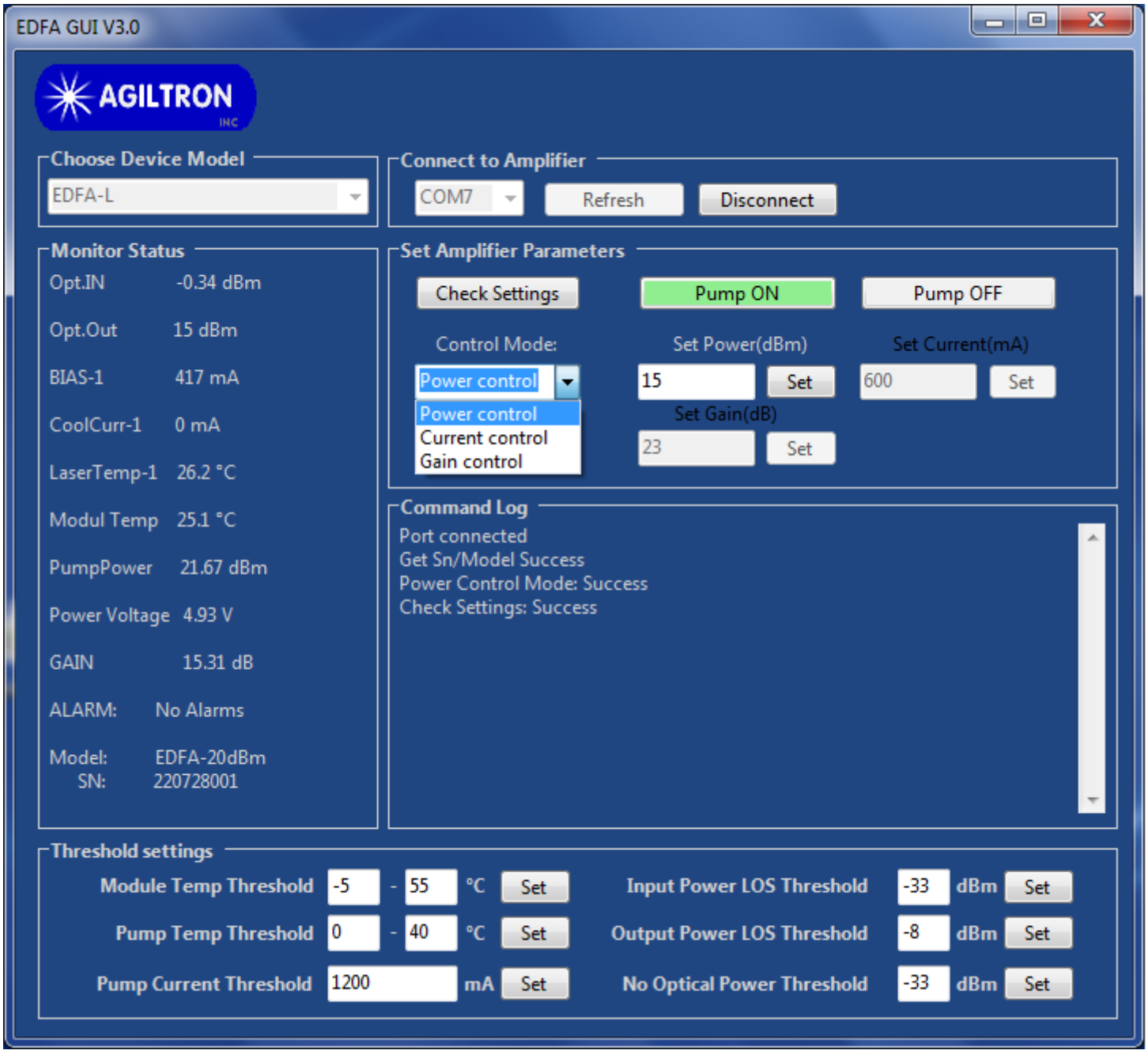
- Load the software, Unzip the folder and Click "setup" to Install the GUI
- Select an amplifier type that matches your PO
- Connect your PC to the Amplifier by first connecting a USB cable and then choosing the necessary port and clicking “Connect“. To change the COM port click "Refresh", choose the necessary port, then click "Connect“
- Obtain the stored settings by clicking "Check Settings“
- To change the setting, first select the control mode
- To set up output power or current, input desired value and click "Set“. There are limits for max output per the model type.
- To turn on the Amplify click "Pump ON“; the green color should appear. To stop click "Pump OFF“; the red color should appear
- To save the setting click "Save Settings to Amplifier”. The Amplifier will store the setting for the next time you turn it on, even without the PC.
- The Amplifier only works if the input optical power level is within the spec.

P +1 781-935-1200 E sales@photonwares.com W www.agiltron.com

Mini Erbium Doped Fiber Amplifier

DATASHEET

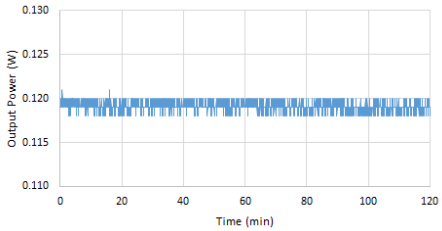
Control GUI

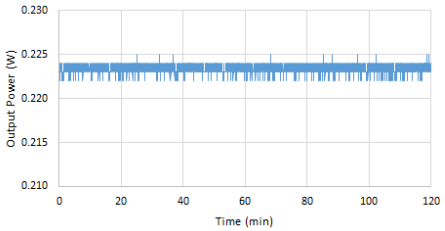


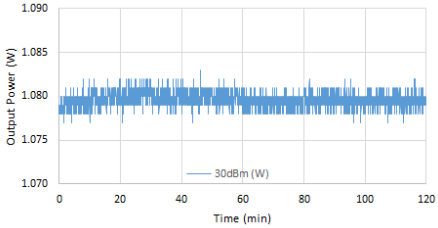
Mini Erbium Doped Fiber Amplifier

DATASHEET

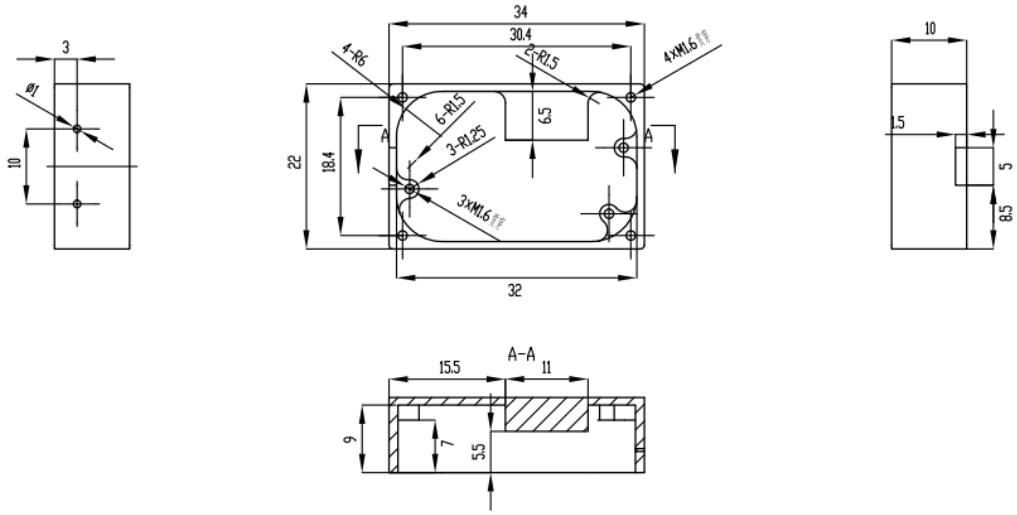
Output Power Stability (33dBm Benchtop)







Mechanical Dimensions (mm)



*Product dimensions may change without notice. This is sometimes required for non-standard specifications.

Mini Erbium Doped Fiber Amplifier

DATASHEET

Ordering Information

	1	☐	☐	1	☐	☐	☐	☐	☐
Prefix	**Type**	**Wavelength**	**Power [1]**	**Polarization**	**Package**	**Cable Type**	**Fiber Length [2]**	**Connector**	**Filter**
MEDF-		C Band = C Special = 0	6dBm = 1 10dBm = 2 18dBm = 3	Random = 1	Component = M PCB Mount = P Special = 0	0.9mm tube = 3 Special = 0	0.5m = 2 1.0m = 3 Special = 0	None = 1 FC/PC = 2 FC/APC = 3 SC/PC = 4 SC/APC = 5 LC/PC = 7 LC/APC = A LC/UPC = U Special = 0	None = 1 Gain flat = 2 Special = 0

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

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

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 how handling by expanding the core side at the fiber ends.

P +1 781-935-1200 E sales@photonwares.com W www.agiltron.com

Mini Erbium Doped Fiber Amplifier

DATASHEET

Laser Safety

This product meets the appropriate standard in Title 21 of the Code of Federal Regulations (CFR). FDA/CDRH Class 1M laser product. This device has been classified with the FDA/CDRH under accession number 0220191. All versions of this laser are Class 1M laser products, tested according to IEC 60825-1:2007 / EN 60825-1:2007. An additional warning for Class 1M laser products. For diverging beams, this warning shall state that viewing the laser output with certain optical instruments (for example eye loupes, magnifiers, and microscopes) within a distance of 100 mm may pose an eye hazard. For collimated beams, this warning shall state that viewing the laser output with certain instruments designed for use at a distance (for example telescopes and binoculars) may pose an eye hazard.

Wavelength = 1.3/1.5 μm.

Maximum power = 30 mW.

*Caution - Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.
*IEC is a registered trademark of the International Electrotechnical Commission.

Q&A About Fiber Optical Amplifier

Q: Can this amplifier pulsed signals?
A: It has been tested to amplify up to 100GHz digital data.

Q: Can this amplifier WDM signals?
A: It has been tested to amplify signals with DWDM wavelength spacing.

Q: Can this amplifier has a flat wavelength response?
A: Yes, by put flattering gain filters, that is an extra cost.

Q: If one puts a small signal into it, can it be amplified to the maximum output power indicated on the spec?
A: The amplifier is set as an analog mode whose output signal strength is approximately proportional to the input strength. It has a certain gain of about 40dB. There are two types: one is a preamplifier and a booster. One can use a preamplifier before the booster for weak signals, as done in electronic amplifiers.

Q: We have an existing amplifier. Can you duplicate it?
A: Yes, we can produce it with a seamless software interface.

P +1 781-935-1200 E sales@photonwares.com W www.agiltron.com

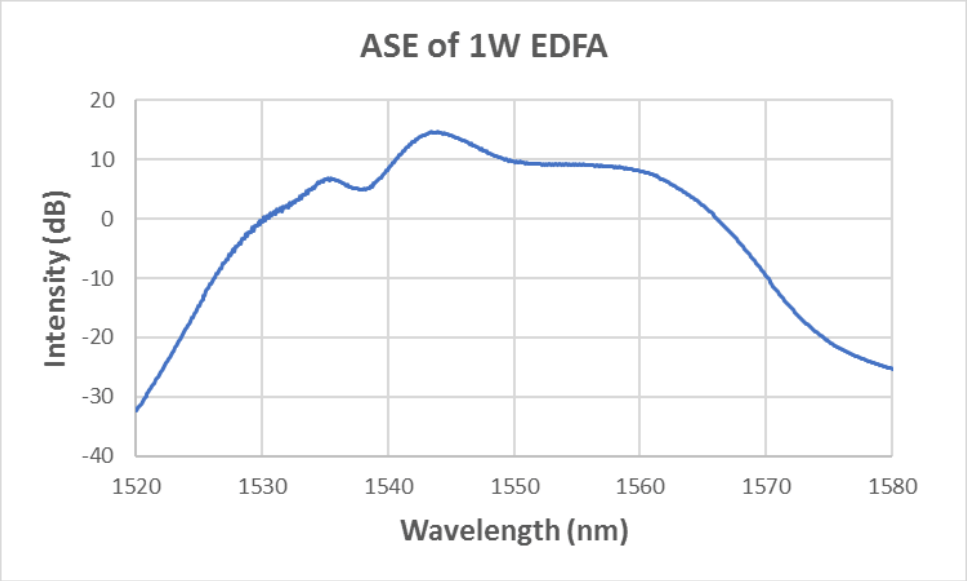
Mini Erbium Doped Fiber Amplifier

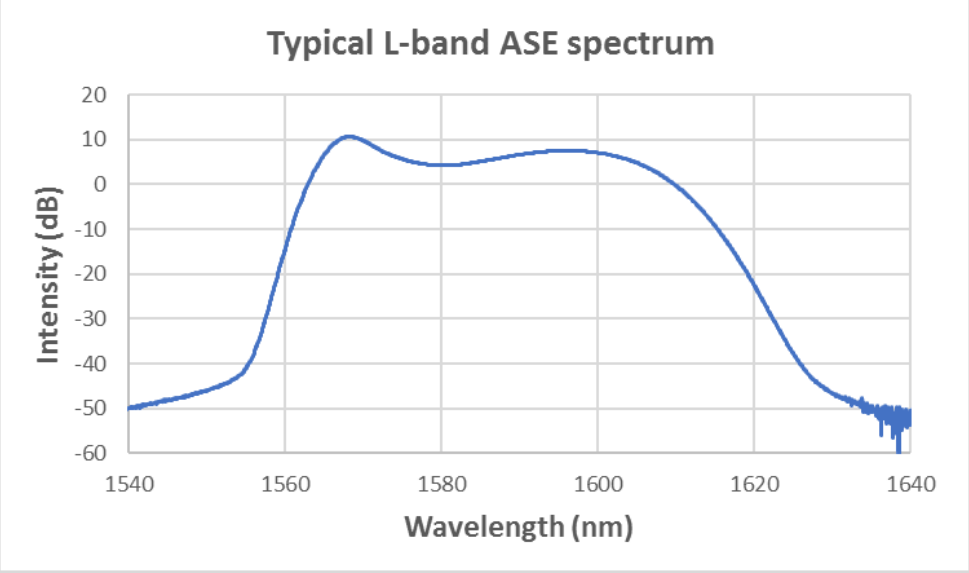
DATASHEET

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.

Typical Spectrums





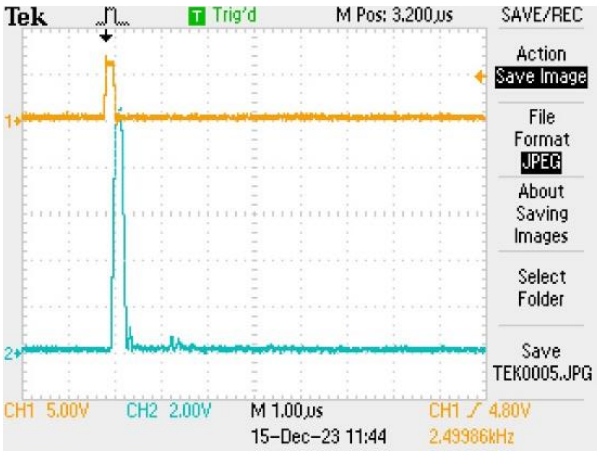
P +1 781-935-1200 E sales@photonwares.com W www.agiltron.com

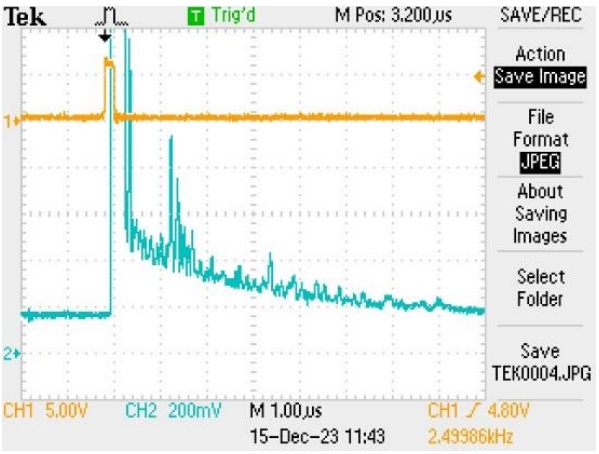
Mini Erbium Doped Fiber Amplifier

DATASHEET

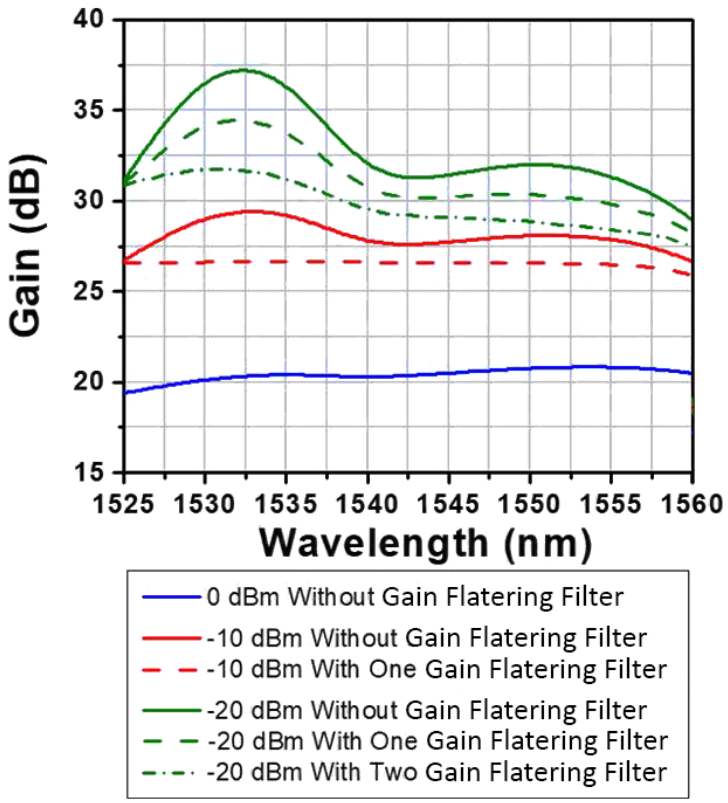
Typical Nanosecond Laser Pulse Amplification

- Source laser: 2.5kHz 200ns pulses with peak power 1.33mW
- Amplified 42dB by 23.5dBm EDFA;
- ASE floor is about 24dB lower than the peak power;





Gain Flattering Filter Effect



P +1 781-935-1200 E sales@photonwares.com W www.agiltron.com