



Specification for 0104- Super Fast Erbium Doped Fiber Amplifier (version 1.2)

09/11/2009

During the WDM transmission line, any line could be added in or dropped out, which will cause the signal power of the remaining line to change, and the total power of the EDFA will have overshoot or undershoot, which is called transient response. The idea transmission line would require no impact on the remaining lines by the adding and dropping process of any number of channels. The regular EDFA with control circuit would have about 100 μ s transient suppression time with +/- 0.5 dB power lever overshoot or undershoot. YY Labs' Super Fast EDFA can reach sub- μ s transient suppression time and +/- 0.3dB overshoot or undershoot with 6 dB add or drop.

This Erbium Doped Fiber Amplifier (EDFA) is designed to be used in the traditional C-band wavelength region. However, during operation, the signal wavelengths will be confined to a 3.2 nm band for each optical amplifier although the band can be anywhere within the C-band. The unit can work from 0 to up to 4 channels.

Due to the nature of the narrow band operation, the transient suppression performance of the Super Fast EDFA will be greatly improved compared to traditional EDFA. A detailed specification is provided below.



Super Fast Optical Amplifier optical Specification

Parameter	Min	Typical	Max	Unit	Note
Optical Specifications					
Operation Wavelength	1529.16		1558.58	nm	(1)
Input Power (per channel)	-19.00		-11.00	dBm	(2)
Gain		24		dB	(3)
Output Power (per channel)	5		13	dBm	(3)
Noise Figure		5.5		dB	
Gain Flatness		±0.3		dB	Within 3.2 nm band; relative to 24dB
PDG			0.3	dB	Polarization Dependent Gain
PMD			0.5	ps/√km	Polarization Mode Dispersion
Transient Suppression Time		50	100	ns	Measured with total output power
Transient Over/Undershoot			±0.1 ±0.3	dB	For 3 dB add/drop within 3.2 nm band For 6 dB add/drop within 3.2 nm band
Input/Output Return Loss			35	dB	
Residual Pump Power at Output			-25	dBm	
Mechanical Specification					
Dimensions			90x70x14	mm	
Fiber Pigtail	Conventional SMF				
Fiber Pigtail Length			1	M	
Connector Type		SC/PC			
Environmental Specifications					
Operating Temperature	0		70	°C	
Storage Temperature	-40		85	°C	

Note:

- (1) During operation, the input signals will be confined in a 3.2 nm band. However, the band will be in the traditional C-band region as indicated here.
- (2) -19 dBm is the minimum per channel input power. The maximum number of channel at this power level will be four. There will be only one channel allowed if the single channel input power is at -11 dBm. The unit can also work from dark.
- (3) Fixed gain operation, the output power follows the input power.

Super Fast Optical Amplifier Electrical Specification

1. Electrical interface

There is a connector for user to apply power voltage or observing the EDFA input, output power, and pump performance. The following is the notation of the pin-out.

2	16
1	15



- 1,2: -5V
- 3,4: GND
- 5,6: +5V
- 7: Temperature Controller Monitor
- 8: V_PDout When $V_{out} = 13\text{dBm}$ about 1V
- 9: GND
- 10: V_PDin When $V_{in} = -11\text{dBm}$ about 1V
- 11: PD in Pump (cathode)
- 12: Pump enable (High-On, Low-Off)
- 13: PD in Pump (anode)
- 14: Pump Current (about $10 \cdot I_{\text{pump}}$)
- 15,16 N.C.

Power supply: +/-5V

Input Power: -19dBm to -11dBm

Gain: 24dB +/- 0.3dB

Temperature Controller Monitor will show voltage below 1V if the voltage on the pump thermal resistor is over 2.1V or below 0.5V (normally 1.25V). The temperature controller will not be able to adjust the temperature to the right range with this situation. To avoid pump damage, please disable the Pump current. When the EDFA is turned on, it will take less than 10 seconds for the temperature controller to reach the stabilization.

Turn on procedure:

1. Apply +/- 5V, while keeping pin-12 at low
2. Then, Set pin-12 at high.

Super Fast Optical Amplifier Mechanical Specification

