FITEL

ErFA11000 Series

Desktop type Er doped optical fiber amplifier

Description:

- ErFA11000 series are desktop type Er doped optical fiber amplifiers (EDFAs) for experimental use.
- ErFA11000 series can be operated with commercial AC power.
- Various models are lined up according to the output power level, gain and noise figure.

Features:

- Both of EDFAs pumped by 1480nm laser diodes and 980nm laser diodes are available.

- Following three operating modes are available
  (1) **ACC** : Automatic pump laser current control
  Pump laser current is controlled to stabilize pump laser power.
  (2) **APC** : Automatic pump power control
  Pump power is monitored and controlled using photo diode in pump laser.
  (3) **ALC** : Automatic amplified output power control
  Output power level of the amplifier is monitored and controlled.

- Pump laser current, pump laser power, temperature of pump laser, input power output power and returned power from output terminal are monitored.
  (Input power monitor and returned power monitor are optional for ErFA11031B)

- Pump laser current, pump laser power, temperature of pump laser and output power are displayed on front panel.

- Maximum output power level is over +24dB.
  (ErFA11023)

- Maximum gain is over 45dB.
  (ErFA11023)

- Noise figure is less than 5.5dB.
  (ErFA11031B and ErFA11032
  pumped by 980nm laser diode(s).)

Appearance of ErFA11022

FURUKAWA ELECTRIC

Specifications

Table1 Line-up of EDFAs for single channel application pumped by 1480 nm laser diodes

Items	ErFA11021B	ErFA11022	ErFA11023
Signal wavelength	1530 - 1565 nm		
Maximum output power (*1)	> +18 dBm	> +21 dBm	> +24 dBm
Gain (*2)	> 35 dB	> 40 dB	> 45 dB
Gain (*3)	> 30 dB	> 35 dB	> 40 dB
Noise figure (*2)	< 7.5 dB		
Polarization dependence of output power	< 0.15 dB		
Polarization extinction ratio	> 17 dB (*5)		
Wavelength of pump laser	1480nm band		
Number of pump laser	1 pc.	2 pcs.	4 pcs.
Dimensions (*4)	190 x 270 x 94 mm	190 x 270 x 94 mm	220 x 355 x 114 mm
Optical interfaces	See *"Ordering information"*		
Optical fiber	SMF (DSF and PMF can be supported.) See *" Ordering information"*		
Power voltage	100-240VAC +4% / -10%		
Operating temperature	0 - 40 deg.C		

Table 2 Line-up of EDFAs for single channel application pumped by 980 nm laser diodes

Items	ErFA11031B	ErFA11032
Signal wavelength	1530 - 1565 nm	
Maximum output power (*1)	> +15 dBm	> +18 dBm
Gain (*3)	> 35 dB	> 40 dB
Noise figure (*3)	< 5.5 dB	
Polarization dependence of output power	< 0.15 dB	
Polarization extinction ratio	> 17 dB (*5)	
Wavelength of pump laser	980nm band	
Number of pump laser	1 pc.	2 pcs.
Dimensions (*4)	190 x 270 x 94 mm	190 x 270 x 94 mm
Optical interfaces	See *"Ordering information"*	
Optical fiber	SMF (DSF and PMF can be supported.)	
Power voltage	100-240VAC +4% / -10%	
Operating temperature	0 - 40 deg.C	

*1 : Input power > 0dBm
*2 : Input power = -35 dBm @ 1530 – 1560 nm
*3 : Input power = -35 dBm @ 1530 – 1565 nm
*4 : Excluding protrusions
*5 : Applicable only to polarization maintaining type EDFA.
The state of input light should be a linear polarization that is parallel to the slow axis of PANDA fiber and key boss of SC connector.

FITEL

Table3 C band EDFA for WDM application

Items	ErFA11101	Notes
Signal wavelength	1534 - 1563 nm	
Maximum output power	+22 dBm	Input power=-8 dBm (total)
Gain	30 dB	
Noise figure	< 6.5 dB	Input power=-8 dBm (total), Output power = +22 dBm
Gain flatness	< 2.0 dBpp (Typ. 1.0 dB)	Input power=-8 dBm (total), Output power = +22 dBm
Polarization dependence of output power	< 0.2 dB	
Wavelength of pump laser	980nm and 1480nm band	
Number of pump laser	4 pcs.	
Dimensions	220 x 355 x 114 mm	Excluding protrusions
Optical interfaces	See *"Ordering information"*	
Optical fiber	SMF (DSF and PMF can be supported.) See *" Ordering information"*	
Power voltage	100-240VAC +4% / -10%	
Operating temperature	0 - 40 deg.C	

Table4 L band EDFA for WDM application

Items	ErFA11501	Notes
Signal wavelength	1570 - 1600 nm	
Maximum output power	+22 dBm	Input power=-8 dBm (total)
Gain	30 dB	
Noise figure	< 7.0 dB	Input power=-8 dBm (total), Output power = +22 dBm
Gain flatness	< 2.0 dBpp (Typ. 1.0 dB)	Input power=-8 dBm (total), Output power = +22 dBm
Polarization dependence of output power	< 0.2 dB	
Wavelength of pump laser	1480nm band	
Number of pump laser	4 pcs.	
Dimensions	220 x 355 x 114 mm	Excluding protrusions
Optical interfaces	See *"Ordering information"*	
Optical fiber	SMF (DSF and PMF can be supported.) See *" Ordering information"*	
Power voltage	100-240VAC +4% / -10%	
Operating temperature	15 - 35 deg.C	

General specifications

Items	Specs.	Notes
Pump LD Control mode	ACC / APC / ALC	
Display	Pump laser current / Pump laser power / Temperature of pump laser / Amplified output power	Displayed on front panel
Alarm	Pump LD current alarm	
	Temperature alarm	When temperature of pump LD is over 30 deg.C.
	Input power alarm (*1)	When Pin is under -10dBm. (*2)
	Reflection alarm (*1)	When returned power from output terminal is over about +3dBm. (*2)
Shut down	Temperature of pump LD	When temperature of pump LD is over 35 deg.C, pump LDs are automatically shut down.

*1 : Optional for ErFA11031
*2 : At the same time, pump LDs are automatically shut down.

Table5 EDFAs for single channel application Clad Pump technology

Items	ErFA11028
Signal wavelength	1545 - 1560 nm
Maximum output power (*1)	> +30 dBm
Gain	> 30 dB
Noise figure (*2)	< 6.5 dB
dependence of output power	< 0.15 dB
Wavelength of pump laser	980nm band Multi Mode Laser (*3)
Number of pump laser	2 pcs. of Multi Mode Laser
Dimensions (*4)	483 x 434.5 x 149 mm
Optical interfaces (*5)	SC/SPC
Optical fiber (*5)	SMF
Power voltage	100-240VAC +10% / -10%
Operating temperature	15 - 35 deg.C

*1 : Input power ＞0dBm
*2 : Input power = 0dBm
*3 :Excluding protrusions
*4 :Ordering code “-SSS”

Table6 EDFAs for single channel application pumped by High power 1480 nm laser diodes

Items	ErFA11053
Signal wavelength	1530 - 1565 nm
Maximum output power (*1)	> +27 dBm
Gain	> 45 dB
Noise figure (*2)	< 7.5 dB
dependence of output power	< 0.15 dB
Wavelength of pump laser	1480nm
Number of pump laser	4 pcs.
Dimensions (*3)	483 x 434.5 x 149 mm
Optical interfaces (*4)	FC/SPC, SC/SPC, SC/AnPC
Optical fiber (*4)	SMF, DSF
Power voltage	100-240VAC +10% / -10%
Operating temperature	0 - 40 deg.C

*1 : Input power ＞0dBm
*2 : Input power = - 35dBm@1530-1565nm, 45dB Gain
*3 :Excluding protrusions
*4 :See “Ordering information”

Ordering information

ErFA 11XXX - X - YY

Model number
See Table1, 2, 3 and 4.

Fiber for optical interfaces

S	SMF
D	DSF
P	All PMF

Optical connector

FS	FC super PC
SS	SC super PC
SA	SC angled PC

High power output
If you need higher output power, we can support up to +27.0 dBm.

Polarization maintaining optical fiber amplifier
We can support polarization maintaining EDFA.
SC/SPC connectors are used as standard optical interfaces.

Any requirement can be considered. Feel free to contact us!

NORTH AMERICA AREA
Furukawa America Inc. (FAI)
e-mail:oesales@FurukawaAmerica.com

EUROPE AREA
Furukawa Electric Europe Ltd. (FEEL)
e-mail:sales@furukawa-fitel.co.uk

ASIA AREA China & Hong Kong
Furukawa Electric H.K. Ltd.
e-mail:guest@fehk.com.hk

ASIA AREA Taiwan
Taiwan Furukawa Electric Co., Ltd.
e-mail:arai@tfe.com.tw

ASIA AREA Others except for Korea
Furukawa Electric Singapore Pte. Ltd. (FES)
e-mail:admin@furukawa.com.sg

SOUTH AMERICA AREA
Furukawa Industrial S.A. (FISA)
e-mail:nhsaito@furukawa.com.br

JAPAN and OTHER AREA
The Furukawa Electric Co.,Ltd.
e-mail:comsales@ho.furukawa.co.jp

FURUKAWA ELECTRIC