

Cooler less pumped small form factor EDFA

Product type: ErFA2401



Applications

- Single channel amplification in WDM network
 - Booster amplifier
 - Preamplifier
- Loss compensation
- Metro Network transmission

Description

- ErFA2401 has been designed for a wide variety of single channel applications of EDFA.
- Miniature Small (103mm x 60mm x10mm) onboard mountable package.
- Simple cooler-less coaxial 1480nm pumped configuration.
- Input and output monitor is implemented on request.
- Input and output isolator is equipped on request.

Features

- Saturated output power $> +9\text{dBm}$ (1480nm pumped version)
- Nominal output power $> +4\text{dBm}$
- Noise figure $< +8\text{dB}$
- Cooler free operation up to $+65^{\circ}\text{C}$ ambient temp

Block diagram

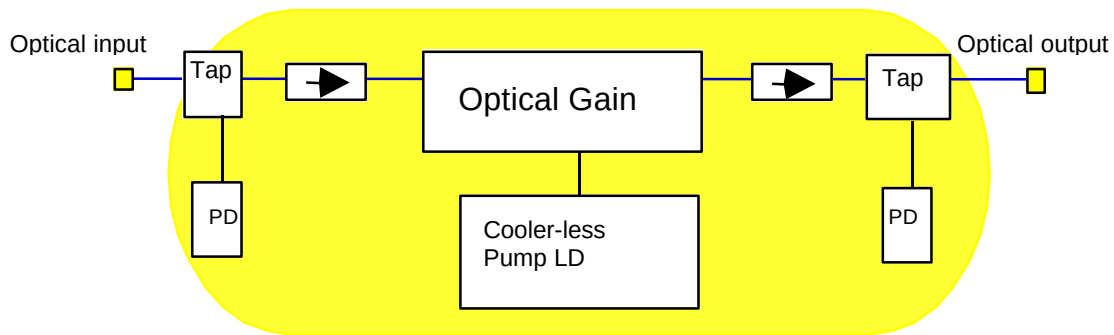
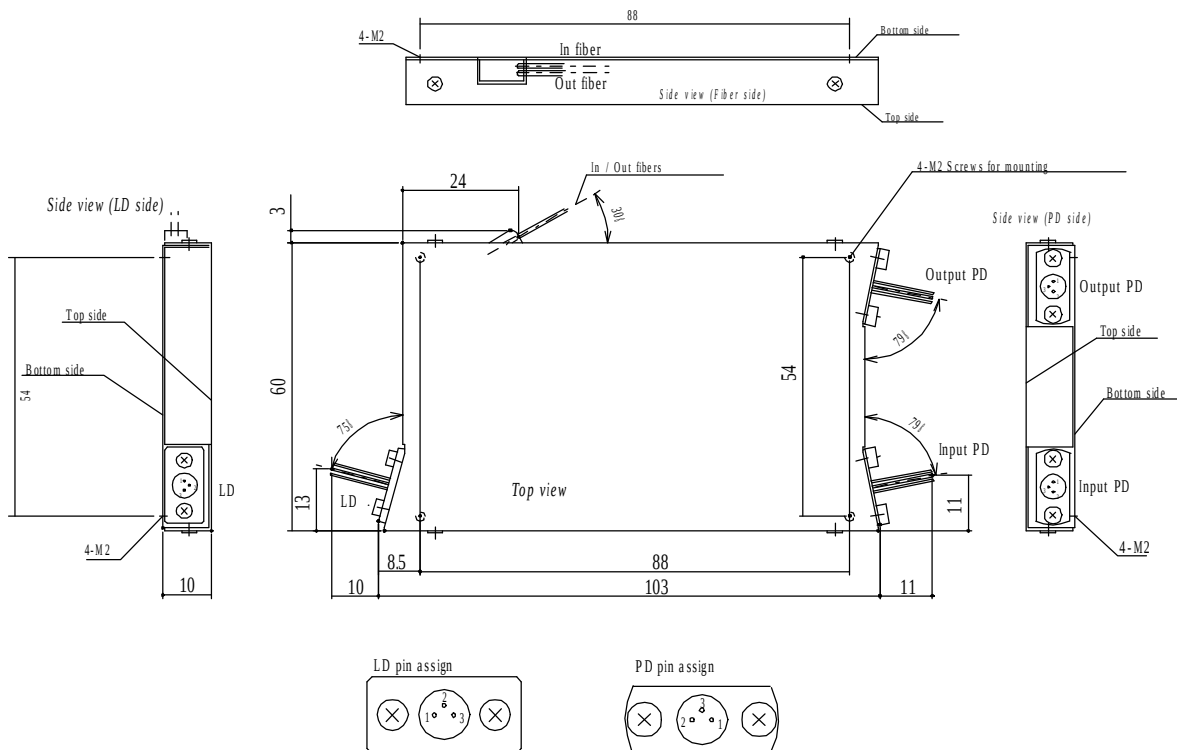


Figure. ErFA2401 EDFA Block Diagram

Outline Drawings



Electrical pin configuration

Device	Pin No.	Description
Pump LD	1	Laser Cathode (-)
	2	Laser Anode (+), Backfacet PD Cathode(+)
	3	Backfacet PD Anode(-)
Input monitor PD	1	PD Anode (-)
	2	PD Cathode (+)
	3	PD case
Output monitor PD	1	PD Anode (-)
	2	PD Cathode (+)
	3	PD case

Environmental conditions

Parameter	Unit	Min	Typ	Max	Remarks
Storage Temperature	°C	-40		70	
Operating Humidity	%RH	10		80	No dew condensation
Storage Humidity	%RH	10		90	No dew condensation
Operating Temperature	°C	0		65	

Absolute maximum ratings

Item	Symbol	Condition	Value limit	Unit
Laser forward current	I_P		400	mA
Laser reverse voltage	$V_{F,P}$		2	V
Monitor photodiode forward current	$I_{F,M}$		5	mA
Monitor photodiode reverse voltage	$V_{R,M}$		20	V
Forward voltage of input signal monitor diode	$V_{F,M,IN}$		0	V
Forward voltage of output signal monitor diode	$V_{F,M,OUT}$		0	V
Reverse voltage of input signal monitor diode	$V_{R,M,IN}$		15	V
Reverse voltage of output signal monitor diode	$V_{R,M,OUT}$		15	V

Electrical Characteristics

Item	Symbol	Conditions	Min	Max	Unit
Pump laser diode current (BOL)	I_{P0}	Over whole operating conditions $-5^{\circ}\text{C} \leq T_{op} \leq 65^{\circ}\text{C}$	-	200	mA
Relative change of pump laser diode current from BOL to EOL	$\Delta I_P / I_{P0}$			20	%
Pump laser diode forward voltage	V_P		-	2.2	V
Pump monitor PD dark current	I_{MD}	$I_P = 0\text{mA}$, $U_{\text{reverse}} = 3.0\text{ V}$	-	100	nA
Pump monitor PD current	I_M	$I_P = I_{P0}$ Not applicable for EDFA power control.	50	4000	μA
Pump monitor PD reverse voltage	U_{MR}		0	10	V

Optical Characteristics

Item	Symbol	Conditions	Min	Typ	Max	Unit
Amplification wavelength	λ	Single channel operation	1530		1565	nm
Input signal power	P_{IN}		-35		0	dBm
Saturated output power	$P_{\text{Sat,Out}}$	$1530\text{nm} \leq \lambda \leq 1565\text{nm}$ $P_{IN} = 0\text{dBm}$	+9	+10		dBm
Nominal output power	$P_{\text{Nom,Out}}$	$1530\text{nm} \leq \lambda \leq 1565\text{nm}$ $P_{IN} = -10\text{dBm}$	+4	+5		dBm
Small signal gain	G	$1530\text{nm} \leq \lambda \leq 1565\text{nm}$ $P_{IN} = -35\text{dBm}$	16	20		dBm
Noise figure	NF	$1530\text{nm} \leq \lambda \leq 1565\text{nm}$ $P_{IN} = -10\text{dBm}$ Excluding input isolator	-	7.2	8.0	dB

Typical performance

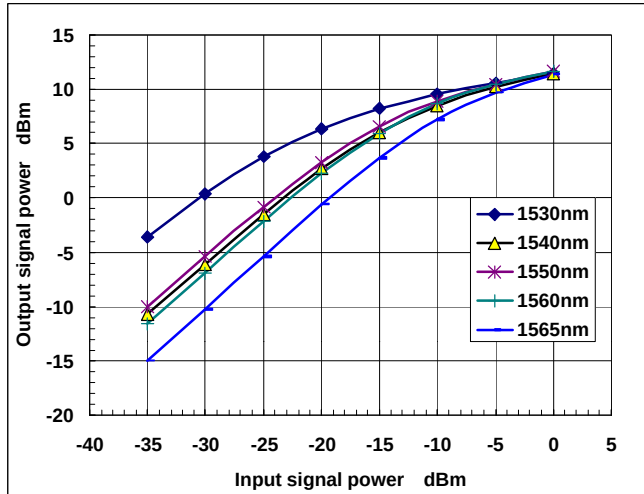


Figure. Output power against input power

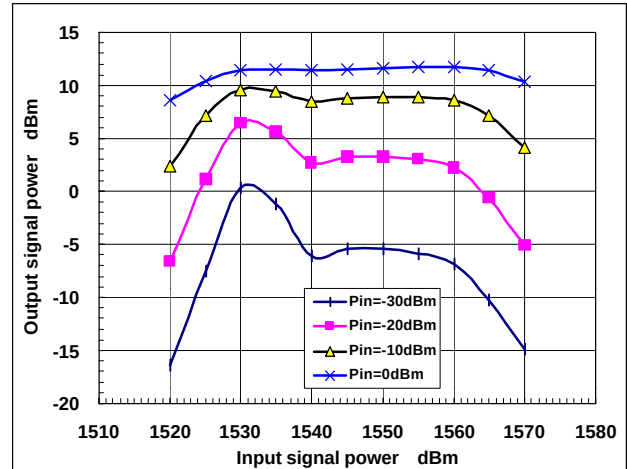


Figure. Output power against input signal wavelength

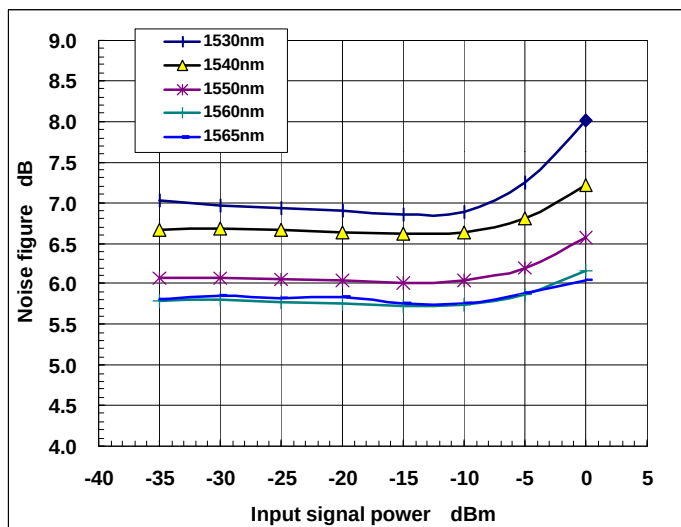
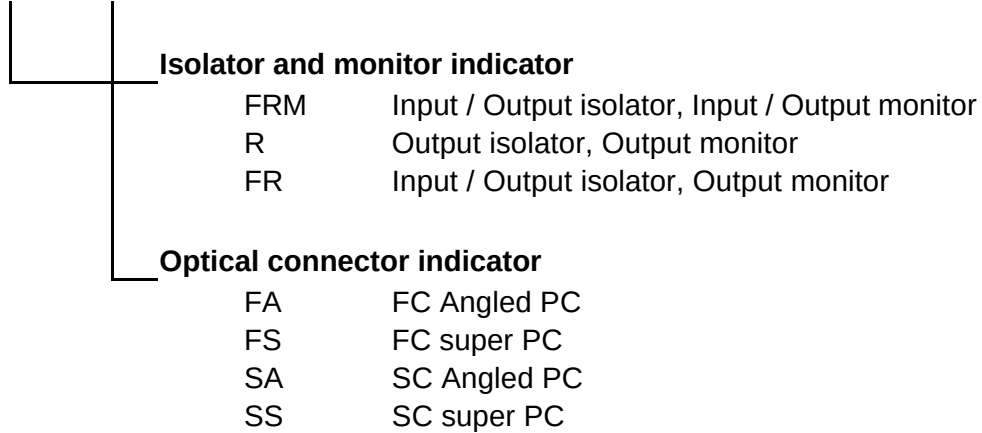


Figure. Noise figure against input power;

ErFA2401 -X X -Y Y



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