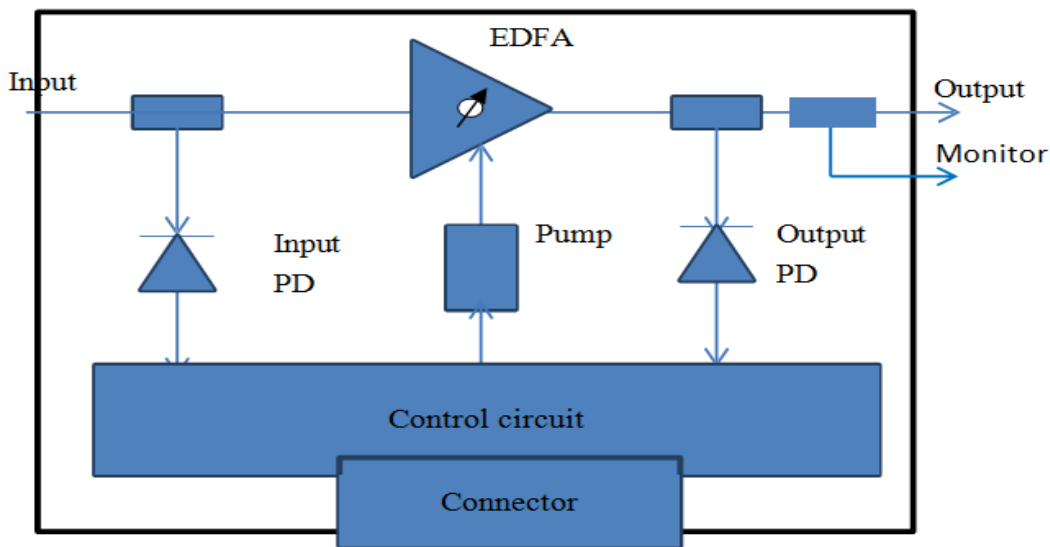


1. Scope

This document specifies the requirements of a DWDM C-band amplifier. The amplifier modules can be operated at constant gain (Automatic Gain Control AGC), constant output power (Automatic Power Control, APC). There are isolators at input and output port. Integrated VOA can be automatically adjusted to achieve smooth gain spectrum. Optical supervisory channel (OSC) is optional function integrated in the module, it can be dropped or added.

Amplifier diagram:



2. Performance

2.1. Absolute maximum ratings

Technical Parameter	Min	Max	Unit
Operating case temperature	-5	55	°C
Operating relative humidity	5	95	%
Storage Temperature	-40	75	°C
Storage relative humidity	5	95	%

Power consumption		10	W
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2.2 Optical Characters

2.2.1 Integrated VOA amplifier (VGA)

EX1: OPA16/G25V

Item	Min.	Typ.	Max.	Unit	Note
Operation wavelength	1529		1561	nm	40 or 48 ch is Optional
	1528		1568	nm	
Input Power Range	-32	-9	-4	dBm	
Gain range	20	25	30	dB	Can be set
Output Power Range	-7		16.5	dBm	
Gain Flatness		1	1.5	dB	
Noise Figure			5.5	dB	@rated Gain
Loss alarm Threshold	-33			dBm	Can be adjusted

EX2: OPA16/G20V

Item	Min.	Typ.	Max.	Unit	Note
Operation wavelength	1529		1561	nm	40 or 48 ch is Optional
	1528		1568	nm	
Input Power Range	-31	-4	1	dBm	
Gain range	15	20	25	dB	Can be set
Output Power Range	-11		16.5	dBm	
Gain Flatness		1	1.5	dB	
Noise Figure			5.5	dB	@rated Gain
Loss alarm Threshold	-32			dBm	Can be adjusted

EX3: OLA20/G20V

Item	Min.	Typ.	Max.	Unit	Note
Operation wavelength	1529		1561	nm	40 or 48 ch is Optional
	1528		1568	nm	
Input Power Range	-27	0	5	dBm	
Gain range	15	20	25	dB	Can be set
Output Power Range	-7		20.5	dBm	
Gain Flatness		1	1.5	dB	
Noise Figure			6	dB	@rated Gain

Loss alarm Threshold	-28			dBm	Can be adjusted
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EX4: OLA20/G25V

Item	Min.	Typ.	Max.	Unit	Note
Operation wavelength	1529		1561	nm	40 or 48 ch is Optional
	1528		1568	nm	
Input Power Range	-32	-5	0	dBm	
Gain range	20	25	30	dB	Can be set
Output Power Range	-7		20.5	dBm	
Gain Flatness		1	1.5	dB	
Noise Figure			6	dB	@rated Gain
Loss alarm Threshold	-33			dBm	Can be adjusted

2.2.2 Fixed Gain amplifier (FGA)

EX1: OBA20/G16

Item	Min.	Typ.	Max.	Unit	Note
Operation wavelength	1529		1561	nm	40 or 48 ch is Optional
	1528		1568	nm	
Input Power Range	-25	4	7	dBm	
Gain range	13	16	19	dB	Can be set
Output Power Range	-9	20	20.5	dBm	
Gain Flatness		1	1.5	dB	@rated Gain
Noise Figure			6	dB	@rated Gain
Loss alarm Threshold	-26			dBm	Can be adjusted

EX2: OBA20/G12

Item	Min.	Typ.	Max.	Unit	Note
Operation wavelength	1529		1561	nm	40 or 48 ch is Optional
	1528		1568	nm	
Input Power Range	-21	8	11	dBm	
Gain range	9	12	15	dB	Can be set
Output Power Range	-9	20	20.5	dBm	
Gain Flatness		1	1.5	dB	@rated Gain
Noise Figure			6.5	dB	@rated Gain
Loss alarm Threshold	-22			dBm	Can be adjusted

EX3: OPA16/G20

Item	Min.	Typ.	Max.	Unit	Note
Operation wavelength	1529		1561	nm	40 or 48 ch is Optional
	1528		1568	nm	
Input Power Range	-32	-4	-1	dBm	
Gain range	17	20	23	dB	Can be set
Output Power Range	-12	16	16.5	dBm	
Gain Flatness		1	1.5	dB	@rated Gain
Noise Figure			5.5	dB	@rated Gain
Loss alarm Threshold	-33			dBm	Can be adjusted

2.3 General specification

2.3.1 Optical general specification

Item	Min	Typ	Max	Units	Note
Operating wavelength range	1528		1568	nm	
Polarization dependence gain			0.3	dB	
Polarization mode dispersion			0.5	ps	
Return Loss	45			dB	UPC connector

2.3.2 OSC specification (If there is no OSC channel, skip this chapter)

Optical supervisor channel is optional, Add/Drop outside, it means drop from PA input and add at BA output. OSC channel wavelength can be customized, center wavelength such as 1490, 1510, 1625nm.

Item	Min.	Typ.	Max.	Unit	Note
OSC channel wavelength	1507	1510	1513	nm	optional
OSC insertion loss			1	dB	

2.4 Pigtail

Function	connector	Length(cm)	description
Input	LC/UPC	50±5	900um,tight,white
Output	LC/UPC	50±5	900um,tight,white
Monitor	LC/UPC	50±5	900um,tight,white
OSCI	LC/UPC	50±5	900um,tight,white
OSCO	LC/UPC	50±5	900um,tight,white

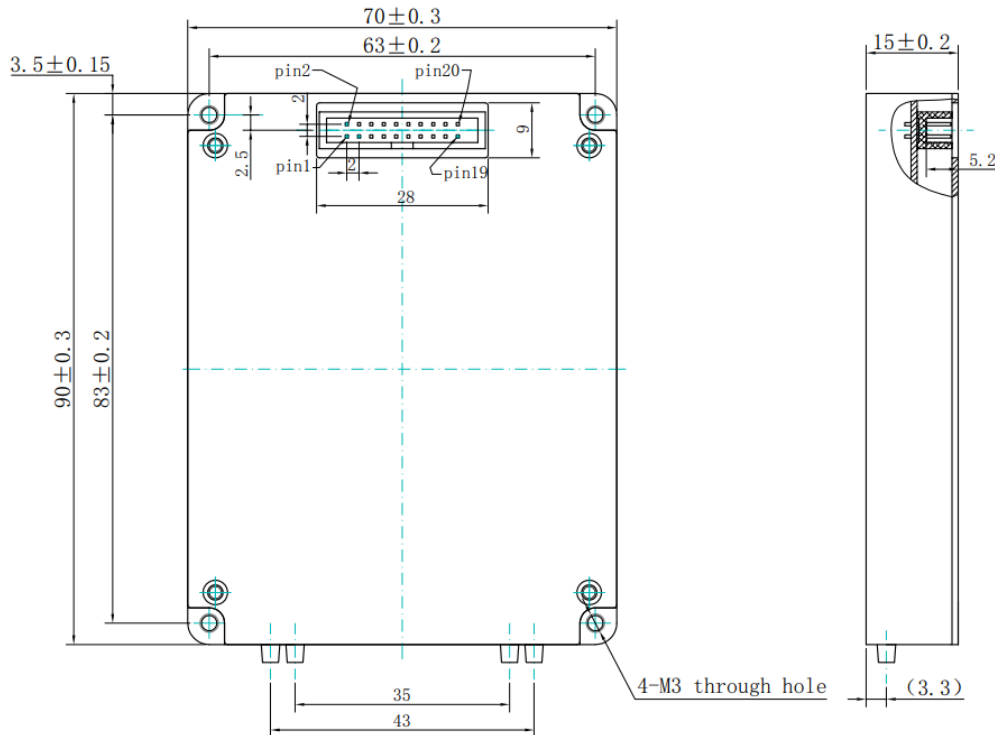
3. Electrical interface

EDFA module electrical connector is 20 pin male

Pin #	Name	Pin #	Name
1	+5VDC	11	Module Temperature Alarm (Active High)
2	+5VDC	12	Reserve
3	Ground	13	Pump Temperature Alarm (Active High)
4	Ground	14	Pump Bias Alarm (Active High)
5	Serial Input LVTTL	15	Loss of Input Alarm (Active High)
6	Serial Output LVTTL	16	Output/Gain Alarm (Active High)
7	Ground	17	Ground
8	Ground	18	Ground
9	Amplifier Disable Input (Active High)	19	+5VDC
10	Reset Input (Active Low)	20	+5VDC

Note: Alarm active is high 3.3V

4. Dimension unit:mm



5. COMMANDS

Baud Rate 57600



ASCII

Command (20PIN MS