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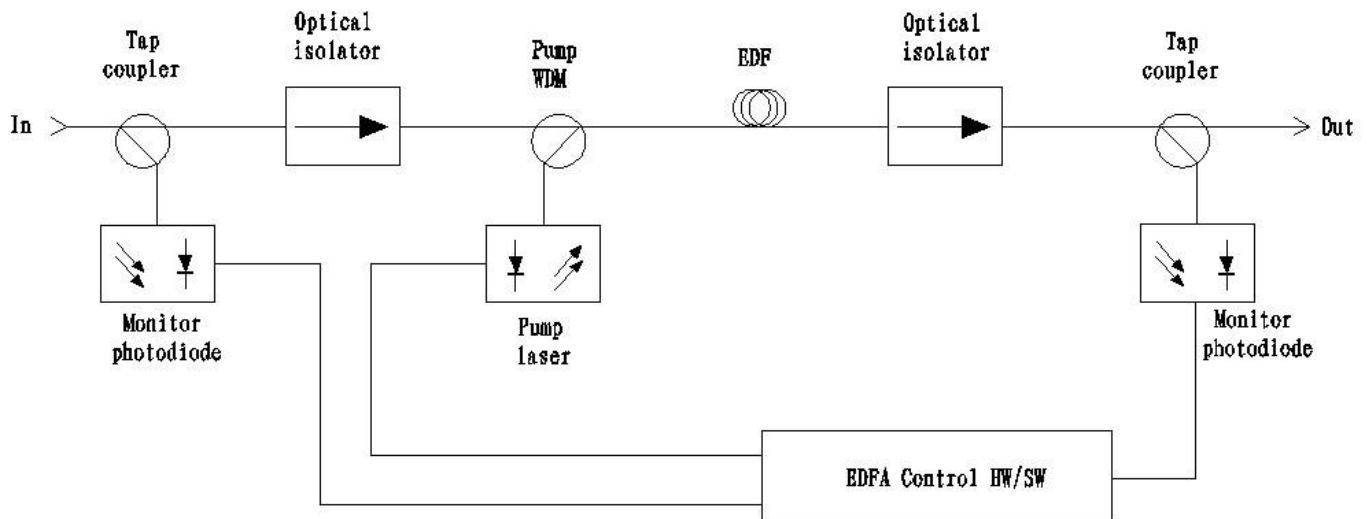
SEM1550 Series EDFA Module

I.Features:：

    1.Adopts JDSU or Oclaro pump laser.

    2.Adopts OFS fiber.

    3.SMT production process to assure small size and low power consumption ,but high stability

    4.Micro monitor PCB

    5.Output adjustable(-4~+0.5)

    6.Max outputs 23dBm(single pump laser).

II. Diagram

IV: Pin Assignment

PIN #	Name	Description	Note
1	+5V	+5V Power supply	
2	+5V	+5V Power supply	
3	+5V	+5V Power supply	
4	+5V	+5V Power supply	
5	Reserve	No Connection	
6	Reserve	No Connection	
7	Tcase_alarm	Alarm=High@case temperature exceeding its upper limit; Output	
8	Lop_alarm	Loss of output power alarm, Alarm=High@output power below its lower limit; Output	
9	L_pump_alarm	Alarm=High@either pump current exceeding its upper limit; Output	

10	T_pump_alarm	Alarm=High@either pump temperature exceeding its upper limit; Output	
11	Reset	Reset=Low; Normal=High	
12	+5V	+5V ower supply	
13	GND	Ground	
14	GND	Ground	
15	GND	Ground	
16	GND	Ground	
17	GND	Ground	
18	RS232-TX	9600 baud rate; Output	
19	LOS_alarm	Loss of input signal alarm, Alarm=High@input power below the setting lower limit; Output	
20	Reserve	No Connection	
21	EN_DIS	EN=High@all pumps are on; EN=Low@all pumps are off; Input	
22	RX232-RX	9600 baud rate; input	
23	Reserve	No Connection	
24	+5V	+5V ower supply	
25	GND	Ground	
26	GND	Ground	

V Parameters

Items	Parameters
Model	1550-14~23
Output (dBm)	14~23
Input (dBm)	-10～10
Wavelength (nm)	1530～1560
Output Adjustable Range (dBm)	UP0.5, down -4.0
Output Stability (dB)	≤0.2
Polarization Sensitivity (dB)	＜0.2
Polarization Dispersion (PS)	＜0.5
Optical Return Loss (dB)	≥45
Fiber Connetor	FC/APC、SC/APC
Noise Figure (dB)	＜5（0dBm input）
Power Consumption (W)	12W
Power Supply (V)	+5V(External 95-250V)
Working Temp (℃)	-20～+60
Weight (Kg)	0.25

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VI:Software Function:：

Port Configuration

The EDFA is set at the baud rate of 9600 bps, 8 data bits, no parity, and 1 stop bit.

Command Syntax

The list shows the commands, which are sent to EDFA and the response, which would be received.

1. Set AGC Gain

Function	Command (PC to EDFA Module)	Acknowledge (EDFA Module to PC)	Comments
Set Gain of AGC	65H + Byte1	55H	1 bytes followed

2. Set APC Power

Function	Command (PC to EDFA Module)	Acknowledge (EDFA Module to PC)	Comments
Set Power of APC	66H + Byte1	55H	1 bytes followed

Unsigned，Power range <=23.0dBm，Step = 0.2dB

Byte1 = Power*10/2

3. Set Case Temperature High alarm threshold

Function	Command (PC to EDFA Module)	Acknowledge (EDFA Module to PC)	Comments
Set Case Temperature limit	69H + Byte1	55H	1 bytes followed

Unsigned，High Temperature set range：25 to +85 ℃，Step = 1℃

Byte1 = Temperature

4. Set input low alarm threshold

Function	Command (PC to EDFA Module)	Acknowledge (EDFA Module to PC)	Comments
Set Input Low limit	6AH + 1 Byte1	55H	1 bytes followed

Signed, Set range: -12.5dBm to 12.5dBm，Step : 0.1dB

Byte1 = Actual Value *10

5. Set input high alarm threshold

Function	Command (PC to EDFA Module)	Acknowledge (EDFA Module to PC)	Comments

Set Input High limit	6BH + Byte1	55H	1 bytes followed

Signed, Set Range -12.5dBm to 12.5dBm，Step : 0.1dB

Byte1 = Actual Value *10

6. Set output low alarm threshold

Function	Command (PC to EDFA Module)	Acknowledge (EDFA Module to PC)	Comments
Set Output Low limit	6CH + Byte1	55H	1 bytes followed

Unsigned, Set Range：0dBm to 25.5dBm，Step : 0.1dB

Byte1 = real Value *10

7. Set input output high alarm threshold

Function	Command (PC to EDFA Module)	Acknowledge (EDFA Module to PC)	Comments
Set Output High limit	6DH + Byte1	55H	1 bytes followed

Unsigned, Set Range：0dBm to 25.5dBm，Step : 0.1dB

Byte1 = real Value *10

8. Set operation mode: AGC/APC/ACC

Function	Command (PC to EDFA Module)	Acknowledge (EDFA Module to PC)	Comments
Set AGC/APC/ACC	71H + Byte1	55H	1 bytes followed

Byte1：0x03 :ACC，0x02 : APC，0x01: AGC

9. Set alarm enable or disable mask

Function	Command (PC to EDFA Module)	Acknowledge (EDFA Module to PC)	Comments
Set Alarm Mask	80H + Byte1-mask + Byte2-mask	55H	2 bytes followed

"1" =masked (i.e. alarm disabled)

"0" =enable alarm

Byte1-mask:

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
TEC_2 high	TEC_1 high	I2 high	I1 high	Output high	Output low	Input high	Input low

Byte2-mask:

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
reserved	reserved	reserved	reserved	reserved	reserved	reserved	Case T high

TEC_2 high：Pump2 TEC current high alarm

TEC_1 high：Pump1 TEC current high alarm

I2 high：Pump2 bias current high alarm

I1 high：Pump1 bias current high alarm

Output high ：Output power high alarm

Output low：Output power low alarm

Input high：Input power high alarm

Input low：Input power low alarm

Case T high：Case Temperature High Alarm

10. Restore Manufacture Default

Function	Command (PC to EDFA Module)	Acknowledge (EDFA Module to PC)	Comments
Restore Manufacture Default	90H	55H	

Default: Rated power on APC mode：

APC/ACC	APC	/
Laser ON/OFF	ON	/
Output Optical power	OPT_type	dBm
Input Low Alarm	-5	dBm
Input High Alarm	10	dBm
Output Low Alarm	OPT_type-4	dBm
Output High Alarm	OPT_type+1	dBm
Module Temperature High Alarm	65	℃
TEC Current High Alarm	1.3	A
Laser Temperature High Alarm	35	℃
set Alarm Mask	(00 00)	enable

OPT_type: the EDFA-module specified power-level

11. Set input power offset

Function	Command (PC to EDFA Module)	Acknowledge (EDFA Module to PC)	Comments
Set input power offset	A0H + Byte1 + Byte2	55H	2 bytes followed

Signed, Offset = (Byte2*256+Byte1)/10，Step : 0.1dB

12. Set output power offset

Function	Command (PC to EDFA Module)	Acknowledge (EDFA Module to PC)	Comments
Set output power offset	A1H + Byte1 + Byte2	55H	2 bytes followed

Signed, Offset = (Byte2*256+Byte1)/10，Step : 0.1dB

13. Set Pump1 bias current on ACC mode

Function	Command (PC to EDFA Module)	Acknowledge (EDFA Module to PC)	Comments
Set Pump1 bias current	67H + Byte1 + Byte2	55H	2 bytes followed

Unsigned, Bias Current = (Byte2*256+Byte1)，Step: 1mA

14. Set Pump1 current high alarm threshold

Function	Command	Acknowledge	Comments

	(PC to EDFA Module)	(EDFA Module to PC)	
Set Pump1 current high alarm threshold	68H + Byte1 + Byte2	55H	2 bytes followed

Unsigned, Actual Value = (Byte2*256+Byte1)，Step : 1mA

17. Shut down Pump

Function	Command (PC to EDFA Module)	Acknowledge (EDFA Module to PC)	Comments
Shut down Pump	82H	55H	

Notes: Enable when external switch enable

18. On Pump

Function	Command (PC to EDFA Module)	Acknowledge (EDFA Module to PC)	Comments
On Pump	83H	55H	

Notes: Enable when external switch enable

19. Read Pump1 Temperature

Function	Command (PC to EDFA Module)	Acknowledge (EDFA Module to PC)	Comments
Read Pump1 Temperature	87H	55H + Byte1	1 bytes followed

Signed，Byte1=Actual Value , Unit : 1℃

21. Read TEC1 current

Function	Command (PC to EDFA Module)	Acknowledge (EDFA Module to PC)	Comments
Read TEC1 current	89H	55H + L-Bytes + H-Bytes	2 bytes followed

Signed，TEC current = H-Bytes*256+ L-Bytes，Unit :1mA

23. Read Pump1 Power

Function	Command (PC to EDFA Module)	Acknowledge (EDFA Module to PC)	Comments
Read Pump1 Power	A2H	55H + L-Bytes + H-Bytes	2 bytes followed

Unsigned，Pump Power = (H-Bytes*256+ L-Bytes)/10，Unit :1mW

25. Read whole data module status

Function	Command (PC to EDFA Module)	Acknowledge (EDFA Module to PC)	Comments
Read whole data module status	79H	55H + Byte1 + Byte2 + Byte3 + Byte4 + Byte5 + Byte6 + Byte7 + Byte8	8 bytes followed

Byte1：Input Power L-Bytes

Byte2：Input Power H-Bytes

Byte3：Output Power L-Bytes

Byte4：Output Power H-Bytes

Byte5：Pump1 Current L-Bytes

Byte6：Pump1 Current H-Bytes

Byte7：Pump2 Current L-Bytes

Byte8：Pump21 Current H-Bytes

Input Power ， Output Power ： Signed number ， formula → power = (H-Bytes*256+L-Bytes)/10

Pmp-1 Current ， Pmp-2 Current ： Unsigned number ， formula → current = (H-Bytes*256+L-Bytes)

26. Read setting parameter

Function	Command (PC to EDFA Module)	Acknowledge (EDFA Module to PC)	Comments
Read setting parameter	7AH	55H + Byte1 + Byte2 + Byte3 + Byte4 + Byte5 + Byte6 + Byte7 + Byte8 + Byte9 + Byte10 + Byte11 + Byte12 + Byte13 + Byte14 + Byte15 + Byte16+ Byte17	17 bytes followed

	Byte	Description	Command	Sequence
Byte1	Pump-1 H limit low	Pump 1 alarm current low byte	68	14
Byte2	Pump-1 H limit high	Pump 1 alarm current high byte	68	14
Byte3	Pump-2 H limit low	Pump 2 alarm current low byte	85	16
Byte4	Pump-2 H limit high	Pump 2 alarm current high byte	85	16
Byte5	Case_T limit	Case Temperature alarm H limit	69	3
Byte6	Input L limit	Input alarm low limit	6A	4
Byte7	Input H limit	Input alarm high limit	6B	5
Byte8	Output L limit	output alarm low limit	6c	6
Byte9	Output H limit	output alarm high limit	6d	7
Byte10	NC			
Byte11	NC			
Byte12	C_POWER_L	Power of APC low byte	66	2
Byte13	C_POWER_H	Power of APC high byte	66	2
Byte14	C_I1_H	operation Current 1 of ACC low byte	67	13
Byte15	C_I1_H	operation Current 1 of ACC high byte	67	13
Byte16	C_I2_H	operation Current2 of ACC low byte	68	15
Byte17	C_I1_H	operation Current 2 of ACC high byte	68	15

27. Read operation mode

Function	Command (PC to EDFA Module)	Acknowledge (EDFA Module to PC)	Comments
Read operation mode	7BH	55H + Byte1 + Byte2 + Byte3	3 bytes followed

Byte1：Type TYP = TYP (Type Power) * 5*2/10, e.g. Type power =22, It's 22dBm EDFA, so TYP is 0x6E

Byte2：0x03: ACC，0x02 : APC，0x01: AGC

Byte3：Pump numbers

28. Read firmware version

Function	Command (PC to EDFA Module)	Acknowledge (EDFA Module to PC)	Comments
Read firmware version	7CH	55H + Byte1	1 bytes followed

Byte1：Actual Version =Version Data / 10

29. Read alarm bit

Function	Command (PC to EDFA Module)	Acknowledge (EDFA Module to PC)	Comments
Read alarm bit	7DH	55H + Byte1 + Byte2	2 bytes followed

Byte1：

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
TEC_2 high	TEC_1 high	I2 high	I1 high	Output high	Output low	Input high	Input low

Byte2：

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
reserved	reserved	reserved	reserved	reserved	reserved	reserved	Case T high

0：OK

1：Alarm

30. Read alarm enable

Function	Command (PC to EDFA Module)	Acknowledge (EDFA Module to PC)	Comments
Read alarm bit	81H	55H + Mask1 + Mask2	2 bytes followed

31. Read case temperature

Function	Command (PC to EDFA Module)	Acknowledge (EDFA Module to PC)	Comments
Read alarm bit	86H	55H + Byte1	1 bytes followed

Byte1：Actual Version = Actual Value / Unit=℃