

**FGA4400-FM05 Series  
C-Band DWDM Fixed Gain  
Optical Amplifier Module**

**Technical Specification**

**Hangzhou Huatai Optic Tech. Co.,Ltd**

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## **1.0 PRODUCT DESCRIPTION**

Huatai FGA4400-FM05 series is a fixed gain Full Functional EDFA module which is specifically designed for C-Band DWDM optic transmission system, accord with various communication technology requirements of 44 channels DWDM system. It adopts nowadays excellent optical performance, advanced electronic control technology and complete software functionalities. Excellent total integration electronic transient control technology ensures amplifier to achieve the locking of optimal flat gain (OFG) in large dynamic input optical power range.

FGA4400-FM05 Fully Functional EDFA module, using 125×150×20mm, a single set of + 5VDC power supply, low power consumption.

FGA4400-FM05 is suitable for DWDM booster amplifier (BA) and DWDM preamplifier (PA).

## **2.0 PRODUCT FEATURE**

- Accord with the various communication technology requirements of 44 channels DWDM system
- Excellent optical performance
- Excellent total integration electronic transient control technology
- Optimal flat gain (OFG) locking ( $GF < 1.0\text{dB}$ )
- Low noise figure
- Standard RS232 communication interface.
- Low power consumption
- Excellent P/P ratio in area

## **3.0 MAIN APPLICATION**

- C-Band 44 channels DWDM booster amplifier
- C-Band 44 channels DWDM preamplifier
- Long distance trunk network
- MAN or access network
- All kinds of SDH/PDH transmission system
- FTTx PON

## **4.0 RELATED PRODUCT**

- FGA4400-FM02 (  $70 \times 90 \times 15\text{mm}$  )
- FGA4400-FM04 ( FGA )
- HWA4500 ( VGA )
- HWA4700 ( VGA with MSA )
- HWA4100 ( WBA ), HWA4200 ( WLA ), HWA4300 ( WPA )

## **5.0 SOFTWARE FUNCTION MONITORING AND ALARM**

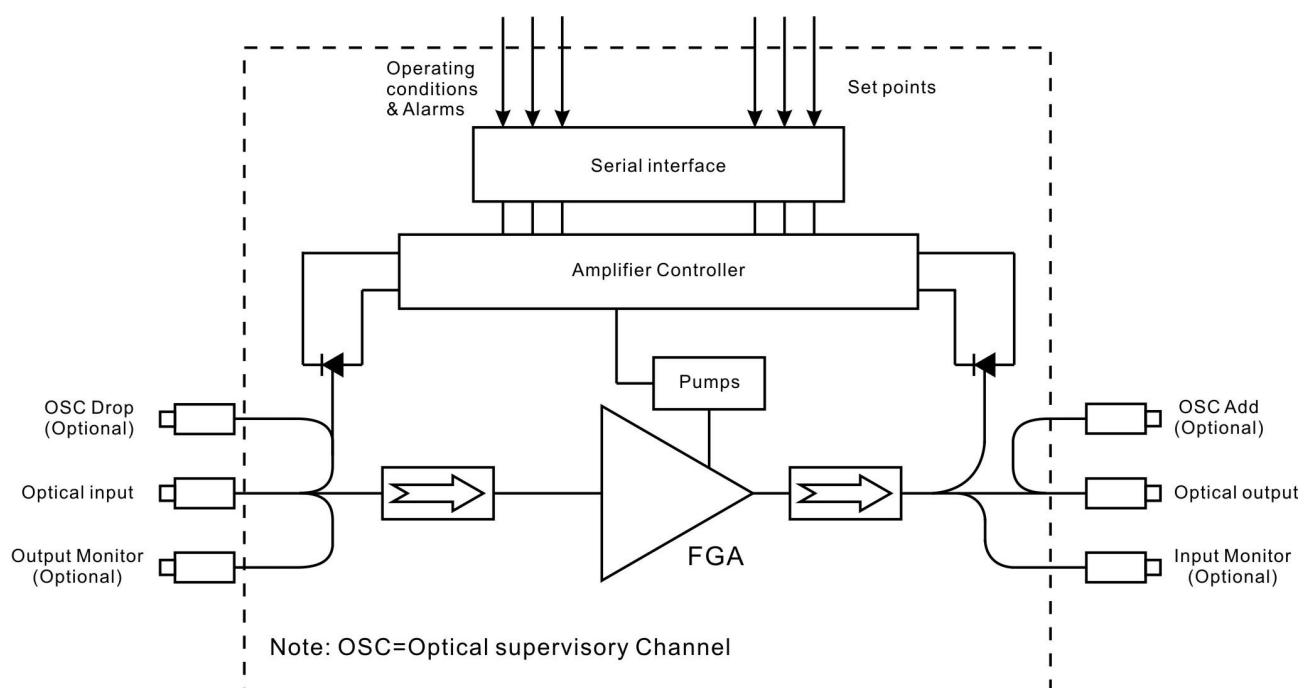
|           |   |
|-----------|---|
| Functions | In-Service Firm ware Upgrades                       |
|           | Auto Shut Down                                      |
|           | Fixed Gain Control mode and Power limiting          |
|           | Output Power Control Mode (APC)                     |
|           | Pump Current Control Mode (ACC)                     |
|           | Pump Maximum working Current limit Protection (APC) |
| Monitors  | Total Input Power                                   |
|           | Total Output Power                                  |
|           | Pump Status   |
|           | Chassis Temperature                                 |
| Alarms    | Loss-of-Signal Alarm                                |
|           | Chassis Temperature Alarm                           |
|           | Pump Temperature Alarm                              |
|           | Pump Bias Alarm                                     |

## 6.0 TECHNICAL INDEX

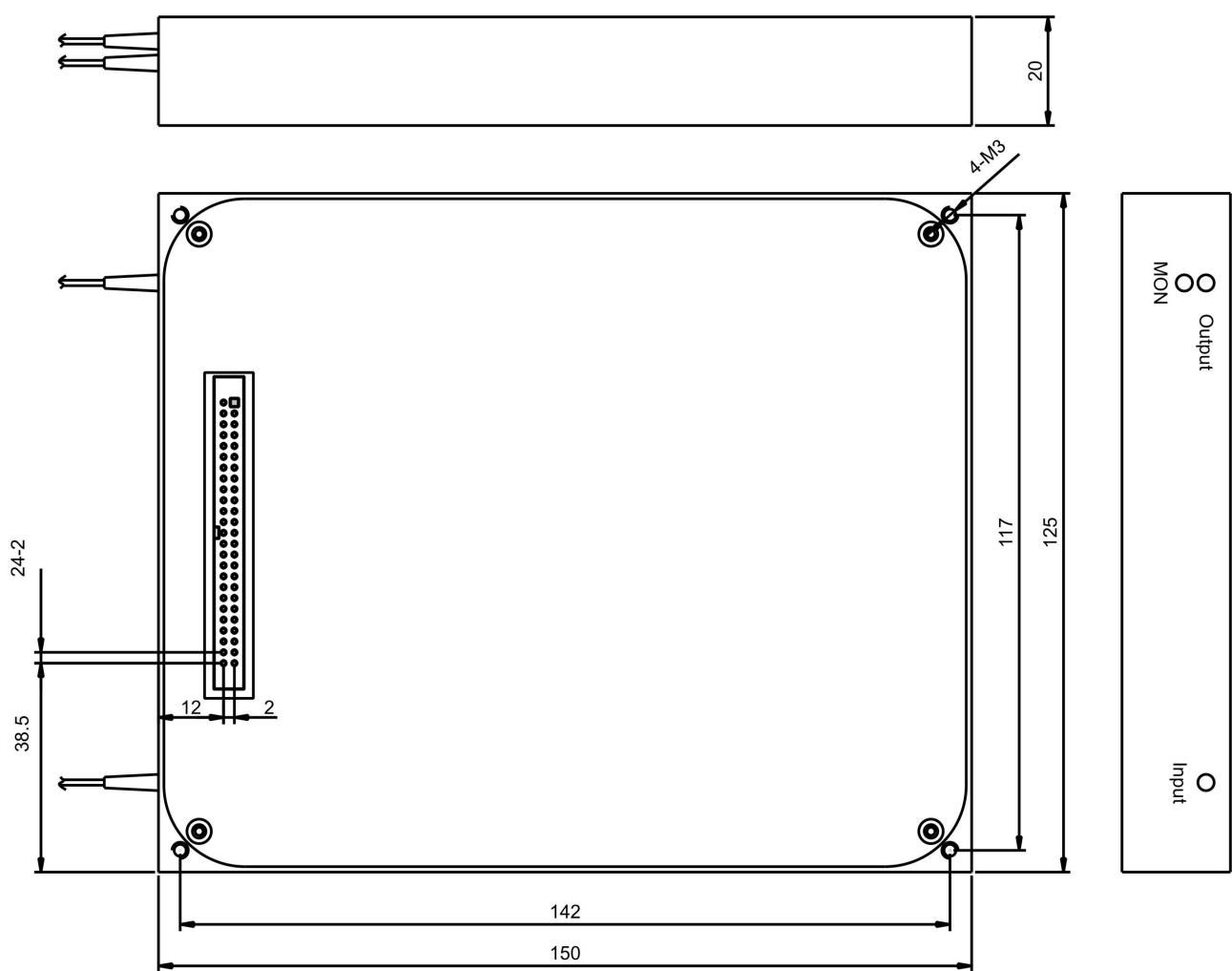
| Performance     |  | Index |         |      | Supplement             |
|-----------------|--|-------|---------|------|------------------------|
|                 |  | Min.  | Typ.    | Max. |                        |
| Optical feature | Work wavelength range( $\lambda$ )           | (nm)  | 1529.16 |      | 1563.86<br>ITU 88CH    |
|                 | Number of channels                           | (CH)  | 1       | 44   |                        |
|                 | Total input power range (Pi) 1)              | (dBm) | -30     |      | +3                     |
|                 | Saturation output power(Po)                  | (dBm) | 22      |      | 24<br>Enhanced version |
|                 | Optimal Flat Gain (OFG)                      | (dB)  | 22      |      | 36<br>Enhanced version |
|                 | Gain flatness                                | (dB)  |         | 0.7  | 1.0<br>Peak to Peak    |
|                 | Noise figure                                 | (dB)  |         | 4.7  | 5.5<br>Max gain        |
|                 | Monitoring accuracy of input optical power   | (dB)  | -0.5    |      | +0.5                   |
|                 | Monitoring accuracy of output optical power  | (dB)  | -0.5    |      | +0.5                   |
|                 | Average gain accuracy                        | (dB)  | -0.5    |      | +0.5                   |
|                 | Gain stability                               | (dB)  | -0.25   |      | +0.25                  |
|                 | Polarization dependence gain                 | (dB)  |         |      | 0.3                    |
|                 | Polarization dependence loss                 | (dB)  |         |      | 0.3                    |
|                 | Polarization mode dispersion                 | (ps)  |         |      | 0.3                    |
|                 | Input/output optic isolation                 | (dB)  | 30      |      |                        |
|                 | Pump leakage power                           | (dBm) |         |      | -30                    |
|                 | Echo loss                                    | (dB)  | 45      |      | UPC                    |
|                 |  |       | 55      |      | APC                    |
|                 | Wavelength range of optic management channel | (nm)  | 1500    | 1510 | 1520                   |

|                   |                            |            |                              |      |       |               |
|-------------------|----------------------------|------------|------------------------------|------|-------|---------------|
| Transient feature | Transient suppression time | ( $\mu$ s) |                              |      | 700   | 15dB Add/Drop |
|                   | Transient Overshoot        | (dB)       | -1.5                         |      | +1.5  | 15dB Add/Drop |
|                   | Transient gain changes     | (dB)       | -0.5                         |      | +0.5  |               |
|                   | SNMP network management    |            | RJ45                         |      |       |               |
| General feature   | Communication interface    |            | RS232                        |      |       |               |
|                   | Fiber type                 |            | Coming SMF-28™ or equivalent |      |       |               |
|                   | Pigtail buffer diameter    | ( $\mu$ m) |                              | 900  |       |               |
|                   | Pigtail length             | (mm)       |                              | 1000 |       |               |
|                   | Power supply               | (V)        | +4.75                        | +5   | +5.25 |               |
|                   | Power consumption          | (W)        |                              |      | 30    |               |
|                   | Working temp.              | (°C)       | -5                           |      | +70   |               |
|                   | Storage temp.              | (°C)       | -40                          |      | +85   |               |
|                   | Working relative humidity  | (%)        | +5                           |      | +95   |               |
|                   | Size (W)×(D)×(H)           | (mm)       | 125×150×20                   |      |       |               |

## 7.0 OPTICAL/ELECTRICAL SCHEMATIC



## 8.0 MODULE CHASSIS SIZE



## 9.0 ELECTRICAL PIN ASSIGNMENTS

| Pins | Description                 | Pins | Description                        |
|------|-----------------------------|------|------------------------------------|
| 1    | Power supply                | 2    | Power supply                       |
| 3    | Power supply                | 4    | Power supply                       |
| 5    | Power supply                | 6    | Power supply                       |
| 7    | Ground                      | 8    | Ground                             |
| 9    | Ground                      | 10   | Ground                             |
| 11   | Reserved ( do not connect ) | 12   | Output reflection alarm            |
| 13   | Ground                      | 14   | Resent input                       |
| 15   | Serial input                | 16   | Serial output                      |
| 17   | Pump current alarm          | 18   | Stage 1 input LOS alarm            |
| 19   | Ground                      | 20   | Ground                             |
| 21   | Reserved ( do not connect ) | 22   | Reserved ( do not connect )        |
| 23   | Reserved ( do not connect ) | 24   | Reserved ( do not connect )        |
| 25   | Ground                      | 26   | Reserved ( do not connect )        |
| 27   | Stage 2 input LOS alarm     | 28   | Ground                             |
| 29   | Stage 2 output/Gain alarm   | 30   | Ground                             |
| 31   | Ground                      | 32   | Ground                             |
| 33   | Case temperature alarm      | 34   | Stage 1 output / Gain alarm        |
| 35   | Pump temperature alarm      | 36   | Pin is absent ( Polarization key ) |
| 37   | Amplifier disable input     | 38   | Output Power mute input            |
| 39   | I2C SCL ( Optional )        | 40   | I2C SDA ( Optional )               |
| 41   | Ground                      | 42   | Ground                             |
| 43   | Ground                      | 44   | Ground                             |
| 45   | Power supply                | 46   | Power supply                       |
| 47   | Power supply                | 48   | Power supply                       |
| 49   | Power supply                | 50   | Power supply                       |

## 10.0 PRODUCT SERIES

| Model             | Saturation output optical power (dBm) | Optimal Flat Gain (dB) | Gain flatness (dB) | Optical port monitoring mode  | OSC Optical port mode   |
|-------------------|---------------------------------------|------------------------|--------------------|---|---|
| FGA4414-G □□-FM05 | 22                                    |                        |                    | 1, MO: With output monitoring<br>2, MI: With input monitoring<br>3, MIO: With input and output monitoring | 1, OD: OSC / Drop<br>2, OA: OSC / Add<br>3, ODA:OSC /Drop & Add |
| FGA4418-G □□-FM05 | 23                                    | 22、24、<br>27、33、<br>36 | <1.0               |   |   |
| FGA4420-G □□-FM05 | 24                                    | Optional               |                    |   |   |

## 11.0 ORDERING INFORMATION

FGA 4 4 □□ - G□□ - FM 05 / □□ - M□□ - O□□

| C-Band DWDM Fixed Gain Optical Amplifier Module | Operation wavelength |                    | Product type |                           | Saturation power |       | Gain |      | Module type |                      | Module size number |              | Connncrtr |        | Monitor options |                             | OSC optical port options |                |
|---|----------------------|--------------------|--------------|---------------------------|------------------|-------|------|------|-------------|----------------------|--------------------|--------------|-----------|--------|-----------------|-----------------------------|--------------------------|----------------|
|   | 4                    | C-Band (1528~1564) | 4            | Fixed Gain Amplifier (BA) | 22               | 22dBm | 18   | 18dB | FM          | Full function module | 05                 | 125×150×22mm | LP        | LC/UPC | MO              | With output monitor         | OD                       | OSC/Drop       |
|   |                      |                    |              |                           | 23               | 23dBm | 20   | 20dB |             |                      |                    |              | LA        | LC/APC |                 |                             |                          |                |
|   |                      |                    |              |                           | 24               | 24dBm | 22   | 22dB |             |                      |                    |              | SP        | SC/UPC | MI              | With input monitor          | OA                       | OSC/Add        |
|   |                      |                    |              |                           |                  |       | 24   | 24dB |             |                      |                    |              | SA        | SC/APC |                 |                             |                          |                |
|   |                      |                    |              |                           |                  |       | 27   | 27dB |             |                      |                    |              | FP        | FC/UPC | MIO             | With input & output monitor | ODA                      | OSC/Drop & Add |
|   |                      |                    |              |                           |                  |       | 33   | 33dB |             |                      |                    |              | FA        | FC/APC |                 |                             |                          |                |