

# Mini-GBIC (SFP)

1.25Gbps, WDM1310~1550, Single Fiber Bi-directional SFP,

## ONU Transceiver

- Distance: 10km, 20km, 40km, 60km, 80km
- Standard Operating Temperature: -10°C ~ 70°C
- Wide Operating Temperature: -40°C ~ 85°C



## OVERVIEW

Lantech 1.25Gbps Bi-directional (BiDi) Small Form Factor Pluggable (SFP) transceiver module series is specifically designed for the high performance integrated duplex data link over a single optical fiber. These transceiver modules are compliant with the SFP Multisource Agreement (MSA). With the hot pluggability, these modules offer an easy way to be installed into

SFP MSA compliant ports at any time without the interruption of the host equipments operating online.

Lantech 1.25Gbps BiDi SFP transceiver module series using a long wavelength DFB laser diode and enable data transmission up to 80km on a single-mode (9/125μm) optical fiber.

## FEATURES & BENEFITS

- 1.25G bi-directional single-fiber link
- Single LC receptacle
- 1310~1550nm FP/DFB transmitter
- 1310~1550nm PIN receiver
- 10km to 80km point-to-point transmission
- SFP Multi-Source Agreement compliant
- Serial ID functionality support
- Class 1 laser safety standard IEC 825 compliant
- Low power dissipation

## SPECIFICATION

### Absolute Maximum Ratings

| Parameter                 | Symbol     | Min. | Max. | Unit | Note |
|---------------------------|------------|------|------|------|------|
| Storage Temperature       | Ts         | -40  | +85  | °C   |      |
| Supply Voltage            | VccT, VccR | -0.5 | 4.0  | V    |      |
| Storage Relative Humidity | RH         | 5    | 95   | %    |      |

### Recommended Operating Conditions

| Parameter                  | Symbol | Min.      | Typ. | Max.    | Unit | Note |  |
|----------------------------|--------|-----------|------|---------|------|------|--|
| Case Operating Temperature | Tc     | -10 / -40 |      | 70 / 85 | °C   | 1    |  |
| Supply Voltage             | Vcc    | 3.1       | 3.3  | 3.5     | V    |      |  |
| Supply Current             | 10km   | WDM1310   |      | 150     | 250  | mA   |  |
|                            |        | WDM1550   |      | 150     | 300  |      |  |
|                            | 20km   | WDM1310   |      | 160     | 250  |      |  |
|                            |        | WDM1550   |      | 150     | 300  |      |  |
|                            | 40km   | WDM1310   |      | 150     | 300  |      |  |
|                            |        | WDM1550   |      | 150     | 300  |      |  |
|                            | 60km   | WDM1310   |      | 150     | 300  |      |  |
|                            |        | WDM1550   |      | 150     | 300  |      |  |
|                            | 80km   | WDM1490   |      | 150     | 300  |      |  |
|                            |        | WDM1550   |      | 150     | 300  |      |  |

Notes: 1. Standard Operating Temperature / Wide Operating Temperature (-E model)

**Transmitter Electro-Optical Interface**

| Parameter                              |      | Symbol     | Min. | Typ. | Max.     | Unit  | Note |
|--|------|------------|------|------|----------|-------|------|
| Transmitter Differential Input Voltage |      | TD +/-     | 400  |      | 2400     | mV    |      |
| Tx_Fault - High                        |      | VFault_H   | 2    |      | VccT     | V     |      |
| Tx_Fault - Low                         |      | VFault_L   | VeeT |      | VeeT+0.8 | V     |      |
| Tx_Disable - High                      |      | VDisable_H | 2    |      | VccT     | V     |      |
| Tx_Disable - Low                       |      | VDisable_L | VeeT |      | VeeT+0.8 | V     |      |
| Optical Output Power                   | 10km | WDM1310    | -9   |      | -3       | dBm   | 1    |
|  |      | WDM1550    | -9   |      | -3       |       |      |
|  | 20km | WDM1310    | -8   |      | -2       |       |      |
|  |      | WDM1550    | -8   |      | -2       |       |      |
|  | 40km | WDM1310    | -3   |      | +2       |       |      |
|  |      | WDM1550    | -3   |      | +2       |       |      |
|  | 60km | WDM1310    | -3   |      | +2       |       |      |
|  |      | WDM1550    | 0    |      | +5       |       |      |
|  | 80km | WDM1490    | -2   |      | +3       |       |      |
|  |      | WDM1550    | -2   |      | +3       |       |      |
| Optical Extinction Ratio               |      | ER         | 6    |      |          | dB    |      |
| Center Wavelength                      | 10km | WDM1310    | 1270 | 1310 | 1355     | nm    |      |
|  |      | WDM1550    | 1530 | 1550 | 1570     |       |      |
|  | 20km | WDM1310    | 1270 | 1310 | 1355     |       |      |
|  |      | WDM1550    | 1530 | 1550 | 1570     |       |      |
|  | 40km | WDM1310    | 1260 | 1310 | 1360     |       |      |
|  |      | WDM1550    | 1530 | 1550 | 1570     |       |      |
|  | 60km | WDM1310    | 1260 | 1310 | 1360     |       |      |
|  |      | WDM1550    | 1530 | 1550 | 1570     |       |      |
|  | 80km | WDM1490    | 1480 | 1490 | 1500     |       |      |
|  |      | WDM1550    | 1530 | 1550 | 1570     |       |      |
| Spectral Width                         | 10km | WDM1310    |      |      |          | nm    | 2    |
|  |      | WDM1550    |      |      | 1        |       |      |
|  | 20km | WDM1310    |      |      | 2.5      |       |      |
|  |      | WDM1550    |      |      | 1        |       |      |
|  | 40km | WDM1310    |      |      | 1        |       |      |
|  |      | WDM1550    |      |      | 1        |       |      |
|  | 60km | WDM1310    |      |      | 1        |       |      |
|  |      | WDM1550    |      |      | 1        |       |      |
|  | 80km | WDM1490    |      |      | 1        |       |      |
|  |      | WDM1550    |      |      | 1        |       |      |
| Optical Rise / Fall Timet              |      | tr / tf    |      |      | 260      | ps    |      |
| Relative Intensity Noise               |      | RIN        |      |      | -113     | dB/Hz |      |
| Total Contributed Jitter               |      | TJ         |      |      | 227      | ps    |      |

**Notes:** 1. Coupling into a 9/125µm single-mode fiber. 2. 1000BASE-BX10 transmitter spectral limits.

| 1000BASE-BX10 transmitter spectral limits |                         |
|---|-------------------------|
| Center wavelength (nm) Max.               | RMS spectral width (nm) |
| 1260                                      | 2.09                    |
| 1270                                      | 2.52                    |
| 1280                                      | 3.13                    |
| 1286-1343                                 | 3.50                    |
| 1350                                      | 3.06                    |
| 1360                                      | 2.58                    |

**Receiver Electro-Optical Interface**

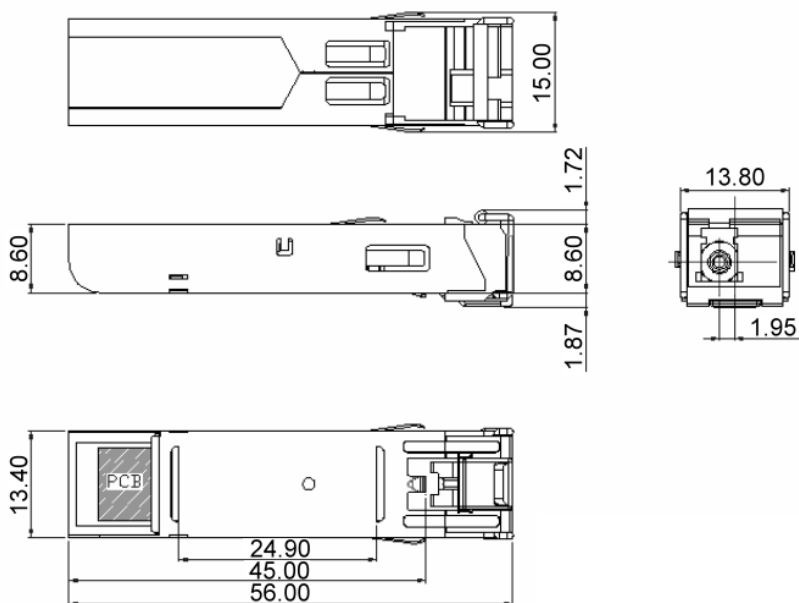
| Parameter                            |                                   | Symbol   | Min.    | Typ. | Max. | Unit | Note |     |     |  |
|--------------------------------------|-----------------------------------|----------|---------|------|------|------|------|-----|-----|--|
| Receiver Differential Output Voltage |                                   | RD +/-   | 400     |      | 2000 | mV   |      |     |     |  |
| Receiver Overload                    | 10km                              | WDM1310  | -3      |      |      |      | 1    |     |     |  |
|                                      |                                   | WDM1550  | -2      |      |      |      |      |     |     |  |
|                                      | 20km                              | WDM1310  | -2      |      |      |      |      |     |     |  |
|                                      |                                   | WDM1550  | -2      |      |      |      |      |     |     |  |
|                                      | 40km                              | WDM1310  | -1      |      |      |      |      |     |     |  |
|                                      |                                   | WDM1550  | -1      |      |      |      |      |     |     |  |
|                                      | 60km                              | WDM1310  | -1      |      |      |      |      |     |     |  |
|                                      |                                   | WDM1550  | -1      |      |      |      |      |     |     |  |
| 80km                                 | WDM1490                           | -1       |         |      |      |      |      |     |     |  |
|                                      | WDM1550                           | -1       |         |      |      |      |      |     |     |  |
| Receiver Sensitivity                 | 10km                              | WDM1310  |         |      | -20  | dBm  | 1    |     |     |  |
|                                      |                                   | WDM1550  |         |      |      |      |      |     |     |  |
|                                      | 20km                              | WDM1310  |         |      | -23  |      |      |     |     |  |
|                                      |                                   | WDM1550  |         |      |      |      |      |     |     |  |
|                                      | 40km                              | WDM1310  |         |      | -23  |      |      |     |     |  |
|                                      |                                   | WDM1550  |         |      |      |      |      |     |     |  |
|                                      | 60km                              | WDM1310  |         |      | -24  |      |      |     |     |  |
|                                      |                                   | WDM1550  |         |      |      |      |      |     |     |  |
| 80km                                 | WDM1490                           |          |         | -26  |      |      |      |     |     |  |
|                                      | WDM1550                           |          |         |      |      |      |      |     |     |  |
| Operating Center Wavelength          | 10km                              | WDM1310  | 1480    |      | 1580 | nm   |      |     |     |  |
|                                      |                                   | WDM1550  | 1260    |      | 1360 |      |      |     |     |  |
|                                      | 20km                              | WDM1310  | 1480    |      | 1580 |      |      |     |     |  |
|                                      |                                   | WDM1550  | 1260    |      | 1360 |      |      |     |     |  |
|                                      | 40km                              | WDM1310  | 1480    |      | 1580 |      |      |     |     |  |
|                                      |                                   | WDM1550  | 1260    |      | 1360 |      |      |     |     |  |
|                                      | 60km                              | WDM1310  | 1480    |      | 1580 |      |      |     |     |  |
|                                      |                                   | WDM1550  | 1260    |      | 1360 |      |      |     |     |  |
|                                      | 80km                              | WDM1490  | 1530    |      | 1570 |      |      |     |     |  |
|                                      |                                   | WDM1550  | 1480    |      | 1500 |      |      |     |     |  |
|                                      | Return Loss                       |          | RL      | 12   |      |      |      |     | dB  |  |
|                                      | Receiver Loss of Signal - TTL Low | 10km     | WDM1310 |      |      |      |      | -20 | dBm |  |
| WDM1550                              |                                   |          |         |      |      |      |      |     |     |  |
| 20km                                 |                                   | WDM1310  |         |      | -23  |      |      |     |     |  |
|                                      |                                   | WDM1550  |         |      |      |      |      |     |     |  |
| 40km                                 |                                   | WDM1310  |         |      | -24  |      |      |     |     |  |
|                                      |                                   | WDM1550  |         |      |      |      |      |     |     |  |
| 60km                                 |                                   | WDM1310  |         |      | -24  |      |      |     |     |  |
|                                      |                                   | WDM1550  |         |      |      |      |      |     |     |  |
| 80km                                 | WDM1490                           |          |         | -26  |      |      |      |     |     |  |
|                                      | WDM1550                           |          |         | -24  |      |      |      |     |     |  |
| Receiver Loss of Signal - TTL High   |                                   | PRX_LOSA | -35     |      |      | dBm  |      |     |     |  |
| Receiver Loss of Signal - Hysteresis |                                   | PRX_LOSH | 0.5     |      |      | dB   |      |     |     |  |

Notes: 1. With BER better than or equal to  $1 \times 10^{-12}$ , measured in the center of the eye opening with PRBS  $2^7 - 1$

**MTBF**

|      |         | 60% Confidence Level, 25°C |      | 90% Confidence Level, 25°C |      |
|------|---------|----------------------------|------|----------------------------|------|
|      |         | MTBF                       | FIT  | MTBF                       | FIT  |
| 10km | WDM1310 | 2532284                    | 395  | 1012914                    | 987  |
|      | WDM1550 | 2532284                    | 395  | 1012914                    | 987  |
| 20km | WDM1310 | 2532284                    | 395  | 1012914                    | 987  |
|      | WDM1550 | 2532284                    | 395  | 1012914                    | 987  |
| 40km | WDM1310 | 813526                     | 1229 | 325410                     | 3073 |
|      | WDM1550 | 813526                     | 1229 | 325410                     | 3073 |
| 60km | WDM1310 | 813526                     | 1229 | 325410                     | 3073 |
|      | WDM1550 | 813526                     | 1229 | 325410                     | 3073 |
| 80km | WDM1490 | 813526                     | 1229 | 325410                     | 3073 |
|      | WDM1550 | 813526                     | 1229 | 325410                     | 3073 |

**DIMENSIONS (unit=mm)**



\*All dimensions are ±0.2mm unless otherwise specified

**ORDERING INFORMATION**

| Part Number | TX     | LD  | RX     | IO    | LOS | Link | Temp.    |
|-------------|--------|-----|--------|-------|-----|------|----------|
| 8330-188    | 1310nm | FP  | 1550nm | AC/AC | TTL | 10km | -10~70°C |
| 8330-186    |        | FP  |        |       |     | 20km |          |
| 8330-180    |        | DFB |        |       |     | 40km |          |
| 8330-181    |        | DFB |        |       |     | 60km |          |
| 8330-184    | 1490nm | DFB |        |       |     | 80km |          |

| Part Number | TX     | LD  | RX     | IO    | LOS | Link | Temp.    |
|-------------|--------|-----|--------|-------|-----|------|----------|
| 8330-188-E  | 1310nm | FP  | 1550nm | AC/AC | TTL | 10km | -40~85°C |
| 8330-186-E  |        | FP  |        |       |     | 20km |          |
| 8330-180-E  |        | DFB |        |       |     | 40km |          |
| 8330-181-E  |        | DFB |        |       |     | 60km |          |
| 8330-184-E  | 1490nm | DFB |        |       |     | 80km |          |

| Part Number | TX     | LD  | RX     | IO    | LOS | Link | Temp.    |
|-------------|--------|-----|--------|-------|-----|------|----------|
| 8330-189    | 1550nm | DFB | 1310nm | AC/AC | TTL | 10km | -10~70°C |
| 8330-187    |        |     |        |       |     | 20km |          |
| 8330-182    |        |     |        |       |     | 40km |          |
| 8330-183    |        |     | 60km   |       |     |      |          |
| 8330-185    |        |     | 1490nm |       |     | 80km |          |

| Part Number | TX     | LD  | RX     | IO    | LOS | Link | Temp.    |
|-------------|--------|-----|--------|-------|-----|------|----------|
| 8330-189-E  | 1550nm | DFB | 1310nm | AC/AC | TTL | 10km | -40~85°C |
| 8330-187-E  |        |     |        |       |     | 20km |          |
| 8330-182-E  |        |     |        |       |     | 40km |          |
| 8330-183-E  |        |     | 60km   |       |     |      |          |
| 8330-185-E  |        |     | 1490nm |       |     | 80km |          |

**Lantech Communications Global Inc.**

www.lantechcom.tw  
info@lantechcom.tw

© 2011 Copyright Lantech Communications Global Inc. all rights reserved.  
The revise authority rights of product specifications belong to Lantech Communications Global Inc.  
Lantech may make changes to specification and product descriptions at anytime, without notice.