

## 155Mb/s SFP 1550nm, 80km,DFB-LD, Single-Mode

### Features:

- Compliant with ITU-T G.957,G.958
- Multi-Source Package with Duplex LC Connector
- Up to 155Mb/s Data Rate
- 1310nm FP Single-Mode
- Single +3.3V Power Supply
- Hot-Pluggable
- Eye Safety Designed to Meet Laser Class1, Compliant with IEC60825-1
- RoHS Compliant Products Available
- Operating case temperature:

Standard : 0 to +70°C

Industrial : -40 to +85°C

### Applications:

- SONET OC-3/SDH STM-1
- Fast Ethernet
- Other Optical Links

### Specification:

#### ● Electrical and Optical Characteristics: (Condition: $T_a=T_{OP}$ )

| Parameter                              | Symbol          | Min. | Typical | Max.            | Unit   |
|----------------------------------------|-----------------|------|---------|-----------------|--------|
| Transmitter Differential Input Voltage | +/-TX_DAT       | 200  |         | 1600            | mV p-p |
| Supply Current                         | I <sub>CC</sub> |      | 200     | 250             | mA     |
| Tx_Disable Input Voltage – Low         | V <sub>IL</sub> | 0    |         | 0.8             | V      |
| Tx_Disable Input Voltage – High        | V <sub>IH</sub> | 2.0  |         | V <sub>CC</sub> | V      |
| Tx_Fault Output Voltage – Low          | V <sub>OL</sub> | 0    |         | 0.8             | V      |
| Tx_Fault Output Voltage – High         | V <sub>OH</sub> | 2.0  |         | V <sub>CC</sub> | V      |
| Receiver Differential Output Voltage   | +/-RX_DAT       | 400  |         | 1400            | mV p-p |
| Rx_LOS Output Voltage- Low             | V <sub>OL</sub> | 0    |         | 0.8             | V      |
| Rx_LOS Output Voltage- High            | V <sub>OH</sub> | 2.0  |         | V <sub>CC</sub> | V      |

#### Transmitter

| Parameter             | Symbol          | Min. | Typical | Max. | Unit |
|-----------------------|-----------------|------|---------|------|------|
| Data Rate             | B               | -    | 155     | -    | Mb/s |
| Centre Wavelength     | $\lambda_c$     | 1480 | 1550    | 1580 | nm   |
| Output Spectral Width | $\Delta\lambda$ | -    | -       | 1    | nm   |
| Average Output Power  | P <sub>o</sub>  | -5   | -       | 0    | dBm  |
| Extinction Ratio      | EXT             | 10   | -       | -    | dB   |

|                           |                            |                       |         |                       |      |
|---------------------------|----------------------------|-----------------------|---------|-----------------------|------|
| Data Input Voltage-High   | V <sub>IHS</sub>           | V <sub>cc</sub> -1.16 | -       | V <sub>cc</sub> -0.89 | V    |
| Data Input Voltage -Low   | V <sub>ILS</sub>           | V <sub>cc</sub> -1.82 | -       | V <sub>cc</sub> -1.48 | V    |
| Supply Current            | I <sub>cc</sub>            | -                     | 90      | 110                   | mA   |
| Output Optical Eye        | Compliant with ITU-T G.957 |                       |         |                       |      |
| Receiver                  |                            |                       |         |                       |      |
| Parameter                 | Symbol                     | Min.                  | Typical | Max.                  | Unit |
| Receive Sensitivity       | P <sub>min</sub>           | -                     | -       | -36                   | dBm  |
| Maximum Input Power       | P <sub>MAX</sub>           | -3                    | -       | -                     | dBm  |
| Signal Detection-Asserted | P <sub>H-L</sub>           | -47                   | -       |                       | dBm  |
| Signal Detection-Deserted | P <sub>L-H</sub>           |                       | -       | -37                   | dBm  |
| Output High Voltage       | V <sub>OH</sub>            | V <sub>cc</sub> -1.03 | -       | V <sub>cc</sub> -0.89 | V    |
| Output Low Voltage        | V <sub>OL</sub>            | V <sub>cc</sub> -1.82 | -       | V <sub>cc</sub> -1.63 | V    |
| Operating Wavelength      | λ <sub>c</sub>             | 1100                  | -       | 1600                  | nm   |
| Supply Current            | I <sub>cc</sub>            | -                     | 80      | 110                   | mA   |

● **Absolute Maximum Ratings: ( $T_c=25^{\circ}\text{C}$ )**

|                       |               |             |             |                    |
|-----------------------|---------------|-------------|-------------|--------------------|
| <b>Parameter</b>      | <b>Symbol</b> | <b>Min.</b> | <b>Max.</b> | <b>Unit</b>        |
| Storage Temperature   | $T_{ST}$      | -40         | +85         | $^{\circ}\text{C}$ |
| Operating Temperature | Standard      | 0           | +70         | $^{\circ}\text{C}$ |
|                       | Industrial    | -40         | +85         | $^{\circ}\text{C}$ |
| Input Voltage         | $T_{CC}$      | 0           | +5          | V                  |

● **Recommended Operating Environment:**

|                       |               |             |                |             |                    |
|-----------------------|---------------|-------------|----------------|-------------|--------------------|
| <b>Parameter</b>      | <b>Symbol</b> | <b>Min.</b> | <b>Typical</b> | <b>Max.</b> | <b>Unit</b>        |
| Supply Voltage        | $V_{CC}$      | +3.0        | +3.3           | +3.6        | V                  |
| Operating Temperature | Standard      | 0           | -              | +70         | $^{\circ}\text{C}$ |
|                       | Industrial    | -40         | -              | +85         | $^{\circ}\text{C}$ |

● **Timing Characteristics:**

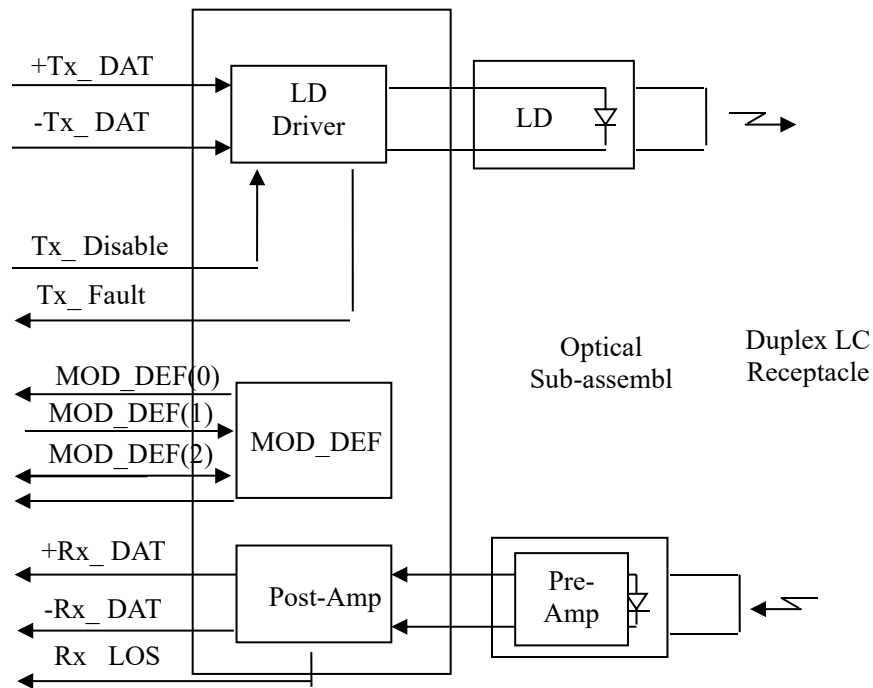
|                                                 |                 |             |                |             |             |
|-------------------------------------------------|-----------------|-------------|----------------|-------------|-------------|
| <b>Parameter</b>                                | <b>Symbol</b>   | <b>Min.</b> | <b>Typical</b> | <b>Max.</b> | <b>Unit</b> |
| TX_DISABLE Assert Time                          | $t_{off}$       |             | 3              | 10          | usec        |
| TX_DISABLE Negate Time                          | $t_{on}$        |             | 0.5            | 1           | msec        |
| Time to Initialize Include Reset of TX_FAULT    | $t_{int}$       |             | 30             | 300         | msec        |
| TX_FAULT from Fault to Assertion                | $t_{fault}$     |             | 20             | 100         | usec        |
| TX_DISBEL Time to Start Reset                   | $t_{reset}$     | 10          |                |             | usec        |
| Receiver Loss of Signal Assert Time (Off to On) | $T_{A,RX\_LOS}$ |             |                | 100         | usec        |

|                                                 |                        |  |  |     |      |
|-------------------------------------------------|------------------------|--|--|-----|------|
| Receiver Loss of Signal Assert Time (On to Off) | T <sub>d</sub> ,RX_LOS |  |  | 100 | usec |
|-------------------------------------------------|------------------------|--|--|-----|------|

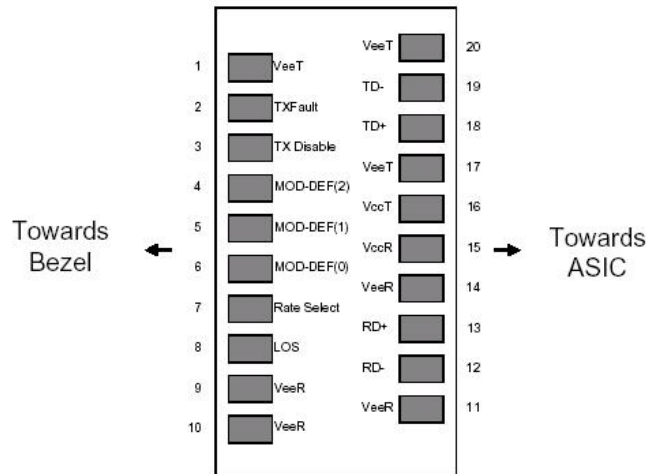
**Serial ID Memory Contents:**

| Data Address              | Length (Byte) | Name of Length | Description and Contents                                                                              |
|---------------------------|---------------|----------------|-------------------------------------------------------------------------------------------------------|
| Base ID Fields            |               |                |                                                                                                       |
| 0                         | 1             | Identifier     | Type of Serial transceiver (03h=SFP)                                                                  |
| 1                         | 1             | Reserved       | Extended identifier of type serial transceiver (04h)                                                  |
| 2                         | 1             | Connector      | Code of optical connector type (07=LC)                                                                |
| 3-10                      | 8             | Transceiver    | Gigabit Ethernet 1000Base-SX & Fiber Channel                                                          |
| 11                        | 1             | Encoding       | 8B10B (01h)                                                                                           |
| 12                        | 1             | BR,Nominal     | Nominal baud rate, unit of 100Mbps                                                                    |
| 13-14                     | 2             | Reserved       | (0000h)                                                                                               |
| 15                        | 1             | Length(9um)    | Link length supported for 9/125um fiber, units of 100m                                                |
| 16                        | 1             | Length(50um)   | Link length supported for 50/125um fiber, units of 10m                                                |
| 17                        | 1             | Length(62.5um) | Link length supported for 62.5/125um fiber, units of 10m                                              |
| 18                        | 1             | Length(Copper) | Link length supported for copper, units of meters                                                     |
| 19                        | 1             | Reserved       |                                                                                                       |
| 20-35                     | 16            | Vendor Name    | SFP vendor name                                                                                       |
| 36                        | 1             | Reserved       |                                                                                                       |
| 37-39                     | 3             | Vendor OUI     | SFP transceiver vendor OUI ID                                                                         |
| 40-55                     | 16            | Vendor PN      | Part Number                                                                                           |
| 56-59                     | 4             | Vendor rev     | Revision level for part number                                                                        |
| 60-62                     | 3             | Reserved       |                                                                                                       |
| 63                        | 1             | CCID           | Least significant byte of sum of data in address 0-62                                                 |
| Extended ID Fields        |               |                |                                                                                                       |
| 64-65                     | 2             | Option         | Indicates which optical SFP signals are implemented (001Ah = LOS, TX_FAULT, TX_DISABLE all supported) |
| 66                        | 1             | BR, max        | Upper bit rate margin, units of %                                                                     |
| 67                        | 1             | BR, min        | Lower bit rate margin, units of %                                                                     |
| 68-83                     | 16            | Vendor SN      | Serial number (ASCII)                                                                                 |
| 84-91                     | 8             | Date code      | Manufacturing date code                                                                               |
| 92-94                     | 3             | Reserved       |                                                                                                       |
| 95                        | 1             | CCEX           | Check code for the extended ID Fields (addresses 64 to 94)                                            |
| Vendor Specific ID Fields |               |                |                                                                                                       |
| 96-127                    | 32            | Readable       | Specific date, read only                                                                              |

## Block Diagram of Transceiver:



## Pin Assignment:



Pin out of Connector Block on Host Board

**Pin Description:**

| Pin | Symbol             | Name/Description                                               | Ref. |
|-----|--------------------|----------------------------------------------------------------|------|
| 1   | V <sub>EET</sub>   | Transmitter Ground (Common with Receiver Ground)               | 1    |
| 2   | T <sub>FAULT</sub> | Transmitter Fault. Not supported.                              |      |
| 3   | T <sub>DIS</sub>   | Transmitter Disable. Laser output disabled on high or open.    | 2    |
| 4   | MOD_DEF(2)         | Module Definition 2. Data line for Serial ID.                  | 3    |
| 5   | MOD_DEF(1)         | Module Definition 1. Clock line for Serial ID.                 | 3    |
| 6   | MOD_DEF(0)         | Module Definition 0. Grounded within the module.               | 3    |
| 7   | Rate Select        | No connection required                                         |      |
| 8   | LOS                | Loss of Signal indication. Logic 0 indicates normal operation. | 4    |
| 9   | V <sub>EER</sub>   | Receiver Ground (Common with Transmitter Ground)               | 1    |
| 10  | V <sub>EER</sub>   | Receiver Ground (Common with Transmitter Ground)               | 1    |
| 11  | V <sub>EER</sub>   | Receiver Ground (Common with Transmitter Ground)               | 1    |
| 12  | RD-                | Receiver Inverted DATA out. AC Coupled                         |      |
| 13  | RD+                | Receiver Non-inverted DATA out. AC Coupled                     |      |
| 14  | V <sub>EER</sub>   | Receiver Ground (Common with Transmitter Ground)               | 1    |
| 15  | V <sub>CCR</sub>   | Receiver Power Supply                                          |      |
| 16  | V <sub>CCT</sub>   | Transmitter Power Supply                                       |      |
| 17  | V <sub>EET</sub>   | Transmitter Ground (Common with Receiver Ground)               | 1    |
| 18  | TD+                | Transmitter Non-Inverted DATA in. AC Coupled.                  |      |
| 19  | TD-                | Transmitter Inverted DATA in. AC Coupled.                      |      |
| 20  | V <sub>EET</sub>   | Transmitter Ground (Common with Receiver Ground)               | 1    |

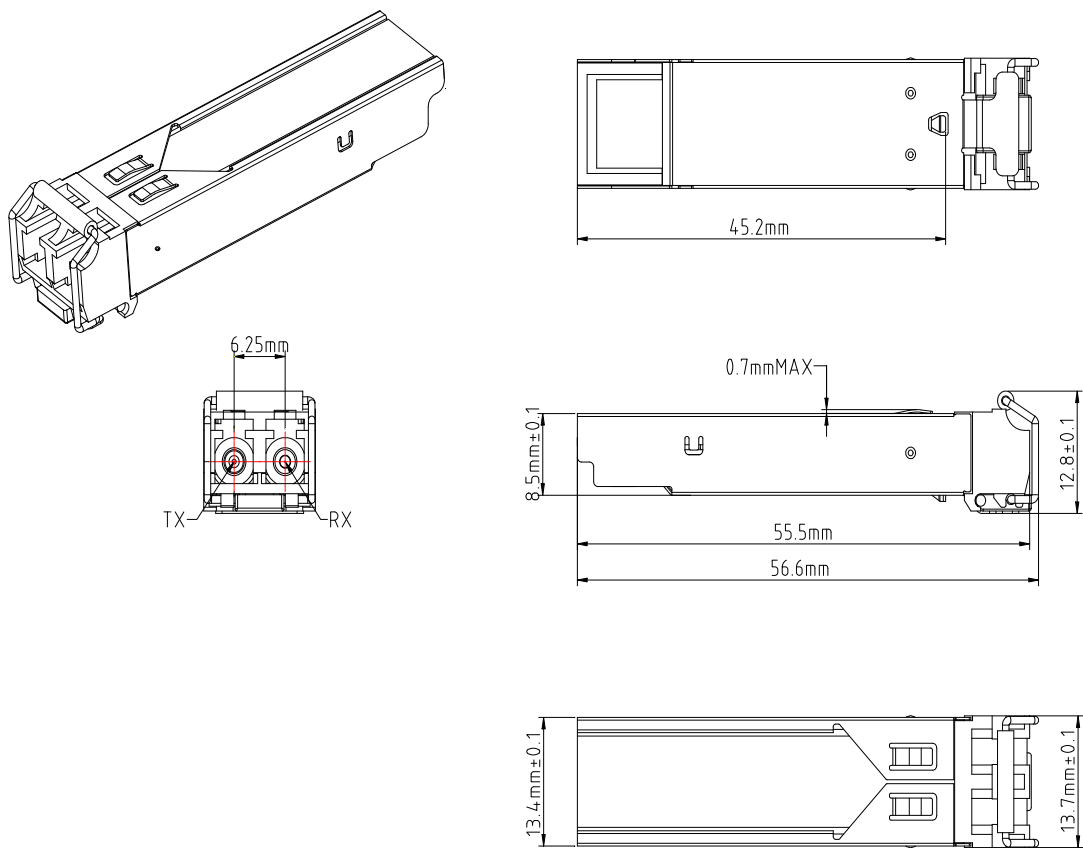
**Notes:**

1. Circuit ground is internally isolated from chassis ground.
2. Laser output disabled on TDIS >2.0V or open, enabled on TDIS <0.8V.
3. Should be pulled up with 4.7k – 10kohms on host board to a voltage between 2.0V and 3.6V.  
MOD\_DEF(0) pulls line low to indicate module is plugged in.
4. LOS is open collector output. Should be pulled up with 4.7k – 10kohms on host board to a voltage between 2.0V and 3.6V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.

**Ordering information:**

| Part Number | Product Description                                                        |
|-------------|----------------------------------------------------------------------------|
| YS100MO80C  | 1550nm, 155Mbps, LC, 80km, 0°C~+70°C, With Digital Diagnostic Monitoring   |
| YS100MO80I  | 1550nm, 155Mbps, LC, 80km, -40°C~+85°C, With Digital Diagnostic Monitoring |

Mechanical Dimensions:



**Recommended Circuit:**