

## SFP-1G-L20

1000Base SFP  
1310nm  
20km Reach

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## Features

- Up to 1.25Gb/s data links
- Duplex LC connector
- Hot-pluggable SFP footprint
- 1310nm FP laser transmitter
- RoHS compliant and Lead Free
- Up to 20km on 9/125um SMF
- Metal enclosure for lower EMI
- Single +3.3V power supply
- Power dissipation <1W (0~70°C),
- Power dissipation <1.2W (-40~85°C)
- Commercial and industrial operating
- temperature optional
- SFP MSA SFF-8074i Compliant



## Applications

- 1000BASE-LX
- Other optical links

| Part number  | Product description                                      |
|--------------|----------------------------------------------------------|
| SFP-1G-L20   | 1000Base SMF SFP 1310nm 10km 0°C to 70°C LC Duplex DDM   |
| SFP-1G-L20-I | 1000Base SMF SFP 1310nm 10km -40°C to 85°C LC Duplex DDM |

# PIN Description

| PIN | Symbol      | Name - Description                                             | Notes |
|-----|-------------|----------------------------------------------------------------|-------|
| 1   | VEET        | Transmitter Ground (Common with Receiver Ground)               |       |
| 2   | TFAULT      | Transmitter Fault. Not supported.                              | 1     |
| 3   | TDIS        | Transmitter Disable. Laser output disabled on high or open.    | 2     |
| 4   | MOD_DEF(2)  | Module Definition 2. Data line for Serial ID.                  | 1     |
| 5   | MOD_DEF(1)  | Module Definition 1. Clock line for Serial ID.                 | 1     |
| 6   | MOD_DEF(0)  | Module Definition 0. Grounded within the module.               | 1     |
| 7   | Rate Select | No connection required                                         |       |
| 8   | LOS         | Loss of Signal indication. Logic 0 indicates normal operation. | 3     |
| 9   | VEER        | Receiver Ground (Common with Transmitter Ground)               |       |
| 10  | VEER        | Receiver Ground (Common with Transmitter Ground)               |       |
| 11  | VEER        | Receiver Ground (Common with Transmitter Ground)               |       |
| 12  | RD-         | Receiver Inverted DATA out. AC Coupled                         | 4     |
| 13  | RD+         | Receiver Non-inverted DATA out. AC Coupled                     | 4     |
| 14  | VEER        | Receiver Ground (Common with Transmitter Ground)               |       |
| 15  | VCCR        | Receiver Power Supply                                          |       |
| 16  | VCCT        | Transmitter Power Supply                                       |       |
| 17  | VEET        | Transmitter Ground (Common with Receiver Ground)               |       |
| 18  | TD+         | Transmitter Non-Inverted DATA in. AC Coupled.                  | 5     |
| 19  | TD-         | Transmitter Inverted DATA in. AC Coupled.                      | 5     |
| 20  | VEET        | Transmitter Ground (Common with Receiver Ground)               |       |

Notes:

1. Open collector/drain output, which should be pulled up with a 4.7kΩ to 10kΩ resistor on the host board if intended for use. Pull up voltage should be between 2.0V to 3.6V. A high output indicates a transmitter fault caused by either the TX bias current or the TX output power exceeding the preset alarm thresholds. A low output indicates normal operation. In the low state, the output is pulled to <0.8V.
2. Laser output disabled on Tx\_Disable >2.0V or open, enabled on Tx\_Disable <0.8V.
3. LOS is open collector output. Should be pulled up with 4.7kΩ to 10kΩ on host board to a voltage between 2.0V and 3.6V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.
4. RD-/+: These are the differential receiver outputs. They are internally AC-coupled 100Ω differential lines which should be terminated with 100Ω (differential) at the user SERDES.
5. TD-/+: These are the differential transmitter inputs. They are internally AC-coupled, differential lines with 100Ω differential termination inside the module.



Figure 1. Diagram of host board connector block pin numbers and names

## Absolute Maximum Ratings

| Parameter              | Min  | Typ | Max | Unit | Notes |
|------------------------|------|-----|-----|------|-------|
| Maximum Supply Voltage | -0.3 | -   | 3.6 | V    | -     |
| Storage Temperature    | -40  | -   | +85 | °C   | -     |
| Relative Humidity      | 5    | -   | 95  | %    | 1     |

Notes:

1. Non-condensing.

## Recommend Operation Conditions

| Parameter                         | Min  | Typ | Max  | Unit | Notes |
|-----------------------------------|------|-----|------|------|-------|
| Power Supply Voltage              | 3.13 | 3.3 | 3.47 | V    | -     |
| Power Supply Current (com.)       | -    | -   | 250  | mA   | -     |
| Power Supply Current (ind.)       | -    | -   | 300  | mA   | -     |
| Case Operating Temperature (com.) | 0    | -   | +70  | °C   | -     |
| Case Operating Temperature (ind.) | -40  | -   | +85  | °C   | -     |

## Electrical Characteristics

| Parameter                      | Min     | Typ | Max     | Unit     | Notes |
|--------------------------------|---------|-----|---------|----------|-------|
| Transmitter                    |         |     |         |          |       |
| Input differential impedance   | -       | 100 | -       | $\Omega$ | 1     |
| Single ended data input swing  | 250     | -   | 1200    | mV       | -     |
| TX Disable-High                | Vcc-1.3 | -   | Vcc     | V        | -     |
| TX Disable-Low                 | Vee     | -   | Vee+0.8 | V        | -     |
| TX Fault-High                  | Vcc-0.5 | -   | Vcc     | V        | -     |
| TX Fault-Low                   | Vee     | -   | Vee+0.5 | V        | -     |
| Receiver                       |         |     |         |          |       |
| Single ended data output swing | 300     | 400 | 800     | mV       | 2     |
| Data output rise time          | -       | -   | 300     | ps       | 3     |
| Data output fall time          | -       | -   | 300     | ps       | 3     |
| LOS-High                       | Vcc-0.5 | -   | Vcc     | V        | -     |
| LOS-Low                        | Vee     | -   | Vee+0.5 | V        | -     |

Notes:

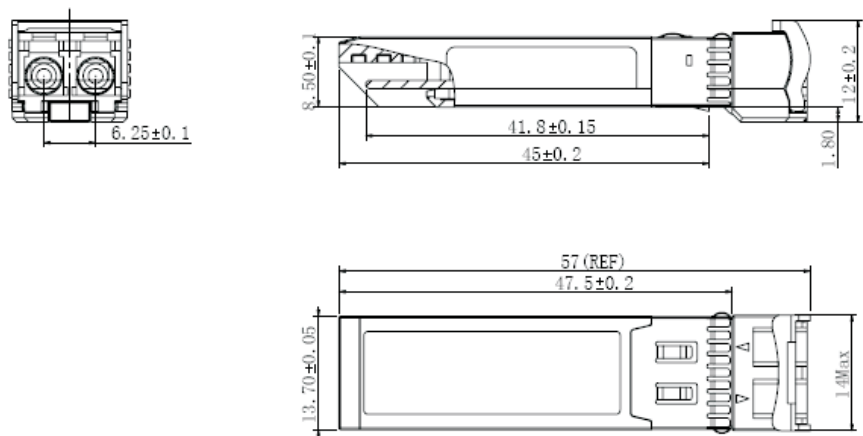
1. AC coupled
2. into 100 $\Omega$  differential termination
3. 20 - 80%

# Optical Characteristics

| Parameter                  | Min  | Typ  | Max  | Unit | Notes |
|----------------------------|------|------|------|------|-------|
| Transmitter                |      |      |      |      |       |
| Optical Center Wavelength  | 1260 | 1310 | 1360 | nm   | -     |
| Average Output Power       | -9.0 | -    | -3   | dBm  | 1     |
| Optical Extinction Ratio   | 9.0  | -    | -    | dB   | -     |
| RMS Spectral Width (-20dB) | -    | -    | 3.5  | nm   | -     |
| Rise/Fall Time             | -    | -    | 260  | ps   | 2     |
| Data Rate                  | -    | 1.25 | -    | Gb/s | -     |
| Receiver                   |      |      |      |      |       |
| Optical Center Wavelength  | 1260 | -    | 1580 | nm   | -     |
| Receiver Sensitivity       | -    | -    | -23  | dBm  | 3,4   |
| Damage Threshold           | -1   | -    | -    | dBm  | -     |
| LOS Assert                 | -45  | -    | -    | dBm  | -     |
| LOS De-Assert              | -    | -    | -24  | dBm  | -     |
| LOS Hysteresis             | 0.5  | -    | -    | dB   | -     |

- Notes:
- Class 1 Laser Safety.
  - Unfiltered, 20-80%. Complies with GE
  - Measured with conformance signals defined in FC-PI-2 Rev. 10.0 specifications.
  - Measured with PRBS 2<sup>7</sup>-1 at 10<sup>-12</sup> BER.

# Mechanical Dimensions



units : mm

# Revision history

| Revision | Date       | Author | Description      |
|----------|------------|--------|------------------|
| V1.1     | 05-03-2020 | JGN    | Initial Document |

Note : Nexgen A/S reserves the right to change this document without notice.