

## GLC-LH-SMD-I-AO

Cisco® Compatible TAA 1000Base-LX SFP Transceiver (SMF, 1310nm, 10km, LC, DOM, -40 to 85C)

### Features

- INF-8074 and SFF-8472 Compliance
- Duplex LC Connector
- Industrial Temperature -40 to 85 Celsius
- Single-mode Fiber
- Hot Pluggable
- Excellent ESD Protection
- Metal with Lower EMI
- RoHS Compliant and Lead Free



### Applications

- 1000Base Ethernet
- Access and Enterprise

### Product Description

This Cisco® SFP transceiver provides 1000Base-LX throughput up to 10km over single-mode fiber (SMF) using a wavelength of 1310nm via an LC connector. It is guaranteed to be 100% compatible with the equivalent Cisco® transceiver. This easy to install, hot swappable transceiver has been programmed, uniquely serialized and data-traffic and application tested to ensure that it will initialize and perform identically. Digital optical monitoring (DOM) support is also present to allow access to real-time operating parameters. This transceiver is Trade Agreements Act (TAA) compliant. We stand behind the quality of our products and proudly offer a limited lifetime warranty.

AddOn's transceivers are RoHS compliant and lead-free.

TAA refers to the Trade Agreements Act (19 U.S.C. & 2501-2581), which is intended to foster fair and open international trade. TAA requires that the U.S. Government may acquire only "U.S. – made or designated country end products."



## Absolute Maximum Ratings

| Parameter                  | Symbol           | Min. | Max. | Unit |
|----------------------------|------------------|------|------|------|
| Maximum Supply Voltage     | V <sub>CC</sub>  | -0.5 | 4.0  | V    |
| Storage Temperature        | T <sub>stg</sub> | -40  | 85   | °C   |
| Operating Case Temperature | T <sub>c</sub>   | -40  | 85   | °C   |
| Operating Humidity         | RH               | 5    | 85   | %    |
| Receiver Power             | R <sub>MAX</sub> |      | 0    | dBm  |
| Maximum Bitrate            | B <sub>max</sub> |      | 1.25 | Gbps |

## Electrical Characteristics (T<sub>c</sub>=25°C, V<sub>CC</sub>=3.3 Volts)

| Parameter                      | Symbol              | Min. | Typ. | Max. | Unit | Notes |
|--------------------------------|---------------------|------|------|------|------|-------|
| Power Supply Voltage           | V <sub>CC</sub>     | 3.15 | 3.30 | 3.43 | V    |       |
| Power Supply Current           | I <sub>CC</sub>     |      |      | 303  | mA   |       |
| Power Consumption              |                     |      |      | 1    | W    |       |
| Transmitter                    |                     |      |      |      |      |       |
| Differential Data Input Swing  | V <sub>IN,pp</sub>  | 120  |      | 850  | mV   |       |
| Input Differential Impedance   | Z <sub>IN</sub>     | 80   | 100  | 120  | Ω    |       |
| Receiver                       |                     |      |      |      |      |       |
| Differential Data Output Swing | V <sub>OUT,pp</sub> | 300  |      | 850  | mV   |       |
| Output Differential Impedance  | Z <sub>IN</sub>     | 80   | 100  | 120  | Ω    |       |

## Optical Characteristics

| Parameter                      | Symbol           | Min. | Typ. | Max. | Unit | Notes |
|--------------------------------|------------------|------|------|------|------|-------|
| Transmitter                    |                  |      |      |      |      |       |
| Optical Power (Average)        | P <sub>AVE</sub> | -9.5 |      | -3   | dBm  | 1     |
| Optical Extinction Ratio       | ER               | 9    |      |      | dB   |       |
| Optical Wavelength             | Tλ               | 1270 | 1310 | 1355 | nm   |       |
| Insertion Loss                 | IL               |      | 0.6  |      |      |       |
| Receiver                       |                  |      |      |      |      |       |
| Receiver Sensitivity (Average) | R <sub>AVE</sub> |      |      | -24  | dBm  | 3     |
| Receiver Overload              | P <sub>max</sub> | 0    |      |      | dBm  | 4     |
| Optical Return Loss            | ORL              | 12   |      |      | dB   |       |
| Receiver Wavelength            | Rλ               | 1260 |      | 1565 | nm   |       |

## Notes:

1. Coupled into a single-mode fiber.
2. Per IEEE 802.3ah specification.
3. Average power, back-to-back, @1.25Gbps, BER 1E<sup>-12</sup>, and PRBS 2<sup>31</sup>-1.
4. Exceeding the Receiver Overload can physically damage the module. Please use appropriate attenuation.

## Pin Descriptions

| Pin | Symbol      | Name/Description                                                 | Notes |
|-----|-------------|------------------------------------------------------------------|-------|
| 1   | VeeT        | Transmitter Ground (Common with Receiver Ground).                | 1     |
| 2   | Tx_Fault    | Transmitter Fault. Not Supported.                                |       |
| 3   | Tx_Disable  | 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   | VeeR        | Receiver Ground (Common with Transmitter Ground).                | 1     |
| 10  | VeeR        | Receiver Ground (Common with Transmitter Ground).                | 1     |
| 11  | VeeR        | 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  | VeeR        | Receiver Ground (Common with Transmitter Ground).                | 1     |
| 15  | VccR        | Receiver Power Supply.                                           |       |
| 16  | VccT        | Transmitter Power Supply.                                        |       |
| 17  | VeeT        | 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  | VeeT        | Transmitter Ground (Common with Receiver Ground).                | 1     |

### Notes:

1. The circuit ground is isolated from the chassis ground.
2. Disabled:  $T_{DIS} > 2V$  or Open, Enabled:  $T_{DIS} < 0.8V$ .
3. Should be pulled up with  $4.7k\Omega$  to  $10k\Omega$  on the host board to a voltage between 2V and 3.6V.
4. LOS is an open collector output.



Top of Board



Bottom of Board



Pin-Out of Connector Block on the Host Board

## Recommended Circuit Schematic



**Mechanical Specifications**

Small Form Factor Pluggable (SFP) transceivers are compatible with the dimensions defined by the SFP Multi-Sourcing Agreement (MSA).



**EEPROM Information**

EEPROM memory map-specific data field description is as below:

| 2 wire address 1010000X (A0h)           | 2 wire address 1010001X (A2h)             |
|-----------------------------------------|-------------------------------------------|
| 0                                       | 0                                         |
| Serial ID Defined by SFP MSA (96 bytes) | Alarm and Warning Thresholds (56 bytes)   |
| 95                                      | 55                                        |
| Vendor Specific (32 bytes)              | Cal Constants (40 bytes)                  |
| 127                                     | 95                                        |
| Reserved, SFF8079 (128 bytes)           | Real Time Diagnostic Interface (24 bytes) |
|                                         | 119                                       |
|                                         | 127                                       |
|                                         | Vendor Specific (8 bytes)                 |
|                                         | User Writable EEPROM (120 bytes)          |
|                                         | 247                                       |
| 255                                     | 255                                       |
|                                         | Vendor Specific (8 bytes)                 |

## About AddOn Networks

In 1999, AddOn Networks entered the market with a single product. Our founders fulfilled a severe shortage for compatible, cost-effective optical transceivers that compete at the same performance levels as leading OEM manufacturers. Adhering to the idea of redefining service and product quality not previously had in the fiber optic networking industry, AddOn invested resources in solution design, production, fulfillment, and global support.

Combining one of the most extensive and stringent testing processes in the industry, an exceptional free tech support center, and a consistent roll-out of innovative technologies, AddOn has continually set industry standards of quality and reliability throughout its history.

Reliability is the cornerstone of any optical fiber network and is ingrained in AddOn's DNA. It has played a key role in nurturing the long-term relationships developed over the years with customers. AddOn remains committed to exceeding industry standards with certifications from ranging from NEBS Level 3 to ISO 9001:2005 with every new development while maintaining the signature reliability of its products.



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