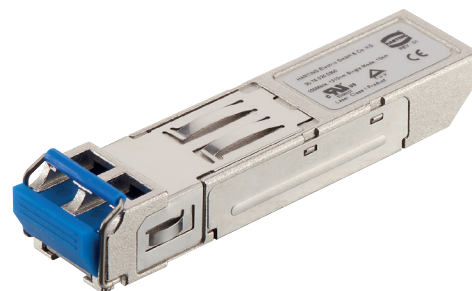


Ha-VIS FE SFP Transceiver SM L15



Ha-VIS FE SFP Transceiver SM L15

Fast Ethernet
for Duplex LC connector, Singlemode Cable, 15 km

Features

- 1310 nm FP LED
- Data Rate: 155 Mbit/s, NRZ
- Single +3.3 V Power Supply
- RoHS Compliant and Lead-free
- AC/AC Differential Electrical Interface
- Compliant with Multi-Source Agreement (MSA) Small Form Factor Pluggable (SFP)
- Duplex LC Connector
- Compliance with 100Base-FX of IEEE 802.3u Standard
- Compliance with FDDI PMD Standard
- Compliance with ATM Standard

General description

The Ha-VIS FE SFP Transceiver SM L15 is the high performance and cost-effective module for serial optical data communication applications specified for single mode of 155 Mbit/s. It operates with +3.3 V power supply. The module is intended for Singlemode fiber, operates at a nominal wavelength of 1310 nm and complies with Multi-Source Agreement (MSA) Small Form Factor Pluggable (SFP).

The module is a duplex LC connector transceiver designed to provide an ATM/SONET OC-3/SDH STM-1 compliant link for 155 Mbit/s intermediate reach applications. The characteristics are performed in accordance with Telcordia Specification GR-468-CORE.

Identification

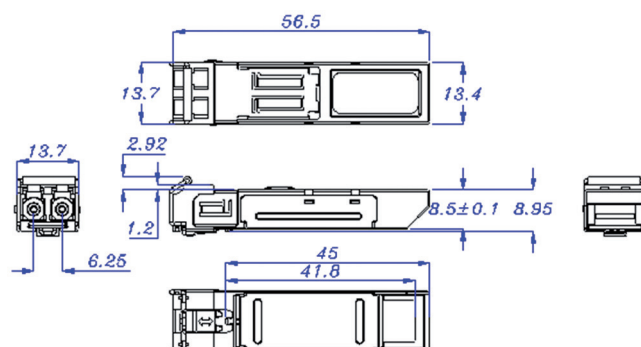
Part number

Drawing

Dimensions in mm

Ha-VIS FE SFP Transceiver SM L15

20 76 020 0300



Technical characteristics

Applications

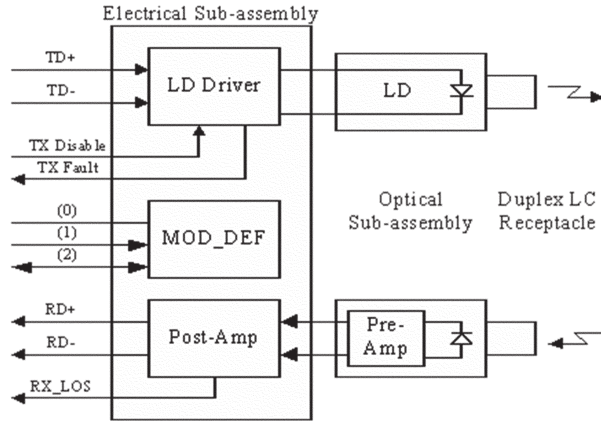
- Fast Ethernet
- FDDI
- ATM/SONET OC-3/SDH STM-1
- Singlemode fibre links
- Optical-Electrical Interface Conversion

Ethernet Interface - Fibre Optic

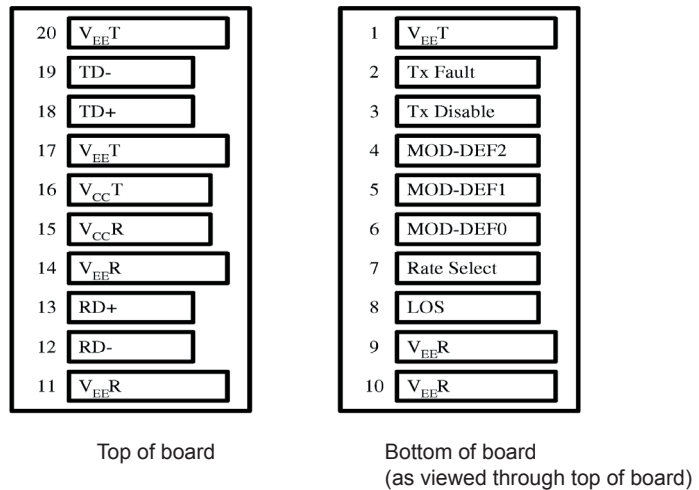
| | |
|---|---|
| Cable types acc. to IEEE 802.3 | Singlemode fibre, 1310 nm; 9 / 125 µm |
| Data rate | 155 Mbit/s |
| Maximum cable length | 15 km |
| Sensitivity | ≤ -34 dBm |
| Wave length | 1310 nm FP |
| Transmitter | |
| Output power | -15 ... -8 dBm |
| Extinction Ratio (min) | 8.2 dB |
| Center wave length | 1263 ... 1360 nm |
| Center wave length (typ.) | 1310 nm |
| Spectral width (FWHM) (max) | 3 nm |
| Optical rise time (10 % ... 90 %) (max) | 2.0 ns |
| Optical fall time (10 % ... 90 %) (max) | 2.0 ns |
| Output eye | compliant with ITU recommendation G.957 |
| Receiver | |
| Maximum input optical power (min) | -3 dBm |
| Receiver sensitivity (max) | ≤ -34 dBm |
| Operating wave length | 1100 ... 1600 nm |
| Loss of Signal - asserted (P_A) (min) | -45 dBm |
| Loss of Signal - deasserted | $0,5 + P_A$... -33 dBm |
| Loss of Signal - hysteresis | 0.5 ... 4 dB |
| Timing characteristics | |
| TX_DISABLE Assert Time (max) | 10 µs |
| TX_DISABLE Negate Time (max) | 1 ms |
| Time to initialize, include reset of TX_FAULT (max) | 300 ms |
| TX_FAULT from fault to assertion (max) | 100 µs |
| TX_DISABLE time to start reset (min) | 10 µs |
| Receiver Loss of Signal Assert Time (max) | |
| off to on | 100 µs |
| on to off | 100 µs |

Technical characteristics

Block diagram of transceiver



Pin assignment diagram of transceiver



| Pin | Symbol | Functional description |
|-----|-------------|---|
| 1 | VeeT | Transmitter ground |
| 2 | TX Fault | Transmitter Fault Indication (not connected) |
| 3 | TX Disable | Transmitter Disable - module disables on high or open |
| 4 | MOD-DEF(2) | Module Definition 2 - two wire serial ID interface |
| 5 | MOD-DEF(1) | Module Definition 1 - two wire serial ID interface |
| 6 | MOD-DEF(0) | Module Definition 0 - grounded in module |
| 7 | Rate Select | Not connected |
| 8 | LOS | Loss of signal |
| 9 | VeeR | Receiver ground |
| 10 | VeeR | Receiver ground |

| Pin | Symbol | Functional description |
|-----|--------|-----------------------------|
| 11 | VeeR | Receiver ground |
| 12 | RD- | Inverse received data out |
| 13 | RD+ | Received data out |
| 14 | VeeR | Receiver ground |
| 15 | VccR | Receiver Power |
| 16 | VccT | Transmitter Power |
| 17 | VeeT | Transmitter ground |
| 18 | TD+ | Transmitter data in |
| 19 | TD- | Inverse transmitter data in |
| 20 | VeeT | Transmitter ground |

Technical characteristics

Power Supply

| | |
|---------------------------------|-----------------|
| Power supply (Vcc) | 0...6 V DC |
| Operating voltage and SD output | 3.3 V TTLAC/AC |
| Permissible range | 3.1 V to 3.5 V |
| Data input voltage swing | 400 ... 1600 mV |

Transmitter

| | |
|---|---------------|
| Transmitter supply current (max) | 200 mA |
| Tx Transmitter Disable Input voltage - low | 0 ... 0.8 V |
| Tx Transmitter Disable Input voltage - high | 2.0 V ... Vcc |
| Tx Transmitter Fault Output voltage - low | 0 ... 0.8 V |
| Tx Transmitter Fault Output voltage - high | 2.0 V ... Vcc |

Receiver

| | |
|---|-------------------------|
| Receiver supply current (max) | 100 mA |
| Receiver Data Output differential voltage | 0.4 ... 1.3 V |
| Rx LOS Output voltage - low | 0 ... 0.8 V |
| Rx LOS Output voltage - high | 2.0 V ... Vcc |
| MOD_DEF (1), MOD_DEF (2) - low | -0.6 V ... Vcc x 0.3 |
| MOD_DEF (1), MOD_DEF (2) - high | Vcc x 0.7 ... Vcc + 0.5 |

Design features

| | |
|------------------------|-----------------------------|
| Housing type | metal housing |
| Dimensions (W x H x D) | 13.7 mm x 8.95 mm x 56.5 mm |

Environmental conditions

| | |
|-----------------------|------------------|
| Operating temperature | -40 °C to +85 °C |
| Storage temperature | -40 °C to +85 °C |

EMC

Most equipment utilizing high-speed transceivers will be required to meet the following requirements:

- 1) FCC in the United States
- 2) CENELEC EN 55 022 (CISPR 22) in Europe

To assist the customer in managing the overall equipment EMC performance, the transceivers have been designed to satisfy FCC class B limits and provide good immunity to radio-frequency electromagnetic fields.

Eye safety

The transceivers have been designed to meet Class 1 eye safety and comply with EN 60 825-1.