

# Ha-VIS GbE SFP Transceiver SM L10



## Ha-VIS GbE SFP Transceiver SM L10 Gigabit Ethernet

for Duplex LC connector, Singlemode Cable, 10 km

### Features

- 1310 nm FP LD
- Data Rate: 1.25 Gbit/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)
- Compliant with SFF-8472 Digital Diagnostic Monitoring Interface
- Duplex LC Connector
- Compliance with specifications for IEEE 802.3z Gigabit Ethernet at 1.25 Gbit/s
- Compliance with ANSI specifications for Fibre Channel applications at 1.06 Gbit/s
- Eye Safety Designed to meet Laser Class 1 comply with EN 60 825-1

### General description

The Ha-VIS GbE SFP Transceiver SM L10 is the high performance and cost-effective module for serial optical data communication applications specified for single mode of 1.25 Gbit/s. It operates with +3.3 V power supply. The module is intended for single mode fiber, operates at a nominal wavelength of 1310 nm and complies with Multi-Source Agreement (MSA) Small Form Factor Pluggable (SFP). Each module is integrated digital diagnostics functions via an I2C serial interface.

The module is a duplex LC connector transceiver designed for use in Gigabit Ethernet applications and to provide IEEE 802.3z compliant link for 1.25 Gbit/s intermediate reach applications. The characteristics are performed in accordance with Telcordia Specification GR-468-CORE.

Identification	Part number	Drawing	Dimensions in mm
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Ha-VIS GbE SFP Transceiver SM L10	20 76 030 0300		

## Technical characteristics

### Applications

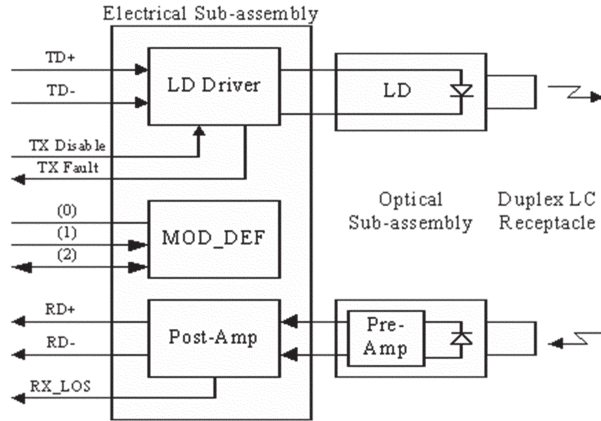
- Gigabit Ethernet Links
- Fibre Channel Links at 1.06 Gbps
- High Speed Backplane Interconnects
- Switched Backbones

### Ethernet Interface - Fibre Optic

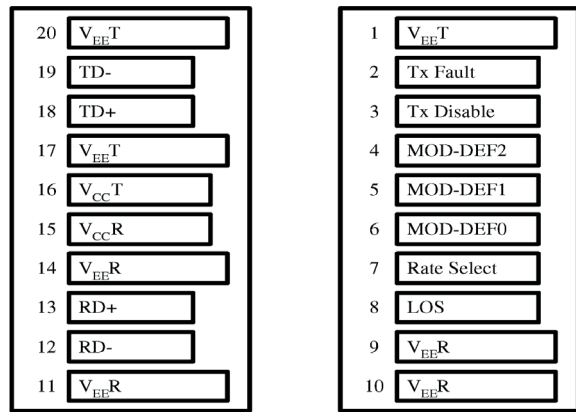
Cable types acc. to IEEE 802.3	Singlemode fibre, 1310 nm; 9 / 125 $\mu$ m
Data rate	1.25 Gbit/s
Maximum cable length	10 km
Sensitivity	$\leq$ -21 dBm
Wave length	1310 nm FP
Transmitter	
Output power	-9.5 ... -3 dBm
Extinction Ratio (min)	9 dB
Center wave length	1275 ... 1355 nm
Spectral width (FWHM) (max)	3 nm
RIN (max)	-117 dB/Hz
Optical rise time (20 % ... 80 %) (max)	260 ps
Optical fall time (20 % ... 80 %) (max)	260 ps
Output eye	compliant with IEEE 802.3z / D5.0
Receiver	
Maximum input optical power	-3 ... -21 dBm
Operating wave length	1100 ... 1600 nm
Optical return loss (min)	12 dB
Receiver Electrical 3 dB upper cutoff frequency (max)	1500 MHz
Loss of Signal - asserted ( $P_A$ ) (min)	-35 dBm
Loss of Signal - deasserted (max)	-20 dBm
Loss of Signal - hysteresis (min)	0.5 dB
Timing characteristics	
TX_DISABLE Assert Time (max)	10 $\mu$ s
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 $\mu$ s
TX_DISABLE time to start reset (min)	10 $\mu$ s
Receiver Loss of Signal Assert Time (max)	
off to on	100 $\mu$ s
on to off	100 $\mu$ s

## Technical characteristics

Block diagram of transceiver



Pin assignment diagram of transceiver



Top of board

Bottom of board  
(as viewed through top of board)

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
Supply current (max)	300 mA
Operating voltage and SD output	3.3 V TTL AC/AC
Permissible range	3.1 V to 3.5 V
Data input voltage	0 V ... Vcc
Data input voltage swing	300 ... 1860 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.