Lanmus

LMT-GE-SM1310-20

DATASHEET

LMT-GE-SM1310-20
SFP, 1.25Gbps, 20K m, LC, DD

The LMT-GE-SM1310-20 is a high-performance SFP optical transceiver designed for reliable Gigabit Ethernet and Fibre Channel applications. It uses a 1310nm FP laser and supports transmission distances up to 20 km over single-mode fiber. With a compact LC connector and hot-pluggable SFP form factor, it ensures easy integration into networking devices. Operating on a 3.3V power supply, it offers low EMI, strong ESD protection, and digital diagnostics monitoring. Its wide temperature range of -40°C to +85°C makes it suitable for demanding environments.



PRODUCT INTRODUCTION

Product Overview



The LMT-GE-SM1310-20 is a high-performance Gigabit SFP optical transceiver designed for long-distance data transmission over single-mode fiber (SMF). Compliant with SFP Multi-Source Agreement (MSA) standards, this module ensures seamless compatibility with a wide range of networking equipment, making it ideal for enterprise, telecom, and data center applications.

Operating at a wavelength of 1310 nm, the transceiver utilizes a FP laser transmitter and PIN photodetector to deliver stable and efficient optical performance. It supports data rates up to 1.25 Gb/s and enables transmission distances of up to 20 km, making it suitable for long-range network connectivity.

Designed for reliability and flexibility, the module features a hot-pluggable SFP form factor with a standard LC connector, allowing easy installation and maintenance without system downtime. It operates on a single 3.3V power supply and supports low power consumption, ensuring energy-efficient performance.

The LMT-GE-SM1310-20 is built to perform in demanding environments, with an operating temperature range of -40°C to +85°C. It also includes Digital Diagnostic Monitoring (DDM) capabilities, enabling real-time monitoring of key parameters such as temperature, voltage, and optical power for improved network management and reliability.

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Key Features

- **High-Speed Data Transmission**
  Supports data rates up to 1.25 Gb/s for Gigabit Ethernet and Fibre Channel applications.
- **Long-Distance Connectivity**
  Enables transmission up to 20 km over single-mode fiber (SMF).
- **1310 nm Optical Technology**
  Uses FP laser transmitter and PIN photodetector for stable signal performance.
- **Hot-Pluggable SFP Form Factor**
  Easy to install or replace without interrupting system operations.
- **LC Duplex Connector**
  Standard optical interface for reliable fiber connectivity.
- **Digital Diagnostic Monitoring (DDM)**
  Real-time monitoring of temperature, voltage, TX/RX power, and bias current.
- **Low Power Consumption**
  Operates on a single +3.3V power supply for energy efficiency.
- **Robust and Reliable Design**
  Features low EMI, excellent ESD protection, and compliance with laser safety standards.
- **Wide Operating Temperature Range**
  Designed for -40°C to +85°C environments.
- **Standards Compliance**
  Compatible with IEEE 802.3z and SFP MSA specifications.

Application

- 1.25Gb/s 1000Base-LX Ethernet
- 1.06 Gb/s Fibre Channel

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Absolute Maximum Ratings

Parameter	Symbol	Minimum	Maximum	Unit
Storage Temperature	Tst	-40	+85	C
Supply Voltage	Vcc	0	+3.6	V
Operating Relative Humidity	RH	5	95	%

Operation Environment

Parameter	Symbol	Min	Typical	Max	Unit
Supply Voltage	Vcc	3.15	3.3	3.45	V
Operating Case Temperature	Tc	-40	-	+85	-
Power Dissipation	-	-	-	1	W
Date Rate	-	-	1.25	-	Gbps

Optical Characteristics

(Ambient Operating Temperature -40°C to +85°C, Vcc =3.3 V)

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Parameter	Symbol	Min	Typ.	Max	Unit
Transmitter Section					
Center Wavelength	λo	1260	1310	1360	nm
Spectral Width(RMS)	△λ	-	-	4	nm
Average Output Power	Po	-9	-	-3	dBm
Extinction Ratio	Er	8	-		dB
Rise/Fall Time(20%~80%)	Tr/Tf	-		300	ps
Total jitter	Tj	-		0.43	UI
Optical Eye Diagram	IEEE 802.3z and ANSI Fibre Channel Compatible				
Receiver Section					
Center Wavelength	λo	1260	-	1620	nm
Receiver Sensitivity	Rsen	-	-	-22	dBm
Receiver Overload	Rov	-3	-	-	dBm
Return Loss	-	12	-	-	dB
LOS Assert	LOSA	-36	-	-	dBm
LOS Dessert	LOSD		-	-23	dBm
LOS Hysteresis	-	0.5	-	5	-

Electrical Characteristics

(Ambient Operating Temperature -40°C to +85°C, Vcc =3.3 V)

Parameter	Symbol	Min	Typ.	Max	Unit
Transmitter Section					
Input Differential Impendence	Zin	90	100	110	Ohm
Data Input Swing Differential	Vin	500	-	2400	mV
TX Disable	Disable	2.0	-	Vcc	V
	Enable	0		0.8	V
TX Fault	Assert	2.0	-	Vcc	V
	Deassert	0		0.8	V
Receiver Section					
Output Differential Impendence	Zout	-	100	-	Ohm
Data Input Swing Differential	Vout	370	-	2000	mV
Rx_LOS	Assert	2.0	-	Vcc	V
	Deassert	0		0.8	V

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EEPROM Information (A0)

Addr	Field Size (Bytes)	Name of Field	HEX	Description
0	1	Identifer	03	SEP
1	1	Ext. Identifier	04	MOD4
2	1	Connector	07	LC
3-10	8	Transceiver	00 00 00 02 12 00 0D 01	Transmitter Code
12	1	11	1	Encoding	01
13	1	Reserved	00	-
14	1	Length (9um)- km	14	20km
15	1	Length (9um)	64/C8/FF	-
16	1	Length (50um)	-	-
17	1	Length (62.5um)	00	-
18	1	Length (copper)	00	-
19	1	Reserved	00	-

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Addr	Field Size (Bytes)	Name of Field	HEX	Description
20-35	16	Vendor name	57 49 4E 54 4F 50 20 20 20 20 20 20 20 20 20 20	WINTOP
36	1	Reserved	00	-
37-39	3	Vendor OUI	00 00 00 00	-
40-55	16	Vendor PN	xx xx xx xx xx xx xx xx xx xx xx xx xx xx xx xx	ASC II
56-59	4	Vendor rev	31 2E 30 20	V1.0
60-61	2	Wavelength	05 1E	1310nm
62	1	Reserved	00	-
63	1	CC BASE	xx	Check sum of byte 0~62
64-65	2	Options	00 1A	LOS, TX_DISABLE, TX_FAULT
66	1	BR, max	32	50%
67	1	BR, min	32	50%
68-83	16	Vendor SN	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	Unspecified
84-91	8	Vendor date code	xx xx xx 20	Year, Month, Day

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Addr	Field Size (Bytes)	Name of Field	HEX	Description
92-94	3	Reserved	00	-
95	1	CC_EXT	xx	Check sum of byte 64~94
96- 255	160	Vendor specific	-	-

Diagnostics

Parameter	Range	Accuracy	Unit	Calibration
Temperature	-40~85	±5	°C	Internal
Voltage	3.15~3.45	±0.1	V	Internal
Bias Current	10~80	±10%	mA	Internal
Tx Power	-9~-3	±3	dBm	Internal
Rx Power	28~-3	±3	dBm	Internal

Pin Description

Pins	Name	Description	Note
1	VeeT	Transmitter Ground	-

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Pins	Name	Description	Note
2	Tx Fault	Transmitter Fault Indication	1
3	Tx Disable	Transmitter Disable	2
4	MOD DEF2	Module Definition 2	3
5	MOD DEF1	Module Definition 1	3
6	MOD DEF0	Module Definition 0	3
7	Rate Select	Not Connected	-
8	LOS	Loss of Signal	4
9	VeeR	Receiver Ground	-
10	VeerR	Receiver Ground	-
11	VeeR	Receiver Ground	-
12	RD-	Inv. Received Data Output	5
13	RD+	IReceived Data Output	5
14	VeeR	Receiver Ground	-
15	VccR	Receiver Power	-
16	VccT	Transmitter Power	-
17	VeeT	Transmitter Ground	-
18	TD+	Transmit Data Input	6
19	TD-	Inv. Transmit Data Input	6
20	VeeT	Transmitter Ground	-

Notes:

- TX Fault is an open collector output, which should be pulled up with a 4.7k~10kΩ resistor on the host board to a voltage between 2.0V and Vcc+0.3V. Logic 0 indicates normal operation; logic 1 indicates a laser fault of some kind. In the low state, the output will be pulled to less than 0.8V.

- TX Disable is an input that is used to shut down the transmitter optical output. It is pulled up within the module with a 4.7k~10kΩ resistor. Its states are:
  Low (0~0.8V): Transmitter on (>0.8V, <2.0V): Undefined
  High (2.0~3.3V): Transmitter Disabled Open: Transmitter Disabled.

- MOD-DEF 0,1,2 are the module definition pins. They should be pulled up with a 4.7k~10kΩ resistor on the host board. The pull-up voltage shall be VccT or VccR.
  MOD-DEF 0 is grounded by the module to indicate that the module is present
  MOD-DEF 1 is the clock line of two wire serial interface for serial ID.
  MOD-DEF 2 is the data line of two wire serial interface for serial ID.

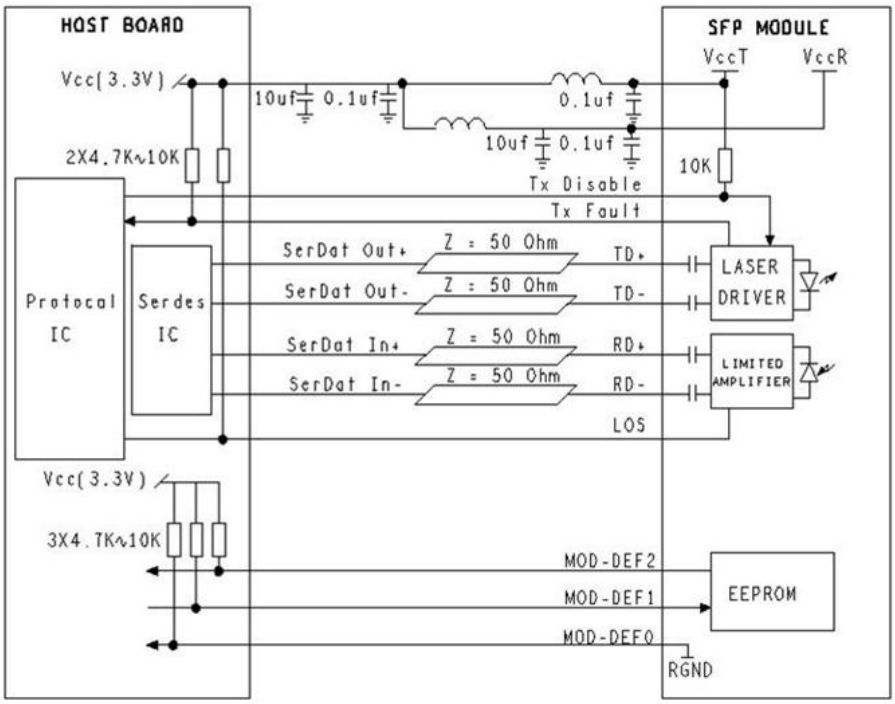
- LOS is an open collector output, which should be pulled up with a 4.7k~10kΩ resistor on the host board to a voltage between 2.0V and Vcc+0.3V. Logic 0 indicates normal operation; logic 1 indicates loss of signal. In the low state, the output will be pulled to less than 0.8V.

- These are the differential receiver output. They are internally AC-coupled 100Ω differential lines which should be terminated with 100Ω (differential) at the user SERDES.

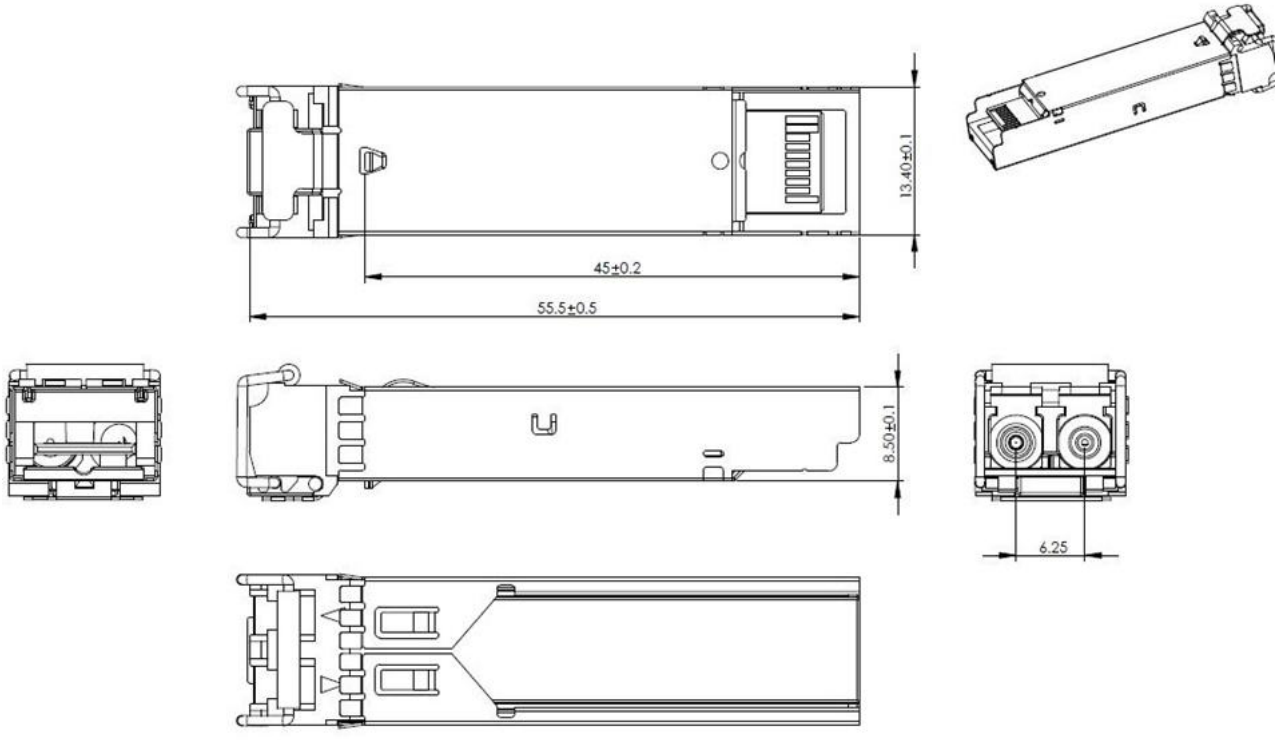
- These are the differential transmitter inputs. They are AC-coupled, differential lines with 100Ω differential termination inside the module.

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Recommended Application Circuit



Outline Dimensions (mm)




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