Foredge

SF410M-LC-300m



SFP 10G 850nm 300m

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HORED's SF410M-LC-300m Small Form Factor Pluggable (SFP+) transceivers are compatible with SFF-8431,SFF-8432 and support 10G Ethernet SR and 10G Fibre Channel .It is designed for use in 10G-Gigabit multi-rate links up to 300mofOM3 . Digital diagnostics functions are available via a 2-wire serial interface, as specified in SFF-8472.

Product Features

- Duplex LC connector
- Hot-pluggable SFP footprint
- Uncooled 850nm VCSEL laser
- RoHScompliant and Lead Free
- Distanceupto300mon 50/125umMMF
- Metal enclosure for lower EMI
- Low power dissipation <1.0W
- Commercial and industrial operating temperature optional
- SFP MSASFF-8472 SFF-8431SFF-8432 Compliant

Applications

- 10GBASE-SR/SW
- 10G Fibre Channel



Regulatory Compliance

- ESDtothe Electrical PINs: compatible with MIL-STD-883 Method 3015
- ESDtothe Duplex LC Receptacle: compatible with EN 61000-4-2
- Immunity compatible with EN 61000-4-3
- EMI compatible with FCC Part 15 Class B
- Laser Eye Safety compatible with FDA 21CFR 1040.10 and 1040.11 IEC 60950, IEC60825-1,2
- RoHS compliant with RoHS 2.0(2015/863/EU)-amending.

Pin Descriptions

Pin	Symbol	Name	Ref.
1	VeeT	Transmitter Ground (Common with Receiver Ground)	1
2	TX Fault	Transmitter Fault. LVTTL-O	2
3	TX Disable	Transmitter Disable. Laser output disabled on high or open. LVTTL-I	3
4	SDA	2-Wire Serial Interface Data Line (Same as MOD-DEF2 in INF-8074i). LVTTL-I/O	2
5	SCL	2-Wire Serial Interface Data Line (Same as MOD-DEF2 in INF-8074i). LVTTL-I	2
6	Mod_ ABS	Module Absent, Connect to VeeT or VeeR in Module.	2
7	RS0	Rate Select 0, optionally controls SFP+ module receiver LVTTL-I	4
8	LOS	Loss of Signal indication. Logic 0 indicates normal operation. LVTTL-O	5
9	RS1	Rate Select 1, optionally controls SFP+ module transmitter. LVTTL-I	4
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. CML-O	
13	RD+	Receiver Non-inverted DATA out. AC Coupled. CML-O	
14	VeeR	Receiver Ground (Common with Transmitter Ground)	1
15	VccR	Receiver Power Supply	6
16	VccT	Transmitter Power Supply	6
17	VeeT	Transmitter Ground (Common with Receiver Ground)	1
18	TD+	Transmitter Non-Inverted DATA in. AC Coupled. CML- I	
19	TD-	Transmitter Inverted DATA in. AC Coupled. CML- I	
20	VeeT	Transmitter Ground (Common with Receiver Ground)	1

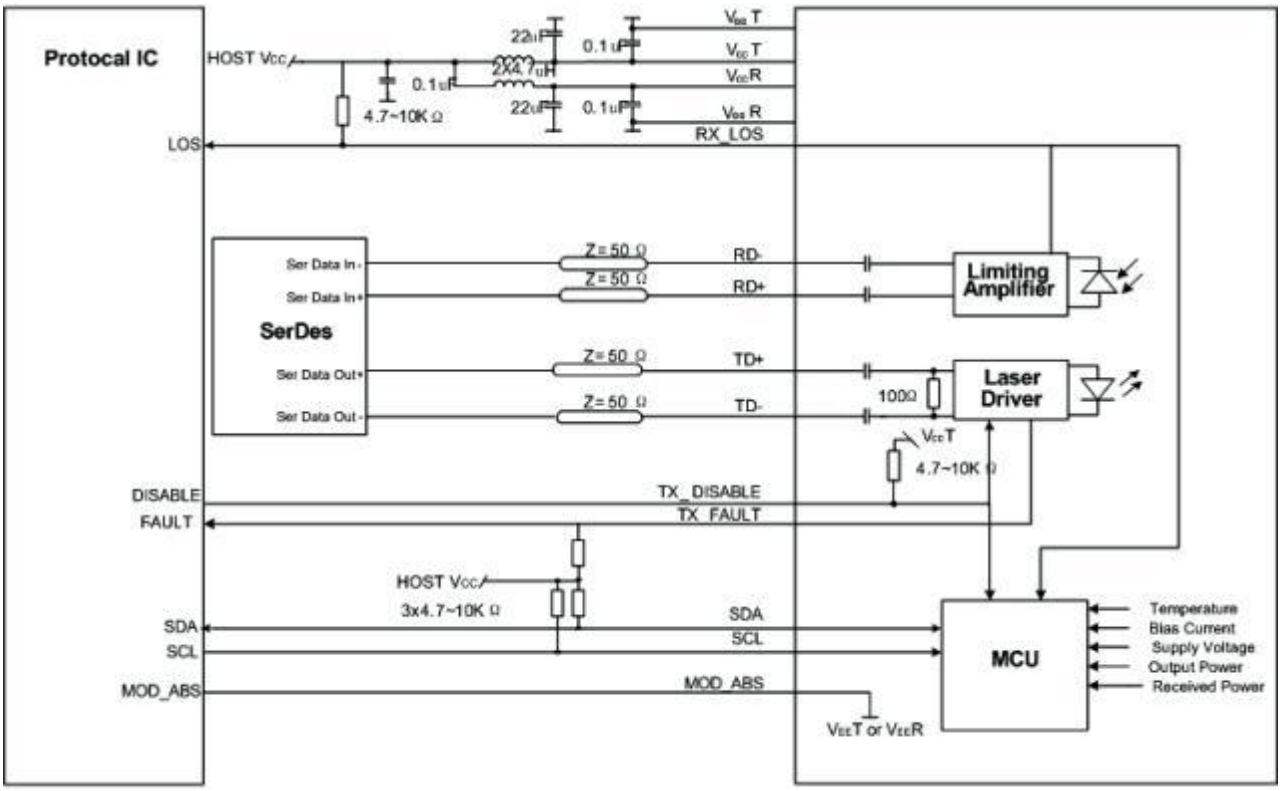
Note

1. Circuit ground is internally isolated from chassis ground.
2. TX Fault isan open collector/drain output .Which should be pulled up with a 4.7K – 10K Ohms resistor on the host board if intended for use. Pull up voltage should be between 2.0VtoVcc+0.3V.A highoutput indicatesatransmitterfaultcaused byeitherthetx bias current orthe 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.
3. Laser output disabled onTX Disable >2.0V or open, enabled onTX Disable<0.8V.
4. Internally pulled down per SFF-8431 Rev4.1.
5. LOS is open collector output. Should be pulled up with 4.7k – 10kohms on host board to a voltage between 2.0V and 3.6V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.
6. Internally connected



Pin-out of Connector Block on Host Board

Recommend Circuit Schematic



Absolute Maximum Ratings

Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Maximum Supply Voltage	Vcc	-0.5		+4.0	V	
Storage Temperature	TS	-40		+85	°C	
Operating Humidity	RH	0		85	%	

Recommended Operating Conditions

Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Power Supply Voltage	Vcc	3.13	3.30	3.47	V	
Power Supply Current	Icc			300	mA	Commercial
Case Operating Temperature	Tc	0		+70	°C	Commercial
	TI	-40		+85	°C	Industrial
Data Rate	BR		10.3		Gbps	
9/125um G.652 SMF	Lmax			300	m	

Electrical Characteristics

Parameter	Symbol	Mir	Typ	Max	Unit	Ref.
Transmitter						
Input differential impedance	Rin	80	100	120	Ω	1
Differential data input swing	Vin, pp	120		850	mV	
TX Disable-High		Vcc – 0.8		Vcc	V	
TX Disable-Low		Vee		Vee+ 0.8	V	
TX Fault-High		Vcc-0.8		Vcc	V	
TX Fault-Low		Vee		Vee+0.8	V	
Receiver						
Differential data output swing	Vout, pp	300		850	mV	2
Data output rise time	Tr	28			ps	3
Data output fall time	Tf	28			ps	3
LOS-High		Vcc – 0.8		Vcc	V	
LOS-Low		Vee		Vee+0.8	V	

Notes:

1. AC coupled.
2. Into 100 ohm differential termination.
3. 20 – 80 %

Optical Characteristics

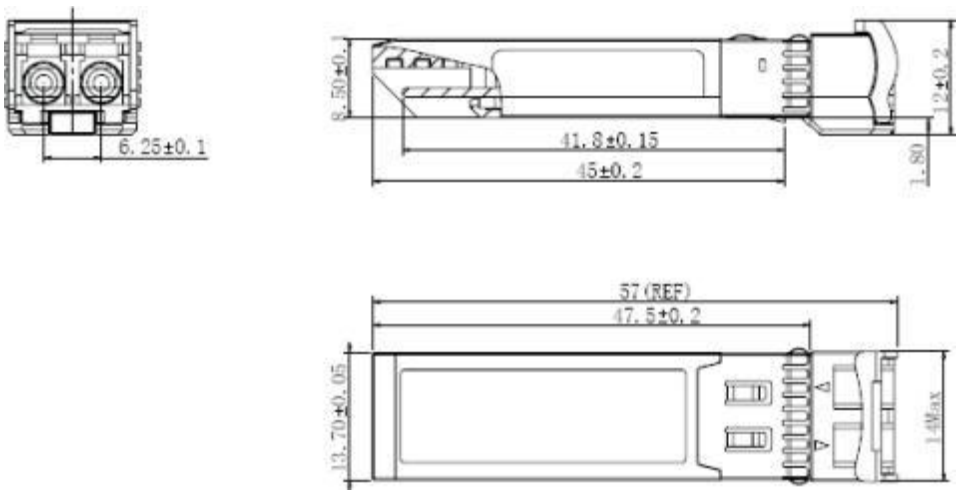
Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Transmitter						
Output Opt. Power	PO	-7.3		-1	dBm	
Optical Wavelength	λ	840	850	860	nm	
RMS Spectral Width(-20dB)	Δλ			0.45	nm	
Optical Extinction Ratio	ER	3.5			dB	
Transmitter and Dispersion Penalty	TDP			3.9	dB	
Receiver						
RX Sensitivity @10.3Gb/s	SENS1			-9.9	dBm	1,2
Receiver Sensitivity (OMA) @ 10.3Gb/s	SENS2			-11.1		
Receiver Overload		-1			dBm	
Optical Center Wavelength	λC	840		860	nm	
LOS De-Assert	LOSD			-13	dBm	
LOS Assert	LOSA	-30			dBm	
LOS Hysteresis		0.5		5	dBm	

Notes:

1. Measured with conformance signals defined in FC-PI-2 Rev. 10.0 specifications.
2. Measured with PRBS 2^{31}-1 at 10^{-12} BER.

Mechanical Specifications

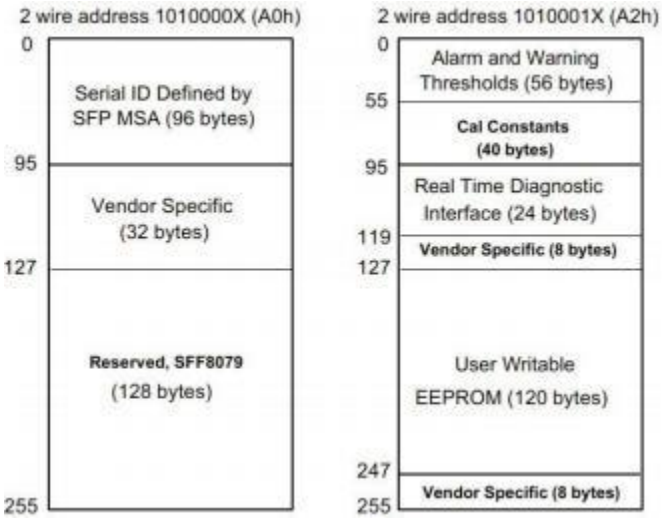
· HORED'sSmall Form Factor Pluggable (SFP+) transceivers are compatible with the dimensions defined by the SFP Multi-Sourcing Agreement (MSA) , dimensions are in mm.



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EEPROM Information

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



Digital Diagnostic Monitoring Interface

Five transceiver parameter values are monitored. The following table defines the monitored parameter's accuracy.

Parameter	Range	Accuracy	Calibration
Temperature	0to+70°C(C)	±3°C	Internal

	-40 to +85°C (I)		
Voltage	2.97 to 3.63V	±3%	Internal
Bias Current	0 to 100mA	±10%	Internal
TX Power	-5 to -1dBm	±3dB	Internal
RX Power	-11.1 to -1dBm	±3dB	Internal