1.25Gb/s SFP BIDI 20km Transceiver
HXSX-1L34/4323x

Features

- Up to 1.25Gb/s data links
- 1310nm FP laser and PIN receiver for HXSX-1L3423x
- 1490nm DFB laser and PIN receiver for HXSX-1L4323x
- Up to 20km on 9/125um SMF
- Hot-pluggable SFP footprint
- Duplex LC/UPC type pluggable optical interface
- Low power dissipation
- RoHS-10 compliant and lead-free
- Support Digital Monitoring interface
- Single +3.3V power supply
- Compliant with SFF-8472
- Metal enclosure, for lower EMI
- Meet ESD requirements, resist 8KV direct contact voltage
- Case operating temperature
  Commercial: 0 ~ +70ºC
  Extended: -10 ~ +80ºC
  Industrial: -40 ~ +85ºC

Applications

- Switch to Switch Interface
- Gigabit Ethernet
- Switched Backplane Applications
- Router/Server Interface
- Other Optical Links

Part Number Ordering Information

Part Number	Data Rate (Gb/s)	Wavelength (nm)	Transmission Distance(km)	Temperature (ºC) (Operating Case)
HXSX-1L34/4323C	1.25	1310Tx/1490Rx 1490Tx/1310Rx	20	0~70 commercial
HXSX-1L34/4323E	1.25		20	-10~80 Extended
HXSX-1L34/4323I	1.25		20	-40~85 Industrial

I. Absolute Maximum Ratings

It has to be noted that the operation in excess of any individual absolute maximum ratings might cause permanent damage to this module.

Parameter	Symbol	Min	Max	Unit	Notes
Storage Temperature	T_S	-40	85	°C	
Power Supply Voltage	V_{CC}	-0.5	3.6	V	
Relative Humidity (non-condensation)	RH	5	95	%	
Damage Threshold	TH_d	5		dBm	

II. Recommended Operating Conditions

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Operating Case Temperature	T_{OP}	0		70	°C	commercial
		-10		80		extended
		-40		85		Industrial
Power Supply Voltage	V_{CC}	3.135	3.3	3.465	V	
Data Rate			1.25		Gb/s	
Control Input Voltage High		2		Vcc	V	
Control Input Voltage Low		0		0.8	V	
Link Distance (SMF)	D			20	km	9/125um

III. General Description

Walsun'HXSX-1L3423x/ HXSX-1L4323x Small Form Factor Pluggable (SFP) transceivers are compatible with the Small Form Factor Pluggable Multi-Sourcing Agreement (MSA), The transceiver consists of five sections: the LD driver, the limiting amplifier, the digital diagnostic monitor, the 1310nm FP/1490nm DFB laser and the PIN photo-detector. The module data link up to 20km in 9/125um single mode fiber.

The optical output can be disabled by a TTL logic high-level input of Tx Disable, and the system also can disable the module via I2C. Tx Fault is provided to indicate that degradation of the laser.

Loss of signal (LOS) output is provided to indicate the loss of an input optical signal of receiver or the link status with partner. The system can also get the LOS (or Link)/Disable/Fault information via I2C register access.

IV. Pin Assignment and Pin Description

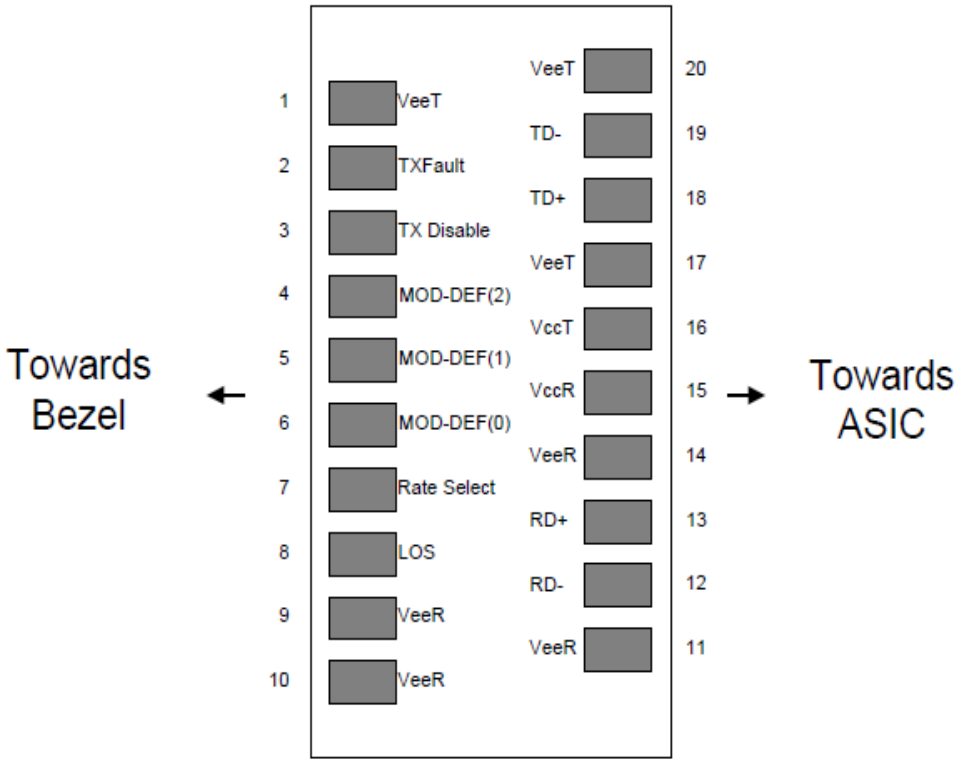

Figure1. Diagram of host board connector block pin numbers and names

Pin	Symbol	Name/Description	Notes
1	VEET	Transmitter Ground (Common with Receiver Ground)	1
2	TXFAULT	Transmitter Fault.	
3	TXDIS	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	4
8	LOS	Loss of Signal indication. Logic 0 indicates normal operation.	5

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. Circuit ground is internally isolated from chassis ground.

2. Laser output disabled on TDIS >2.0V or open, enabled on TDIS <0.8V.

3. Should be pulled up with 4.7k-10k ohms on host board to a voltage between 2.0V and 3.6V.MOD_DEF (0) pulls line low to indicate module is plugged in.

4. This is an optional input used to control the receiver bandwidth for compatibility with multiple data rates (most likely Fiber Channel 1x and 2x Rates). If implemented, the input will be internally pulled down with > 30kΩ resistor. The input states are:

1) Low (0 – 0.8V): Reduced Bandwidth

2) (>0.8, < 2.0V): Undefined

3) High (2.0 – 3.465V): Full Bandwidth

4) Open: Reduced Bandwidth

5. LOS is open collector output should be pulled up with 4.7k-10k ohms on host board to a voltage between 2.0V and 3.6V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.

V. Electrical Characteristics

The following electrical characteristics are defined over the Recommended Operating Environment unless otherwise specified.

Parameter	Symbol	Min.	Typical	Max	Unit	Notes
Power Consumption	P			0.86	W	commercial
				0.95		Industrial

Supply Current	Icc			260	mA	commercial
				280		Industrial
Transmitter						
Single-ended Input Voltage Tolerance	V_{CC}	-0.3		4.0	V	
Differential Input Voltage Swing	Vin,pp	200		2400	mV pp	
Differential Input Impedance	Zin	90	100	110	Ohm	
Transmit Disable Assert Time				5	us	
Transmit Disable Voltage	Vdis	Vcc-1.3		Vcc	V	
Transmit Enable Voltage	Ven	Vee-0.3		0.8	V	
Receiver						
Differential Output Voltage Swing	Vout,pp	500		900	mV pp	
Differential Output Impedance	Zout	90	100	110	Ohm	
Data output rise/fall time	Tr/Tf		100		ps	20% to 80%
LOS Assert Voltage	VlosH	Vcc-1.3		Vcc	V	
LOS De-assert Voltage	VlosL	Vee-0.3		0.8	V	

VI. Optical Characteristics

The following optical characteristics are defined over the Recommended Operating Environment unless otherwise specified.

Parameter	Symbol	Min.	Typical	Max	Unit	Notes
Transmitter						
Center Wavelength	λ_C	1290	1310	1330	nm	
		1470	1490	1510	nm	
Spectrum Bandwidth (RMS)	σ			3.5/1	nm	FP/DFB
Side Mode Suppression Ratio	SMSR	30			dB	DFB

Average Optical Power	P_{AVG}	-9		-3	dBm	1
Extinction Ratio	ER	9			dB	
Transmitter OFF Output Power	Poff			-45	dBm	
Transmitter Eye Mask	Compliant with 802.3z(class 1 laser safety)					2
Receiver						
Center Wavelength	λ_C	1470	1490	1510	nm	
		1290	1310	1330	nm	
Sensitivity (Average Power)	Sen.			-20	dBm	3
Input Saturation Power(overload)	Psat	-3			dBm	
LOS Assert	LOSA	-36			dBm	4
LOS De-assert	LOSD			-21	dBm	4
LOS Hysteresis	LOSH	0.5			dB	

Notes:

1. Measure at 2^7-1 NRZ PRBS pattern
2. Transmitter eye mask definition.
3. Measured with Light source 1310nm/1490nm, ER=9dB; BER≤1E-12 @PRBS=2^7-1 NRZ
4. When LOS de-asserted, the RX data+/- output is High-level (fixed).

VII. Digital Diagnostic Functions

The following digital diagnostic characteristics are defined over the Recommended Operating Environment unless otherwise specified. It is compliant to SFF-8472 Rev10.2 with internal calibration mode. For external calibration mode please contact our sales staff.

Parameter	Symbol	Min.	Max	Unit	Notes
Temperature monitor absolute error	DMI_ Temp	-3	3	°C	Over operating temp
Supply voltage monitor absolute error	DMI _VCC	-0.15	0.15	V	Full operating range
RX power monitor absolute error	DMI_RX	-3	3	dB	
Bias current monitor	DMI_ bias	-10%	10%	mA	
TX power monitor absolute error	DMI_TX	-3	3	dB	

VIII. Mechanical Dimensions

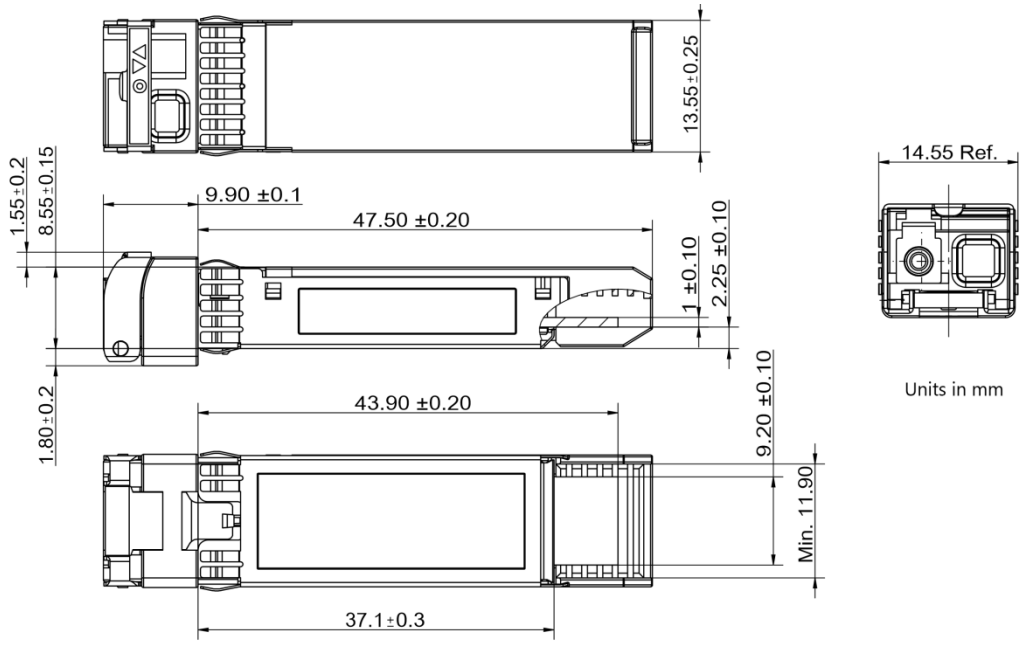

Figure2. Mechanical Outline

IX. Revision History

Version No.	Initiated	Revised contents	Release Date
1.0	Andy Zhang	Preliminary datasheet	2014-06-11
1.1	Andy Zhang	Mechanical Change	2016-04-08

X. Contact us

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