LinkPro™

REV:A0

LPHKAAx1-M(L)xxC

SFP+ 10Gb/s 850nm Multi-mode (0.5~150)m DDM

PRODUCT FEATURES

- Up to 10.3125Gbps Data Links
- 850nm VCSEL laser transmitter and PIN/TIA receiver
- Maximum link length of 150m on OM2 MMF
- Hot-pluggable SFP+ footprint
- Power consumption less than 1W
- RoHS compliant and lead-free
- Support Digital Diagnostic Monitor interface
- +3.3V Single power supply
- Case operating temperature Commercial: 0°C to +70°C

APPLICATIONS

- 10GBASE-SR Ethernet

Compliance

- SFP+ MSA.
- SFP+ SFF-8431 and SFF-8432.
- RoHS

Ordering information

Package	Product part NO.	Distance	Temperature Range
SFP+	LPHKAAX$_1$1-M(L)XX$_2$C	0.5~150m	0~70℃
X_1:2—OM2; 3—OM3 LXX_2:0.5~99—L05~L99 MXX_2:100~150—M10~M15 *For availability of additional cable lengths, please contact Oubochao			

I. Pin Diagram

Pin out of Connector Block on Host Board

II. Pin Descriptions

Pin	Symbol	Name/ Description	Ref.
1	V_{EET}	Transmitter Ground (Common with Receiver Ground)	1
2	T_{FAULT}	Transmitter Fault.	2
3	T_{DIS}	Transmitter Disable. Laser output disabled on high or open.	3
4	SDA	2-wire Serial Interface Data Line	4
5	SCL	2-wire Serial Interface Clock Line	4
6	MOD_ABS	Module Absent. Grounded within the module	4
7	RS0	No connection required	
8	LOS	Loss of Signal indication. Logic “0” indicates normal operation.	5
9	RS1	No connection required	
10	V_{EER}	Receiver Ground (Common with Transmitter Ground)	1
11	V_{EER}	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	V_{EER}	Receiver Ground (Common with Transmitter Ground)	1
15	V_{CCR}	Receiver Power Supply	
16	V_{CCT}	Transmitter Power Supply	
17	V_{EET}	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	V_{EET}	Transmitter Ground (Common with Receiver Ground)	1

Notes:

1. Circuit ground is internally isolated from chassis ground.

2. T_{FAULT} is an open collector/drain output, which is pulled up with a 4.7kΩ – 10kΩ resistor on the host board, but is grounded inside the SFP+ cable plug.

3. Laser output disabled on T_{DIS} >2.0V or open, enabled on TDIS <0.8V.

4. Should be pulled up with 4.7kΩ – 10kΩ on host board to a voltage between 2.0V and 3.6V. MOD_ABS pulls line low to indicate module is plugged in.

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

III. Absolute Maximum Ratings

Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Maximum Supply Voltage	Vcc	-0.5		3.6	V	
Storage Temperature	T_S	-40		85	℃	1
Case Operating Temperature	T_{OP}	0		70	℃	
Relative Humidity	RH	0		85	%	2

Notes:

1.Limited by the fiber cable jacket, not the active ends.

2.Non-condensing.

IV. Electrical Characteristics (TOP = 0 to 70 C, VCC = 3.3 ±5% Volts)

Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Supply Voltage	Vcc	3.15		3.45	V	
Supply Current	Icc			300	mA	
Transmitter						
Input differential impedance	Rin		100		Ω	1
Differential data input swing	Vin, pp	200		1000	mV	
Transmit Disable Voltage	V_D	2		Vcc	V	
Transmit Enable Voltage	V_{EN}	Vee		Vee+0.8	V	
Receiver						
Differential data output swing	Vout, pp	200		100	mV	2
LOS Fault	V_{LOS_fault}	2		VccHOST	V	3
LOS Normal	V_{LOS_norm}	Vee		Vee+0.8	V	3
Power Supply Noise Tolerance	V_{CCT}/ V_{CCR}	Per SFF-8431 Rev 4.1			mVpp	4

Notes:

1.Connected directly to TX data input pins.AC coupling from pins into laser driver IC.

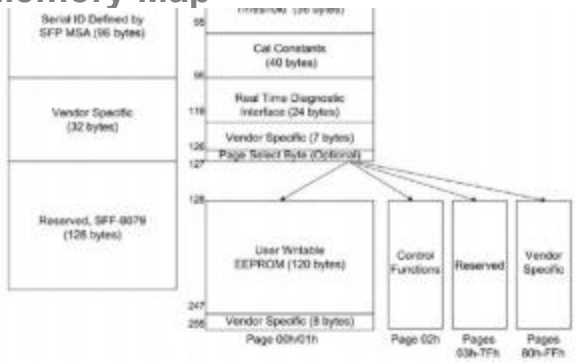
2.Into 100Ω differential termination。

3.20-80%.Measured with Module Compliance Test Board and OMA test pattern. Use of four 1's and four 0's in sequence in the PRBS^9 is an acceptable alternative. SFF-8431 Rev 4.1

4. LOS is an open collector output. Should be pulled up with 4.7kΩ – 10kΩ on the host board. Normal operation is logic 0; loss of signal is logic 1. Maximum pull-up voltage is 5.5V.

5. Testing methodology per SFF-8431. Rev 4.1

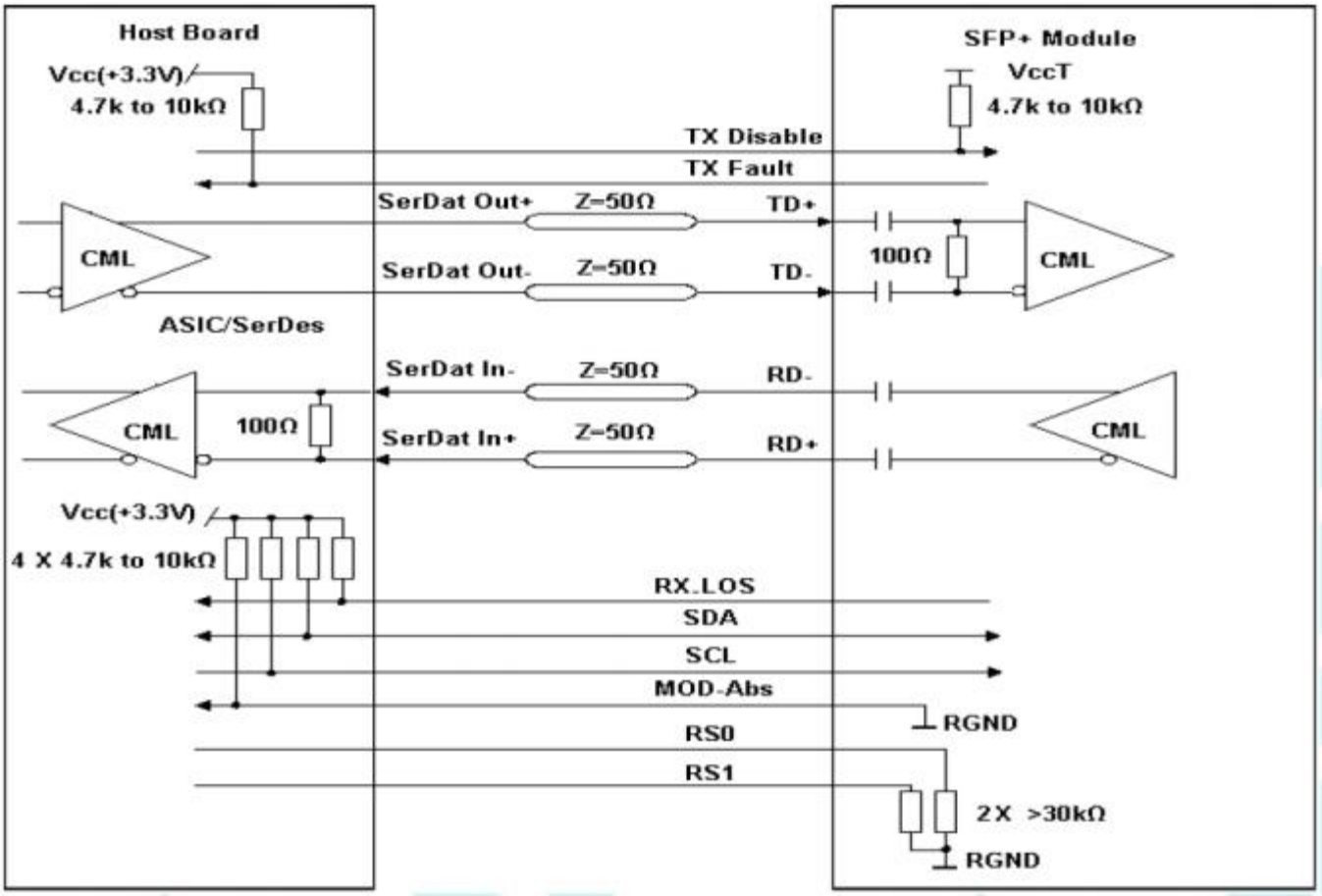
V. Digital Diagnostic Memory Map



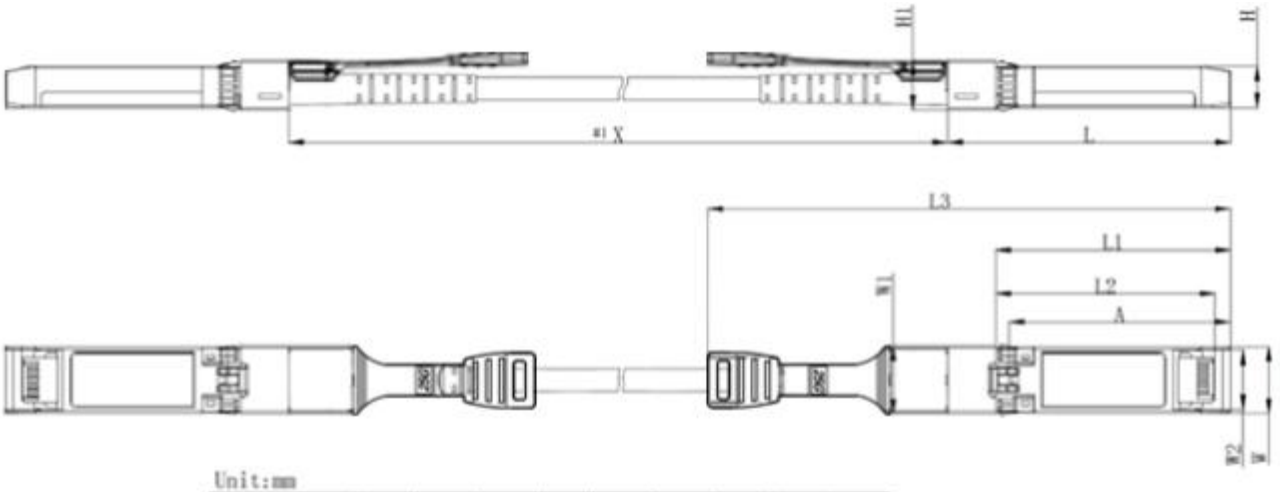
VI. Digital Diagnostic Monitoring Information

Parameter	Unit	Accuracy
Case Temperature	℃	±3
Supply Voltage	V	±3%
Tx Bias Current	mA	±10%
Tx Optical Power	dB	±3
Rx Optical Power	dB	±3

VII. Recommended Interface Circuit



VIII. Mechanical Dimensions



Unit:mm

	L	L1	L2	L3	W	W1	W2	H	H1	A
MAX	57.6	47.7	44.55	92.5	13.8	14.0	12.3	8.7	10.3	45.25
Typical	57.4	47.5	44.35	91.5	13.55	13.8	12.1	8.5	10.1	45
MIN	57.2	47.3	44.15	90.5	13.3	13.6	11.9	8.4	9.9	44.65

SFP wire mechanical drawing(Unit: mm)