REV:A0

LPLNAA31-M(L)xxC

Mini SAS HD 4x Active Optical Cables

PRODUCT FEATURES

- Support SAS 3.0 application
- Compliant to Electrical MSA SFF-8436
- Multi rate of up to 12Gb/s
- +3.3V single power supply
- Low power consumption
- UL certification cables (optional)
- RoHS 6 compliant
- Operating case temp Commercial:0℃ to +70℃

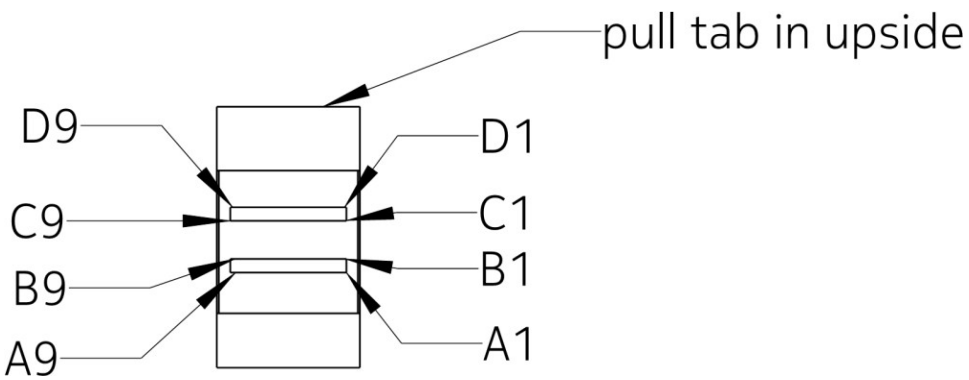
APPLICATIONS

- SAS 3.0 at 12Gb/s per lane
- SAS 2.1 at 6Gb/s per lane
- Other optical links

Ordering information

Bit Rate (Gbps)	Laser (nm)	Product part NO.	Distance	Temperature Range
12	850	LPLNAA31-L03C	0.3-metercable	Commercial:0~70℃
		LPLNAA31-M01C	1-metercable	Commercial:0~70℃
		LPLNAA31-M05C	5-metercable	Commercial: 0~70℃
		LPLNAA31-M10C	10-metercable	Commercial: 0~70℃
		LPLNAA31-M15C	15-metercable	Commercial: 0~70℃
		LPLNAA31-M20C	20-metercable	Commercial: 0~70℃
		LPLNAA31-M25C	25-metercable	Commercial: 0~70℃
		LPLNAA31-M30C	30-metercable	Commercial: 0~70℃
		LPLNAA31-M50C	50-metercable	Commercial: 0~70℃
*For availability of additional cable lengths, please contact Oubochao				

I. Pin arrangement



II. Pin Descriptions

Pin	Symbol	Name/Description	Ref
A1	Reserved	Must be unconnected	
A2	IntL	Interrupt	
A3	GND	Ground	1
A4	RX1p	Receiver Non-Inverted Data Input	
A5	RX1n	Receiver Inverted Data Input	
A6	GND	Ground	1
A7	RX3p	Receiver Non-Inverted Data Input	
A8	RX3n	Receiver Inverted Data Input	
A9	GND	Ground	1
B1	Vact	+3.3V Power Supply	
B2	ModPrsL	Module Present	
B3	GND	Ground	1
B4	RX0p	Receiver Non-Inverted Data Input	
B5	RX0n	Receiver Inverted Data Input	
B6	GND	Ground	1
B7	RX2p	Receiver Non-Inverted Data Input	
B8	RX2n	Receiver Inverted Data Input	
B9	GND	Ground	1
C1	SCL	2-wire serial interface clock	
C2	SDA	2-wire serial interface data	
C3	GND	Ground	1
C4	TX1p	Transmitter Non-Inverted Data Input	
C5	TX1n	Transmitter Inverted Data Input	
C6	GND	Ground	1
C7	TX3p	Transmitter Non-Inverted Data Input	
C8	TX3n	Transmitter Inverted Data Input	
C9	GND	Ground	1
D1	Vact	+3.3V Power Supply	
D2	Vman	Management interface power	
D3	GND	Ground	1
D4	TX0p	Transmitter Non-Inverted Data Input	
D5	TX0n	Transmitter Inverted Data Input	
D6	GND	Ground	1
D7	TX2p	Transmitter Non-Inverted Data Input	
D8	TX2n	Transmitter Inverted Data Input	
D9	GND	Ground	1

III. Absolute Maximum Ratings

Parameter	Symbol	Min	Type	Max	Unit	Ref.
Maximum Supply Voltage	Vcc	-0.5		3.6	V	
Storage Temperature	TS	-10		85	℃	
Operating Humidity	RH	5		85	%	1

Notes:

1.Non-condensing.

IV. Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit	Ref
Operating Case Temperature	T_C	0	-	+70	°C	
Power Supply Voltage	Vcc	3.14	3.3	3.46	V	
Bit Rate	BR	2.5	12.0	14.025	Gbps	

V. Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Units	Ref
Power Dissipation	Pd	-	-	1.5	W	1
Transmit turn-on time	T_{ON}	2000	-	-	ms	
Input Logic Level High	V_{IH}	2.5	-	V_{CC}+0.3	V	
Input Logic Level Low	V_{IL}	0	-	0.8	V	
Output Logic Level High	V_{OH}	2.4	-	V_{CC}	V	
Output Logic Level Low	V_{OL}	0	-	0.4	V	
Transmitter						
Differential Data Input Swing	$V_{in,P-P}$	200	-	1200	mV_{PP}	
Input Differential Impedance	Z_{IN}	90	100	110	Ω	
Average Launch power Tx_off	P_{OFF}	dBm	-	-	-30	
Receiver						
Differential Date Output	V_{out}	200	-	1100	mV	
Output Differential Impedance	Z_D	90	100	110	Ω	
Bit Error Ratio	BER	-	-	10^-12	-	2

Note:

1 Per terminal

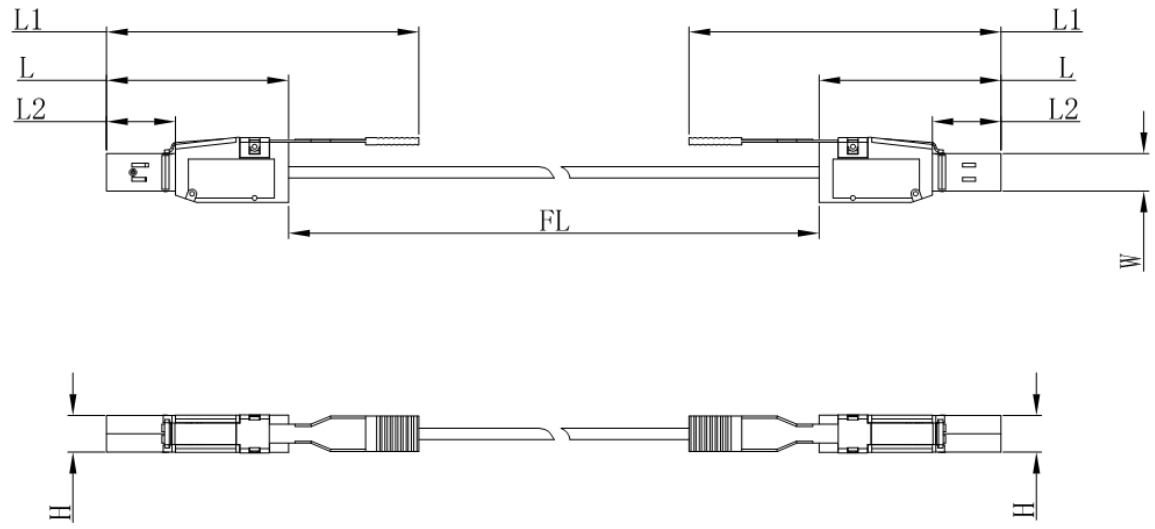
2 PRBS2^31-1@12.0Gbps

VI. Monitoring Specification

2-Wire Serial Address 1010000x
Lower Page 00h
0 Identifier
1- 2 Status
3- 21 Interrupt Flags
22- 33 Free Side Device Monitors
34- 81 Channel Monitors
82- 85 Reserved
86- 98 Control
99 Reserved
100-104 Hardware Interrupt Pin Masks
105-106 Vendor Specific
107 Reserved
108-110 Free Side Device Properties
111-112 Assigned for use by PCI Express
113 Free Side Device Properties
114-118 Reserved
119-122 Password Change Entry Area (Optional)
123-126 Password Entry Area (Optional)
127 Page Select Byte

Upper Page 00h	Optional Page 01h	Optional Page 02h	Optional Page 03h
128 Identifier	128 CC_APPS	128-255 User EEPROM Data	128-175 Free Side Device Thresholds
129-191 Base ID Fields	129 AST Table Length (TL)		
	130-131 Application Code Entry 0		
	132-133 Application Code Entry 1		
	134-253 other entries		176-223 Channel Thresholds
192-223 Extended ID			224 Tx EQ & Rx Emphasis Magnitude ID
224-255 Vendor Specific ID			225 RX output amplitude indicators
			226-241 Channel Controls
			242-251 Channel Monitor Masks
	254-255 Application Code Entry TL		252-255 Reserved

VII. Mechanical Dimensions



Unit: mm

Unit: mm

	L	L1	L2	W	H
MAX	51.8	—	—	10.70	10.50
TYPE	—	88.3	19.5	—	—
MIN	51.2	—	—	10.50	10.30

Cable Length

Fiber Cable Length （Unit: m）	Tolerant （Unit: cm）
＜1.0	+5/-0
1.0~4.5	+15/-0
5.0~14.5	+30/-0
≥15.0	+2%/-0

Appendix A. Document Revision

Version	Initiated	Reviewed	Revision	Release Date
A0	Tomas	Luke	New Release	2019-7-31