

LPLNAA34-M(L)xxC

Mini SAS HD to QSFP+ 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°C to +70°C



APPLICATIONS

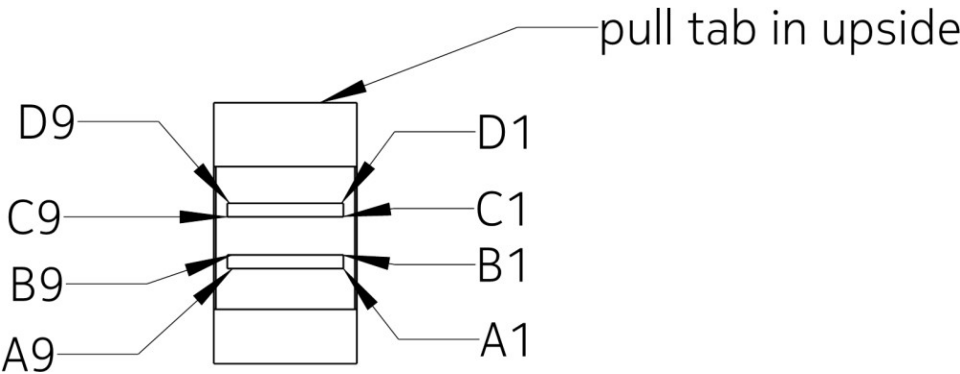
- SAS 3.0 at 12Gb/s per lane
- SAS 2.1 at 6Gb/s per lane
- Other optical links

Ordering information

Bit Rate (Gbps)	Laser (nm)	Product part NO.	Distance	Temperature Range
12	850	LPLNAA34-L03C	0.3-metercable	Commercial:0~70℃
		LPLNAA34-M01C	1-metercable	Commercial:0~70℃
		LPLNAA34-M05C	5-metercable	Commercial: 0~70℃
		LPLNAA34-M10C	10-metercable	Commercial: 0~70℃
		LPLNAA34-M15C	15-metercable	Commercial: 0~70℃
		LPLNAA34-M20C	20-metercable	Commercial: 0~70℃
		LPLNAA34-M25C	25-metercable	Commercial: 0~70℃
		LPLNAA34-M30C	30-metercable	Commercial: 0~70℃
		LPLNAA34-M50C	50-metercable	Commercial: 0~70℃

*For availability of additional cable lengths, please contact Oubochao.

I. Pin arrangement



II. Pin Descriptions

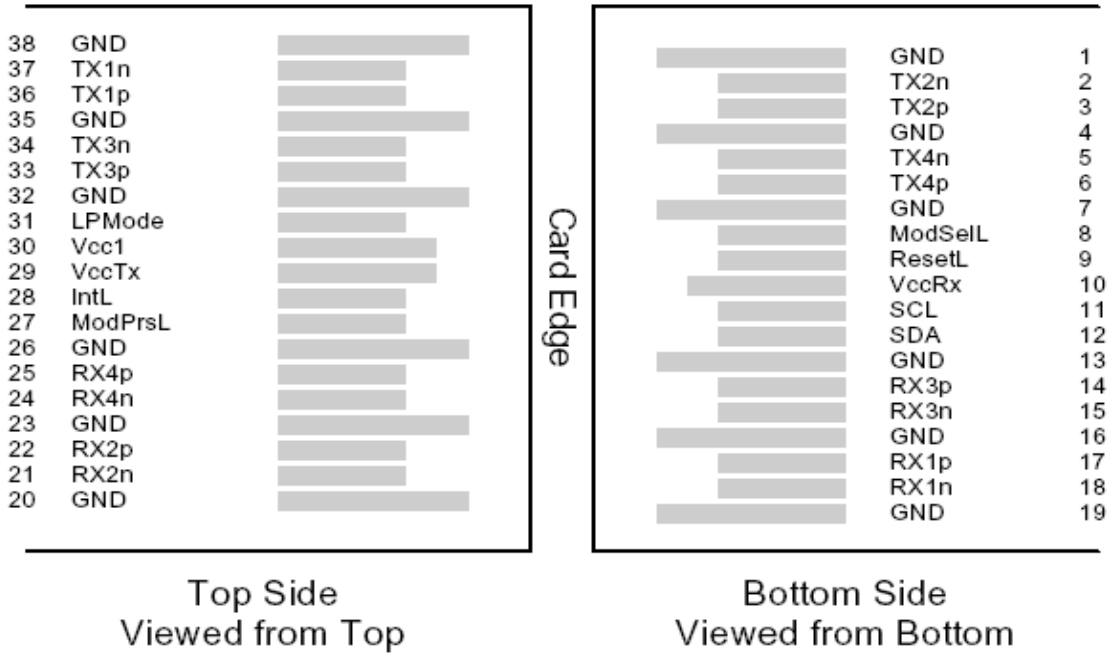
Mini-SAS HD Pin Function Definitions

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

Notes:

- 1. Circuit ground is internally isolated from chassis ground.

QSFP+ termina



QSFP MSA-compliant 38-pinconnector

Pin	Symbol	Name/Description	Notes
1	GND	Ground	1
2	Tx2n	Transmitter Inverted Data Input	
3	Tx2p	Transmitter Non-Inverted Data Input	
4	GND	Ground	1
5	Tx4n	Transmitter Inverted Data Input	
6	Tx4p	Transmitter Non-Inverted Data Input	
7	GND	Ground	1
8	ModSelL	Module Select	
9	ResetL	Module Reset	
10	VccRx	+3.3 V Power supply receiver	
11	SCL	2-wire serial interface clock	
12	SDA	2-wire serial interface data	
13	GND	Ground	1
14	Rx3p	Receiver Non-Inverted Data Output	
15	Rx3n	Receiver Inverted Data Output	
16	GND	Ground	1
17	Rx1p	Receiver Non-Inverted Data Output	
18	Rx1n	Receiver Inverted Data Output	
19	GND	Ground	1

20	GND	Ground	1
21	Rx2n	Receiver Inverted Data Output	
22	Rx2p	Receiver Non-Inverted Data Output	
23	GND	Ground	1
24	Rx4n	Receiver Inverted Data Output	
25	Rx4p	Receiver Non-Inverted Data Output	
26	GND	Ground	1
27	ModPrsL	Module Present	
28	IntL	Interrupt	
29	VccTx	+3.3 V Power supply transmitter	
30	Vcc1	+3.3 V Power Supply	
31	LPMode	Low Power Mode	
32	GND	Ground	1
33	Tx3p	Transmitter Non-Inverted Data Input	
34	Tx3n	Transmitter Inverted Data Input	
35	GND	Ground	1
36	Tx1p	Transmitter Non-Inverted Data Input	
37	Tx1n	Transmitter Inverted Data Input	
38	GND	Ground	1

Notes:

- 1.Circuit ground is internally isolated from chassis ground.

III. Absolute Maximum Ratings

Parameter	Symbol	Min	Type	Max	Unit	Ref.
Maximum Supply Voltage	Vcc	-0.5		3.6	V	
Storage Temperature	TS	-5		75	°C	
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		Gbps	Per lane

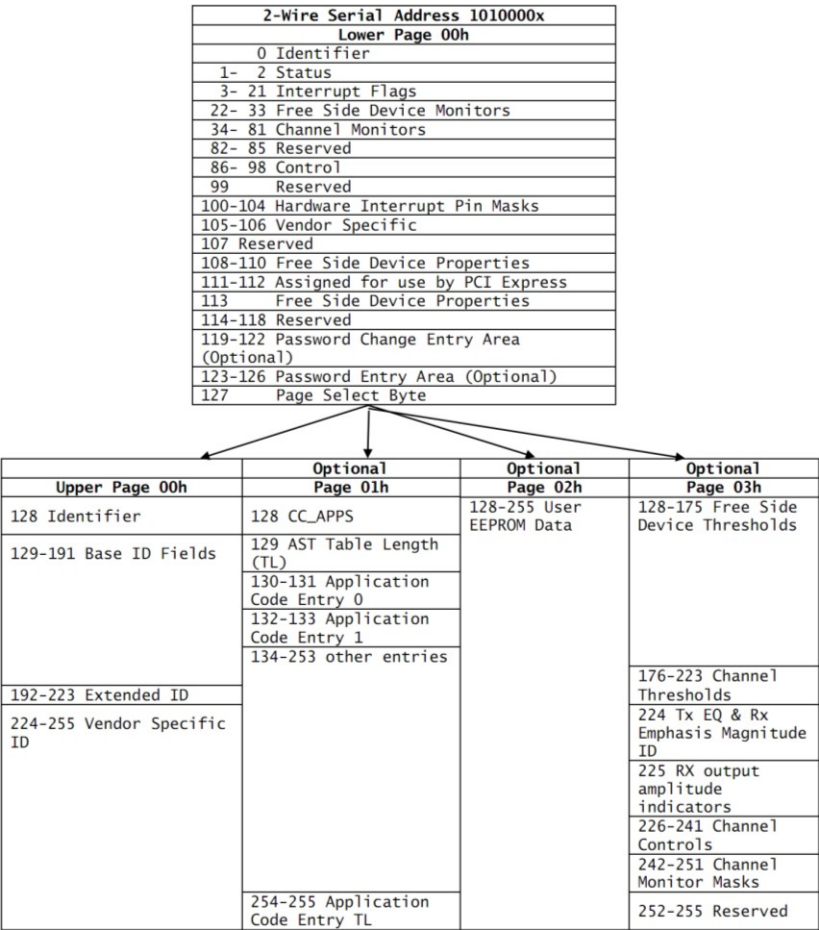
V. Characteristics

Parameter		Symbol	Min.	Typ.	Max.	Units	Ref
Power Dissipation per QSFP+		Pd	-	-	1.5	W	
Power Dissipation per MiniSAS		Pd	-	-	1.5	W	
Transmitter							
Differential Data Input Swing		$V_{in,P-P}$	200	-	1200	mV _{pp}	
Input Differential Impedance		Z_{IN}	90	100	110	Ω	
ModSelL	Module Select	V_{OL}	$V_{CC}-0.3$		0.4	V	
	Module Unselect	V_{OH}	2.0		$V_{CC}+0.3$	V	
LpMode	Low Power Mode	V_{IL}	$V_{CC}-0.3$		0.8	V	
	Normal Operation	V_{IH}	2.0		$V_{CC}+0.3$	V	
ResetI	Reset	V_{IL}	$V_{CC}-0.3$		0.8	V	
	Normal Operation	V_{IH}	2.0		$V_{CC}+0.3$	V	
Receiver							
Differential Date Output		V_{out}	200	-	1100	mV	
Output Differential Impedance		Z_D	90	100	110	Ω	
ModPrsI	Normal Operation	V_{OL}	$V_{CC}-0.3$		0.4	V	
Intl	Interrupt	V_{OL}	$V_{CC}-0.3$		0.4	V	
	Normal Operation	V_{OH}	2.0		$V_{CC}+0.3$	V	
Bit Error Ratio		BER	-	-	10^{-12}	-	1

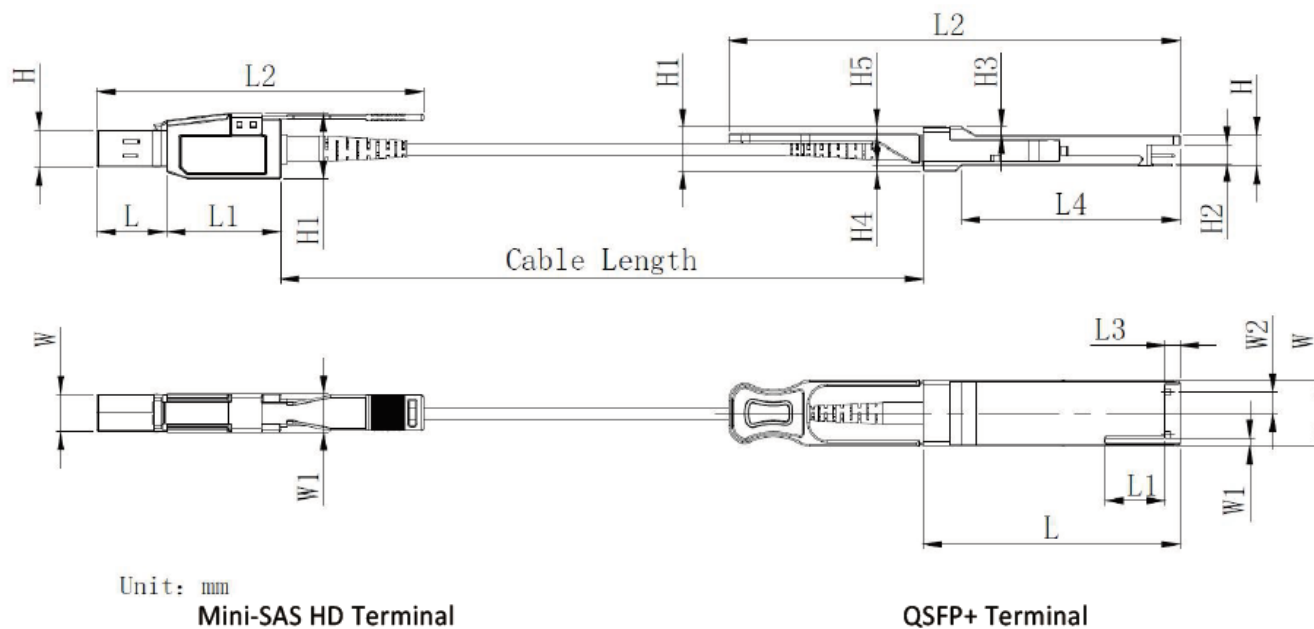
Note:

1. PRBS2³¹-1@12.0Gbps

VI. Monitoring Specification



VII. Mechanical Dimensions



Mini-SAS HD	L	L1	L2	W	W1	H	H1
MAX	19.66	32.0	91.91	10.60	10.85	10.60	20.3
TYPE	19.56	31.9	91.41	10.45	10.7	10.45	
MIN	19.46	31.8	90.91	10.55	10.55	10.30	

Unit: mm

QSFP+	L	L1	L2	L3	L4	W	W1	W2	H	H1	H2	H3	H4	H5
MAX	72.2	—	128	4.35	61.4	18.45	—	6.2	8.6	12.4	5.35	2.5	1.6	2.0
TYPE	72.0	—	—	4.20	61.2	18.35	—	—	8.5	12.2	5.2	2.3	1.5	1.8
MIN	68.8	16.5	124	4.05	61.0	18.25	2.2	5.8	8.4	12.0	5.05	2.1	1.3	1.6

Unit: mm

Cable Length

Parameter	Value	Units
Diameter	3	mm
Minimum bend radius	30	mm
Length tolerance	Length < 1m:	cm
	1 m ≤ Length ≤ 4.5 m:	cm
	5 m ≤ Length ≤ 14.5 m	cm
	Length ≥ 15.0m	m
Cable color	Orange (OM2) ,Aqua (OM3) ,Megenta (OM4)	

Appendix A. Document Revision

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