REV:A0

LPBQAA34-M(L)xxC

QSFP28 100Gb/s Parallel Breakout Active Optical Cable DDM

PRODUCT FEATURES

- Multi rate of up to 25.78125 Gb/s per channel
- Four-channel full-duplex active optical cable with breakout from QSFP28 to four SFP28
- Complies with QSFP28 and SFP28 MSA form factors
- Hot-pluggable
- +3.3V Single power supply
- Low power consumption
- RoHS-6 Compliant
- Case operating temperature Commercial: 0°C to +70°C

APPLICATIONS

- 4x25.78125G Ethernet

Compliance

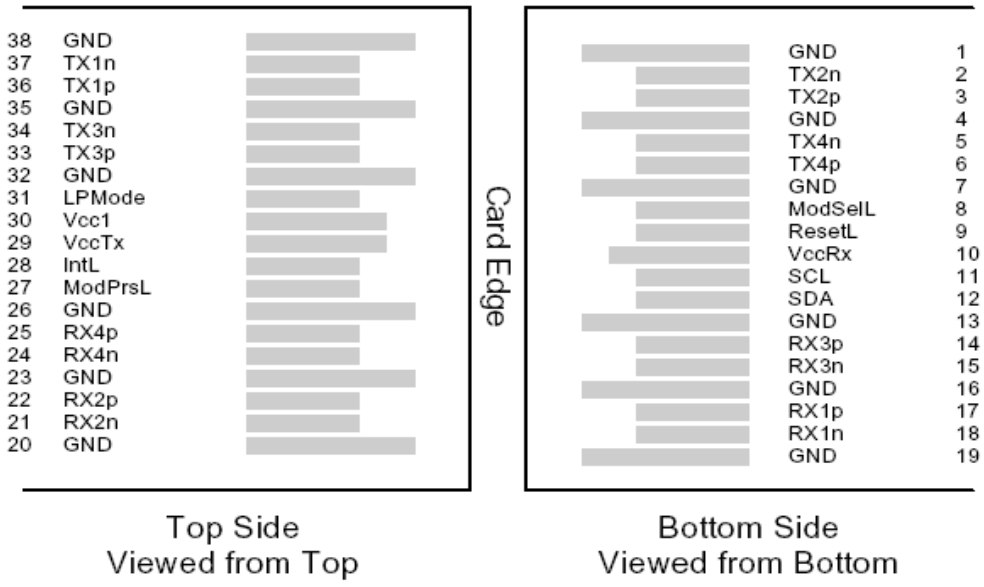
- SFF-8636
- SFF-8431
- QSFP28 and SFP28 MSA
- RoHS

Ordering information

Package	Product part NO.	Distance	Temperature
QSFP28 to 4xSFP28	LPBQAA34-M01C	1-metercable	Commercial: 0~70℃
QSFP28 to 4xSFP28	LPBQAA34-M01C	3-metercable	Commercial: 0~70℃
QSFP28 to 4xSFP28	LPBQAA34-M05C	5-metercable	Commercial: 0~70℃
QSFP28 to 4xSFP28	LPBQAA34-M06C	6-metercable	Commercial: 0~70℃
QSFP28 to 4xSFP28	LPBQAA34-M10C	10-metercable	Commercial: 0~70℃
QSFP28 to 4xSFP28	LPBQAA34-M15C	15-metercable	Commercial: 0~70℃
QSFP28 to 4xSFP28	LPBQAA34-M20C	20-metercable	Commercial: 0~70℃
QSFP28 to 4xSFP28	LPBQAA34-M25C	25-metercable	Commercial: 0~70℃
QSFP28 to 4xSFP28	LPBQAA34-M30C	30-metercable	Commercial: 0~70℃
QSFP28 to 4xSFP28	LPBQAA34-M50C	50-metercable	Commercial: 0~70℃
***For availability of additional cable lengths, please contact Oubochao.**			

I. Pin Descriptions

QSFP28 end



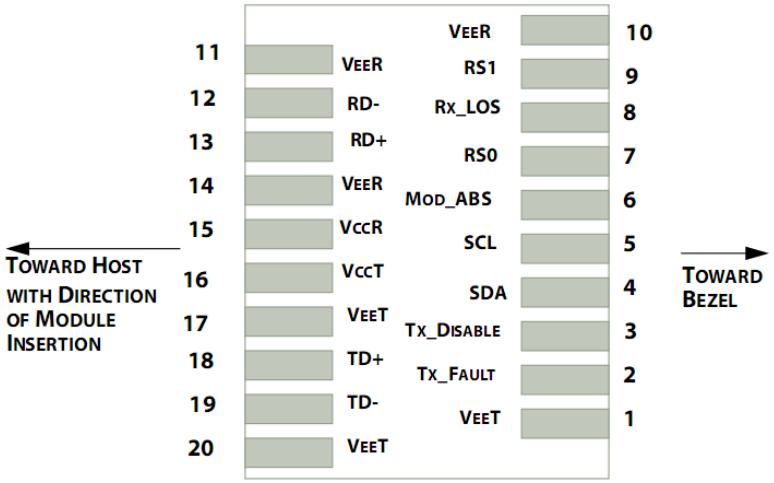
QSFP MSA-compliant 38-pinconnector

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.

SFP28 end



Pin out of Connector Block on Host Board

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. TX Fault is an open drain output, which should be pulled up with 4.7K – 10KΩ resistor on the host board. Pull up voltage between 2.0V to VccT/R+0.3V. When high, output indicates a laser fault of

some kind. Low indicates normal operation. In the low state, the output will be pulled to < 0.8V. When sensing an improper power level in the laser driver, the SFP sets this signal high and turns off the laser. TX-FAULT can be reset with the TX-DISABLE line. The signal is in LVTTL level.

3. TX disable is an input that is used to shut down the transmitter optical output. It is pulled up within the module with 4.7K – 10KΩ resistor. Its states are: Low (0 – 0.8V): Transmitter on; (>0.8, < 2.0V): Undefined; High (2.0V to VccT/R+0.3V): Transmitter Disabled; Open: Transmitter Disabled. The TX-DISABLE signal is high (LVTTL logic “1”) to turn off the laser output. The laser will turn on when TX-DISABLE is low (LVTTL logic “0”).
4. Should be pulled up with 4.7K - 10KΩ on host board to a voltage between 2.0V to VccT/R+0.3V. MOD_ ABS pulls line low to indicate module is plugged in.
5. LOS (Loss of Signal) is an open collector/drain output, which should be pulled up with 4.7K – 10KΩ resistor. Pull up voltage between 2.0V to VccT/R+0.3V. When high, this output indicates the received optical power is below the worst-case receiver sensitivity (as defined by the standard in use). Low indicates normal operation. In the low state, the output will be pulled to < 0.8V.

The RX-LOS is high (LVTTL logic “1”) when there is no incoming light from the companion transceiver. This signal is normally used by the system for the diagnostic purpose. The signal is operated in LVTTL level.

II. Absolute Maximum Ratings

Parameter	Symbol	Min.	Type	Max.	Unit	Ref.
Maximum Supply Voltage	Vcc1,VccT,VccRx	-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.

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

Electrical Characteristics For QSFP28

Parameter	Symbol	Min.	Typ.	Max.	Unit	Ref.
Supply Voltage	$V_{CC}1$, $V_{CC}T_X$, $V_{CC}R_X$	3.15		3.45	V	
Supply Current	I_{CC}			750	mA	
Transmitter(per Lane)						
Input different impedance	R_{in}	90	100	110	Ω	
Single ended input voltage tolerance	VinT	-0.3		4.0	V	
Single ended data input swing	$V_{in,pp}$	200		1000	mV	
Receiver (per Lane)						
Output different impedance	R_{out}	90	100	110	Ω	
Single ended data output swing	$V_{out,pp}$	200		1000	mV	
Single-ended output voltage	VoutR	-0.3		4.0	V	

Electrical Characteristics For SFP28

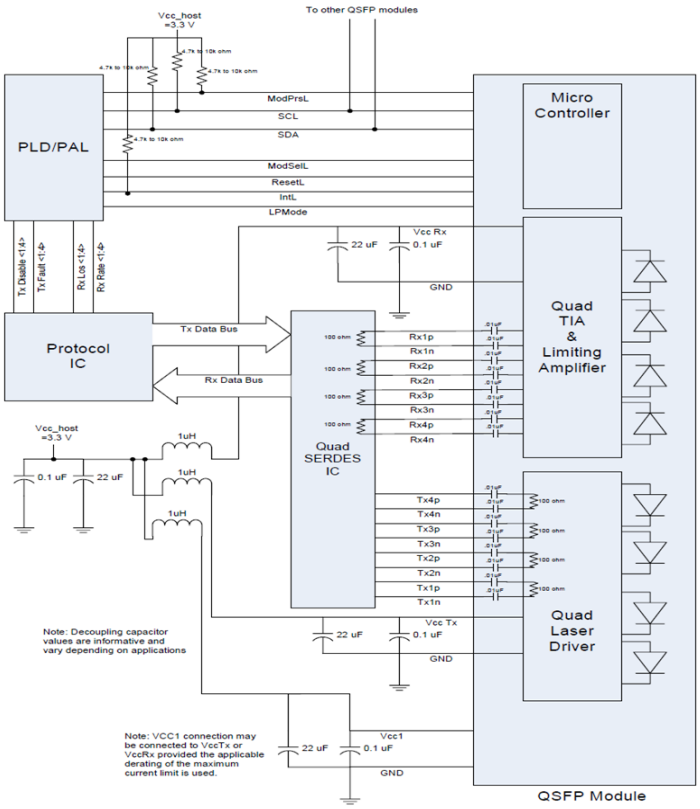
Parameter	Symbol	Min.	Typ.	Max.	Unit	Ref.
Supply Voltage	$V_{CC}1$, $V_{CC}T_X$, $V_{CC}R_X$	3.15		3.45	V	
Supply Current	I_{CC}			350	mA	
Transmitter(per Lane)						
Input different impedance	R_{in}	90	100	110	Ω	
Single ended input voltage tolerance	VinT	-0.3		4.0	V	
Single ended data input swing	$V_{in,pp}$	200		1000	mV	
Receiver (per Lane)						
Output different impedance	R_{out}	90	100	110	Ω	
Single ended data output swing	$V_{out,pp}$	200		1000	mV	
Single-ended output voltage	VoutR	-0.3		4.0	V	

IV. Memory Map and Control Registers

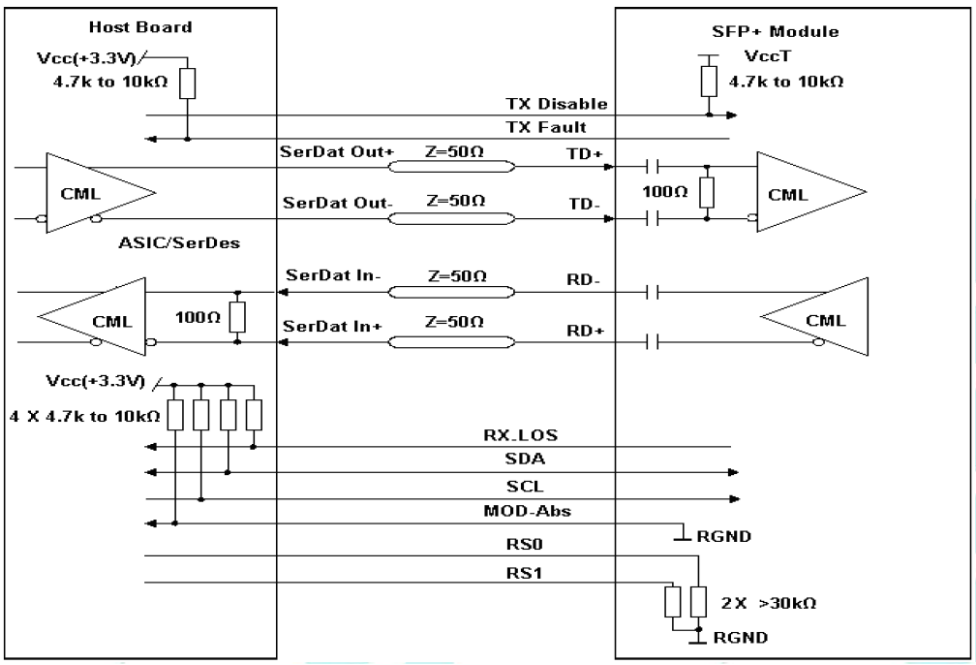
Compatible with SFF-8636 and SFF-8472.

V. Recommended Interface Circuit

QSFP28

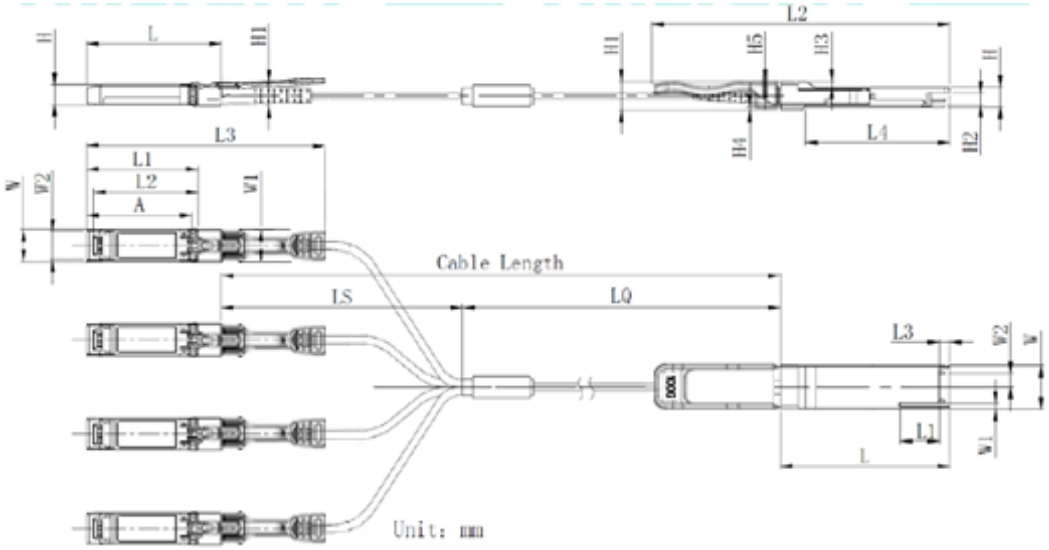


SFP28



VI. Mechanical Specifications

The Quadwire mechanical specifications are based on QSFP28 and SFP8 transceiver module specifications, substituting the optical connectors with a cable connecting both ends.



Unit mm

QSFP+	L	L1	L2	L3	L4	W	W1	W2	H	H1	H2	H3	H4	H5
Max	72.2	-	-	4.35	61.4	18.45	-	6.2	8.6	12.4	5.35	2.5	1.6	2
Type	72	-	121	4.2	61.2	18.35	-	-	8.5	12.2	5.2	2.3	1.5	1.8
Min	68.8	16.5	-	4.05	61	18.25	2.2	5.8	8.4	12	5.05	2.1	1.3	1.6

SFP+	L	L1	L2	L3	W	W1	W2	H	H1	A
Max	57.6	47.7	44.55	92.5	13.8	14	12.3	8.7	10.3	45.25
Type	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

Cable Length

Parameter	Value	Units
Diameter	3	mm
Minimum bend radius	30	mm
Length tolerance	Length<1m: +5/-0	cm
	1≤Length≤4.5m: +15/-0	cm
	5≤Length≤14.5m: +30/-0	cm
	Length≥15.0m： +2/-0	m
Cable color	Orange(OM2),Aqua(OM3),Magenta(OM4)	

Breakout Cable Nominal Length

Total Length X (Unit:mm)	Breakout Point Measured From QSFP LQ(Unit:m)	Breakout Piont Measured from SFP LS(Unit:m)
1	0.3	0.7
2	0.6	1.4
3	1	2
5	2	3
7	4	3
10	7	3
15	12	3
20	17	3
25	22	3
30	27	3
40	37	3
50	47	3

Appendix A. Document Revision

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