

LPWSAA3(4)4-MxxC

400G QSFP-DD to 4x 100G QSFP56 Active Optical Cable

Product Features

- 400Gb/s to 4x100Gb/s data rate
- 400GAUI-8 Electrical interface aligned with IEEE 802.3bs
- Single 3.3V power supply
- Max 2.5W power dissipation each QSFP56 end
- Max 10W power dissipation QSFP-DD end
- Case operating temperature: 0°C to +70°C
- Hot-pluggable QSFP-DD / QSFP56 footprint
- RoHS compliant

Applications

- 400GAUI-8
- Other 400G optical links

Ordering information

Part No. ^{Note1}	BitRate (Gbps)	Packag form of two opposite sides	Total Cable lengths	Fiber Type	Temp ^{Note2}
LPWSAA32-M ₁ XX ₂ C	400G to 4*100G	QSFP-DD to 4 x QSFP56	60 m	OM3 MMF	0°C~+70°C
LPWSAA42-M ₁ XX ₂ C			100 m	OM4 MMF	
note1 : The "M1XX2" means : ①"XX"= 01~99 ② MXX = XX*1meter; SXX = XX*10meter ; LXX = XX*0.1meter					
note2: For module case temperature					

I. Absolute Maximum Ratings

Parameter	Symbol	Min.	Typical	Max.	Unit	Ref.
Supply Voltage	V _{CC3}	-0.5	-	+3.6	V	
Storage Temperature	T _s	-10	-	+75	°C	
Operating Humidity	RH	+5	-	+85	%	No condensation

II. Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit	Ref.
Operating Case Temperature	T _C	0	-	+70	°C	
Power Supply Voltage	V _{CC}	3.14	3.3	3.47	V	
Baud Rate (per channel)	BR		26.5625		GBd	PAM4
Power dissipation	Pd _{400G}	-	-	10	W	400G QSFPDD end
Power dissipation	Pd _{200G}	-	-	2.5	W	each QSFP56 end

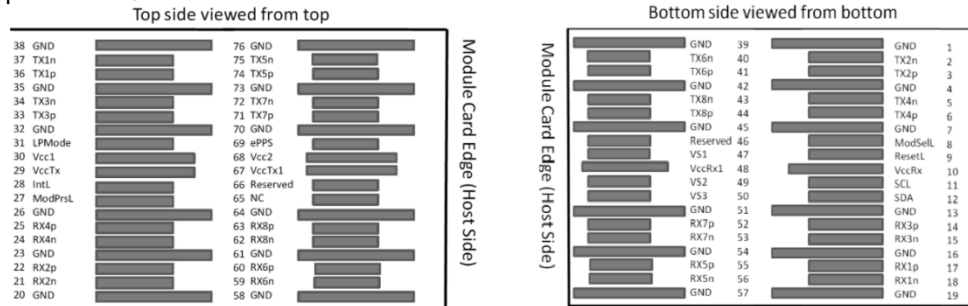
III. Electrical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Transmitter						
Signaling rate (each lane)	R _S	26.5625 ± 100 ppm			GBd	
Differential data input voltage per lane	V _{in,pp,diff}	-	-	900	mV	
Differential termination mismatch	-	-	-	10	%	
Single-ended voltage tolerance range	-	-0.4	-	3.3	V	
DC common mode voltage	-	-350	-	2850	mV	
Receiver						
Signaling rate (each lane)	R _S	26.5625 ± 100 ppm			GBd	
Differential output voltage	-	-	-	900	mV	
Differential termination mismatch	-	-	-	10	%	
Transition time (min, 20% to 80%)	-	9.5	-	-	ps	
DC common mode voltage	-	-350	-	2850	mV	
Error Bit Rate	BER	-	-	2.4E-4		1

Note: 1 PRBS31Q@26.5625Gbd PAM4

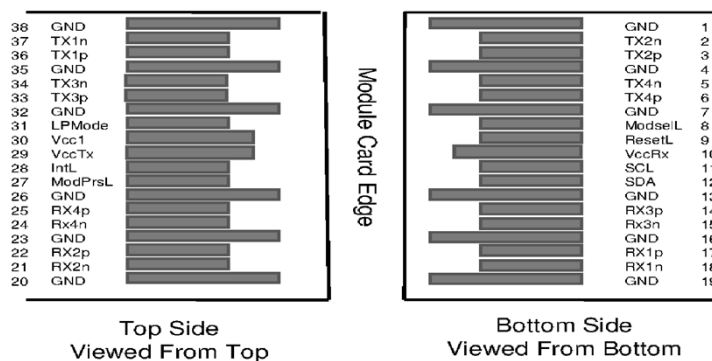
IV. Pin Diagram

Pin Descriptions for QSFP-DD end:



Pin NO.	Logic	Symbol	Definition	PinNO.	Logic	Symbol	Definition
1		GND	Ground	39		GND	Ground
2	CML-I	Tx2n	Transmitter Inverted Data Input	40	CML-I	Tx6n	Transmitter Inverted Data Input
3	CML-I	Tx2p	Transmitter Non-inverted Data Input	41	CML-I	Tx6p	Transmitter Non-inverted Data Input
4		GND	Ground	42		GND	Ground
5	CML-I	Tx4n	Transmitter Inverted Data Input	43	CML-I	Tx8n	Transmitter Inverted Data Input
6	CML-I	Tx4p	Transmitter Non-inverted Data Input	44	CML-I	Tx8p	Transmitter Non-inverted Data Input
7		GND	Ground	45		GND	Ground
8	LVTTL-I	ModSelL	Module Select	46		Reserved	
9	LVTTL-I	ResetL	Module Reset	47		VS1	Module Vendor Specific 1
10		VccRx	+3.3 V Power Supply Receiver	48		VccRx1	3.3 V Power Supply
11	LVC MOS-I/O	SCL	2-wire serial interface clock	49		VS2	Module Vendor Specific 2
12	LVC MOS-I/O	SDA	2-wire serial interface data	50		VS3	Module Vendor Specific 3
13		GND	Ground	51		GND	Ground
14	CML-O	Rx3p	Receiver Non-inverted Data Output	52	CML-O	Rx7p	Receiver Non-inverted Data Output
15	CML-O	Rx3n	Receiver Inverted Data Output	53	CML-O	Rx7n	Receiver Inverted Data Output
16		GND	Ground	54		GND	Ground
17	CML-O	Rx1p	Receiver Non-inverted Data Output	55	CML-O	Rx5p	Receiver Non-inverted Data Output
18	CML-O	Rx1n	Receiver Inverted Data Output	56	CML-O	Rx5n	Receiver Inverted Data Output
19		GND	Ground	57		GND	Ground
20		GND	Ground	58		GND	Ground
21	CML-O	Rx2n	Receiver Inverted Data Output	59	CML-O	Rx6n	Receiver Inverted Data Output
22	CML-O	Rx2p	Receiver Non-inverted Data Output	60	CML-O	Rx6p	Receiver Non-inverted Data Output
23		GND	Ground	61		GND	Ground
24	CML-O	Rx4n	Receiver Inverted Data Output	62	CML-O	Rx8n	Receiver Inverted Data Output
25	CML-O	Rx4p	Receiver Non-inverted Data Output	63	CML-O	Rx8p	Receiver Non-inverted Data Output
26		GND	Ground	64		GND	Ground
27	LVTTL-O	ModPrsL	Module Present	65		NC	Not connected
28	LVTTL-O	IntL	Interrupt	66		Reserved	
29		VccTx	+3.3V Power Supply Transmitter	67		VccTx1	3.3 V Power Supply
30		Vcc1	+3.3 V Power Supply	68		Vcc2	3.3 V Power Supply
31	LVTTL-I	InitMode	Initialization mode	69		Reserved	
32		GND	Ground	70		GND	Ground
33	CML-I	Tx3p	Transmitter Non-inverted Data Input	71	CML-I	Tx7p	Transmitter Non-inverted Data Input
34	CML-I	Tx3n	Transmitter Inverted Data Input	72	CML-I	Tx7n	Transmitter Inverted Data Input
35		GND	Ground	73		GND	Ground
36	CML-I	Tx1p	Transmitter Non-inverted Data Input	74	CML-I	Tx5p	Transmitter Non-inverted Data Input
37	CML-I	Tx1n	Transmitter Inverted Data Input	75	CML-I	Tx5n	Transmitter Inverted Data Input
38		GND	Ground	76		GND	Ground

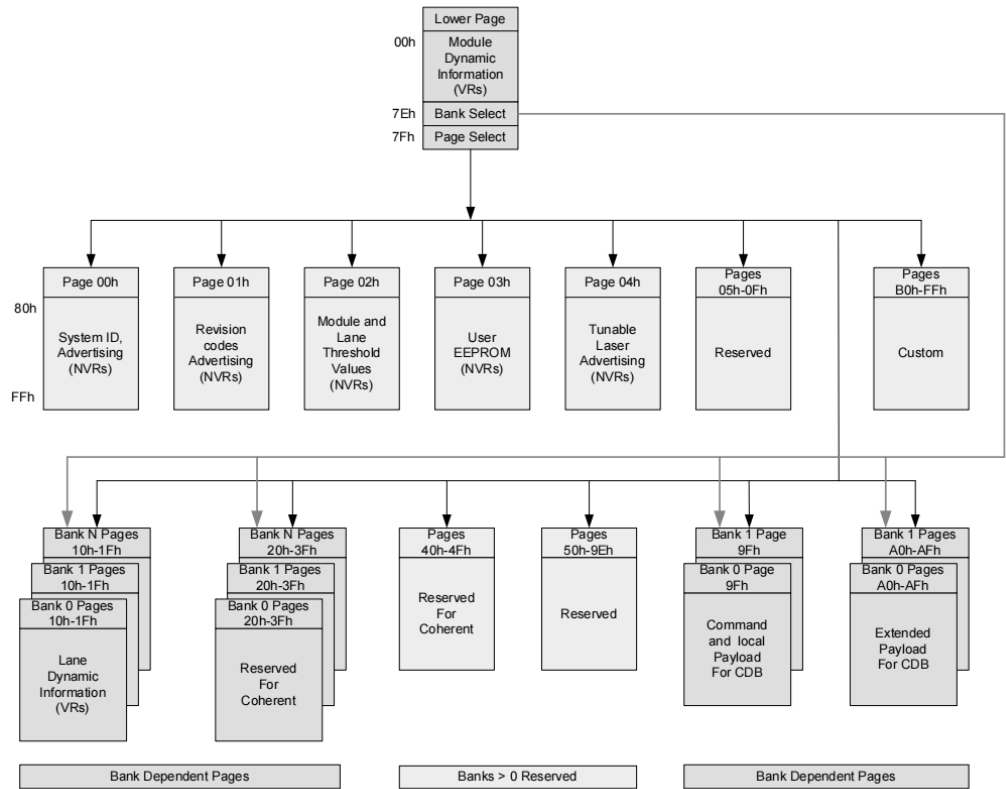
Pin Descriptions for QSFP56 end :



Pin NO.	Symbol	Definition	PinNO.	Symbol	Definition
1	GND	Ground	20	GND	Ground
2	Tx2n	Transmitter Inverted Data Input	21	Rx2n	Receiver Inverted Data Output
3	Tx2p	Transmitter Non-Inverted Data Input	22	Rx2p	Receiver Non-Inverted Data Output
4	GND	Ground	23	GND	Ground
5	Tx4n	Transmitter Inverted Data Input	24	Rx4n	Receiver Inverted Data Output
6	Tx4p	Transmitter Non-Inverted Data Input	25	Rx4p	Receiver Non-Inverted Data Output
7	GND	Ground	26	GND	Ground
8	ModSelL	Module Select	27	ModPrsL	Module Present
9	ResetL	Module Reset	28	IntL	Interrupt
10	Vcc Rx	+3.3V Power Supply Receiver	29	Vcc Tx	+3.3V Power supply transmitter
11	SCL	2-wire serial interface clock	30	Vcc1	+3.3V Power supply
12	SDA	2-wire serial interface data	31	LPMode	Low Power Mode
13	GND	Ground	32	GND	Ground
14	Rx3p	Receiver Non-Inverted Data Output	33	Tx3p	Transmitter Non-Inverted Data Input
15	Rx3n	Receiver Inverted Data Output	34	Tx3n	Transmitter Inverted Data Input
16	GND	Ground	35	GND	Ground
17	Rx1p	Receiver Non-Inverted Data Output	36	Tx1p	Transmitter Non-Inverted Data Input
18	Rx1n	Receiver Inverted Data Output	37	Tx1n	Transmitter Inverted Data Input
19	GND	Ground	38	GND	Ground

V. Digital Diagnostic Functions

400G QSFP-DD end and 200G QSFP56 end all Compatible with CMIS rev 4.0 and upper.



200G QSFP56 end could change to Compatible with SFF-8636 , by ording.

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 224 Tx EQ & Rx Emphasis Magnitude ID 225 RX output amplitude indicators 226-241 Channel Controls 242-251 Channel Monitor Masks 252-255 Reserved
192-223 Extended ID			
224-255 Vendor Specific ID	254-255 Application Code Entry TL		

VI. Digital Diagnostic Specification

Parameter	Accuracy	Unit
Internally Measured Transceiver Temperature	+/-3	°C
Internally Measured Transceiver Supply Voltage	+/-3	%
Measured Tx Bias Current	+/-10	%
Measured Tx Output Power	+/-3	dB
Measured Rx Received Average Optical Power	+/-3	dB

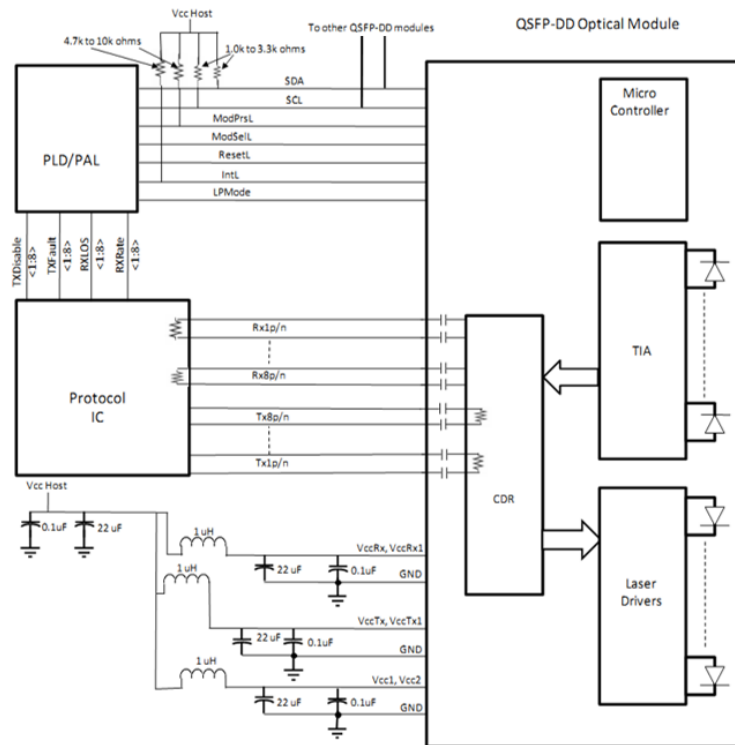
VII. Branch out Connectivity Schematic

QSFP-DD to QSFP56 Branch out Connectivity Schematic:

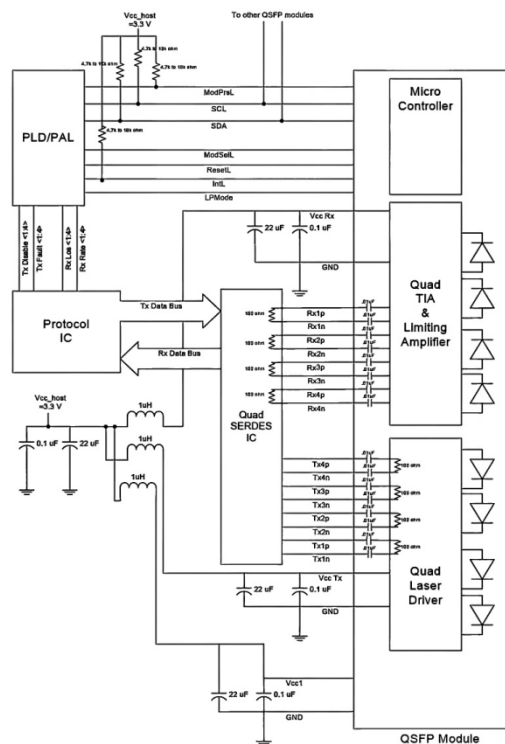
400Gb/s Side		100Gb/s Side	
400Gb/s Side	TX1	RX1	100Gb/s Side Port 1
	TX2	RX2	
	RX1	TX1	
	RX2	TX2	
	TX3	RX1	100Gb/s Side Port 2
	TX4	RX2	
	RX3	TX1	
	RX4	TX2	
	TX5	RX1	100Gb/s Side Port 3
	TX6	RX2	
	RX5	TX1	
	RX6	TX2	
	TX7	RX1	100Gb/s Side Port 4
	TX8	RX2	
	RX7	TX1	
	RX8	TX2	

VIII. Recommended Interface Circuit

QSFP-DD to Host side :

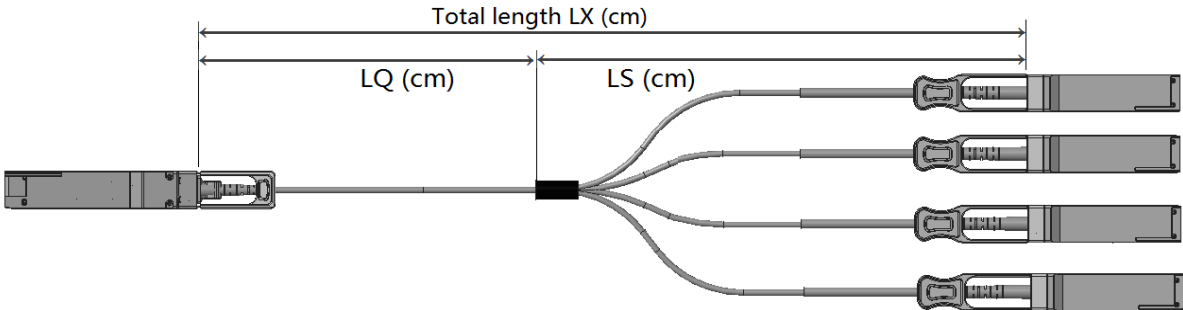


QSFP56 to Host side :



IX. Mechanical Specifications

Recommended trunk Length and branch out Length:
(The length of trunk and branch can be customized)

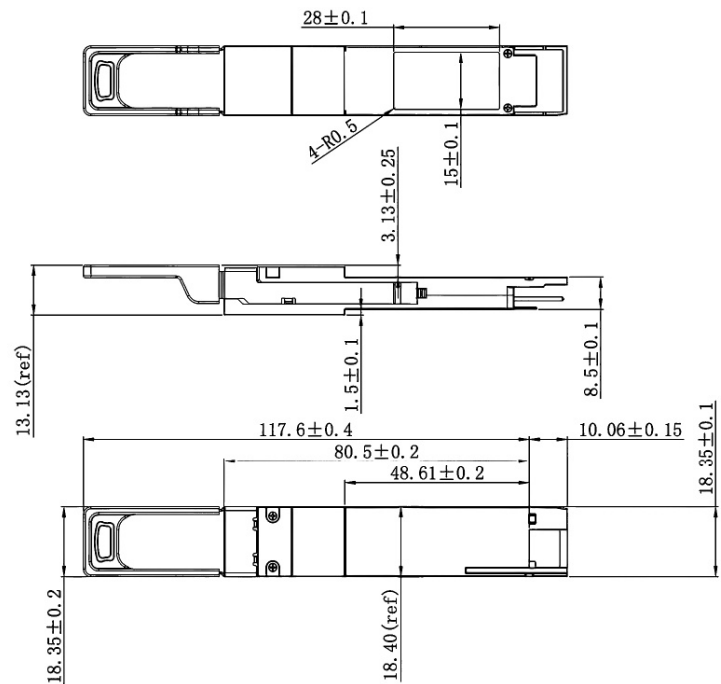


Total Length LX (Unit: m)	Breakout to QSFPDD LQ (Unit: m)	Breakout to QSFP56 LS(Unit: m)
1	0.3	0.7
2	0.6	1.4
3	1	2
5	2	3
7	4	3
10	7	3
50	47	3
100	97	3

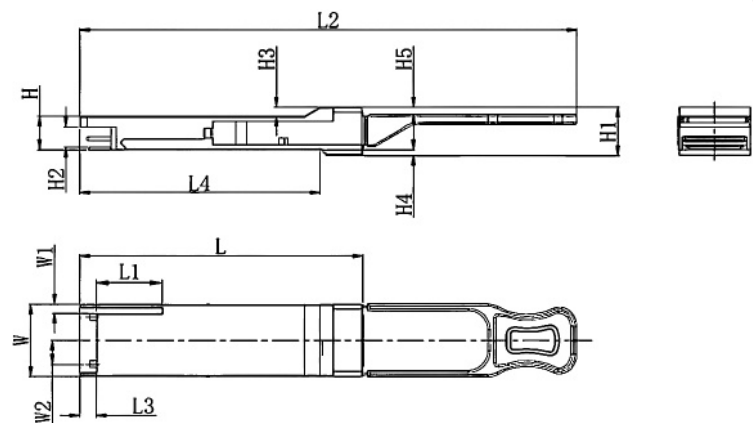
Cable Length tolerance :

Parmeter	Value	Units
Length tolerance	1m≤length≤5m: +15 / -0	cm
	5m<length≤15m: +30 / -0	cm
	Length> 15m: +2% / -0	m
Cable color	Aqua	

QSFP-DD terminal module :(Unit: mm)



QSFP56 module: (Unit: mm)



	L	L1	L2	L3	L4	W	W1	W2	H	H1	H2	H3	H4	H5	H6
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	6.55
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	-