

56Gb/s QSFP+ Active Optical Cable

Features

- Support Ethernet and Fibre Channel application
- Compliant to QSFP+ Electrical MSA SFF-8436
- Multi rate of up to 14.025Gbps
- +3.3V single power supply
- Low power consumption
- 0 to 70°C case temperature operating range
- RoHS-6 compliant (lead-free)
- Metal enclosure for low EMI
- Distance 1m/2m/3m/5m/7m/10m/15m/20m/30m/50m/100m/150m

Applications

- 16G Fibre Channel at 14Gb per lane
- Super Computer
- Other optical links

Absolute Maximum Ratings

Table1-Absolute Maximum Ratings						
Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Supply Voltage	Vcc ₃	-0.5	-	+3.6	V	
Storage Temperature	T _s	- 5	-	+75	°C	
Operating Humidity	RH	+5	-	+85	%	1

Note:

[1] No condensation

Recommended Operating Conditions

Table2-Recommended Operating Conditions						
Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Case Temperature	T _c	0	-	+70	°C	
Power Supply Voltage	Vcc	3.135	3.3	3.465	V	
Power Dissipation	Pd	-	-	1.5	W	1
Bit Rate	BR	1.25	14.025	-	Gbps	

Note:

[1] Per terminal

Characteristics

Table3-Electrical Characteristics						
Parameter	Symbol	Unit	Min.	Typical	Max.	Note
Transmitter						
Differential Data Input Swing	Vout	mV	200		1000	
Input Differential Impedance	ZD	Ω	90	100	110	
Module Select	VOL	V	VEE-0.3		0.4	
Module Unselect	VIL	V	2.0		VCC+0.3	
Low Power Mode	VIH	V	VEE-0.3		0.8	
Normal Operation	VIL	V	2.0	-	VCC+0.3	
Reset	VIL		VEE-0.3		0.8	
Normal Operation	VIH		2.0		VCC+0.3	
Receiver						
Differential Data Output Swing	Vin,P-P	mVPP	200		1000	
Output Differential Impedance	ZD	Ω	90	100	110	
ModPrsL	VOL	V	VEE-0.3	-	0.4	
Interrupt	VOL	V	VEE-0.3	-	0.4	

Normal Operation	VoH	V	2.0	-	VCC+0.3	
Bit Error Rate	BER				E-12	1

Note: PRBS2³¹-1 @ 14.025Gbps

Recommended Interface

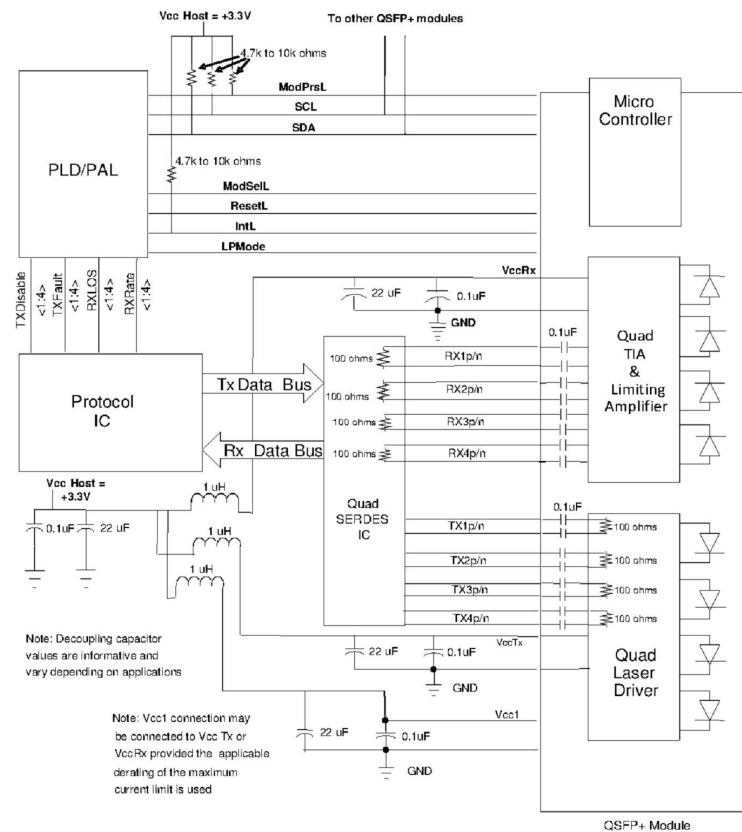


Figure 1 Recommended Interface Circuit

Pin arrangement

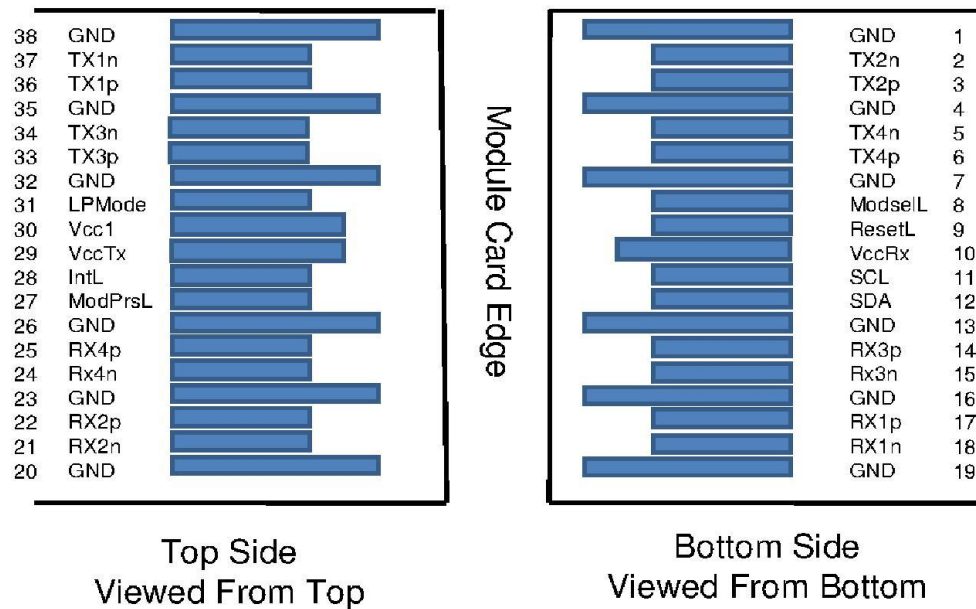


Figure 2 Pin View

Pin Descriptions

Table4-QSFP-DD Pin Function Definition			
Pin	Symbol	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	Vcc Rx	+3.3V 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	
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	Vcc Tx	+3.3V Power supply transmitter	
30	Vcc1	+3.3V 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

Monitoring Specification

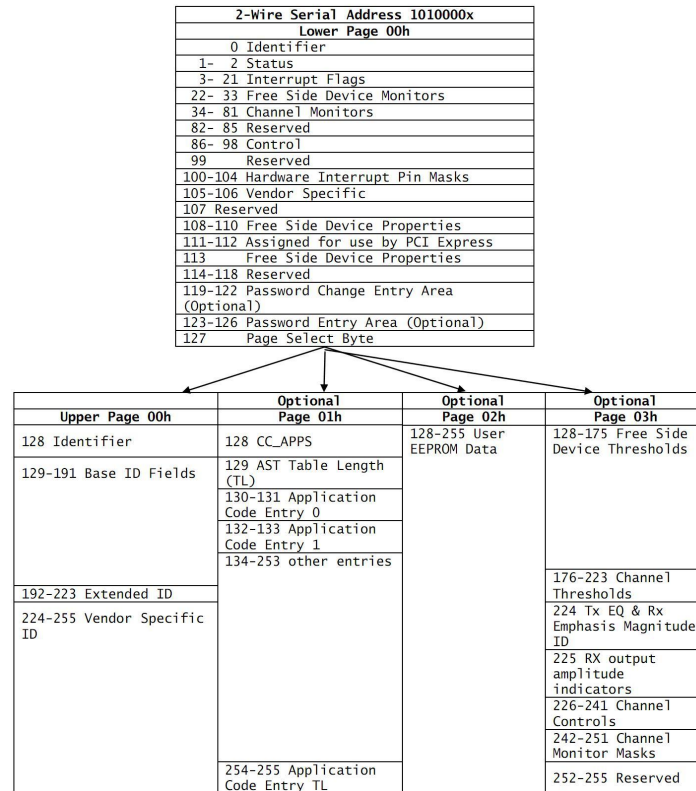


Figure 3 Monitoring Specification

Mechanical

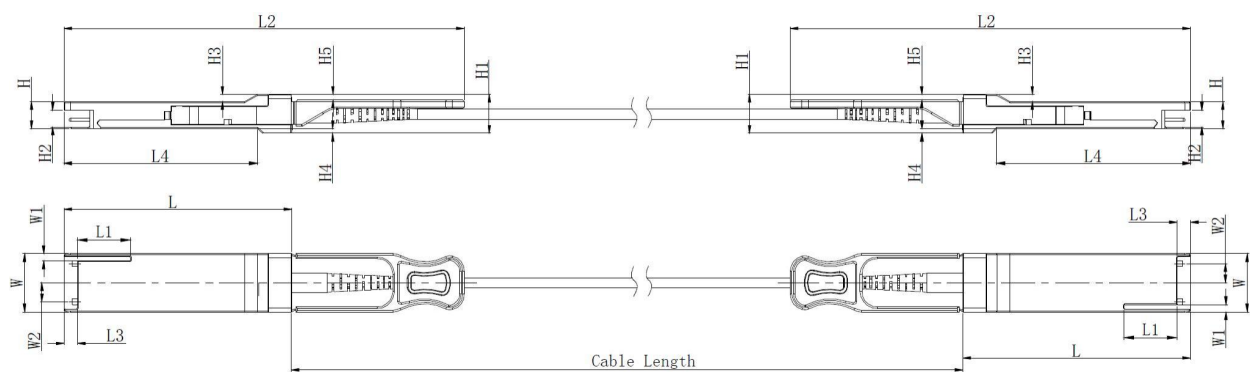


Figure 4 Mechanical Diagram

Unit mm

	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	-	-	4.2	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

Cable Length

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

Warnings

Handling Precautions: This device is susceptible to damage as a result of electrostatic discharge (ESD). A static free environment is highly recommended. Follow guidelines according to proper ESD procedures.

Laser Safety: Radiation emitted by laser devices can be dangerous to human eyes. Avoid eye exposure to direct or indirect radiation.

Further Information:

Web www.naddod.com

Email For order requirements: sales@naddod.com
For customer service: support@naddod.com
For technical support: tech@naddod.com

For cooperation: agency@naddod.com

For other informations: info@naddod.com

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2. Nothing herein should be construed as constituting an additional warranty.

3. NADDOD assumes no responsibility for the use or reliability of equipment or software not provided by NADDOD.

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