100Gb/s QSFP56 HDR SR2 850nm 100m MMF Optical Transceiver

Features

- Up to 100Gb/s data rate
- Up to 100m on OM4 and 70m on OM3 multimode fiber at 100Gb/s
- 2x 50Gb/s PAM4 modulation
- MPO-12 UPC connector
- Programmable Rx output amplitude and emphasis
- Adaptive Tx input equalizer
- SFF-8665 compliant QSFP56 port
- SFF-8636 DDM compliant
- Single 3.3V power supply
- 3.5W power dissipation
- QSFP56 power class 5
- Class 1 laser safety
- Hot pluggable
- RoHS compliant
- IEEE 802.3 200GAUI-4 / 200GBASE SR4 compliant
- SFF-8636 compliant I^2C management interface

Description

The QSFP56 100G SR2 optical module utilizes a 2x50G PAM4 channel design, supporting 100Gbps aggregate bandwidth and a transmission distance of up to 70-100 meters (OM4 fiber). It features low power consumption and low latency, and complies with IEEE 802.3 standards. This module is commonly used for short-distance, high-speed interconnects in data centers and is suitable for use in 200GbE to 2x100G applications, enabling flexible bandwidth deployment and interconnect expansion.

The Q56-100G-SR2H transceiver has Digital Diagnostic Monitoring functions for supply voltage, temperature, laser bias current, optical transmit and receive levels with associated warning and alarm thresholds.The Q56-100G-SR2H transceiver will work with a fiber plant as specified in the QSFP MSA standard.

Absolute Maximum Ratings

Table1-Absolute Maximum Ratings

Parameter	Symbols	Min.	Typical	Max.	Unit	Notes
Storage Temperature	TSTG	-40		+85	ºC	
Operating Relative Humidity (non-condensing)	RH	+5		85	%	1
Supply Voltage	Vcc	-0.3		3.6	V	
Receiver Damage Threshold per Lane	PRDMG	3.4			dBm	
Data input voltage	Vcc	-0.3		3.465	V	
Control input voltage	Vcc	-0.3		4.0	V	

Notes:

[1] No condensation

Recommended Operating Conditions

Table2-Recommended Operating Conditions

Parameter	Symbols	Min.	Typical	Max.	Unit	Notes
Case Temperature	Tc	0		+70	℃	
Supply Voltage	VCC	3.135	3.3	3.465	V	
Power Dissipation	Pd		3.5		W	
Supply noise tolerance (10Hz-10MHz)		66			mVpp	
Link Distance with G.652	D			100	m	

Electrical Characteristics

Table3-Electrical Characteristics

Parameter	Symbols	Min.	Typical	Max.	Unit	Notes
Transmitter						

Signaling rate (each lane)	SR	GBPS	26.5625 ± 100 ppm			
Differential data input voltage per lane	Vin,pp,diff	mV	900	-	-	
Differential termination mismatchal	-	%	-	-	10	
Single-ended voltage tolerance range	-	V	-0.4	-	3.3	
DC common mode voltage	-	mV	-350	-	2850	
Receiver						
Signaling rate (each lane)	SR	GBd	26.5625 ± 100 ppm			
Differential output voltage	-	mV	-	-	900	
Near-end ESMW (Eye symmetry mask width)	-	UI	0.265	-	-	
Near-end Eye height, differential (min)	-	mV	70	-	-	
Far-end ESMW (Eye symmetry mask width)	-	UI	0.2	-	-	
Far-end Eye height, differential (min)	-	mV	30	-	-	
Differential termination mismatch	-	%		-	10	
Transition time (min, 20% to 80%)	-	ps	9.5	-	-	
DC common mode voltage	-	mV	-350	-	2850	

Optical Characteristics

Table3-Optical Characteristics

Parameter	Symbols	Min.	Typical	Max.	Unit	Notes
Transmitter						
Signaling rate (each lane)	SR	GBd	26.5625 ± 100 ppm			
Modulation format	-	-	PAM4			
Lane wavelength	λ	nm	840	850	860	
RMS spectral width	Δ λ	nm	-	-	0.6	
Average launch power, each lane	-	dBm	-6.5	-	4	
Outer Optical Modulation Amplitude (OMAouter), each lane	-	dBm	-4.5	-	3	1
Launch power in OMAouter minus TDECQ, each lane	-	dBm	-5.9	-	-	
Transmitter and dispersion eye closure for PAM4 (TDECQ), each lane	-	dB	-	-	4.5	
Average launch power of OFF transmitter, each lane	-	dBm	-	-	-30	
Extinction ratio	-	dB	3	-	-	
Transmitter transition time, each lane	-	ps	-	-	34	
Optical return loss tolerance	-	dB	-	-	12	
Receiver						

Signaling rate (each lane)	SR	GBd	26.5625 ± 100 ppm			
Modulation format	-	-	PAM4			
Lane wavelength	λ	nm	840	850	860	
Damage threshold, each lane	P_{IN}	dBm	5	-	-	
Average receive power, each lane	-	dBm	-8.4	-	4	
Receive power (OMAouter), each lane	-	dBm	-	-	3	
Receiver sensitivity (OMAouter), each lane	-	dBm	-	-	Max(6.5,SECQ -7.9)	2
LOS Assert	-	dBm	-30	-	-10	
LOS De-Assert	-	dBm	-	-	-9	
LOS Hysteresis	-	dB	0.5	-	-	

Note:

1. Even if the TDECQ ＜ 1.4 dB, the OMAouter (min) must exceed this value.
2. Bit Error Ratio ＜ 2.4x10-4, Pattern PRBS31Q

Recommended Interface

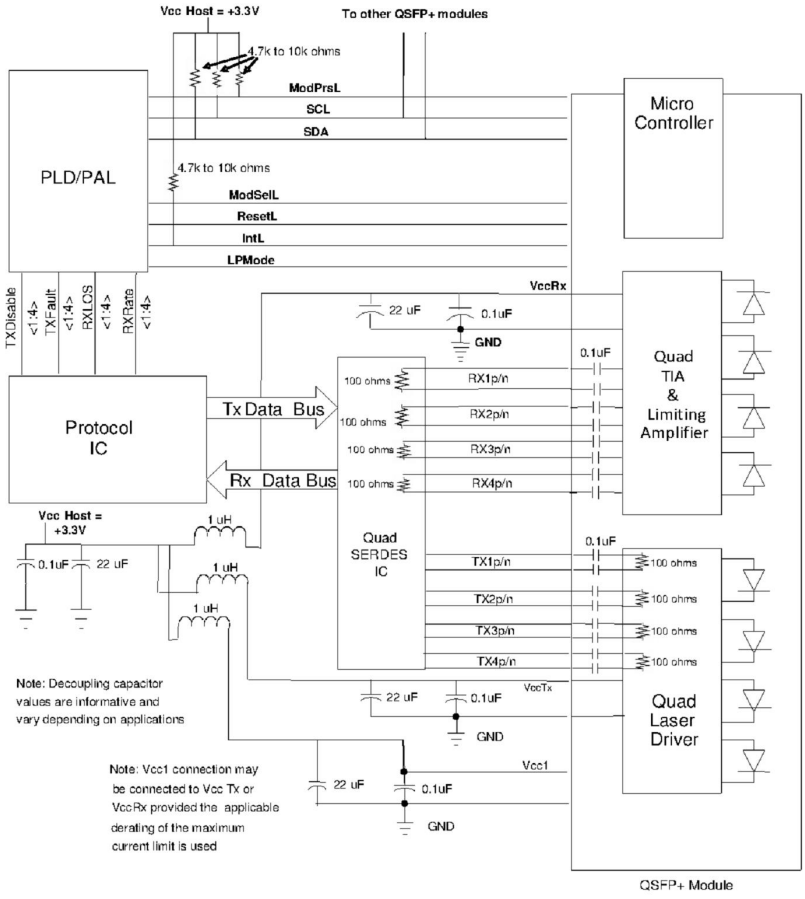

Figure 1 Recommended Interface Circuit

Pin arrangement

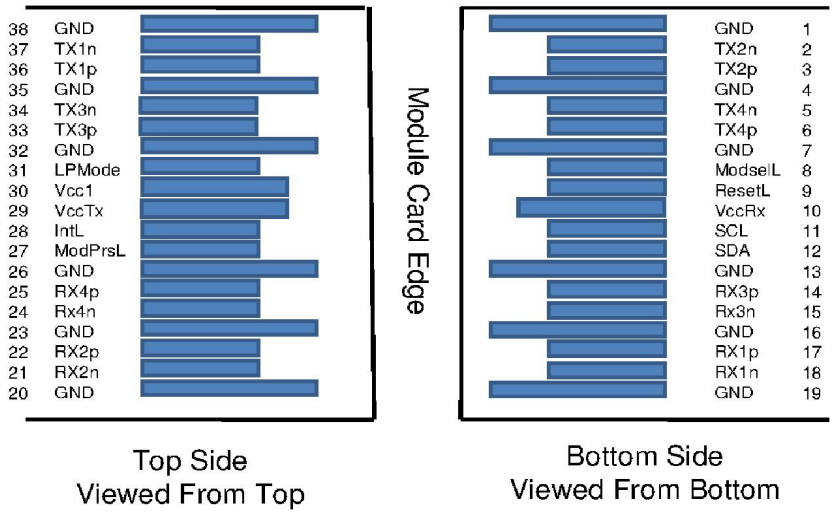

Figure 2 Pin View

Table4-Pin Function Definitions

Pin	Symbols	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	
8	ModSelL	Module Select	
9	ResetL	Module Reset	
10	Vcc Rx	+3.3V Power Supply Receiver	2
11	SCL	2-wire serial interface clock	
12	SDA	2-wire serial interface data	
13	GND	Ground	
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	1
19	GND	Ground	1
20	GND	Ground	
21	Rx2n	Receiver Inverted Data Output	
22	Rx2p	Receiver Non-Inverted Data Output	
23	GND	Ground	
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	+3.3V Power supply transmitter	2
30	Vcc1	+3.3V Power supply	2
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

Optical interface arrangement

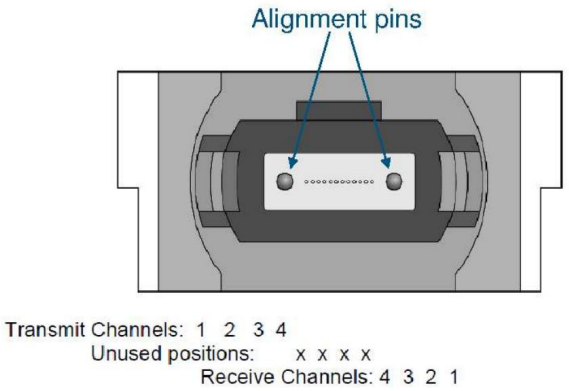

Figure 3 Optical interface arrangement

Mechanical Dimensions

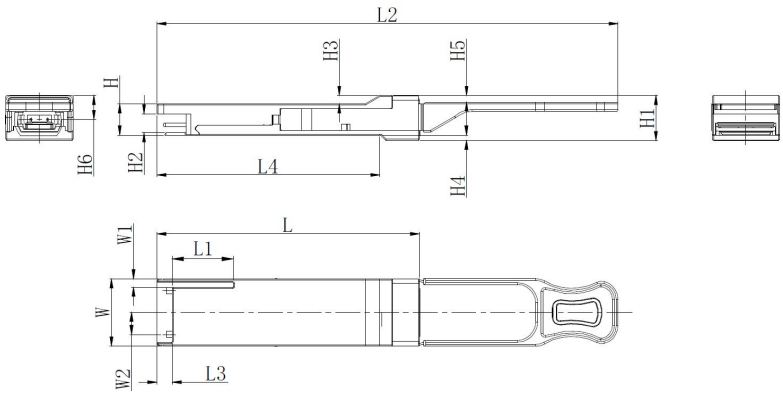

Figure 4 Mechanical Outline

Notice

This document is provided for information purposes only and shall not be regarded as a warranty of a certain functionality, condition, or quality of a product. Neither NADDOD make any representations or warranties, expressed or implied, as to the accuracy or completeness of the information contained in this document and assumes no responsibility for any errors contained herein. NADDOD shall have no liability for the consequences or use of such information or for any infringement of patents or other rights of third parties that may result from its use. This document is not a commitment to develop, release, or deliver any material (defined below), code, or functionality.

NADDOD reserves the right to make corrections, modifications, enhancements, improvements, and any other changes to this document, at any time without notice. Customer should obtain the latest relevant information before placing orders and should verify that such information is current and complete.

NADDOD makes no representation or warranty that products based on this document will be suitable for any specified use. Testing of all parameters of each product is not necessarily performed by NADDOD. It is customer's sole responsibility to evaluate and determine the applicability of any information contained in this document, ensure the product is suitable and fit for the application planned by customer, and perform the necessary testing for the application in order to avoid a default of the application or the product.

NADDOD products are sold subject to the NADDOD standard terms and conditions of sale supplied at the time of order acknowledgement, unless otherwise agreed in an individual sales agreement signed by authorized representatives of NADDOD and customer ("Terms of Sale"). NADDOD hereby expressly objects to applying any customer general terms and conditions with regards to the purchase of the NADDOD product referenced in this document. No contractual obligations are formed either directly or indirectly by this document.

\

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 information: info@naddod.com

Disclaimer

1. We are committed to continuous product improvement and feature upgrades, and the contents contained in this manual are subject to change without notice.

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.