

TSDR8-NAAMA1C Optical Transceiver

Multi-mode 850nm 400G BASE-SR8 QSFP-DD Transceiver, With Diagnostic Monitoring

Features

- Hot-pluggable QSFP-DD form factor
- Data Rate 53.125 Gb/s PAM4 per lane
- 8x53Gbps PAM4 transmitter and PAM4 receiver
- 8 channels 850nm VCSEL laser array and 8 channels PIN photo-detector array
- Maximum link length of 70m on OM3 MMF and 100m on OM4 MMF
- Digital diagnostics functions are available via the I2C interface
- Single 3.3V Power Supply and Power Dissipation < 12W
- MPO-24 connector
- Operating Case Temperature: 0°C~+70°C
- RoHS compliant 

Applications

- 400G BASE-SR8 Ethernet

Production Description

The TSDR8-NAAMA1C is an 8-Channel, Pluggable, Fiber-Optic QSFP-DD for 400Gbps SR8 Applications. It is a high performance module for short-range data communication and interconnect applications which operate at 53.125Gbps per lane up to 70m using OM3 fiber and 100m using OM4 fiber. The optical interface uses MPO receptacles.

This module is designed to operate over multimode fiber systems using a nominal wavelength of 850nm. The electrical interface uses a 76 contact edge type connector.

Absolute Maximum Rating

These values represent the damage threshold of the module. Stress in excess of any of the individual Absolute Maximum Ratings can cause immediate catastrophic damage to the module even if all other parameters are within Recommended Operating Conditions.

Parameters	Symbol	Min.	Max.	Unit
Power Supply Voltage	VCC	-0.5	+3.6	V
Storage Temperature	Tc	-40	+85	°C
Relative Humidity	RH	0	85	%

Recommended Operating Environment

Recommended Operating Environment specifies parameters for which the electrical and optical characteristics hold unless otherwise noted.

Parameter	Symbol	Min.	Typical	Max	Unit
Power Supply Voltage	VCC	3.15	3.30	3.45	V
Operating Case Temperature	T _{Ca}	0	-	70	°C

Electrical Characteristics

The following electrical characteristics are defined over the Recommended Operating Environment unless otherwise specified.

Parameter	Symbol	Min.	Typical	Max	Unit	Notes
Data Rate per lane	DR	-	53.125	-	Gbps	-
Transmitter						
Single Ended Output Voltage Tolerance	-	-0.3	-	4.0	V	-
Common mode voltage tolerance	-	15	-	-	mV	-
Input differential impedance	R _{in}	-	100	-	Ω	-
Differential Input Voltage swing	V _{in}	300	-	1100	mV	-
Tx Fault	VoL	-0.3	-	0.4	V	At 0.7mA
Receiver						
Single Ended Output Voltage Tolerance	-	-0.3	-	4.0	V	-
Differential Output Swing	V _{out}	300	-	900	mV	-
Output differential impedance	R _{out}	-	100	-	Ω	-

Optical Characteristics

The following optical characteristics are defined over the Recommended Operating Environment unless otherwise specified.

Parameter	Symbol	Min.	Typical	Max	Unit	Notes
Transmitter						
Center Wavelength	λ	820	850	880	nm	-
RMS spectral width	P _m	-	-	0.6	nm	1
Average Optical Power	P _o	-6.5	-	4	dBm	2
Extinction Ratio	ER	3.0	-	-	dBm	-
Optical Modulation Amplitude	OMA	-4.5	-	3	dB	-
Transmitter and Dispersion Eye Closure	TDECQ	-	-	4.5	dB	-
Optical Return Loss Tolerance	ORL	-	-	12	dB	-
Receiver						
Center Wavelength	λ	820	-	880	nm	-
Average Receive power ,each lane	-	-8.4	-	4	dBm	-

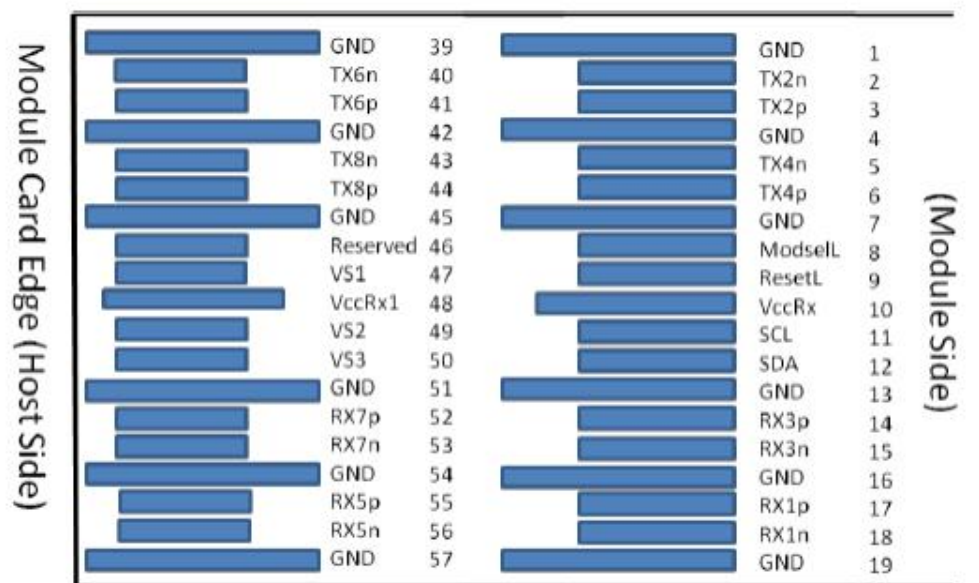
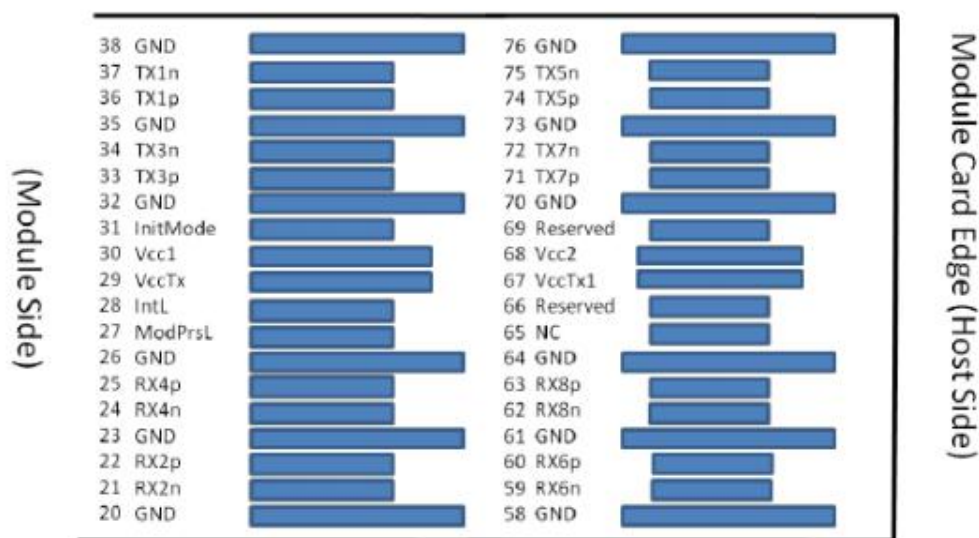
Receive power (OMA _{outer}), each lane	-	-	-	3	dBm	-
Receiver Sensitivity (OMA _{outer})	Psens	-	-	-6.5	dBm	3
LOS Asserted	Lsa	-30	-	-	dBm	-
LOS De-Asserted	Lda	-	-	-10	dBm	-
LOS Hysteresis	Lh	0.5	-	-	dB	-

Note:

{1} Trade-offs are available between spectral width, center wavelength and minimum OMA.

[2] The optical power is launched into MMF

[3] BER=2.4E-4; PRBS31Q@26.5625GBd.

Qsfp-Dd Transceiver Electrical Pad Layout**Bottom side viewed from bottom****Top side viewed from top****Figure 1 – QSFP-DD -compliant 76-pin connector (per QSFP-DD MSA)**

Pin Definition

Pin	Symbol	Name/Description
1	GND	Ground
2	Tx2n	Transmitter Inverted Data Input
3	Tx2p	Transmitter Non-Inverted Data Input
4	GND	Ground
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	+3.3 V Power supply receiver
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
17	Rx1p	Receiver Non-Inverted Data Output
18	Rx1n	Receiver Inverted Data Output
19	GND	Ground
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
27	ModPrsL	Module Present
28	IntL	Interrupt
29	VCC Tx	+3.3 V Power supply transmitter
30	VCC1	+3.3 V Power Supply
31	InitMode	Initialization mode; In legacy QSFP applications, the InitMode pad is called LPMODE
32	GND	Ground
33	Tx3p	Transmitter Non-Inverted Data Input
34	Tx3n	Transmitter Inverted Data Input
35	GND	Ground
36	Tx1p	Transmitter Non-Inverted Data Input
37	Tx1n	Transmitter Inverted Data Input
38	GND	Ground
39	GND	Ground
40	Tx6n	Transmitter Inverted Data Input

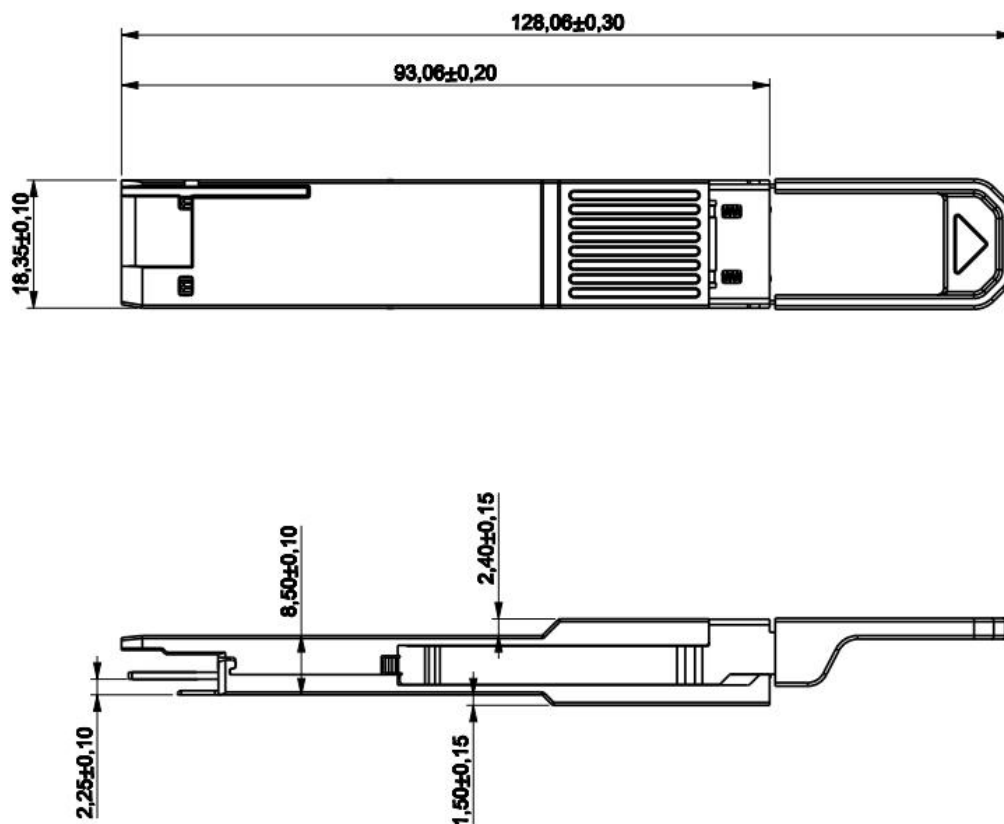
Information and specifications are subject to change without notice.
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41	Tx6p	Transmitter Non-Inverted Data Input
42	GND	Ground
43	Tx8n	Transmitter Inverted Data Input
44	Tx8p	Transmitter Non-Inverted Data Input
45	GND	Ground
46	Reserved	For future use
47	VS1	Module Vender Specific 1
48	Vcc Rx1	+3.3 V Power supply receiver
49	VS2	Module Vender Specific 2
50	VS3	Module Vender Specific 3
51	GND	Ground
52	Rx7p	Receiver Non-Inverted Data Output
53	Rx7n	Receiver Inverted Data Output
54	GND	Ground
55	Rx5p	Receiver Non-Inverted Data Output
56	Rx5n	Receiver Inverted Data Output
57	GND	Ground
58	GND	Ground
59	Rx6n	Receiver Inverted Data Output
60	Rx6p	Receiver Non-Inverted Data Output
61	GND	Ground
62	Rx8n	Receiver Inverted Data Output
63	Rx8p	Receiver Non-Inverted Data Output
64	GND	Ground
65	NC	No Connect
66	Reserved	For future use
67	VCC Tx1	+3.3 V Power supply transmitter
68	VCC2	+3.3 V Power Supply
69	Reserved	For future use
70	GND	Ground
71	Tx7p	Transmitter Non-Inverted Data Input
72	Tx7n	Transmitter Inverted Data Input
73	GND	Ground
74	Tx5p	Transmitter Non-Inverted Data Input
75	Tx5n	Transmitter Inverted Data Input
76	GND	Ground

Mechanical



Unit: mm

Ordering Information

Part Number	Product Description
TSDR8-NAAMA1C-01	400Gbps QSFP-DD SR8 CDR Transceiver 70m on OM3 MMF and 100m on OM4 MMF 0°C ~ +70°C
TSDR8-NAAMA1C-02	400Gbps QSFP-DD SR8 DSP Transceiver 70m on OM3 MMF and 100m on OM4 MMF 0°C ~ +70°C

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