

PRODUCT FEATURES

- QSFP-DD MSA compliant
- 8x25.78125Gb/s electrical interface
- Supports 206.25Gb/s aggregate bit rate
- Up to 70m transmission on MMF OM3
- Single MPO24 receptacle
- 8 channels 850nm VCSEL array
- 8 channels PIN photo detector array
- Commercial case temperature: 0~70°C
- Single 3.3V power supply
- Maximum power consumption 5 Watts

APPLICATIONS

- 200GBASE-SR8 Ethernet
- Data Center Interconnect

COMPLIANCE

- QSFP-DD MSA
- CMIS 4.0
- IEEE802.3cd
- RoHS 2.0

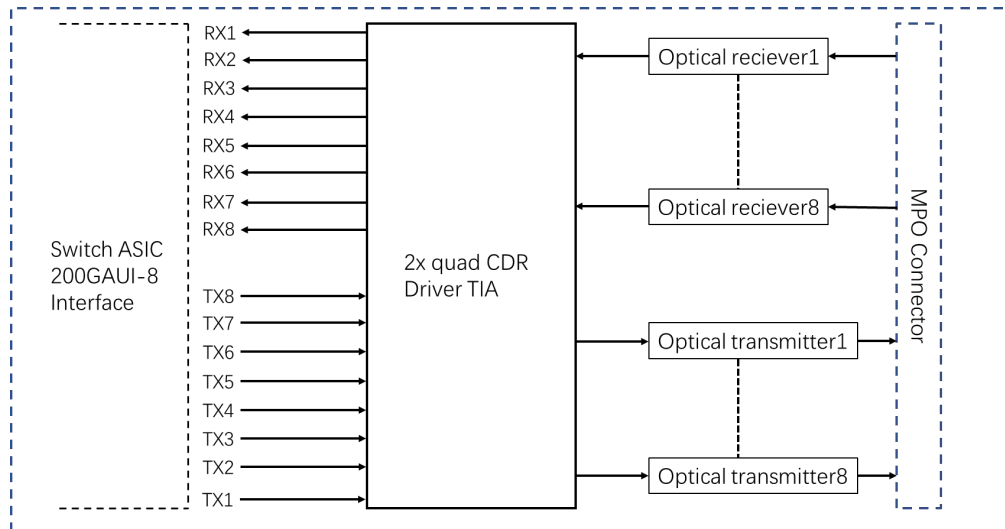
Ordering information

Part Number	Data Rate (Gb/s)	Media	Wavelength(nm)	Operating distance(m)	Temperature(°C)
IP-BTMM70M85C	206.25	MMF	850	70 on OM3	0~70

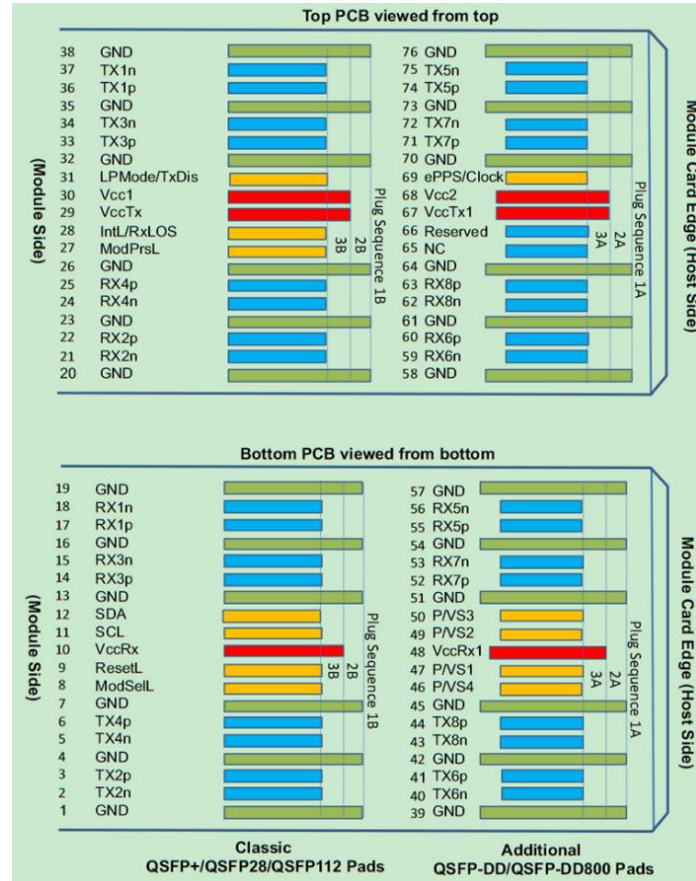
PRODUCT DESCRIPTION

The 200G NRZ QSFP-DD SR8 optical transceiver provides 8 lane 25Gb/s optical links. Each Lane converts a 25Gb/s serial electrical data stream to a 25Gb/s optical output optical signal and a 25Gb/s serial optical input signal to a 25Gb/s electrical data stream. It operates at 25.78Gb/s up to 100m over OM4 Multi-mode fiber.

1. Block Diagram



2. Pin Diagram



MSA compliant Connector

3. Pin Descriptions

Pad	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	VccRx	+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	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	+3.3V 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
39	GND	Ground	1
40	Tx6n	Transmitter Inverted Data Input	
41	Tx6p	Transmitter Non-Inverted Data Input	
42	GND	Ground	1
43	Tx8n	Transmitter Inverted Data Input	
44	Tx8p	Transmitter Non-Inverted Data Input	
45	GND	Ground	1
46	Reserved	For future use	
47	VS1	Module Vendor Specific 1	
48	VccRx1	3.3V Power Supply	
49	VS2	Module Vendor Specific 2	
50	VS3	Module Vendor Specific 3	
51	GND	Ground	1
52	Rx7p	Receiver Non-Inverted Data Input	
53	Rx7n	Receiver Inverted Data Input	
54	GND	Ground	1

55	Rx5p	Receiver Non-Inverted Data Output	
56	Rx5n	Receiver Inverted Data Output	
57	GND	Ground	1
58	GND	Ground	1
59	Rx6n	Receiver Non-Inverted Data Output	
60	Rx6p	Receiver Inverted Data Output	
61	GND	Ground	1
62	Rx8n	Receiver Inverted Data Output	
63	Rx8p	Receiver Non-Inverted Data Output	
64	GND	Ground	1
65	NC	No Connect	
66	Reserved	For future use	
67	VccTx1	3.3V Power Supply	
68	Vcc2	3.3V Power Supply	
69	Reserved	For future use	
70	GND	Ground	1
71	Tx7p	Transmitter Non-Inverted Data Output	
72	Tx7n	Transmitter Inverted Data Output	
73	GND	Ground	1
74	Tx5p	Transmitter Non-Inverted Data Input	
75	Tx5n	Transmitter Inverted Data Input	
76	GND	Ground	1

Note:

1.Circuit ground is internally isolated from chassis ground.

4. Absolute Maximum Ratings

It has to be noted that the operation in excess of any individual absolute maximum ratings might cause permanent damage to this module.

Parameter	Symbol	Min	Typical	Max	Unit	Note
Maximum Supply Voltage	Vcc	0		3.6	V	
Storage Temperature	Ts	-40		85	°C	
Relative Humidity	RH	5		85	%	

5. Recommended Operating Conditions

Parameter	Symbol	Min	Typical	Max	Unit	Note
Operating Case Temperature	Tcase	0		70	°C	
Supply Voltage	Vcc	3.135	3.3	3.465	V	
Relative Humidity	RH	5		85	%	
Data Rate (Optical)	DRO		8*25.78125		Gb/s	
Operating Distance				70	m	

6. Electrical Characteristics

200GBASE-SR8 Operation (EOL, Tcase=0~70°C, Vcc=3.135 to 3.465V)

Parameter	Symbol	Min	Typical	Max	Unit	Note
Power Dissipation				5	W	
Supply Current	Icc			1.5	A	1
Transmitter						
Data Rate, each lane			25.78125		Gb/s	
Differential Voltage pk-pk	V _{IN}			900	mV	
Input differential impedance	Z _{IN}		100		Ohm	

Differential Termination Resistance Mismatch				10	%	
Receiver						
Data Rate, each lane			25.78125		Gb/s	
Output differential impedance	Z _{OUT}		100		Ohm	
Differential Termination Resistance Mismatch				10	%	
Differential output voltage	V _{OUT}			900	mV	

Note:

1. Steady state.

7. Optical Characteristics

200GBASE-SR8 Operation (EOL, T_{case}=0~70°C, V_{cc}=3.135~3.465 V)

Parameters	Symbol	Min	Typical	max	Unit	Notes
Transmitter						
Transmit OMA per Lane	TxOMA	-6.4		4	dBm	
Extinction Ratio	ER	2.0	4.5		dB	
Optical return loss tolerance (max)	TOL			12	dB	
Relative intensity noise	RIN(OMA)		-130	-128	dB/Hz	
Center Wavelength	λ	840	850	860	nm	
RMS Spectral Width	σ			0.6	nm	
Transmitter OFF Output Power	P _{OFF}			-30	dBm	
Transmitter eye mask definition {X1,X2,X3,Y1,Y2,Y3}		{0.3,0.38,0.45,0.35,0.41,0.5}				1
Receiver						
Input Optical Wavelength	λ	840	850	860	nm	
Rx Sensitivity (OMA) per lane	RSENS			-9.5	dBm	2
Rx Sensitivity (OMA) per lane	RSENS			-8.0	dBm	3
Crosstalk	Xtalk			2	dB	
Input Saturation Power (Overload)	PSAT	4.5			dBm	
Receiver Reflectance	RFL			-12	dBm	
Loss of Signal Assert	PA	-30			dBm	
Loss of Signal De-assert	PD			-11.3	dBm	
LOS Hysteresis	P _{Hv}	0.5		6	dB	

Notes:

1. Hit ratio 1.5x10⁻³ hits per sample.
2. BER @5E-5.
3. BER @1E-12.

8. Digital Diagnostic Monitoring Functions

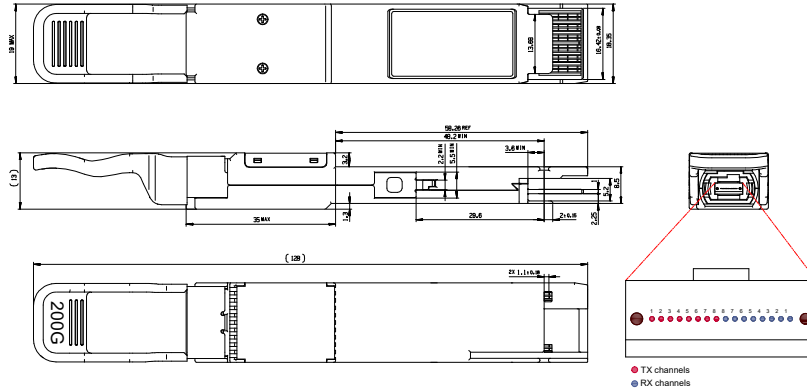
IP-BTMM70M85C support the I2C-based Diagnostic Monitoring Interface (DMI) defined in document CMIS 4.0. The host can access real-time performance of transmitter and receiver optical power, temperature, supply voltage and bias current.

Parameter	Accuracy	Unit
Case Temperature	±3	°C
Supply Voltage	±3%	V
Tx Bias Current	±10%	mA

200GBASE-SR8 70m QSFP-DD Optical Transceiver with DDM	IP-BTMM70M85C
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Tx Optical Power	±3	dB
Rx Optical Power	±3	dB

9. Mechanical Specifications



10. Regulatory Compliance

Feature	Reference	Performance
EMC	EN61000-3	Compatible with standards
Electrostatic Discharge (ESD)	IEC/EN 61000-4-2	Compatible with standards
Electromagnetic Interference (EMI)	FCC Part 15 Class B EN 55022 Class B (CISPR 22A)	Compatible with standards
Laser Eye Safety	FDA 21CFR 1040.10, 1040.11 IEC/EN 60825-1, EC/EN 60825-2	Class 1 laser product
Component Recognition	IEC/EN 60950, L 60950	Compatible with standards
RoHS	2002/95/EC	Compatible with standards

11. Contact Information

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12. Revision History

Version No.	Date	Description
1.0	Aug.25, 2022	Preliminary datasheet
1.1	Dec.12, 2023	Delete TDECQ, Updated TX_OMA and Power Dissipation.
1.2	Jun.30, 2024	Update contact information.

