

PRODUCT FEATURES

- QSFP56 MSA compliant
- 4x50Gb/s electrical interface
- Supports 212.5Gb/s aggregate bit rate
- Up to 70m transmission on MMF OM3
- Single MPO12 receptacle
- 4 channels 850nm VCSEL array
- 4 channels PIN photo detector array
- Commercial case temperature: 0 °C to 70°C
- Single 3.3V power supply
- Maximum power consumption 4 Watts

APPLICATIONS

- 200GBASE-SR4 Ethernet (PAM4)
- Data Center Interconnect

COMPLIANCE

- QSFP56 MSA
- SFF-8636
- IEEE802.3cd
- RoHS 2.0

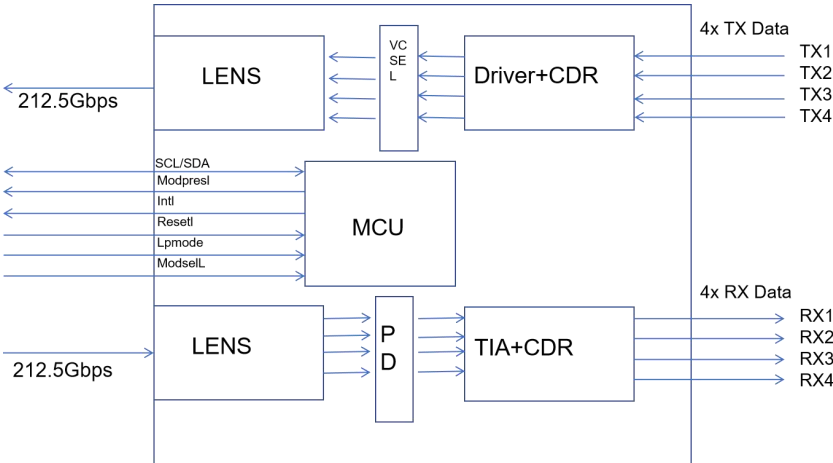
Ordering information

Part Number	Data Rate (Gb/s)	Media	Wavelength(nm)	Operating distance(m)	Temperature(°C)
IP-BAMM70M85C	212.5	MMF	850	70 on OM3	0~70

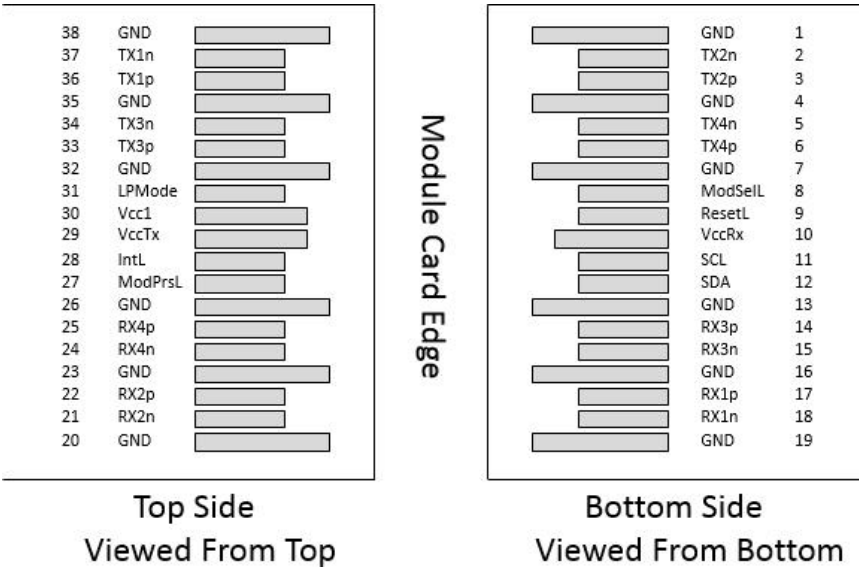
PRODUCT DESCRIPTION

IP-BAMM70M85C is designed for 70m optical communication applications. This module contains 4-lane VCSEL optical transmitter, 4-lane optical receiver and module management block including 2 wire serial interfaces. The transceiver operates at 212.5 Gb/s over 4-lane parallel multi-mode fiber.

1. Block Diagram



2. Pin Diagram



MSA compliant Connector

3. Pin Descriptions

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	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 Non-Inverted Data Output	
25	Rx4p	Receiver 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

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	V _{CC}	0		3.6	V	
Storage Temperature	T _s	-40		85	°C	
Relative Humidity	RH	5		85	%	

5. Recommended Operating Conditions

Parameter	Symbol	Min	Typical	Max	Unit	Note
Operating Case Temperature	T _{case}	0		70	°C	
Supply Voltage	V _{CC}	3.135	3.3	3.465	V	
Relative Humidity	RH	5		85	%	
Power Dissipation	PD			4	W	
Data Rate (Optical)	DRO		4*26.5625		GBd	
Operating Distance				70	m	

6. Electrical Characteristics

200GBASE-SR4 Operation (EOL, T_{case}=0~70°C, V_{CC}=3.135 to 3.465V)

Parameter	Symbol	Min	Typical	Max	Unit	Note
Power Dissipation				4	W	
Supply Current	I _{CC}			1.2	A	1
Transmitter						
Data Rate, each lane			26.5625		GBd	
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			26.5625		GBd	
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-SR4 Operation (EOL, T_{case}=0~70°C, V_{CC}=3.135~3.465 V)

Parameters	Symbol	Min	Typical	max	Unit	Notes
Transmitter						
Signal Speed per Lane	BR	26.5625 ± 100 ppm			GBd	
Modulation format		PAM4				
Transmit wavelength	λ	840	850	860	nm	
RMS Spectral Width	σ			0.6	nm	
Average launch power, each	P _{out}	-6		4	dBm	

lane						
Optical Modulation Amplitude (OMA), each lane	P _{OMA}	-4		3	dBm	
Launch power OFF per lane	P _{OFF}			-30	dBm	
Launch power in OMA _{outer} minus TDECQ		-5.9			dBm	
Transmitter and dispersion eye closure (TDECQ), each lane	TDECQ			4.9	dB	
Extinction Ratio (ER)	ER	3			dB	
Optical return loss tolerance				12	dB	
Receiver						
Signaling Speed per Lane	BR	26.5625 ± 100 ppm			GBd	
Modulation format		PAM4				
Receive wavelength	λ	840	850	860	nm	
Damage threshold, each lane		5			dBm	
Average receive power, each lane		-7.9		4	dBm	
Receive power, each lane (OMA)				3	dBm	
Stressed receiver Sensitivity (OMA _{outer}), each lane				-3	dBm	1
Receiver sensitivity (OMA _{outer}), each lane		-7			dBm	2,3
Receiver reflectance				-12	dB	

Notes:

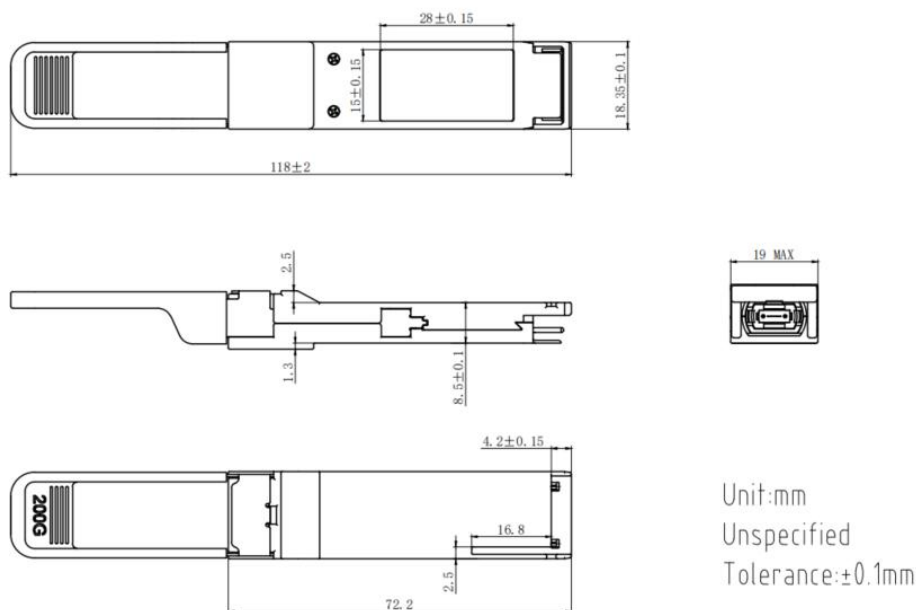
1. Measured with conformance test signal at TP3 for the BER specified in section 138.1.1 of IEEE802.3cd.
2. Receiver sensitivity is informative and is defined for a transmitter with a value of SECQ up to 4.9 dB.
3. Receiver sensitivity should meet Equation (138–1) in section 138.8.7 of IEEE802.3cd.

8. Digital Diagnostic Monitoring Functions

IP-BAMM70M85C support the I2C-based Diagnostic Monitoring Interface (DMI) defined in document SFF-8636. 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
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	Apr. 12, 2022	Preliminary datasheet
1.1	Jun.30, 2024	Update contact information.