

PRODUCT FEATURES

- QSFPDD MSA compliant
- 8X53.125Gb/s electrical interface
- Up to 70m on OM3 and 100m on OM4 with MMF
- 8 channels 850nm VCSEL array and PIN photo detector array
- Commercial case temperature: 0~70°C
- Single 3.3V power supply
- PAM4 Modulation
- Maximum power consumption 7.5 Watts
- MPO-16 APC optical receptacle type

APPLICATIONS

- 400GBASE-SR8 400G Ethernet
- Data Center Interconnect

COMPLIANCE

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

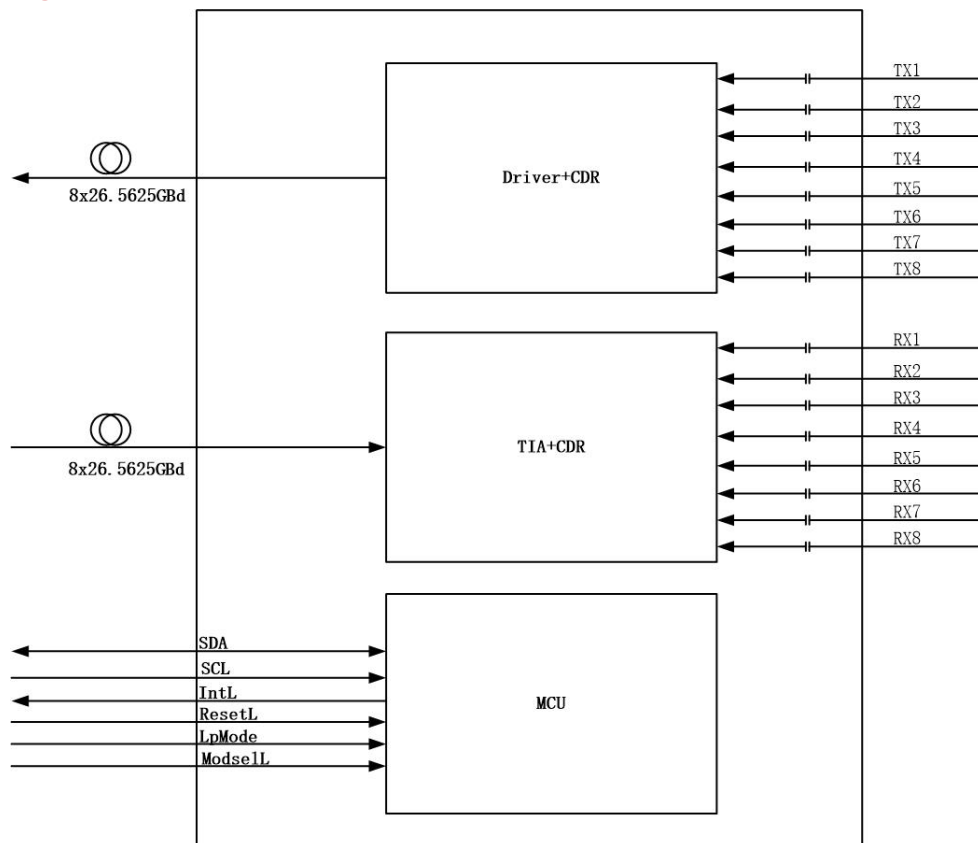
Ordering information

Part Number	Data Rate(Gb/s)	Media	Wavelength(nm)	Operating distance(m)	Temperature(°C)
IP-ATMM70M85C	8X53.125	MMF	850	70@OM3	0~70
IP-ATMS10M85C	8X53.125	MMF	850	100@OM4	0~70

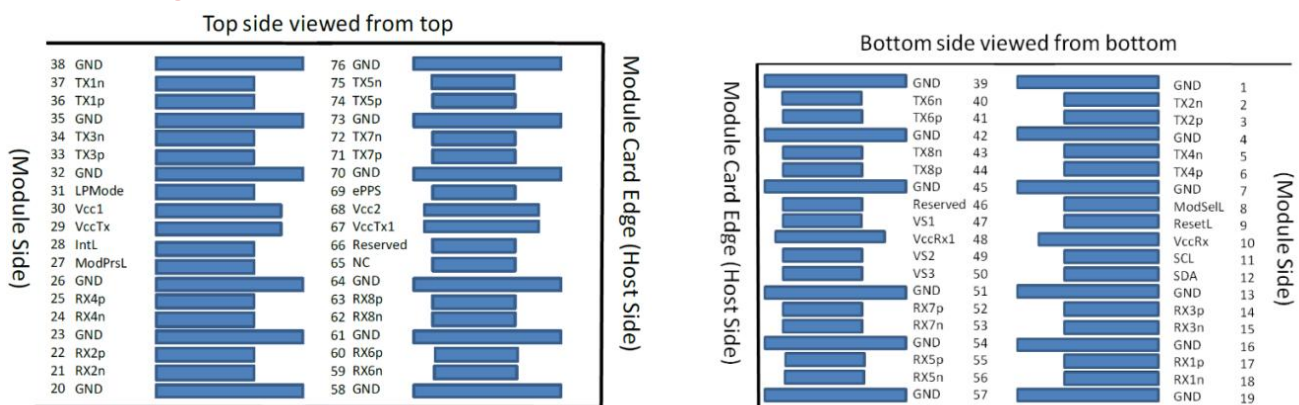
PRODUCT DESCRIPTION

IP-ATMM70M85C is a hot-pluggable QSFP-DD optical transceiver for 400G links over multimode fiber. It is compliant with the QSFP-DD MSA specifications. It operates at 53.125Gbps per lane up to 70m over OM3 and 100m OM4 Multi-mode fiber. The module is designed to operate over multimode fiber systems using a nominal wavelength of 850nm. The optical interface is MPO connector.

1. Block Diagram



2. Pin Diagram



3. Pin Descriptions

Pad	Symbol	Description	Note
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	VccRx	+3.3V 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	VccTx	+3.3V Power supply transmitter	
30	Vcc1	+3.3V Power supply	
31	LPMode	Low Power mode;	
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	

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40	Tx6n	Transmitter Inverted Data Input	
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 Vendor Specific 1	
48	VccRx1	3.3V Power Supply	
49	VS2	Module Vendor Specific 2	
50	VS3	Module Vendor 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	VccTx1	3.3V Power Supply	
68	Vcc2	3.3V 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	

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.	Typ.	Max.	Unit	Notes
Storage Temperature	T _s	-40		85	°C	
Storage Ambient Humidity	H _A	0		85	%	
Maximum Supply Voltage	V _{CC}	-0.5		3.6	V	
Lead Soldering Temperature/Time	TSOLD			260/10	°C/sec	1
Lead Soldering Temperature/Time	TSOLD			360/10	°C/sec	2

Notes:

1. Suitable for wave soldering.
2. Only for soldering by iron.

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	%	
Data Rate (Optical)	DRO		8*53.125		Gbps	
Data Rate (Electrical)	DRE		8*53.125		Gbps	
Operating Link Distance	LD			70	m	

6. Electrical Characteristics

400GBASE-SR8 Operation (EOL, T_{case}=0~70°C, V_{CC}=3.135~3.465 V)

Parameter	Symbol	Min	Typical	Max	Unit	Note
Power Dissipation				7.5	W	
Supply Current	I _{CC}			2.27	A	
Transmitter						
Data Rate, each lane			53.125		Gbps	
Differential Voltage pk-pk	V _{IN}	400		900	mV	
Input differential impedance	Z _{IN}		100		Ohm	
Differential Termination Resistance Mismatch				10	%	
Receiver						
Data Rate, each lane			53.125		Gbps	
Output differential impedance	Z _{OUT}		100		Ohm	
Differential Termination Resistance Mismatch				10	%	
Differential output voltage	V _{OUT}			900	mV	

7. Optical Characteristics

400GBASE-SR8 Operation (EOL, T_{case}=0~70°C, V_{CC}=3.135~3.465 V)

Parameter	Symbol	Min	Typical	Max	Unit	Note
Transmitter						
Signaling Speed per Lane			26.5625±100ppm		GBd	
Center Wavelength	λ	840	850	860	nm	
RMS Spectral Width				0.6	nm	
Extinction ratio	ER	3	--	--	dB	

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Average launch power, each lane	P _o	-6	--	4	dBm	
OMA, each lane	OMA	-4	--	3	dBm	
Transmitter and dispersion eye closure (TDECQ), each lane(max)	TDECQ			4.9	dB	
Average launch power of OFF transmitter, each lane	P _{OFF}			-30	dBm	
Receiver						
Signaling Speed per Lane		26.5625± 100 ppm			Gb/s	
Damage threshold		5			dBm	
Average receive power, each lane		-7.9		4		
Unstressed receive sensitivity, each lane	R _{SENS}			-7	dBm	1
Loss of Signal Assert	P _A	-30			dBm	
Loss of Signal De-assert	P _D			-7.5	dBm	
LOS Hysteresis		0.5		6	dB	

Note:

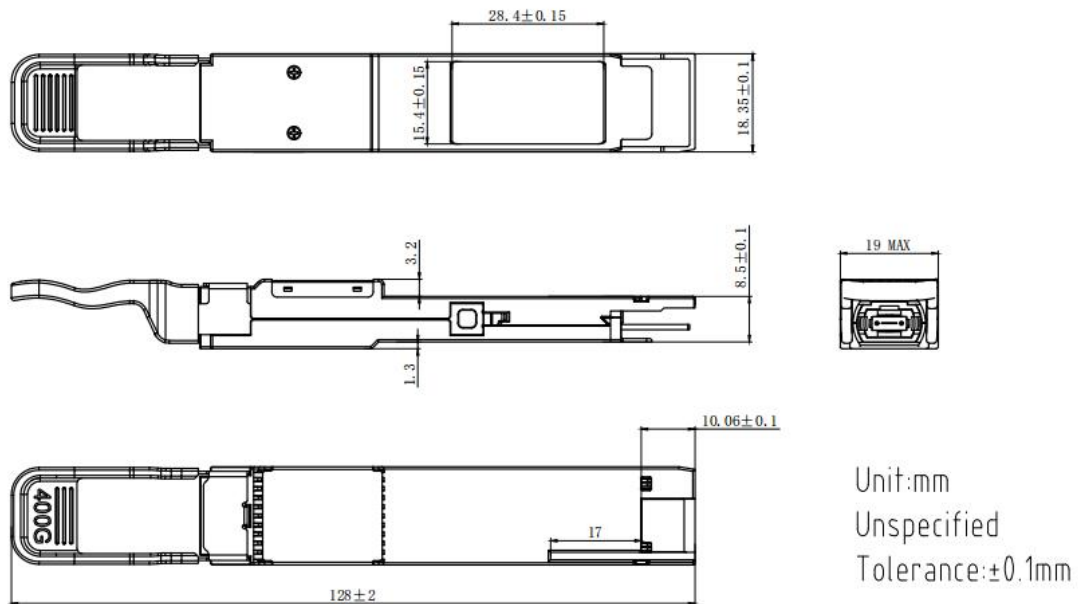
1. Measured where BER=2.4E-4 with a PRBS31Q @26.5625GBaud.

8. Digital Diagnostic Monitoring Functions

IP-ATMM70M85C support the I2C-based Diagnostic Monitoring Interface (DMI) . 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	℃
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	Mar. 4, 2019	Preliminary datasheet
1.1	Jun. 6, 2022	According to the new naming rules,update PN.
1.2	Mar.20,2024	Add PN (100m@OM4)
1.3	Jun.30, 2024	Update contact information.