

400G SR4 QSFP-DD Optical Transceiver

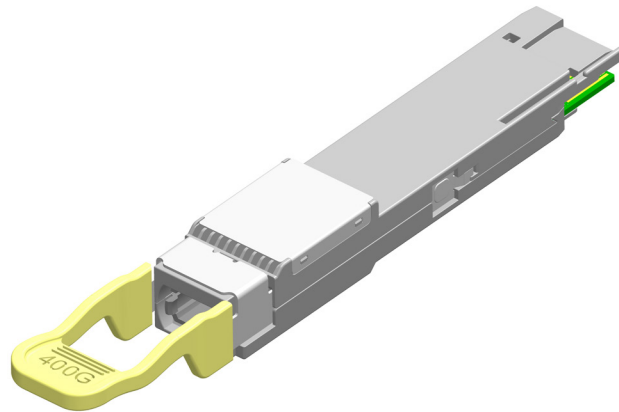
The IP-IP-ATMM50M85C4 is a QSFP-DD optical transceiver for 4X53.125GBaud optical links, and the electrical interface is 8x26.5625GBaud. Transmission is based on VCSEL 850nm with electrical driver, while Receiver side is based on PIN photodetector and TIA. Module is equipped with DSP to provide channel equalization. The receptacle of the optical type is APC MPO-12.

FEATURES

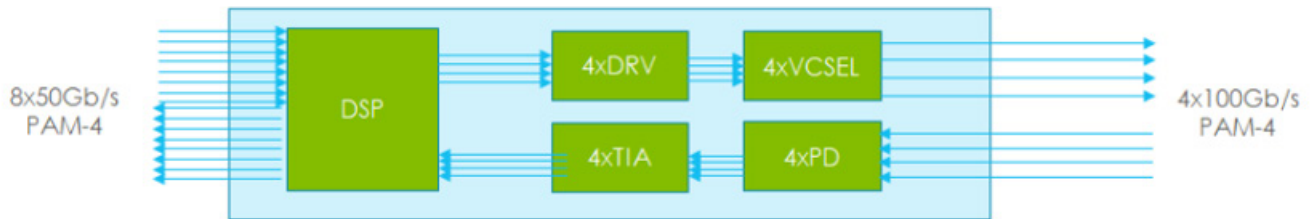
- QSFP-DD MSA compliant
- 8X26.5625GBaud electrical interface
- 4X53.125GBaud Optical interface
- Up to 50m on OM4 with MMF
- MPO-12 APC optical receptacle type
- Commercial case temperature:0~ 70°C
- Single 3.3V power supply
- Maximum power consumption 9 Watts
- CMIS 5.0 standard interface
- Aligned to IEEE802.3db

APPLICATIONS

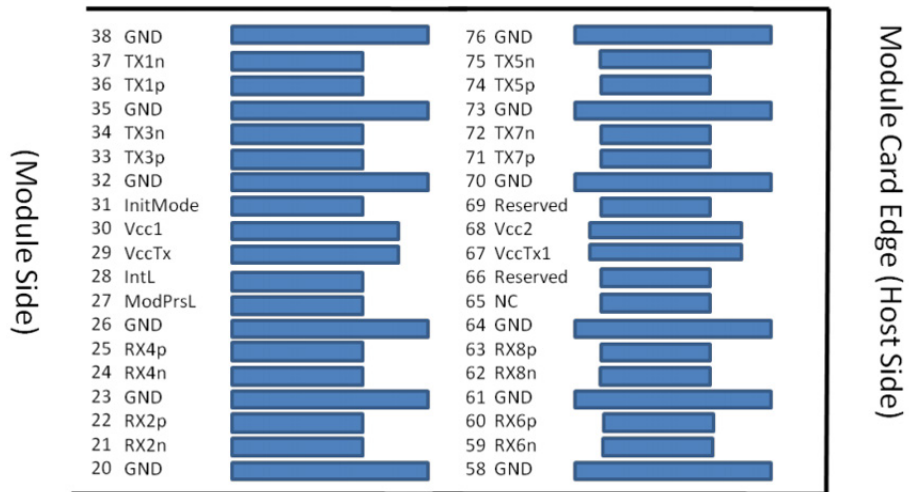
- 400GBASE-SR4 400G Ethernet
- Data Center Interconnect



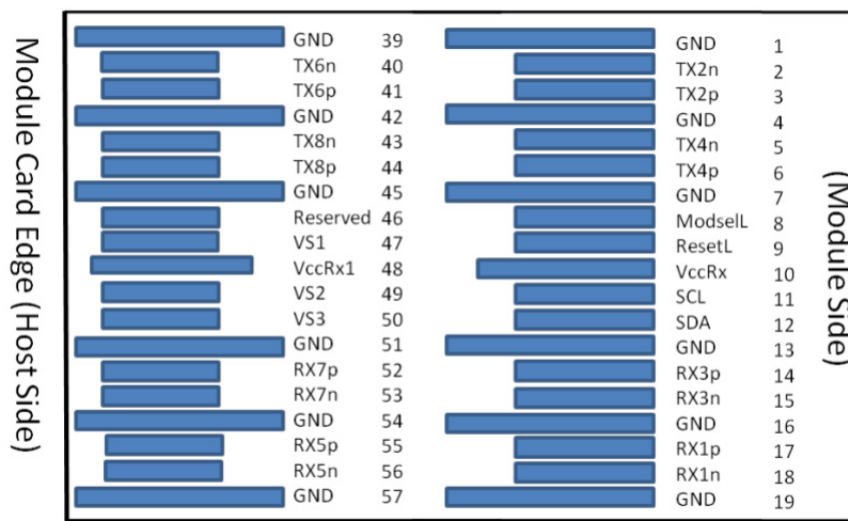
PRODUCT ARCHITECTURE



QSFP-DD PIN DIAGRAM



Top side viewed from top



Bottom side viewed from bottom

QSFP-DD PIN DESCRIPTIONS

PAD	SYMBOL	DESCRIPTION	LOGIC	PLUG SEQUENCE ²	NOTES
1	GND	Ground		1B	
2	Tx2n	Transmitter Inverted Data Input	CML-I	3B	
3	Tx2p	Transmitter Non-Inverted Data Input	CML-I	3B	
4	GND	Ground		1B	
5	Tx4n	Transmitter Inverted Data Input	CML-I	3B	
6	Tx4p	Transmitter Non-Inverted Data Input	CML-I	3B	
7	GND	Ground		1B	
8	ModSelL	Module Select	LVTTL-I	3B	
9	ResetL	Module Reset	LVTTL-I	3B	
10	VccRx	+3.3V Power Supply Receiver		2B	
11	SCL	2-wire serial interface clock	LVC MOS-I/O	3B	
12	SDA	2-wire serial interface data	LVC MOS-I/O	3B	
13	GND	Ground		1B	
14	Rx3p	Receiver Non-Inverted Data Output	CML-O	3B	
15	Rx3n	Receiver Inverted Data Output	CML-O	3B	
16	GND	Ground		1B	
17	Rx1p	Receiver Non-Inverted Data Output	CML-O	3B	
18	Rx1n	Receiver Inverted Data Output	CML-O	3B	
19	GND	Ground		1B	
20	GND	Ground		1B	
21	Rx2n	Receiver Inverted Data Output	CML-O	3B	
22	Rx2p	Receiver Non-Inverted Data Output	CML-O	3B	
23	GND	Ground		1B	
24	Rx4n	Receiver Inverted Data Output	CML-O	3B	
25	Rx4p	Receiver Non-Inverted Data Output	CML-O	3B	
26	GND	Ground		1B	
27	ModPrsL	Module Present	LVTTL-O	3B	

(1) All Vendor Specific, Reserved and No Connect pins may be terminated with 50 ohms to ground on the host. Pad 65 (No Connect) shall be left unconnected within the module. Vendor specific and Reserved pads shall have an impedance to GND that is greater than 10k Ohms and less than 100pF.

(2) Plug Sequence specifies the mating sequence of the host connector and module. The sequence is 1A, 2A, 3A, 1B, 2B, 3B. Contact sequence A will make, then break contact with additional QSFP-DD pads. Sequence 1A, 1B will then occur simultaneously, followed by 2A, 2B, followed by 3A,3B.

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PAD	SYMBOL	DESCRIPTION	LOGIC	PLUG SEQUENCE ²	NOTES
28	IntL	Interrupt	LVTTL-O	3B	
29	VccTx	+3.3V Power supply transmitter		2B	
30	Vcc1	+3.3V Power supply		2B	
31	LPMODE	Low Power mode;	LVTTL-I	3B	
32	GND	Ground		1B	
33	Tx3p	Transmitter Non-Inverted Data Input	CML-I	3B	
34	Tx3n	Transmitter Inverted Data Input	CML-I	3B	
35	GND	Ground		1B	
36	Tx1p	Transmitter Non-Inverted Data Input	CML-I	3B	
37	Tx1n	Transmitter Inverted Data Input	CML-I	3B	
38	GND	Ground		1B	
39	GND	Ground		1A	
40	Tx6n	Transmitter Inverted Data Input	CML-I	3A	
41	Tx6p	Transmitter Non-Inverted Data Input	CML-I	3A	
42	GND	Ground		1A	
43	Tx8n	Transmitter Inverted Data Input	CML-I	3A	
44	Tx8p	Transmitter Non-Inverted Data Input	CML-I	3A	
45	GND	Ground		1A	
46	Reserved	For future use		3A	1
47	VS1	Module Vendor Specific 1		3A	1
48	VccRx1	3.3V Power Supply		2A	
49	VS2	Module Vendor Specific 2		3A	1
50	VS3	Module Vendor Specific 3		3A	1
51	GND	Ground		1A	
52	Rx7p	Receiver Non-Inverted Data Output	CML-O	3A	
53	Rx7n	Receiver Inverted Data Output	CML-O	3A	
54	GND	Ground		1A	

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55	Rx5p	Receiver Non-Inverted Data Output	CML-O	3A	
56	Rx5n	Receiver Inverted Data Output	CML-O	3A	
57	GND	Ground		1A	
58	GND	Ground		1A	
59	Rx6n	Receiver Inverted Data Output	CML-O	3A	
60	Rx6p	Receiver Non-Inverted Data Output	CML-O	3A	
61	GND	Ground		1A	
62	Rx8n	Receiver Inverted Data Output	CML-O	3A	
63	Rx8p	Receiver Non-Inverted Data Output	CML-O	3A	
64	GND	Ground		1A	
65	NC	No Connect		3A	1
66	Reserved	For future use		3A	1
67	VccTx1	3.3V Power Supply		2A	
68	Vcc2	3.3V Power Supply		2A	
69	Reserved	For future use		3A	1
70	GND	Ground		1A	
71	Tx7p	Transmitter Non-Inverted Data Input	CML-I	3A	
72	Tx7n	Transmitter Inverted Data Input	CML-I	3A	
73	GND	Ground		1A	
74	Tx5p	Transmitter Non-Inverted Data Input	CML-I	3A	
75	Tx5n	Transmitter Inverted Data Input	CML-I	3A	
76	GND	Ground		1A	

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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	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	

RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	MIN	TYPICAL	MAX	UNIT	NOTES
Operating Case Temperature	T_{case}	0	25	70	°C	
Supply Voltage	VCC	3.135	3.3	3.465	V	
Relative Humidity	RH	5		85	%	
Data Rate (Optical)	DRO		4*106.25		Gbps	
Data Rate (Electrical)	DRE		8*53.125		Gbps	

ELECTRICAL CHARACTERISTICS

(EOL, $T_{case} = 0 \sim 65^\circ$, $V_{CC} = 3.135 \sim 3.465$ V)

PARAMETER	SYMBOL	MIN	TYPICAL	MAX	UNIT	NOTES
Power Dissipation	P_d			9	W	
TRANSMITTER						
Data Rate, each lane	DRE		53.125		Gbps	
Differential Voltage pk-pk	VIN	40		900	mV	
Input differential impedance	ZIN		100		Ohm	
Differential Termination Resistance Mismatch				10	%	
RECEIVER						
Data Rate, each lane	DRE		53.125		Gbps	
Output differential impedance	Z_{OUT}		100		Ohm	
Differential Termination Resistance Mismatch				10	%	
Differential output voltage	V_{OUT}			1000	mV	

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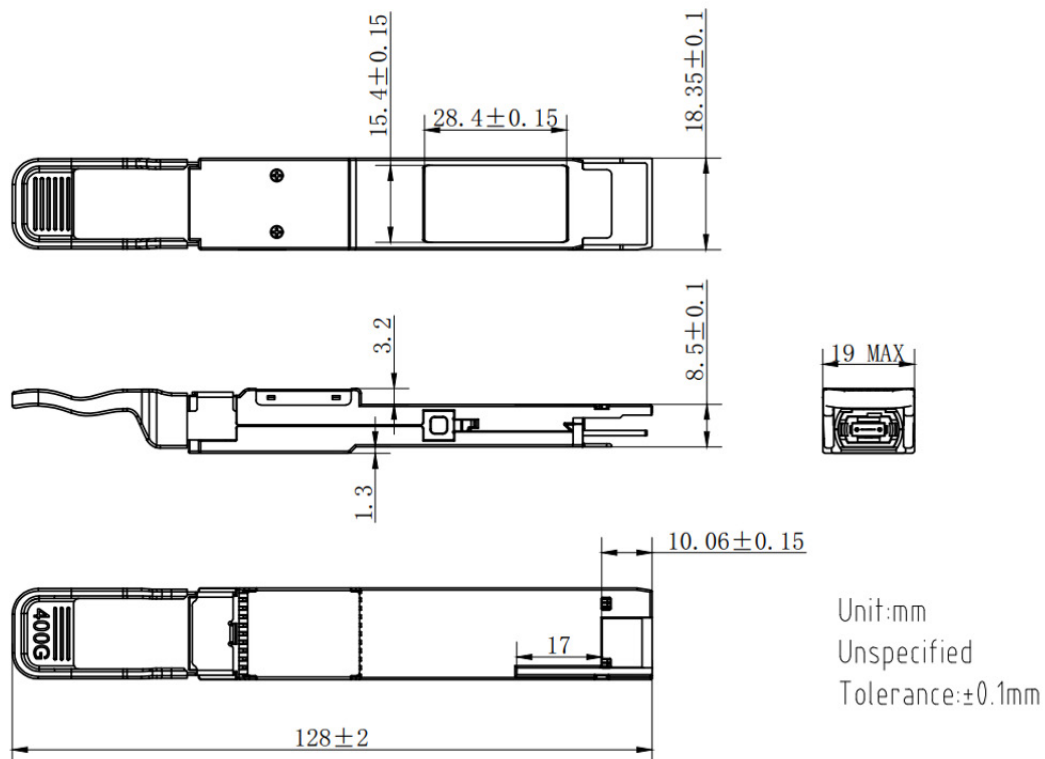
OPTICAL CHARACTERISTICS

(EOL, Tcase= 0~65°, VCC=3.135~3.465 V)

PARAMETER	SYMBOL	MIN	TYPICAL	MAX	UNIT	NOTES
Signaling Speed per Lane	DRO		106.25		Gbps	
Center Wavelength	λ		850		nm	
RMS Spectral Width	$\Delta\lambda$			0.6	nm	
Average launch power		-1		4	dBm	
TX TDECQ				4.4	dB	
TX ER		2.5			dB	
Receiver sensitivity (max) For TDECQ \leq 1.8dB For 1.8 < TDECQ \leq 4.4dB			-4.4 -6.2+TDECQ		dBm	

ORDERING INFORMATION

JABIL PART NUMBER	PACKAGE	RATE	REACH	OTHER INFO
QD4CS1MOC000PAM	QSFP-DD	s400G	50m	C-temp

QSFP-DD FORM MECHANICAL SPECIFICATIONSFor additional information, visit jabil.com

REGULATORY COMPLIANCE

FEATURE	REFERENCE STANDARDS	PERFORMANCE
ESD-HBM	JESD22-A114-B	1KV high speed Pins, 2KV other Pins
ESD-Air Discharge	IEC 61000-4-2	+/-15KV
ESD-Contact Discharge	IEC 61000-4-2	+/-8KV
EMC-RE	FCC Part 15 Class B	
EMC-RS	IEC 61000 4-3	
ROHS 2.0	2011/65/EU	

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