

PRODUCT FEATURES

- QSFP+ MSA compliant
- 4x10Gb/s electrical interface
- Supports 41.2Gb/s aggregate bit rate
- Up to 150m on OM3 MMF
- Single 1x12 MPO receptacle
- Hot-pluggable QSFP+ footprint
- Quad channel full-duplex transceiver module
- Commercial case temperature: 0°C to 70°C
- Single 3.3V power supply
- Maximum power consumption 1 Watts
- Support Digital Diagnostic Monitor interface
- Unretimed XLPPI electrical interface



APPLICATIONS

- 40GBASE-SR4 Ethernet
- Data Center Interconnect
- Breakout to 10GBASE-SR Ethernet
- Proprietary interconnections

COMPLIANCE

- QSFP+ MSA
- SFF-8436
- IEEE802.3ba
- RoHS 2.0

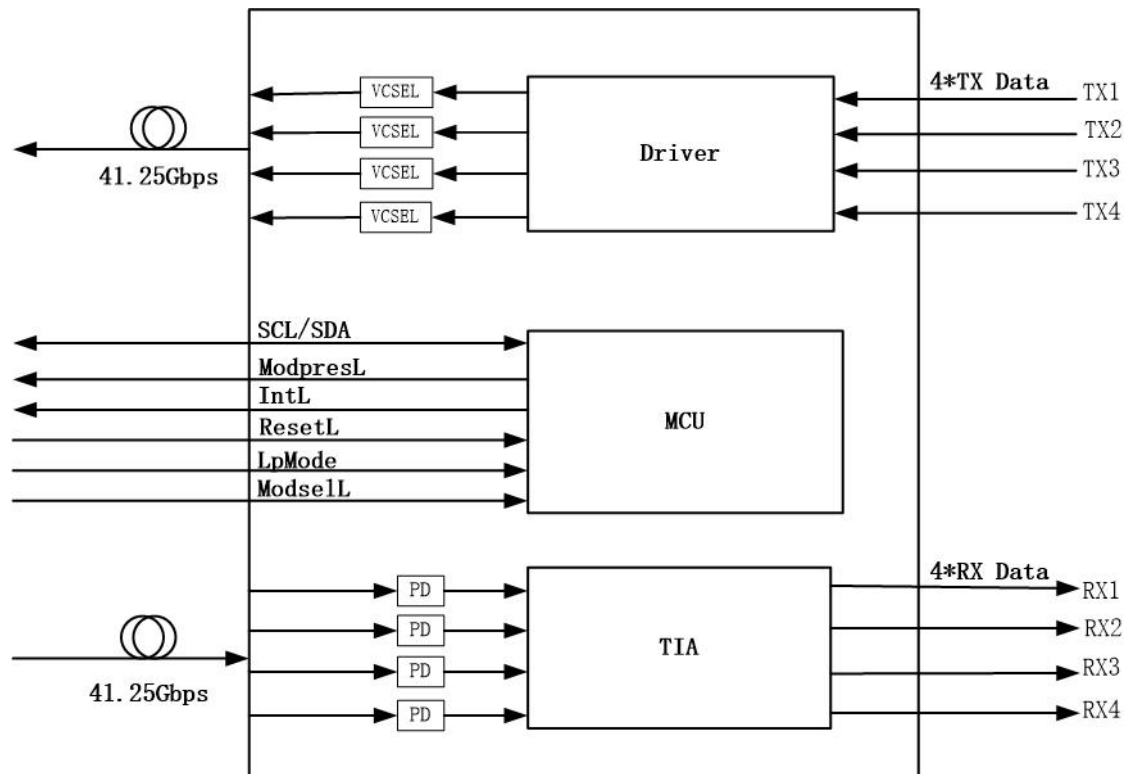
Ordering information

Part Number	Data Rate (Gb/s)	Media	Wavelength(nm)	Operating distance(m)	Temperature(°C)
IP-EAMS15M85C	41.2	MMF	850	150(OM3)	0~70

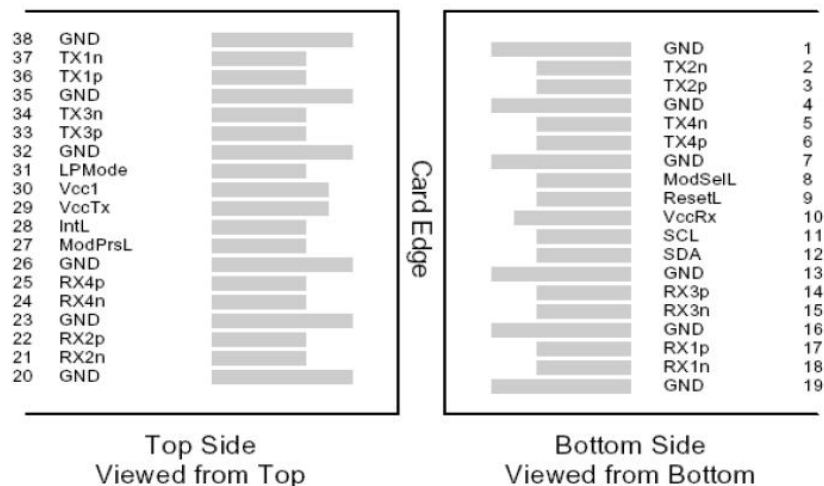
Product Description

IP-EAMS15M85C is designed for 40 Gigabit per second links over multi-mode fiber. It is compliant with the QSFP+ MSA and IEEE 802.3ba 40GBASE-SR4. Module-level digital diagnostic functions are available via an I²C interface, as specified by the QSFP+ MSA. The optical transceiver is compliant per the RoHS Directive 2011/65/EU.

1. Block Diagram



2. Pin Diagram



QSFP+ MSA-compliant 38-pin connector

3. Pin Descriptions

Pin	Symbol	Name/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	ModSe1L	Module Select	
9	ResetL	Module Reset	
10	Vcc Rx	+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

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	0		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	R _H	5		85	%	
Data Rate (Optical)	DR _O		4*10.3125		Gbps	
Data Rate (Electrical)	DR _E		4*10.3125		Gbps	
Operating Distance	L _D			150(OM3)	m	

6. Electrical Characteristics

40GBASE-SR4 Operation (EOL, TOP = 0 ~70°C ,VCC = 3.135 to 3.465 V)

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Power Dissipation				1	W	
Supply Current	I _{CC}			300	mA	
Transmitter						
Data Rate, each lane			10.3125		Gbps	
Differential Voltage pk-pk	V _{pp}			900	mV	
Input differential impedance	R _{in}		100		Ohm	1
Differential Termination Resistance Mismatch				10	%	
Receiver						
Data Rate, each lane			10.3125		Gbps	
Output differential impedance	R _{out}		100		Ohm	
Differential Termination Resistance Mismatch				10	%	
Differential output voltage	V _{out, pp}			900	mV	2

Notes:

- 1.Connected directly to TX data input pins, AC coupled thereafter.
- 2.Into 100Ω differential termination.

7. Optical Characteristics

40GBASE-SR4 Operation (EOL, TOP = 0 ~70°C ,V_{CC} = 3.135 to 3.465 V)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Transmitter(per Lane)						
Average Output Power	POUT	-7.6		2.4	dBm	
Transmit OMA per Lane	TxOMA	-5.6		3.0	dBm	1
Extinction Ratio	ER	3.0			dB	
Center Wavelength	λ	840	850	860	nm	
RMS Spectral Width	σ			0.65	nm	
Transmitter and Dispersion Penalty	TDP			3.5	dB	
Transmitter OFF Output Power	POff			-30	dBm	
Transmitter eye mask definition {X1,X2,X3,Y1,Y2,Y3}		0.23,0.34,0.43,0.27,0.35,0.4				
Receiver(per Lane)						
Input Optical Wavelength	λ	840	850	860	nm	
Rx Sensitivity per lane	RSENS			-9.5	dBm	2
Input Saturation Power (Overload)	PSAT	+2.4			dBm	
Receiver Reflectance	Rfl			-12	dBm	
Loss of Signal Assert	PA	-30			dBm	
Loss of Signal De-assert	PD			-12	dBm	
LOS Hysteresis	PD - PA	0.5		6	dB	

Notes:

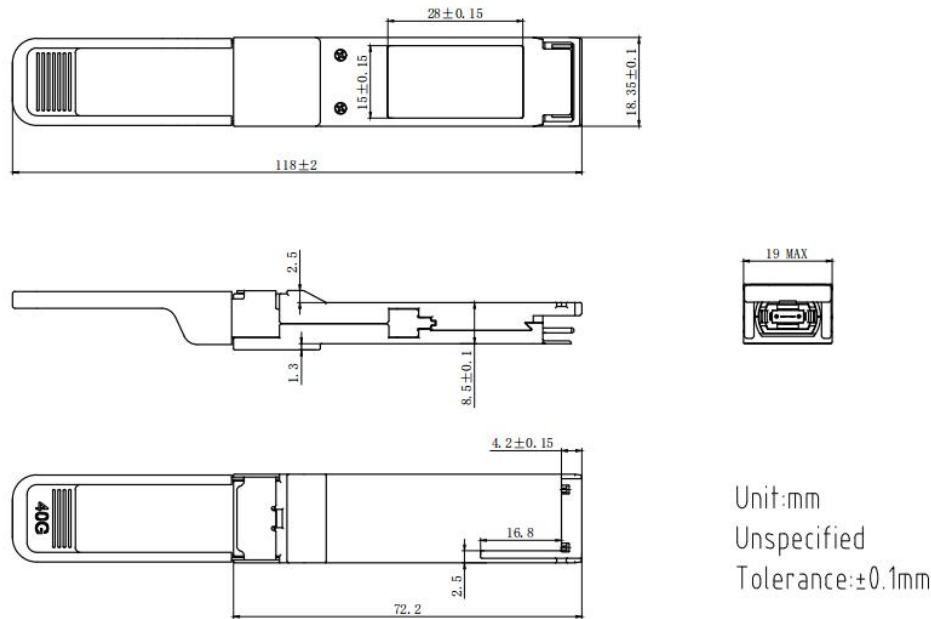
- 1.Even if TDP is <0.9dB, the OMA min must exceed this value.
- 2.Sensitivity is specified at BER@1E-12.

8. Digital Diagnostic Monitoring Functions

IP-EAMS15M85C support the I2C-based Diagnostic Monitoring Interface (DMI) defined in document SFF-8436. 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 2.0	2002/95/EC	Compatible with standards

11. Contact Information

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12. Revision History

Version No.	Date	Description
1.0	Dec.20,2021	Preliminary datasheet
1.1	Jul.8,2022	Update mechanical specifications
1.2	Aug.25.2022	Modifying Error Description
1.3	Jun.30, 2024	Update contact information.