

PRODUCT FEATURES

- QSFP28 MSA compliant
- 4x25Gb/s electrical interface
- Supports 103.1Gb/s aggregate bit rate
- Up to 100m on OM4 MMF
- Single 1x12 MPO receptacle
- Hot-pluggable QSFP28 footprint
- Quad channel full-duplex transceiver module
- Commercial case temperature: 0°C to 70°C
- Single 3.3V power supply
- Maximum power consumption 3.5 Watts
- Support Digital Diagnostic Monitor interface

APPLICATIONS

- 100GBASE-SR4 Ethernet

COMPLIANCE

- QSFP28 MSA
- SFF-8665
- IEEE802.3bm
- RoHS 2.0

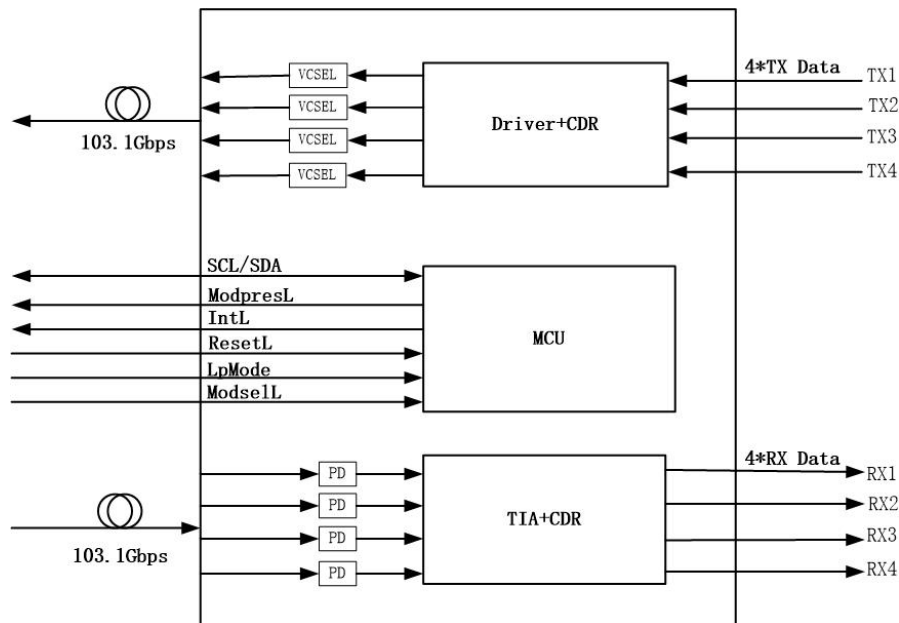
Ordering information

Part Number	Data Rate (Gb/s)	Media	Wavelength(nm)	Operating distance(m)	Temperature(°C)
IP-CAMS10M85C	103.1	MMF	850	100(OM4)	0~70

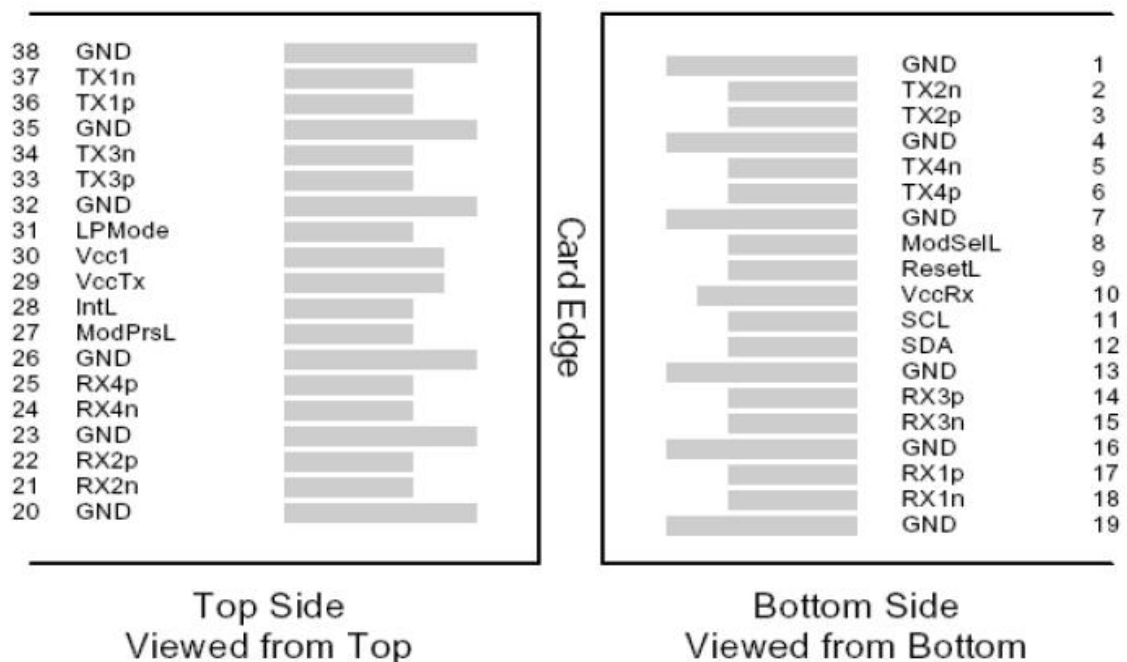
Product Description

IP-CAMS10M85C is designed for 100 Gigabit per second links over multi-mode fiber. It is compliant with the QSFP28 MSA and IEEE 802.3bm. Module-level digital diagnostic functions are available via an I²C interface, as specified by the QSFP28 MSA. The optical transceiver is compliant per the RoHS Directive 2011/65/EU.

1. Block Diagram



2. Pin Diagram



QSFP28 38pin connector (SFF 8665)

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	ModSelL	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	Vcc Tx	+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		4	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*25.78125		Gbps	
Data Rate (Electrical)	DR _E		4*25.78125		Gbps	
Operating Distance	L _D			100(OM4)	m	

6. Electrical Characteristics

100GBASE-SR4 Operation (EOL, TOP = 0 ~70°C ,V_{cc} = 3.135 to 3.465 V)

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Power Dissipation				3.5	W	1
Supply Current	I _{cc}			1.5	A	
Transmitter						
Data Rate, each lane			25.78125		Gbps	
Differential Voltage pk-pk	V _{pp}			900	mV	
Input differential impedance	R _{in}		100		Ohm	
Differential Termination Resistance Mismatch				10	%	
Receiver						
Data Rate, each lane			25.78125		Gbps	
Output differential impedance	R _{out}		100		Ohm	
Differential Termination Resistance Mismatch				10	%	
Differential output voltage	V _{out, pp}	400	600	800	mV	2

Notes:

1.Maximum total power value is specified across the full temperature and voltage range when CDR is locked or a lack of input signal results in squelch being activated.If incorrect frequencies cause the CDR to continuously attempt to lock, maximum power dissipation may reach 3.5W.

2.Output voltage is settable in 4 discrete range via I2C.Default range is Range 2 (400 – 800mV).

7. Optical Characteristics

100GBASE-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	-8.4		2.4	dBm	
Transmit OMA per Lane	TxOMA	-6.4		3.0	dBm	
Extinction Ratio	ER	2			dB	
Center Wavelength	λ	840	850	860	nm	
RMS Spectral Width	σ			0.6	nm	
Transmitter OFF Output Power	POff			-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(per Lane)						
Input Optical Wavelength	λ	840	850	860	nm	
Rx Sensitivity average,per lane	SEN			-10.3	dBm	2
Rx Sensitivity OMA,per lane	SEN_OMA			-10	dBm	ER=5dB
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			-11.3	dBm	
LOS Hysteresis	PD - PA	0.5		6	dB	

Notes:

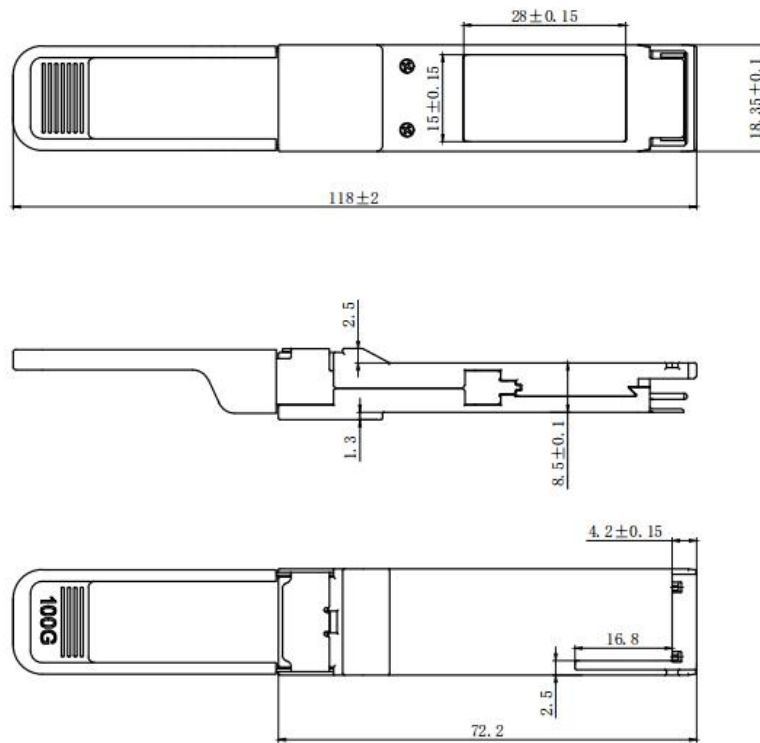
- 1.Hit Ratio 5×10^{-5} .
- 2.Sensitivity is specified at BER@5E-5.

8. Digital Diagnostic Monitoring Functions

IP-CAMS10M85C support the I2C-based Diagnostic Monitoring Interface (DMI) defined in document SFF-8665. 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	$\pm 3\%$	V
Tx Bias Current	$\pm 10\%$	mA
Tx Optical Power	± 3	dB
Rx Optical Power	± 3	dB

9. Mechanical Specifications



Unit:mm
Unspecified
Tolerance:±0.1mm

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

Wuhan Inphilight Technology Company Limited

NO.4 Building,Bonded Optoelectronics Industrial Park,Wuhan East Lake Comprehensive Bonded Area,NO.777-30 Optics Valley 3rd Road,East Lake Hi-Technology Development Zone,Wuhan, Hubei, China

Email: sales@inphilight.com

12. Revision History

Version No.	Date	Description
1.0	Jun.6,2022	Preliminary datasheet
1.1	Aug.25.2022	Modifying Error Description
1.2	Mar. 13,2024	Add OMA sensitivity
1.3	Jun.30, 2024	Update contact information.