

Product Specification

QSFP28 100GBASE-SR4 100m

CL100GQSFP4SR4

Product Features

- 4 channels full-duplex transceiver module
- Up to 25.78125Gbps data links per channel
- Maximum link length of 100m on OM3 Multimode Fiber (MMF) and 150m on OM4 MMF
- 850nm VCSEL array laser and receiver
- MPO Connector
- Built-in digital diagnostic functions
- Hot-pluggable QSFP+ form factor
- Single 3.3V power supply
- Operating temperature: 0°C to 75°C
- RoHS 6 compliant (lead free)
- Digital Diagnostic Monitor (DDM)
- Power Consumption < 2.5W



Applications

- √ 100GBase-SR4 Ethernet
- √ Switch, Router
- √ 4CH SDR, DDR and QDR
- √ Backplane Application

1. Product Description

This product is an integrated transceiver module containing a micro-optic component and semiconductor material, and can

implement optical-electrical conversion and electrical-optical conversion. The module is designed as a four-channel,

pluggable, parallel, QSFP28 transceiver for 100Gbps fiber-communication. Each channel can operate at 25.78125Gbps up

to 100m on OM3 fiber or 150m on OM4 fiber. And the operating wavelength is 850nm. The optical interface uses an 12 fiber

MTP(MPO) connector, and the electrical interface uses a 38 contact edge type connector.

This product is compliant to 100GBASE-SR4 of IEEE802.3bm standard and SFF-8636、SFF-8665 specification, and

provides reliable long life, high performance, and consistent service.

2. 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	Max	Unit	Note
Storage Temperature Tst	Tst	-40	+85	degC	
Relative Humidity (non-condensation)	RH	5	90	%	
Operating Case Temperature	Topc	0	+75	degC	
Operating Range		0.002	100	m	OM3
Supply Voltage	VCC	-0.3	3.6	V	

3. Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit
Supply Voltage	Vcc	3.1	3.3	3.5	V
Case Operating Temperature	Tca	0	25	70	°C
Data Rate Per Lane	fd		25.78125		Gbps
Humidity	Rh	5		85	%
Power Dissipation	Pm			2.5	W
Fiber Bend Radius	Rb	0.5			cm

4.Specifications

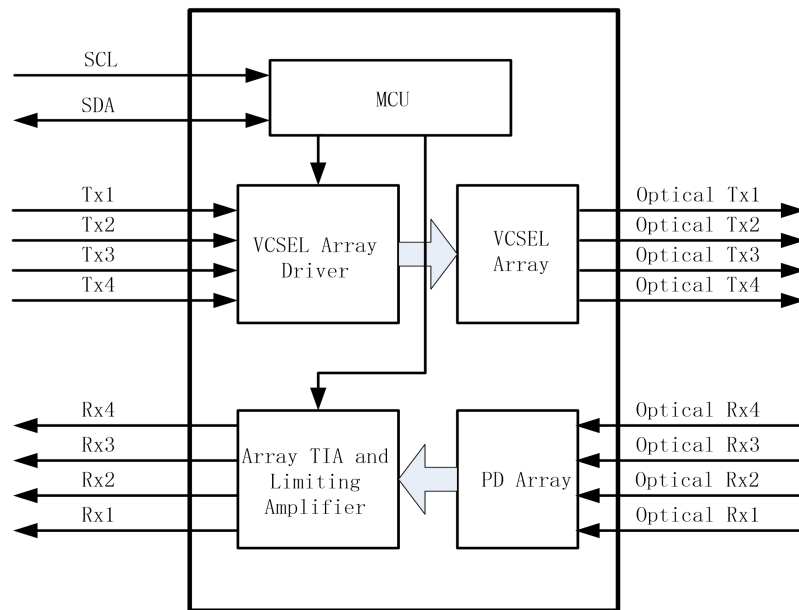
Test under recommended operating conditions, unless otherwise noted

Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Transmitter						
Signaling Speed per Lane		25.78125 ± 100ppm			Gb/s	1
Center wavelength		840	850	860	nm	
RMS Spectral Width	SW			0.6	nm	
Average Launch Power per Lane	TXP _x	-8.4		2.4	dBm	
Transmit OMA per Lane	TxOMA	-6.4		3	dBm	
Launch Power [OMA] minus TDEC per Lane	P-TDEC	-7.3			dBm	
TDEC per Lane	TDEC			4.3	dBm	
Optical Extinction Ratio	ER	2			dB	
Optical Return Loss Tolerance	ORL			12	dB	
Encircled Flux	FLX	>86% at 19 um <30% at 4.5 um				
Average Launch Power of OFF Transmitter, per Lane				-30	dBm	
Transmitter Eye mask definition {X1, X2, X3, Y1, Y2, Y3}		{0.3,0.38,0.45,0.35,0.41,0.5}				2
Receiver						
Signaling Speed per Lane		25.78125 ± 100ppm			GBd	3
Center wavelength		840		860	nm	
Damage Threshold	DT	3.4			dBm	
Average Receive Power per Lane	RXP _x	-10.3		2.4	dBm	4
Receive Power (OMA) per Lane	RxOMA			3	dBm	
Receiver Reflectance	Rfl			-12	dB	
Stressed Receiver Sensitivity (OMA) per Lane	SRS			-5.2	dBm	
Stressed Conditions:						
Stressed Eye Closure	SEC	4.3			dB	
Stressed Eye J2 Jitter	J2	0.39			UI	
Stressed Eye J4 Jitter	J4	0.53			UI	
OMA of each aggressor lane		3			dBm	
Stressed Receiver Eye Mask Definition {X1, X2, X3, Y1, Y2, Y3}		{0.28,0.5,0.5,0.33,0.33,0.4}				5
LOS De-Assert	LOS _D			-13	dBm	
LOS Assert	LOS _A	-30			dBm	
LOS Hysteresis		0.5	2		dB	

Notes:

1. Transmitter consists of 4 lasers operating at a maximum speed of 25.78125Gb/s ±100ppm each.
2. Hit Ratio 1.5×10^{-3} hits/sample.
3. Receiver consists of 4 photodetectors operating at a maximum speed of 25.78125Gb/s ±100ppm each.
4. Minimum value is informative only and not the principal indicator of signal strength.
5. Hit Ratio 5×10^{-5} hits/sample.

5. Transceiver Block Diagram



6. Pin Assignment

Pin No.	Description	Pin No.	Description
1	GND	38	GND
2	TX1n	37	TX2n
3	TX1p	36	TX2p
4	GND	35	GND
5	TX3n	34	TX4n
6	TX3p	33	TX4p
7	GND	32	GND
8	LPMode	31	ModSetL
9	Vcc1	30	ResetL
10	VccTx	29	VccRx
11	IntL	28	SCL
12	ModPrsL	27	SDA
13	GND	26	GND
14	Rx4p	25	RX3p
15	Rx4n	24	RX3n
16	GND	23	GND
17	Rx2p	22	RX1p
18	Rx2n	21	RX1n
19	GND	20	GND

Pin Definitions

PIN	Logic	Symbol	Name/Description	No
1		GND	Ground	1
2	CML-I	Tx2n	Transmitter Inverted Data Input	
3	CML-I	Tx2p	Transmitter Non-Inverted Data output	
4		GND	Ground	1
5	CML-I	Tx4n	Transmitter Inverted Data Input	
6	CML-I	Tx4p	Transmitter Non-Inverted Data output	
7		GND	Ground	1
8	LVTLL-I	ModSelL	Module Select	
9	LVTLL-I	ResetL	Module Reset	
10		VccRx	+ 3.3V Power Supply Receiver	2
11	LVC MOS-I/O	SCL	2-Wire Serial Interface Clock	
12	LVC MOS-I/O	SDA	2-Wire Serial Interface Data	
13		GND	Ground	
14	CML-O	Rx3p	Receiver Non-Inverted Data Output	
15	CML-O	Rx3n	Receiver Inverted Data Output	
16		GND	Ground	1
17	CML-O	Rx1p	Receiver Non-Inverted Data Output	
18	CML-O	Rx1n	Receiver Inverted Data Output	
19		GND	Ground	1
20		GND	Ground	1
21	CML-O	Rx2n	Receiver Inverted Data Output	
22	CML-O	Rx2p	Receiver Non-Inverted Data Output	
23		GND	Ground	1
24	CML-O	Rx4n	Receiver Inverted Data Output	1
25	CML-O	Rx4p	Receiver Non-Inverted Data Output	
26		GND	Ground	1
27	LVTTL-O	ModPrsL	Module Present	
28	LVTTL-O	IntL	Interrupt	
29		VccTx	+3.3 V Power Supply transmitter	2
30		Vcc1	+3.3 V Power Supply	2
31	LVTTL-I	LPMODE	Low Power Mode	
32		GND	Ground	1
33	CML-I	Tx3p	Transmitter Non-Inverted Data Input	
34	CML-I	Tx3n	Transmitter Inverted Data Output	
35		GND	Ground	1
36	CML-I	Tx1p	Transmitter Non-Inverted Data Input	

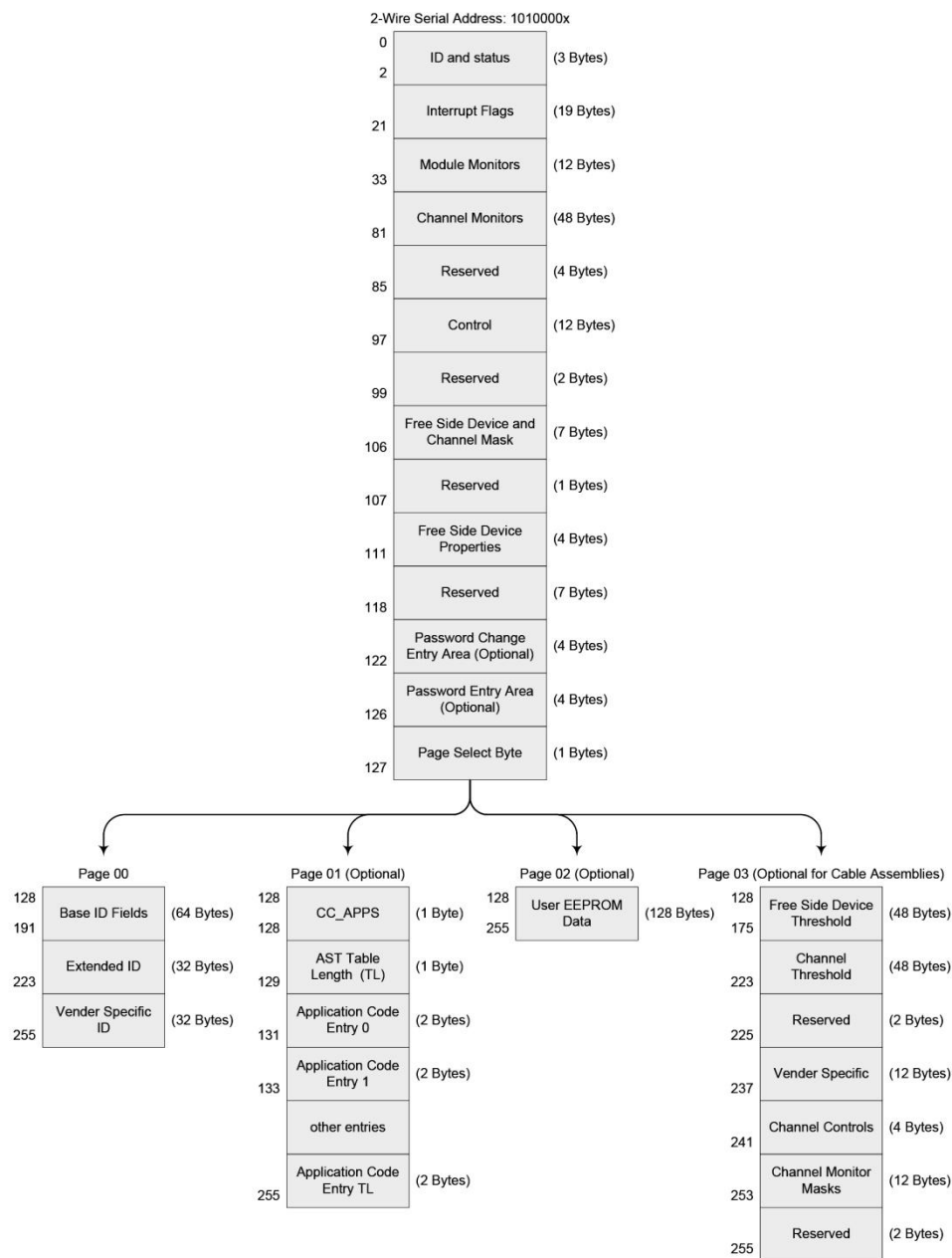
37	CML-I	Tx1n	Transmitter Inverted Data Output	
38		GND	Ground	1

Note:

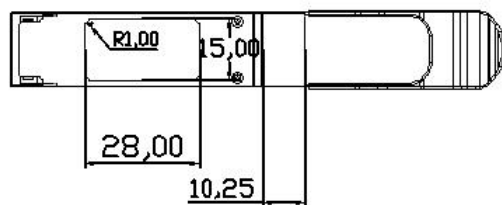
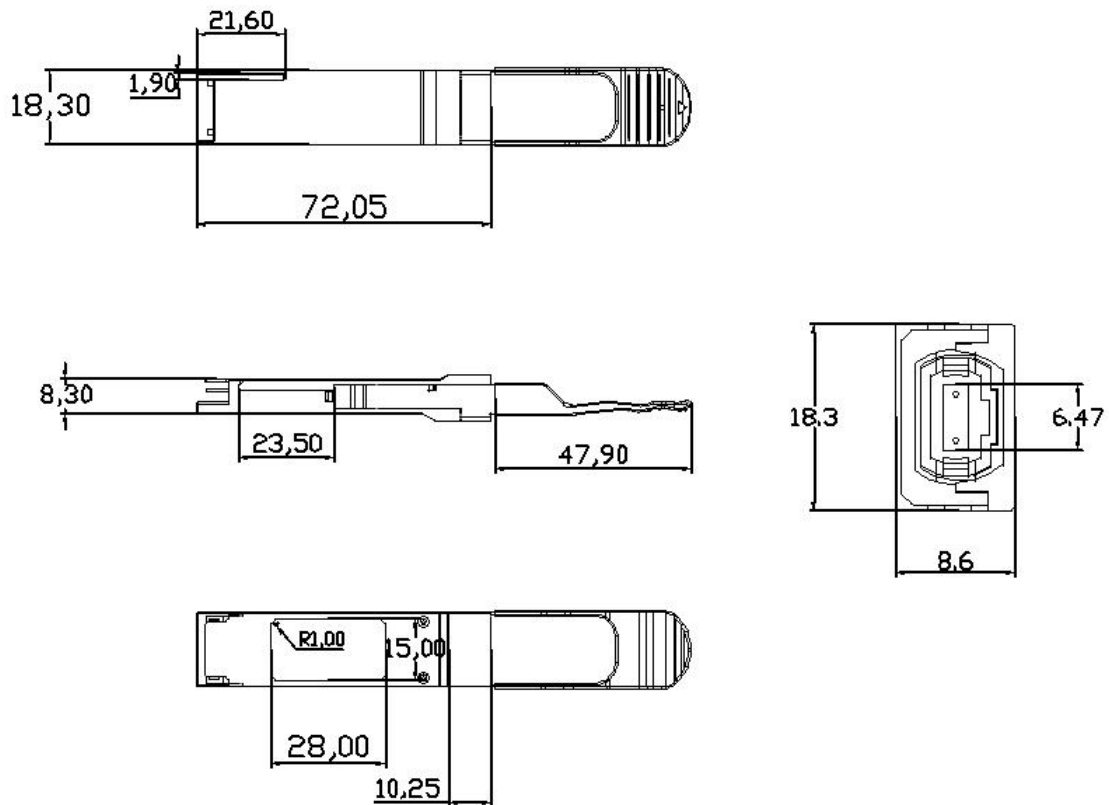
GND is the symbol for signal and supply (power) common for QSFP28 modules. All are common within the QSFP28 module and all module voltages are referenced to this potential unless otherwise noted. Connect these directly to the host board signal common ground plane.

VccRx, Vcc1 and VccTx are the receiving and transmission power suppliers and shall be applied concurrently. Recommended host board power supply filtering is shown below. Vcc Rx, Vcc1 and Vcc Tx may be internally connected within the QSFP28 transceiver module in any combination. The connector pins are each rated for a maximum current of 500mA

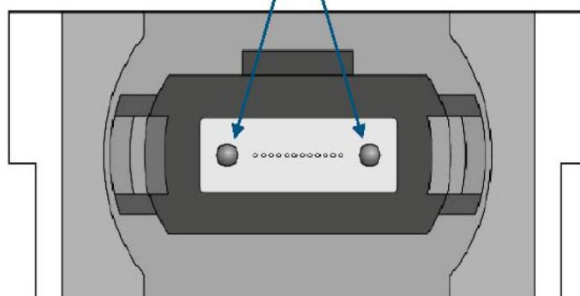
7.QSFP28 Memory Map



8. Mechanical Specifications



Alignment pins



Transmit Channels: 1 2 3 4
 Unused positions: x x x x
 Receive Channels: 4 3 2 1

9. ESD

This transceiver is specified as ESD threshold 1kV for all electrical input pins, tested per MIL-STD-883, Method 3015.4 /JESD22-A114-A (HBM). However, normal ESD precautions are still required during the handling of this module. This transceiver is shipped in ESD protective packaging. It should be removed from the packaging and handled only in an ESD protected environment.

10. Laser Safety

This is a Class 1 Laser Product according to IEC 60825-1:1993+A1:1997+A2:2001. This product complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated (July 24, 2007)

Ordering Information

Part Number	Product Description
CL100GQSFP28R4	100Gbps QSFP28, 850nm, 100m, 0°C~+75°C

VERSION UPDATE:

VERSION NO.	DATE	UPDATED INFORMATION
V20161101	20161101	1. NEW PUBLISHED

NOTICE:

C-LIGHT reserves the right to make changes to this product in this specification without notice, in order to improve product performance.

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