

SOQP-SR4-10

QSFP28 100GBASE-SR4 100m

Features

- 4 channels full-duplex transceiver modules
- Transmission data rate up to 25.78125Gbps per channel
- 4 channels 850nm VCSEL array
- 4 channels PIN photo detector array
- Low power consumption <1.5W
- Hot Pluggable QSFP28 form factor
- Maximum link length of 100m on OM3 Multimode Fiber (MMF) and 150m on OM4 MMF
- Single MPO connector receptacle
- Built-in digital diagnostic functions
- Operating case temperature -5°C to +75°C
- 3.3V power supply voltage
- RoHS 6 compliant(lead free)

Applications

- 100GBASE-SR4 Ethernet
- Switch, router and HBAs
- Infiniband transmission at 4 channels SDR, DDR and QDR
- High-performance Backplane Applications
- Proprietary Protocol Applications

General 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.

Transceiver Block Diagram

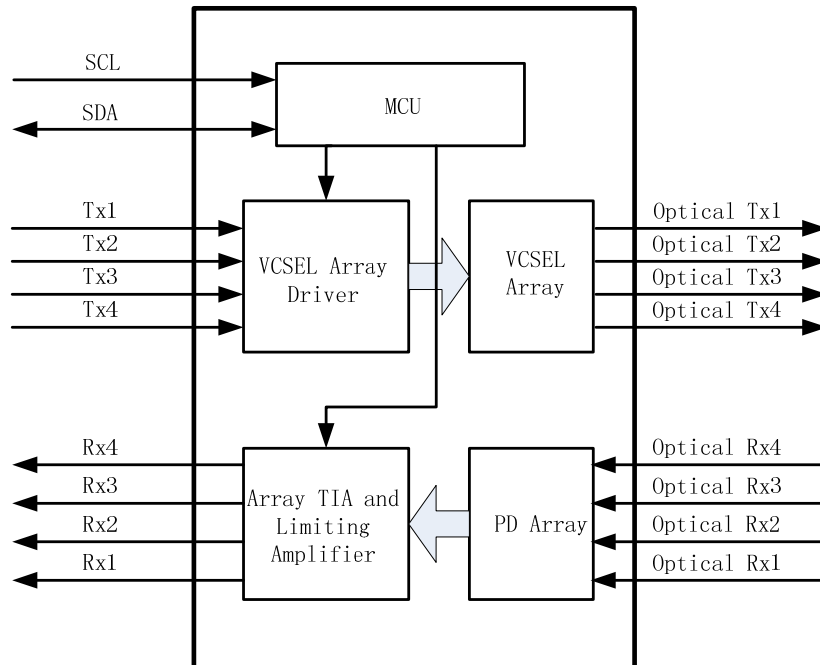


Figure1. Transceiver Block Diagram

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	Note
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	LVTTTL-O	ModPrsL	Module Present	
28	LVTTTL-O	IntL	Interrupt	
29		VccTx	+3.3 V Power Supply transmitter	2
30		Vcc1	+3.3 V Power Supply	2
31	LVTTTL-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:

1. 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.

2. 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.

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	-40	+85	degC	
Relative Humidity (non-condensation)	RH	5	90	%	
Operating Case Temperature	Topc	-5	+75	degC	
Operating Range		0.002	100	m	
Supply Voltage	VCC	-0.3	3.6	V	

Recommended Operating Conditions

Parameter	Symbol	Min	Typical	Max	Unit
Supply Voltage	Vcc	3.1	3.3	3.5	V
Case Operating Temperature	Tca	-5	25	+75	°C
Data Rate Per Lane	fd		10.3	10.5	Gbps
Humidity	Rh	5		85	%
Power Dissipation	Pm			1.5	W
Fiber Bend Radius	Rb	0.5			cm

Specifications

Test under recommended operating conditions, unless otherwise noted.

Description	Unit	Value	
		Min	Max
Transmitter(each lane)			
Center wavelength	nm	840	860
RMS spectral width	nm		0.6
Average launch power(OMA),each lane	dBm	-8.4	2.4
Optical Modulation Amplitude, each lane	dBm	-6.4	3.0
Extinction ratio	dB	2	
Average launch power of OFF transmitter, each lane	dBm		-30
Receiver(each lane)			
Center wavelength	nm	840	860

Damage threshold	dBm	3.4	
Average power at receiver input,each lane	dBm	-10.3	2.4
Optical Modulation Amplitude(OMA),each lane	dBm		3
Stressed receiver sensitivity in OMA,each lane	dBm		-5.2

QSFP28 Memory Map

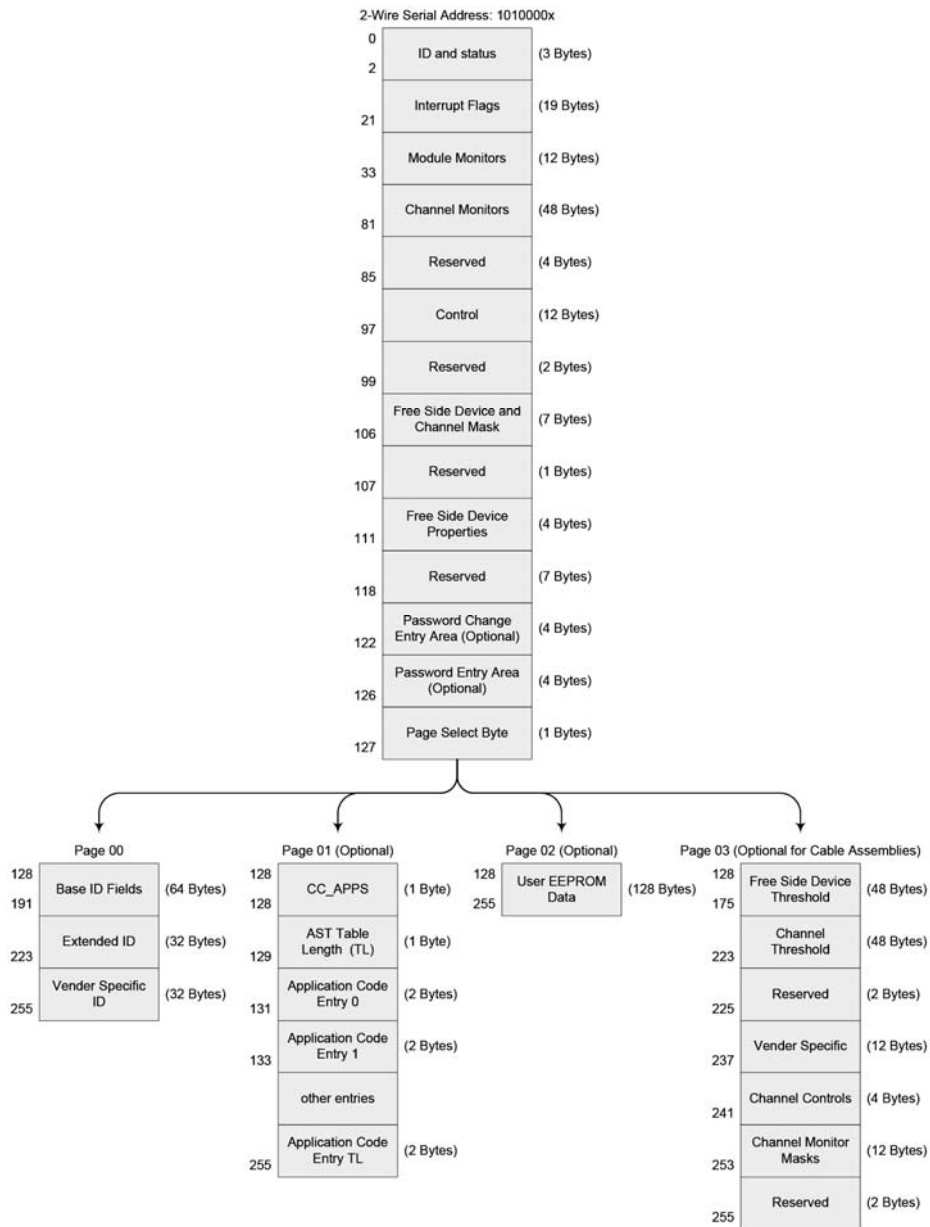


Figure3. QSFP28 Memory Map

Mechanical Dimensions

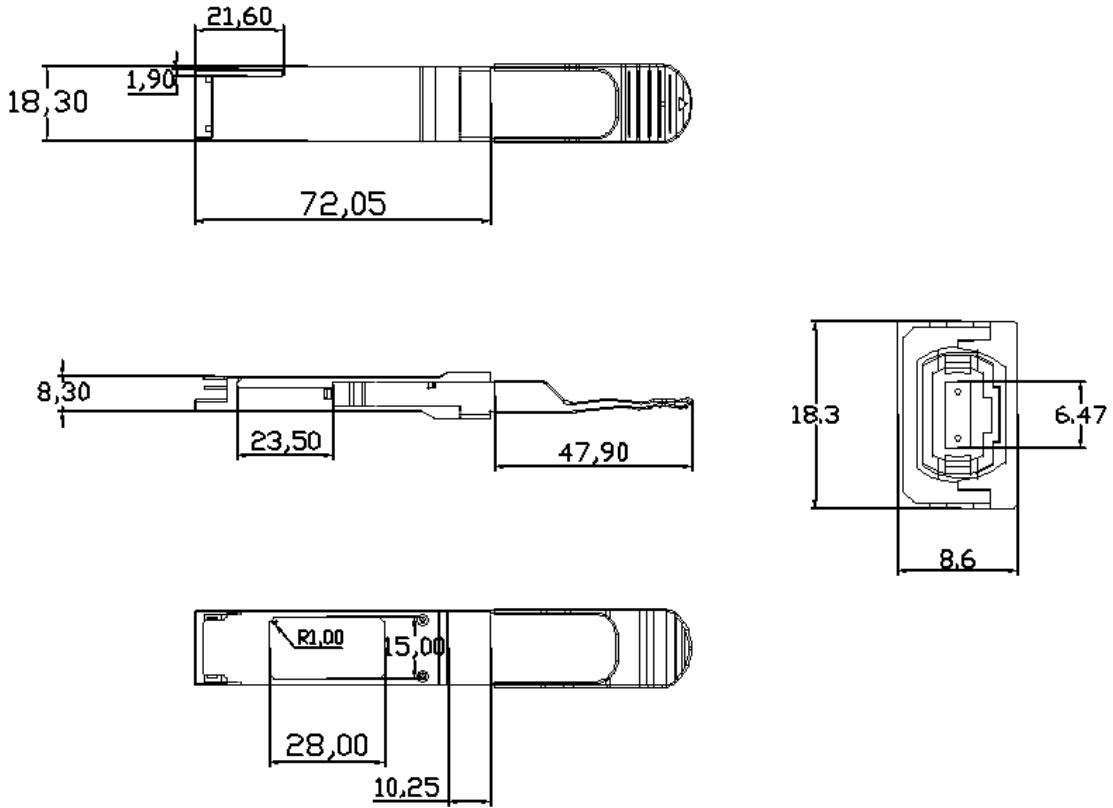


Figure4. Drawing of QSFP28 Module

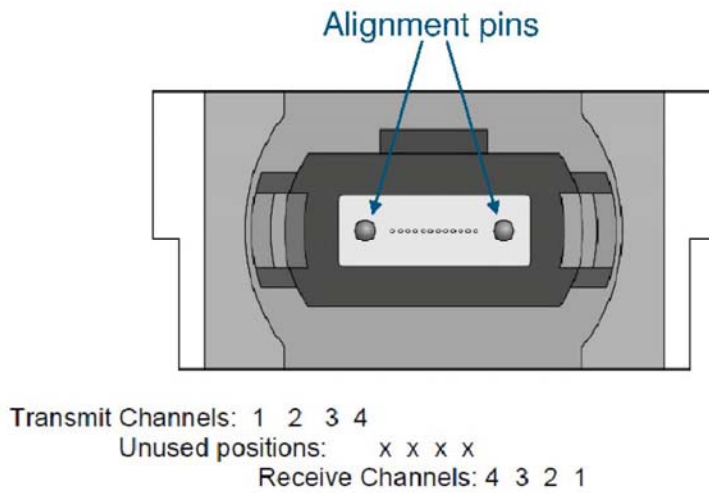


Figure5. QSFP28 Optical Receptacle and Channel Orientation for MPO connector

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.

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
SOQP-SR4-10	100Gbps QSFP28, 850nm,100m, -5 °C~+75°C

Contract

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