HR1H-Q2MM85SR4C

100Gbps 850nm QSFP28 Transceiver

Features

- Hot-plug gable QSFP28 footprint
- Support 103.1Gbps aggregate bit rate
- 4x25Gbps 850nm VCSEL transmitter
- 4x25Gpbs electrical interface
- Maximum link length of 100m on OM4 MMF
- Power Dissipation <2.5W
- Single +3.3V power supply
- Single MPO12 receptacle
- Operating Case temperature range
  0°C to 70°C
- RoHS-6 compliant
- Compliant with SFF-8679
- Compliant with SFF-8636
- Compliant with IEEE 802.3bm 100GBASE-SR4

Applications

- 100GBASE-SR4 Ethernet
- Date Center
- Other Optical Links

Ordering information

Part No.	Data Rate	Laser	Temp.	Optical Interface	DDMI
HR1H-Q2MM85SR4C	103.1Gbps	VCSEL	0°C to 70°C	MPO12	YES

Description

HR1H-Q2MM85SR4C transceivers is designed for using in 100Gb/s data rate over multi-mode fiber. The transceiver is compliant with SFF-8679, and the mechanical QSFP28 plug is compatible with SFF-8661. Digital diagnostics functions are available via a 2-wire serial interface, as specified in SFF-8636.

Absolute Maximum Ratings

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Power Supply Voltage	V_{CC}	0		3.6	V	
Storage Temperature	Ts	-40		+85	°C	
Relative Humidity	RH	5		85	%	Non-condensing
Case Operating Temperature	Tc	0		+70	°C	

Electrical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Power Supply Voltage	V_{CC}	3.135	3.3	3.465	V	
Power Dissipation	P_D			2.5	W	
Power Supply Current	Icc			800	mA	
Aggregate Data Rate			103.1		Gbps	
Signaling rate per lane			25.78		Gbps	
Clock Rate-I2C				400	kHz	
Transmitter						
Input Differential impedance	Z_{IN}		100		ohm	
Differential data input swing	V_{IN}	180		900	mV	
Single-ended voltage tolerance		-0.3		3.3	V	
Receiver						
Output Differential impedance	Zout		100		ohm	
Differential data Output Swing	Vout	300		850	mV	

Optical Parameters

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Power budget (for max TEDC)		8.2			dB	
Aggregate Data Rate			103.1		Gbps	
Signaling rate per lane			25.78		Gbps	
Transmitter						
Center Wavelength	λ	840	850	860	nm	
RMS spectral width	$\Delta\lambda_{RMS}$			0.6	nm	
Average Optical Power	P_{AVG}	-8.4		2.4	dBm	
Laser Off Power	P_{OFF}			-30	dBm	
Extinction Ratio	ER	2	4		dB	
Transmitter and dispersion eye closure	TDEC			4.3	dB	
Optical Return Loss Tolerance	ORL			12	dB	
Receiver						
Center Wavelength	λ	840	850	860	nm	
Receiver Sensitivity (OMA)	R_{SENSE1}			-10	dBm	1
Stressed Receiver Sensitivity (OMA)	SRS			-5.2	dBm	

Maximum Input Power	Pmax	3.4			dBm	
Los Assert	LOS_A	-30			dBm	
Los Dessert	LOS_D			-11	dBm	
Los Hysteresis	LOS_H	0.5			dB	
Receiver Reflectance	R_{REFL}			-12	dB	

Note1:Sensitivity for 25.78Gb/s PRBS31 and BER better than or equal to 5E-5.

General Specifications

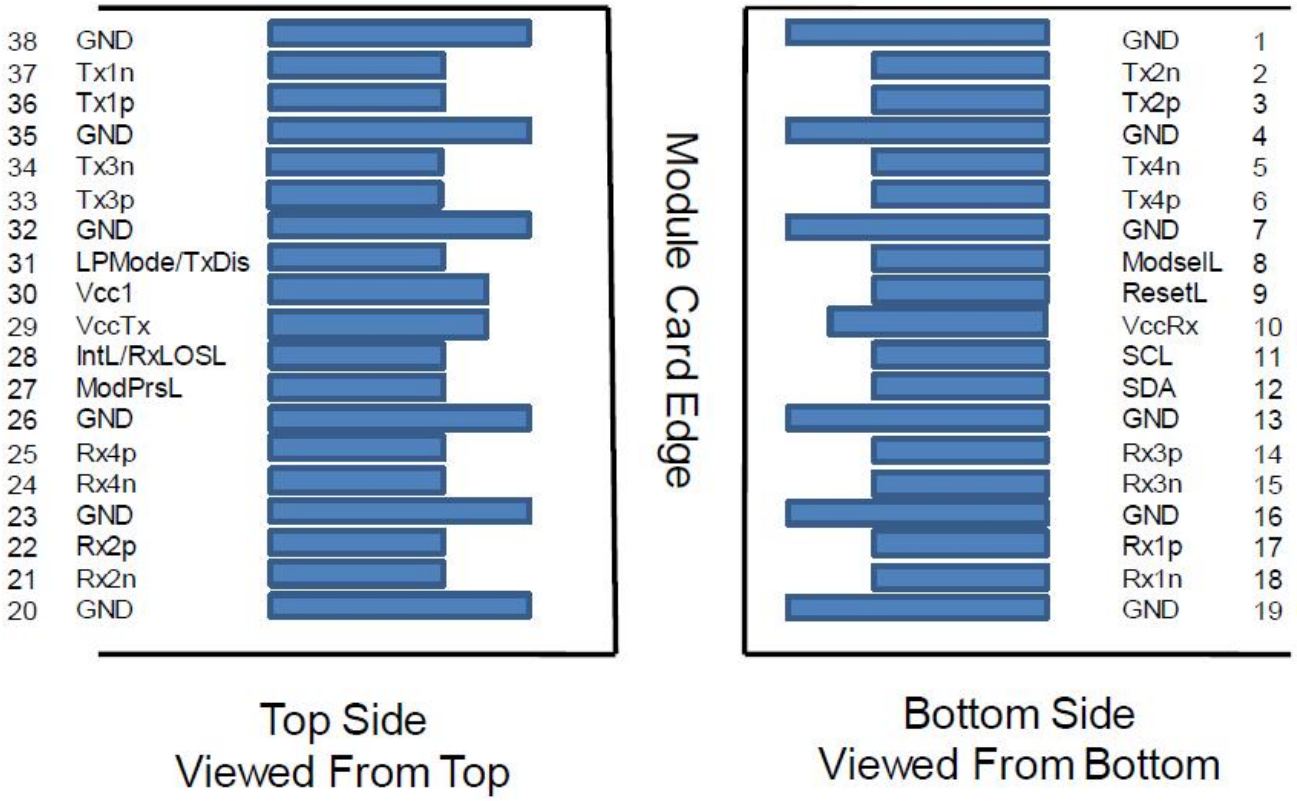
Parameter		Symbol	Min.	Typical	Max.	Unit	Note
Aggregate Data Rate				103.1		Gbps	
Signaling rate per lane				25.78		Gbps	
Bit Error Ratio (pre-FEC)		BER			5E-5		PRBS31
Maximum Supported Distances							
Fiber Type	Bandwidth (850nm)						
50um	2000MHz*km				70	m	OM3
50um	4700MHz*km				100	m	OM4

Digital Diagnostic Functions

HR1H-Q2MM85SR4C transceivers can be used in host systems that require either internally or externally calibrated digital diagnostics.

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Temperature monitor absolute error		-3		3	℃	
Laser power monitor absolute error		-3		3	dB	
RX power monitor absolute error		-3		3	dB	
Supply voltage monitor absolute error		-100		100	mV	
Bias current monitor		-10%		10%	mA	

Pin Assignment:



Pin Descriptions

PIN	Symbol	Name / Description	Note
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	2
9	ResetL	Module Reset	
10	Vcc Rx	3.3V Power Supply Receiver	
11	SCL	2-wire serial interface clock	3
12	SDA	2-wire serial interface data	3
13	GND	Ground	1
14	Rx3p	Receiver Non-Inverted Data Output	

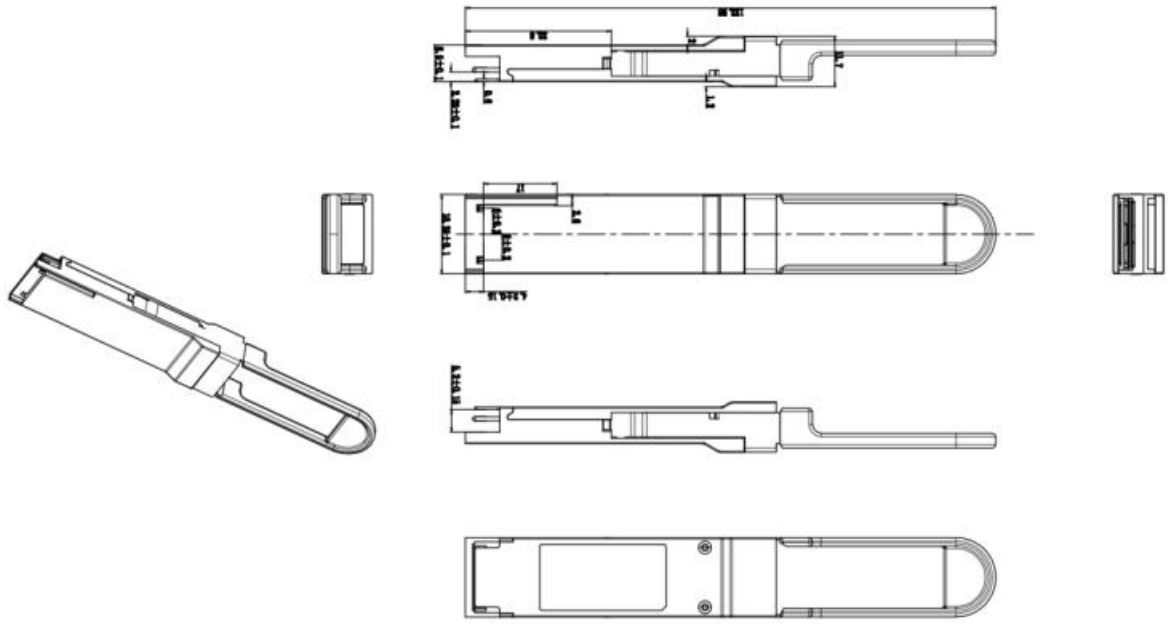
15	Rx3n	Receiver Inverted Data Output	
16	GND	Ground	1
17	Rx1p	Receiver Non-Inverted Data Output	
18	Rx1n	Receiver Inverted Data Output	
19	GND	Ground	1
20	GND	Ground	1
21	Rx2n	Receiver Inverted Data Output	
22	Rx2p	Receiver Non-Inverted Data Output	
23	GND	Ground	1
24	Rx4n	Receiver Inverted Data Output	
25	Rx4p	Receiver Non-Inverted Data Output	
26	GND	Ground	1
27	ModPrsL	Module Present	3
28	IntL	Interrupt	3
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

Note1: Module ground pins GND are isolated from the module case.

Note2: ModSelL is an input signal. When held low by the host, the module responds to two-wire serial communication commands. The ModSelL signal allows the use of multiple modules on a single two-wire interface. When ModSelL is high, the module shall not respond to or acknowledge any two-wire interface communication from the host.

Note3: Shall be pulled up with 4.7K-10Kohms to a voltage between 3.15V and 3.45V on the host board.

Mechanical Dimensions



Revision History

Revision	Initiated	Reviewed	Approved	DCN	Release Date
V1.0	Virgil	XX	XX	Released.	July 16, 2025

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