

40G SR4 QSFP+ Optical Transceiver Module**HC-QP-M85M-01D****Features**

RoHS 6/6 compliant
+3.3V single power supply
Low power consumption
Multi rate of up to 10.3125Gbps
Support 40GBASE-SR4/QDR application
Compliant to QSFP+ Electrical MSA SFF-8436
Transmission distance up to 150m (OM3) and 300m (OM3) optional
Operating case temp Commercial: 0°C to +70 °C

Applications

InfiniBand QDR
Other optical links
40GBASE-SR4 at 10.3125Gbps per lane

Absolute Maximum Ratings**Table 1- Absolute Maximum Ratings**

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Supply Voltage	V _{CC3}	-0.5	-	+3.6	V	
Storage Temperature	T _s	-10	-	+85	°C	
Operating Humidity	RH	+5	-	+85	%	1
Receiver Damage Threshold per Lane	P _{IND}	+3.4	-	-	dBm	

Note: 1 No condensation

Recommended Operating Conditions**Table 2- Recommended operating Conditions**

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Operating Case Temperature	T _C	0	-	+70	°C	
Power Supply Voltage	V _{CC}	3.14	3.3	3.47	V	
Power Dissipation	P _d	-	-	1.5	W	

Bit Rate	BR	1.25	10.3125	-	Gbps	
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Electrical Characteristics

Table 3- Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Units	Notes
Input Logic Level High	V_{IH}	2.5	-	$V_{CC}+0.3$	V	
Input Logic Level Low	V_{IL}	0	-	0.8	V	
Output Logic Level High	V_{OH}	2.4	-	V_{CC}	V	
Output Logic Level Low	V_{OL}	0	-	0.4	V	
Transmitter						
Differential Data Input Swing	$V_{in,p-p}$	200	-	1600	mV _{pp}	
Input Differential Impedance	Z_{IN}	80	100	120	Ω	
Receiver						
Differential Date Output Swing	V_{out}	350	-	1000	mV	
Output Differential Impedance	Z_D	80	100	120	Ω	

Optical Characteristics

Table 4-Optical Characteristics

Parameter	Symbol	Unit	Min	Typ	Max	Notes
Optical transmitter Characteristics						
Bit Rate	BR	Gbps	1.25	10.3125	-	
Center Wavelength Range	λ_c	nm	830	850	870	
RMS Spectral Width	$\Delta\lambda$	nm	-	-	0.65	
Average Launch power Tx_off	P _{off}	dBm	-	-	-30	
Launch Optical Power	P ₀	dBm	-7.5		2	1
Extinction Ratio	ER	dB	3	-	-	
Optical Receiver Characteristics						

Bit Rate	BR	Gbps	1.25	10.3125	-	
Sensitivity@BER=E-12	BER	dBm	-	-	-10.3	
Overload Input Optical Power	P _{IN}	dBm	2.5	-	-	2
Center Wavelength Range	λ _c	nm	820	-	880	
LOS Assert	-	dBm	-30	-	-	
LOS De-Assert	-	dBm	-	-	-12	
LOS Hysteresis	-	dB	0.5	-	-	

Note:

1. Coupled into 50/125 MMF.
2. Measured with PRBS 2³¹-1 test pattern @10.3125Gbps.BER=E-12

Recommended Interface Circuit

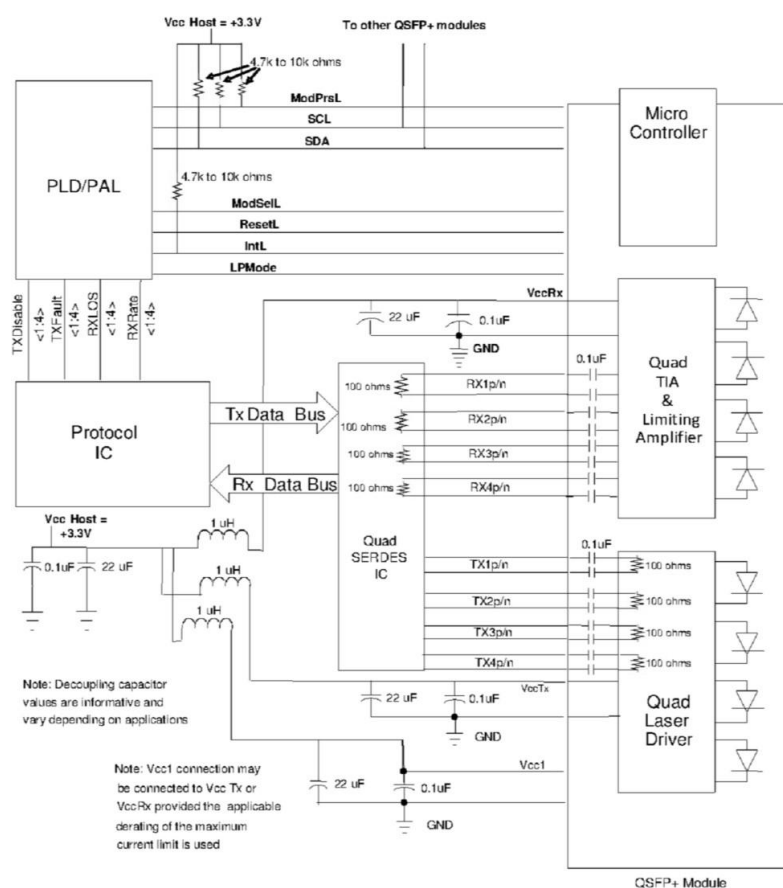


Figure 1, Recommended Interface Circuit

Pin arrangement

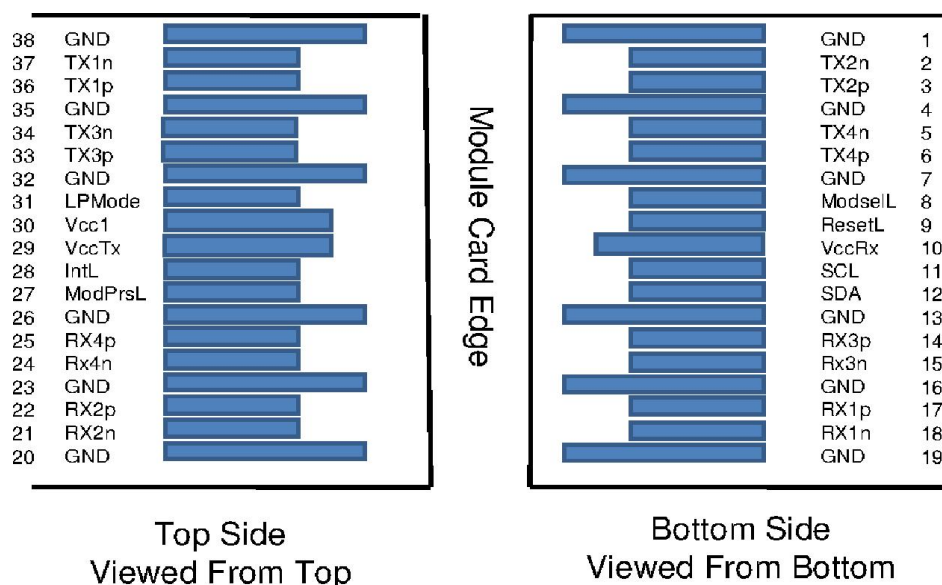


Figure 2, Pin View

Table 5-Pin Function Definitions

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.

Optical interface arrangement

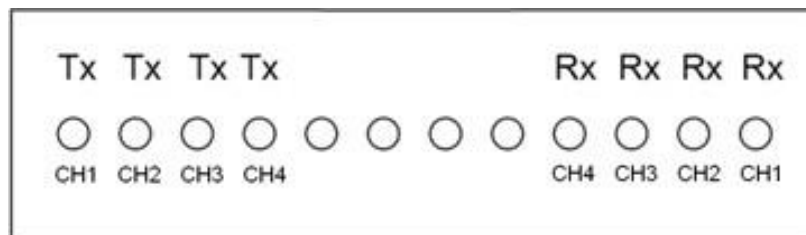


Figure 4, Optical interface arrangement. Lens upwards.

Monitoring Specification

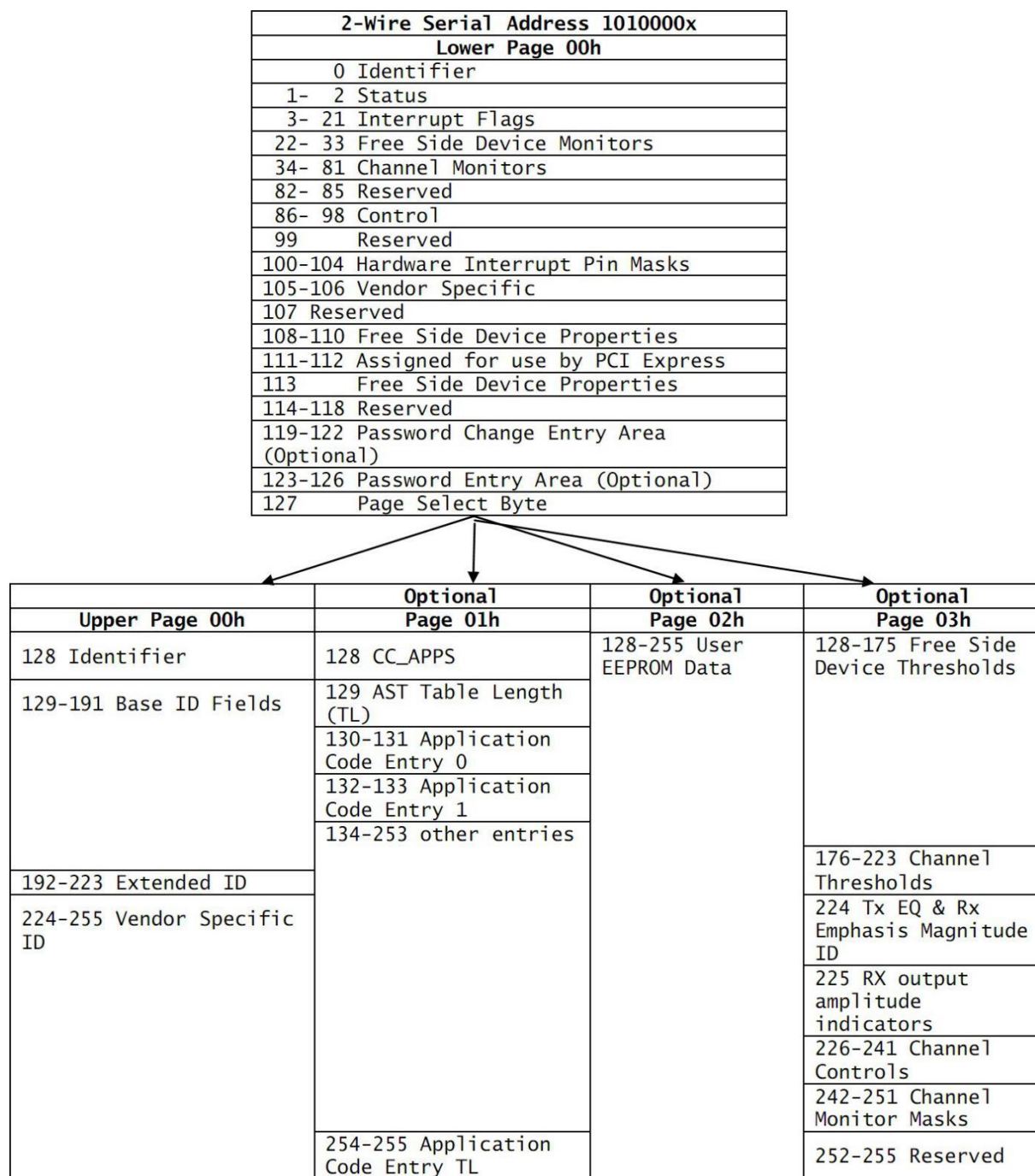
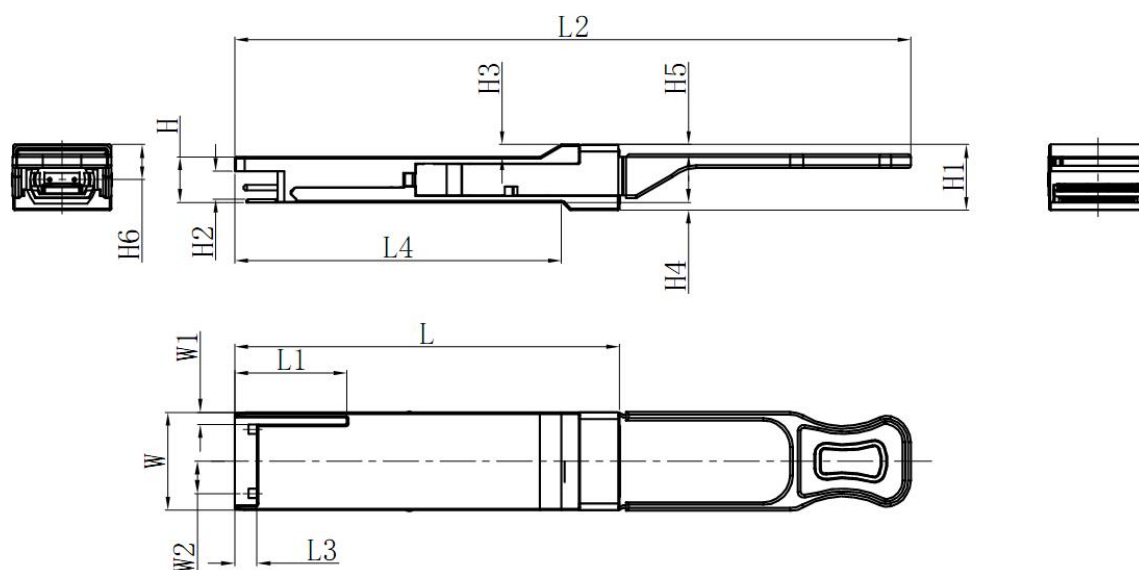


Figure 4, Memory Map

Mechanical



Unit mm

	L	L1	L2	L3	L4	W	W1	W2	H	H1	H2	H3	H4	H5	H6
Max	72.2	-	128	4.35	61.4	18.45	-	6.2	8.6	12.4	5.35	2.5	1.6	2.0	-
Type	72.0	-	-	4.20	61.2	18.35	-	-	8.5	12.2	5.2	2.3	1.5	1.8	6.55
Min	68.8	16.5	124	4.05	61.0	18.25	2.2	5.8	8.4	12.0	5.05	2.1	1.3	1.6	-

Figure 5, Mechanical Diagram

Order Information

Part No.	Bit Rate (Gbps)	Laser (nm)	Distance ^{note1}	Fiber Type	DDMI	Connector	Temp ^{note2}
HC-QP-M85M-01D	41.25	850	1~300m	MMF	YES	MPO 1x12	0°C~+70°C

Note:

1. OM3 fiber, 150m and 300m optional
2. Case Temperature