

40Gbps 850nm 300m MPO QSFP+ Optical Transceiver Module

S-QS4085M03-CD

Features

- Hot Pluggable QSFP+ form factor
- Supports bit rate up to 10.3125Gb/s per lane
- Single MPO12 interface
- 4x10.3125G/s 850nm VCSEL transmitter, PIN array detector
- Low power consumption <1.5W
- Maximum link length of 300m on OM3 (MMF)
- All-metal housing for superior EMI performance
- I2C management interface
- Single +3.3V power supply
- Operating case temperature: 0 to 70 °C
- RoHS compliant (lead free)

Applications

- 40GBASE-SR4 40G Ethernet
- 40G-IB-QDR / 20G-IB-DDR / 10G-IB-SDR InfiniBand
- Breakout to 4 x 10GBASE-SR
- Proprietary interconnections

Standards

- Compliant with QSFP+ MSA
- Compliant to IEEE 802.3ba
- Compliant to SFF-8436

Description

40G-eSR4 QSFP+ transceiver is designed to meet the requirements of 40G ethernet including breaking out to 10G SR links over OM3 MMF up to 300m. It is compliant with QSFP+ MSA, IEEE 802.3ba. It is cost-effective, low power consumption with a single 3.3V power supply. It is fabricated with all-metal and compact size housing for superior EMI performance.

Absolute Maximum Ratings

Parameter	Symbol	Min	Typ	Max	Unit
Power Supply Voltage	V _{cc}	-0.5		4	V
Storage Temperature Range	T _s	-40		85	°C
Relative Humidity - Storage	RH _s	0		95	%
Relative Humidity - Operating	RH _o	0		85	%

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Recommended Operating Conditions

Parameter	Symbol	Min	Typ	Max	Unit
Case Operating Temperature Range	T _c	0	-	70	°C
Power Supply Voltage	V _{cc}	3.14	3.3	3.46	V
Total Power Consumption	P	-	-	1.5	W
Data Rate	BR	-	10.3125	-	Gbps

Electrical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	Note
Differential Input Voltage Swing	V _{IN}	180	-	1200	mV	
Tx Differential Input Impedence	Z _{IN}	-	100	-	Ω	
Differential input return loss		Per IEEE P802.3ba 86A.4.1.1			dB	10MHz to 11.1GHz
Differential to common-mode input return loss		10	-	-	dB	10MHz to 11.1GHz
J2 Jitter Tolerance	J2T	0.17	-	-	UI	Per IEEE P802.3ba 86A.4.1
J9 Jitter Tolerance	J9T	0.29	-	-	UI	
Receiver Electrical Characteristics						
Parameter	Symbol	Min	Typ	Max	Unit	
Differential output Voltage Swing	V _{OUT}	300	-	900	mV	
Rx Differential Output Impedence	Z _{OUT}	-	100	-	Ω	
Differential output return loss		Per IEEE P802.3ba 86A.4.2.1			dB	10MHz to 11.1GHz
Common mode output return loss		Per IEEE P802.3ba 86A.4.2.2			dB	10MHz to 11.1GHz
Output transition time,20% to 80%		28	-	-	ps	Per IEEE P802.3ba 86A.4.2
J2 Jitter output	J2O	-	-	0.42	UI	
J9 Jitter output	J9O	-	-	0.65	UI	

Optical Characteristics

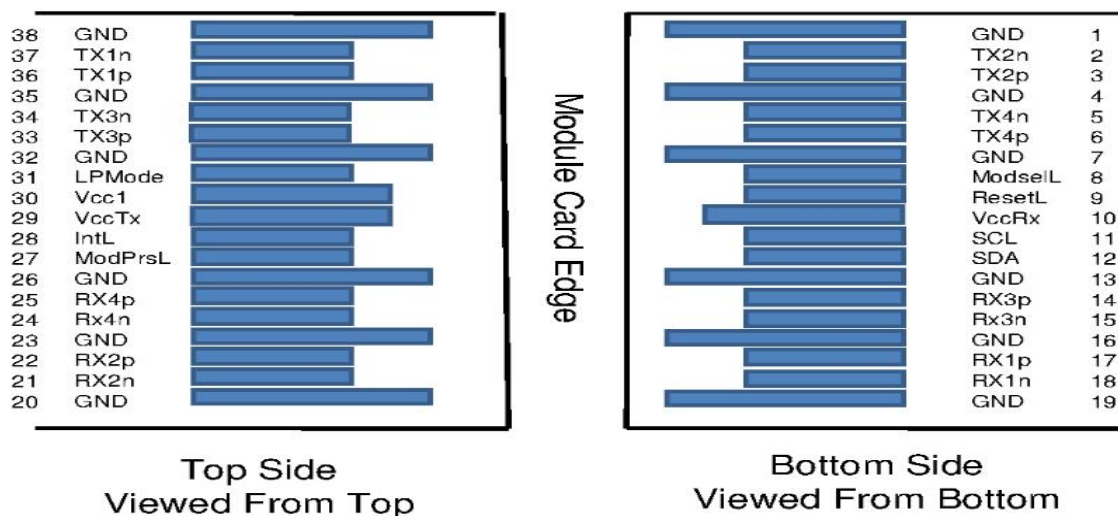
Parameter	Symbol	Min	Typ	Max	Unit	Notes
Transmitter Characteristics						
Laser Type		VCSEL				
Center Wavelength	λ	840	850	860	nm	
RMS Spectral Width	Δλ	-	-	0.4	nm	
Average Launch Power, each lane	P _{OUT}	-7.5	-	2.4	dBm	
Difference in launch power between any two lanes(OMA)	DP _x	-	-	4	dB	
Peak power, each lane	PP _x	-	-	4	dBm	

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Extinction Ratio	ER	3	-	-	dB	
Transmitter dispersion penalty	TDP	--	--	3.5	dB	
Average Launch Power of OFF transmitter, each lane	P _{OFF}	-	-	-30	dBm	
Optical return loss tolerance	ORL	-	-	12	dB	
Transmitter eye mask definition{X1,X2,X3,Y1,Y2,Y3}	{0.23,0.34,0.43,0.27,0.35,0.4}					
Receiver Characteristics						
Receiver Type per lane		PIN				
Receiver Wavelength	λ	840	850	860	nm	
Average power at receive input, each lane	PXPx	- 9.5	-	2.4	dBm	
Stressed Receiver Sensitivity in OMA	SRS	-	-	-5.4	dBm	1
LOS Assert	LOSA	-30	-	-	dBm	
LOS De-Assert	LOSD	-	-	-12	dBm	
LOS Hysteresis	LOSH	0.5			dB	
Receiver Reflectance	Rfl			-12	dB	
Notes						
1.Measured with a PRBS 2 ³¹ -1 test pattern, @10.3125Gb/s, BER<1E-12.						

Pin Definitions



Pin	Symbol	Description	Ref.
1	GND	Transmitter Ground	1
2	Tx2n	Transmitter Inverted Data Input	
3	Tx2p	Transmitter Non-Inverted Data output	
4	GND	Transmitter Ground	1
5	Tx4n	Transmitter Inverted Data Input	

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6	Tx4p	Transmitter Non-Inverted Data output	
7	GND	Transmitter Ground	1
8	ModSelL	Module Select	
9	ResetL	Module Reset	
10	VccRx	3.3V Power Supply Receiver	2
11	SCL	2-Wire serial Interface Clock	
12	SDA	2-Wire serial Interface Data	
13	GND	Receiver Ground	1
14	Rx3p	Receiver Non-Inverted Data Output	
15	Rx3n	Receiver Inverted Data Output	
16	GND	Receiver Ground	1
17	Rx1p	Receiver Non-Inverted Data Output	
18	Rx1n	Receiver Inverted Data Output	
19	GND	Receiver Ground	1
20	GND	Receiver Ground	1
21	Rx2n	Receiver Inverted Data Output	
22	Rx2p	Receiver Non-Inverted Data Output	
23	GND	Receiver Ground	1
24	Rx4n	Receiver Inverted Data Output	
25	Rx4p	Receiver Non-Inverted Data Output	
26	GND	Receiver Ground	1
27	ModPrsl	Module Present	
28	IntL	Interrupt	
29	VccTx	3.3V power supply transmitter	2
30	Vcc1	3.3V power supply	2
31	LPMode	Low Power Mode, not connect	
32	GND	Transmitter Ground	1
33	Tx3p	Transmitter Non-Inverted Data Input	
34	Tx3n	Transmitter Inverted Data Output	
35	GND	Transmitter Ground	1
36	Tx1p	Transmitter Non-Inverted Data Input	
37	Tx1n	Transmitter Inverted Data Output	
38	GND	Transmitter Ground	1

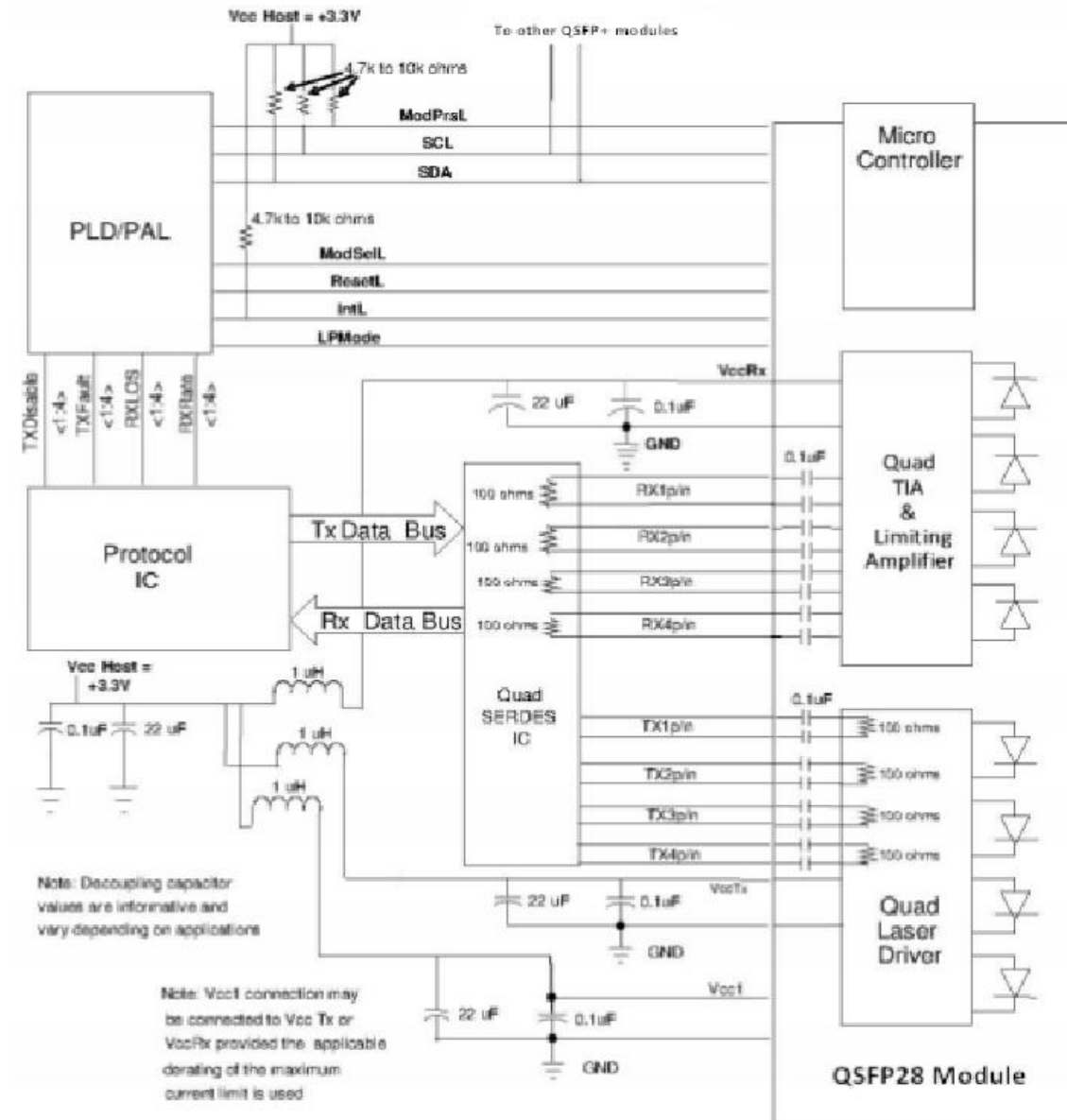
Notes

- 1.GND is the symbol for signal and supply (power) common for the QSFP+ module. All are common within the QSFP+ 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.Vcc Rx, Vcc1 and Vcc Tx are the receiver and transmitter power supplies and shall be applied concurrently. Vcc Rx Vcc1 and Vcc Tx may be internally connected within the QSFP+ Module in any combination. The connector pins are each rated for a maximum current of 500 mA.

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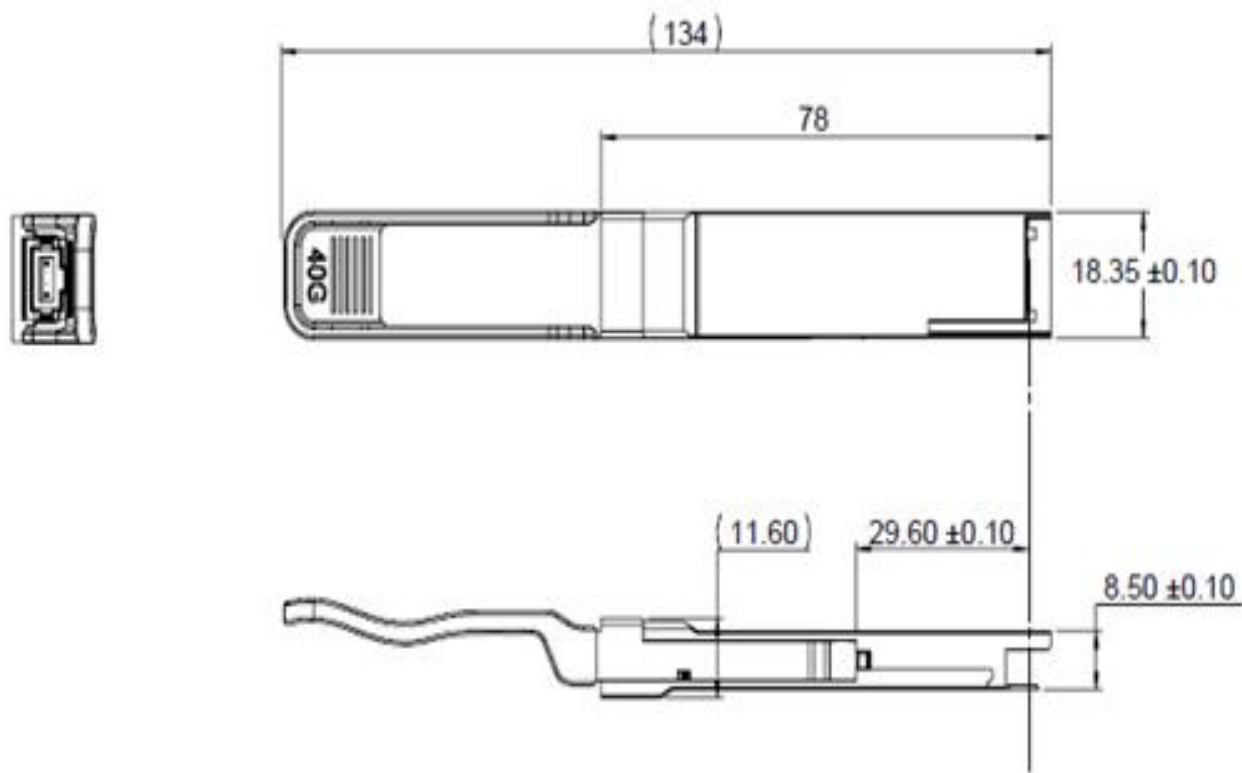
Recommended Interface Circuit



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Mechanical Dimensions



Ordering information

Part Number	Product Description
S-QS4085M03-CD	QSFP+, 40Gbps, 850nm, MM, MPO,300m, 0°C~+70°C, With DDM