400G QSFP112 VR4 Optical Transceiver

Features

- Hot-pluggable QSFP112 form factor
- Maximum link length of 50m on OM4 fiber with FEC
- +3.3V single power supply
- Power dissipation < 9W
- Operating case temp Commercial: 0°C to +70 °C
- MPO-12 APC connector
- RoHS compliant

Standards Compliance

- IEEE 802.3db
- Compatible with OSFP CMIS rev 5.2

Applications

- 400GBASE-VR4 Ether
- The transceiver is designed for Ethernet, Telecom and InfiniBand use cases

General Description

Part No.	Specifications					
	Package	Data rate	Wavelength	Temp	Reach	Optical Interface
VD4H0-E085R	QSFP112	425Gbps	850nm	0~70℃	50m	MPO 1x12 APC

1 Absolute Maximum Ratings and Operation Conditions

Table 1.1 Absolute Maximum Ratings

Parameter	Symbol	Unit	Min	Max
Supply Voltage	V_{CC}	V	-0.5	+3.6
Storage Temperature	Tsto	℃	-40	+85
Operating Humidity	RH	%	+5	+85
Control Input Voltage	V_i	V	-0.3	V_{CC}+0.5

Table 1.2 Operating Conditions

Parameter	Symbol	Unit	Min	Typ	Max	NOTE
Operating Case Temperature	Tc	°C	0	-	+70	
Power Supply Voltage	Vcc	V	3.135	3.3	3.465	
Power Dissipation	Pd	W	-	-	9	

2 QSFP112 Parameters

2.1 QSFP112 Electrical Pin Assignment

The QSFP112 module is based on a 38 pin electrical connector with pin out as specified in QSFP112 Hardware specification. The 38 electrical pins allow exchanging high speed data, control and alarm signals between module and host board. The pin-outs are summarized below：

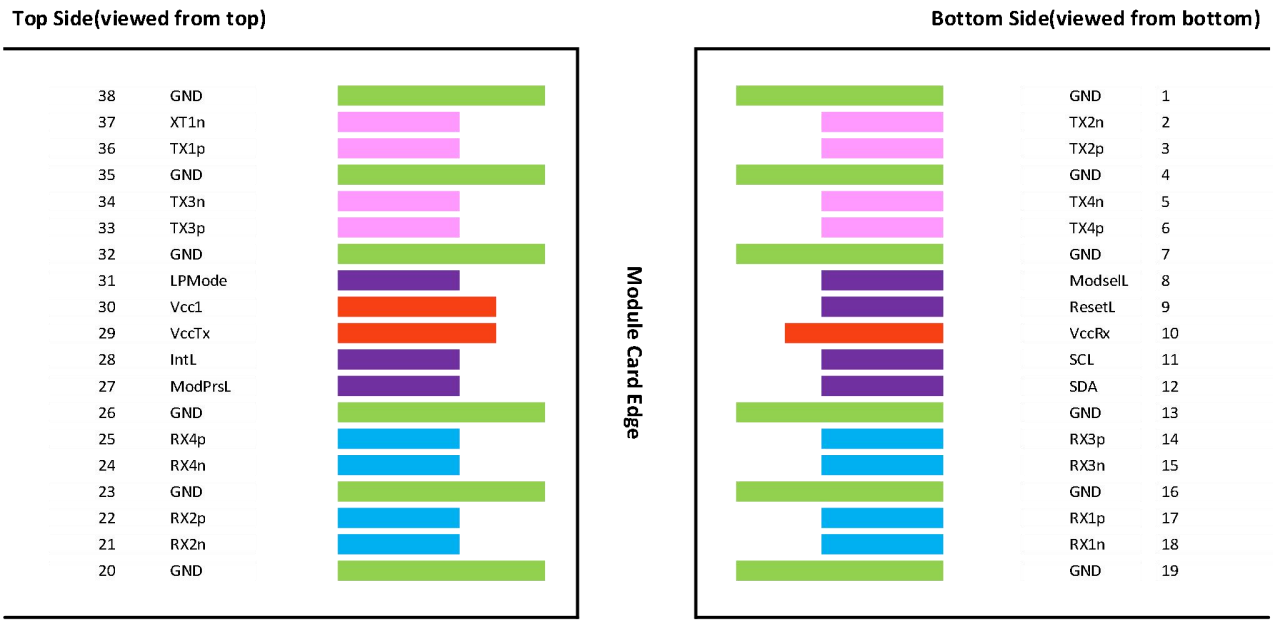


Figure 2.1 OSFP module pinout

Pad#	Symbol	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	VccRx	+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	TX3n	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	VccTx	+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.

2.2 Electrical Characteristics

Parameter	Symbol	Unit	Min	Typ	Max	Note
Transmitter						
Signaling Speed, each lane	SR	GBd	53.125 ± 100 ppm			
Modulation format			PAM4			
Differential pk-pk input voltage tolerance	Vin,pp,diff	mV	750			
Differential termination mismatchal		%			10	
Single-ended voltage tolerance range		V	-0.4		3.3	
DC Common Mode Voltage		V	-0.35		2.85	
Receiver						
Signaling Rate per Lane	SR	GBd	53.125 ± 100 ppm			
Modulation format			PAM4			
Differential output Voltage (Long mode)		mV			845	
Differential output Voltage (Short mode)		mV			600	
Near-end Eye height, differential		mV	70			
Far-end Eye height, differential		mV	30			
Far end pre-cursor ratio		%	-4.5		2.5	
Differential Termination Mismatch		%			10	
Transition Time, 20% to 80%		%	9.5			
DC Common Mode Voltage		V	-0.35		2.85	

2.3 Optical Characteristics

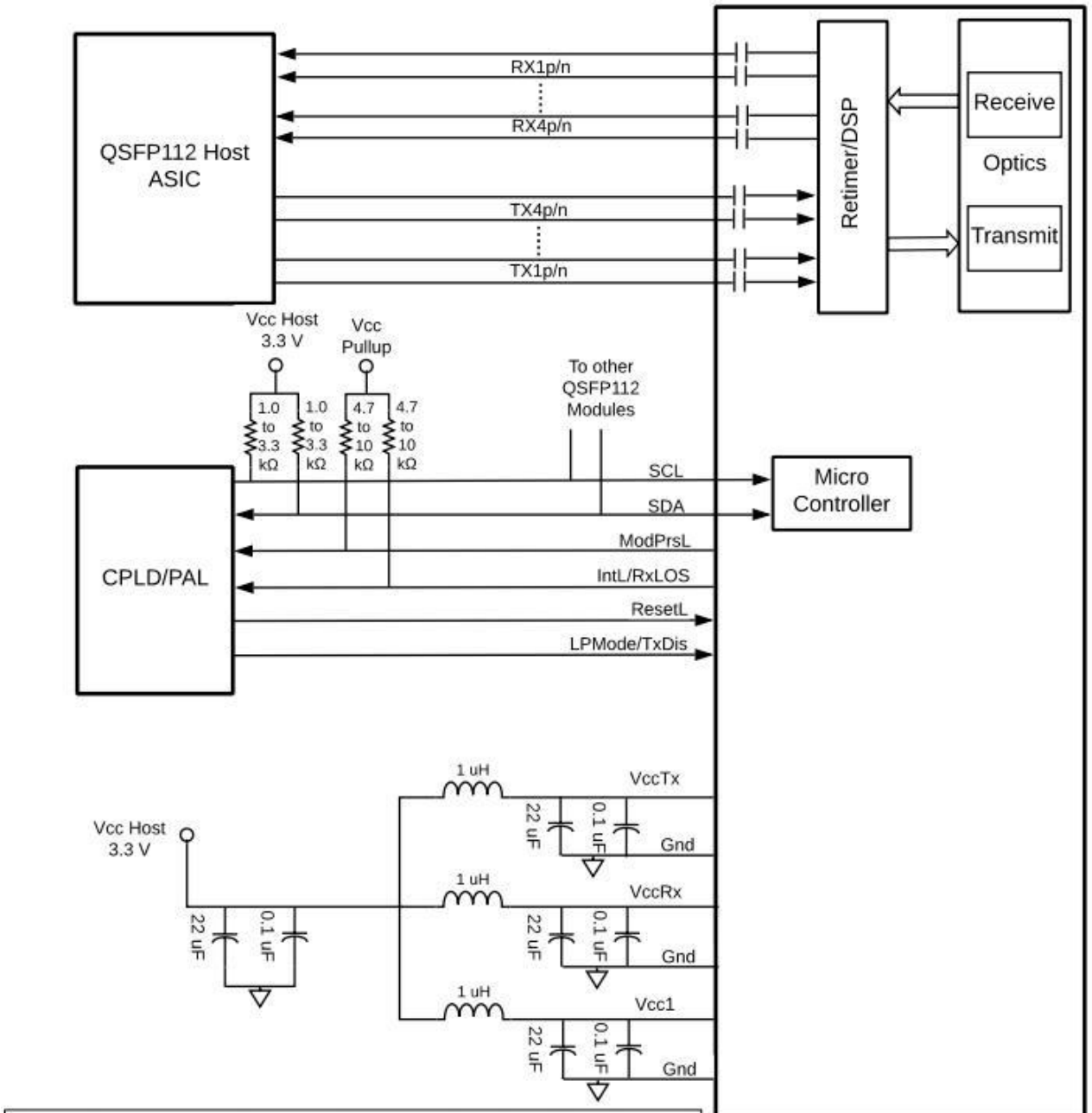
Parameter	Symbol	Unit	Min	Typ	Max	Note
Transmitter						
Center wavelength	CW	nm	844	850	863	
RMS Spectral Width	SW	dBm	-	-	0.6	
Average Launch Power per Lane	AOP	dBm	-4.6	-	4.0	1

Outer Optical Modulation Amplitude (OMA outer), each lane (min)	TX OMA	dBm	-2.6	-	3.5	
Transmitter and Dispersion Eye Closure for PAM4(TDECQ), each lane	TDECQ	dB	-	-	4.4	
Average Launch Power of OFF Transmitter, each lane	TOFF	dBm	-	-	-30	
Extinction Ratio, each lane	ER	dB	2.5	-	-	
Optical Return Loss Tolerance	ORL	dB	-	-	12	
Transmitter Reflectance	TR	dBm	-	-	-26	2
Receiver						
Wavelength	W		842	-	865	
Damage Threshold, average optical power, each lane	DT	dBm	5	-	-	
Average Receive Power, each lane	RXPx	dBm	-6.3	-	4	
Receive Power (OMA) per Lane	RxOMA	dBm	-	-	3.5	
Receiver Reflectance	Rfl	dB	-	-	-26	
Receiver Sensitivity (OMAouter), each lane	SOMA	dBm	-4.4	-	-	3

Notes:

1. Minimum value is informative only and not the principal indicator of signal strength.
2. Transmitter reflectance is defined looking into the transmitter.
3. Receiver sensitivity (OMA outer), each lane (max) is informative and is defined for a transmitter with TDECQ<=1.8dB

2.4 Recommended Interface



Note: Filter capacitors values are informative and application dependent, 0.1 μF capacitors should be placed in close proximity to power pads and may be duplicated for individual pads to provide additional high frequency filtering.

Note: Vcc1 may be connected to VccTx or VccRx within the module provided the applicable derating of the maximum current limit is used.

Figure 2.2 Recommended Interface Circuit

3 Environment Regulation Compliance and product Safety

Category	Standard
Radiated Emissions	EN 55032 Class B CISPR 32 Class B FCC rules 47 CFR Part15
Radiated Immunity	EN 55035 CISPR 35 IEC/EN 61000-4-3
RoHS	EU RoHS 2.0 (2011/65/EU) REACH (EC 1907/2006) China RoHS SJ/T 11363
Laser Safety	IEC 60825-1:2014+A11:2021 FDA/CDRH Class 1 Laser Product, 21 CFR 1040.10 & 1040.11
ESD	IEC 61000-4-2；ANSI/ESDA/JEDEC JS-001；MIL-STD-883C Contact ±8kV, Air ±15kV
Flammability (PCB)	UL Class 94 V-0
Reliability	GR-468-CORE、IEC 61300-2

4 Important Notice

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5 Revision History

Revision	Date	Description
V1.0	2025.4.12	Advance Release.