

QDD-SM31QG-DR4CA
QSFP-DD 400GE DR4 500 m Optical Transceiver Module

Product Features

- **Compliant with IEEE802.3bs 400GBASE-DR4 standard**
- **Compliant with QSFP-DD MSA HW Rev 5.1**
- **Four Parallel 1310nm Optical Lanes**
- **Up to 500m Transmission on Single Mode Fiber (SMF) with FEC**
- **8*53.125Gb/s Electrical interface(400GAUI-8)**
- **Data Rate 4*106.25Gbps (PAM4) Optical interface**
- **Type 2 housing with MPO-12 APC connector**
- **Compliant with QSFP-DD CMIS Rev 5.2**
- **Maximum power consumption 10W**
- **Case temperature Range: 0 to 70°C**
- **Two wire serial Interface with digital diagnostic monitoring**
- **Complies with RoHS Requirement**
- **Laser Safety Class 1**

Applications

- **400G Ethernet**
- **InfiniBand Interconnects**
- **Data Center and Enterprise Networking**

Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit	Note.
Storage Temperature	Ts	-40	85	°C	
Relative Humidity	RH	5	85	%	
Power Supply Voltage	Vcc	-0.5	3.63	V	

Recommended Operating Conditions

Parameter	Symbol	Unit	Min	Typ	Max	Note
Operating Case Temperature	Top	°C	0	-	70	
Power Supply Voltage	VCC	V	3.135	3.3	3.465	
Bit Rate	BR	Gb/s		53.125		PAM4
Instantaneous peak current at hot plug	Icc_IP	mA			4000	
Sustained peak current at hot plug	Icc_SP	mA			3300	
Pre-FEC Bit Error Ratio	BER	-		2E-4		
Max Supported Link Length	-	m			500	
Power Consumption	Pd	W			10	

Electrical Characteristics

Parameter	Symbol	Unit	Min	Typ	Max	Note
Transmitter						
Signaling Rate, each Lane		GBd	-100 ppm	26.5625	100 ppm	TP1
Input Differential Impedance	RIN	Ohm	90	100	110	
Differential pk-pk input voltage tolerance	VIN	mVp-p	900			TP1a
DC common-mode output voltage		V	-0.3		2.8	

Single-ended output voltage ³		V	-0.4		3.3	TP1a
Receiver						
Signaling Rate, each Lane		GBd	-100 ppm	26.5625	100 ppm	TP4
Data Output Swing Differential/RX		mV			900	
Data Differential Impedance	Z _o	Ohm	90	100	110	
Far end pre-cursor ratio		mV	30			
Differential Termination Mismatch		-			10%	
Transition Time (min, 20% to 80%)	TR	ps	9.5			
DC common mode Voltage		mV	-350		2850	3

Optical Characteristics

Parameter	Symbol	Unit	Min	Typ	Max	Note
Transmitter(per Lane)						
Signaling rate, each lane		Gbd	-100 ppm	53.125	100 ppm	PAM4
TX Central Wavelength	λ_c	nm	1304.5	1310	1317.5	
Side-mode Suppression Ratio (SMSR)	SMSR	dB	30			
Spectral Width (20dB)	DI	nm			1	
Average Launch Power, each lane	POP	dBm	-2.9		4	
Outer Optical Modulation Amplitude (OMA _{outer}),each lane	T _{OMA}	dBm	-0.8		4.2	1
Launch Power in OMA outer minus TDECQ,each lane		dBm	-2.2			
Transmitter and Dispersion Eye Closure for PAM4 (TDECQ), each lane	TDECQ	dB			3.4	
Average Launch Power of OFF Transmitter, each lane (max)	P _{OFF}	dBm			-15	
Extinction Ratio, each lane	ER	dB	3.5			

Optical Return Loss Tolerance (max)	ORL	dB			21.4	
Transmitter transition time		ps			17	
RIN21.4OMA (max)	RIN	dB/Hz			-136	
Transmitter Reflectance (max)		dB			-26	
Receiver(per Lane)						
Signaling Speed per Lane		GBd	-100 ppm	53.125	100 ppm	PAM4
Lane Wavelength (range)	λ_c	nm	1304.5	1310	1317.5	
Damage Threshold, each lane	AOP _D	dBm	5			
Average Receive Power per Lane	Sens	dBm	-5.9		4	2
Receive Power (OMA outer), each lane	Sens_OMA	dBm			-4.4	
Receiver Reflectance	ORL	dB			-26	
OMA outer of each aggressor lane		dBm		4.2		
Stressed Receiver Sensitivity (OMAAouter) per Lane	Stress_OMA	dBm			-1.9	
Stressed eye closure for PAM4 (SECQ)		dB			3.4	
LOS Assert	LOS_A	dBm			-7.5	
LOS De-Assert	LOS_D	dBm	-6.5			
LOS Hysteresis	LOS_H	dB	0.5	2	5	

Note 1. Even if the TDECQ < 1.4dB for an extinction ratio of ≥ 5 dB or TDECQ < 1.1dB for an extinction ratio of < 5dB, the OMAouter (min) must exceed the minimum value specified here

Note 2. Average receive power, (min) is informative and not the principal indicator of signal strength

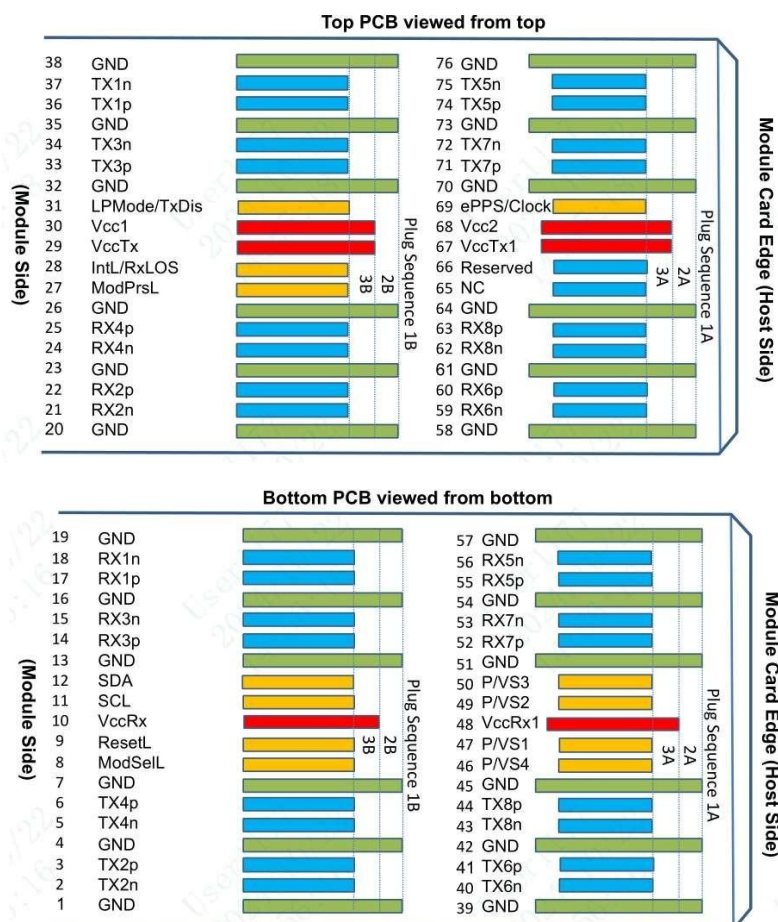
Note 3. DC common mode voltage generated by the host. Specification includes effects of ground offset voltage

Electrical Specification Low Speed Signal

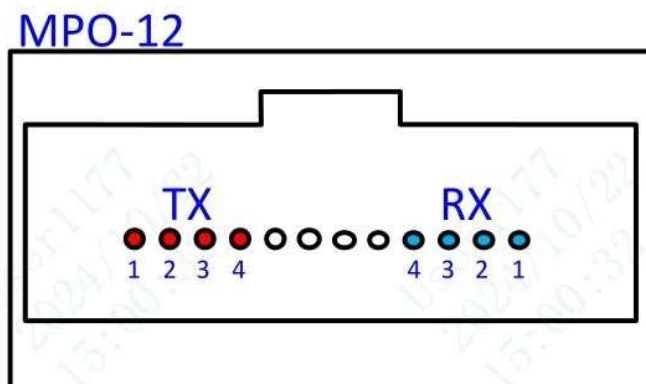
Parameter	Symbol	Unit	Min	Max	Note
LPMODE, ResetL and ModSelL	VIL	V	-0.3	0.8	

	VIH	V	2	VCC+0.3	
IntL	VOL	V	0	0.4	
	VOH	V	VCC-0.5	VCC+0.3	

Pin function definitions



Optical Interface definitions

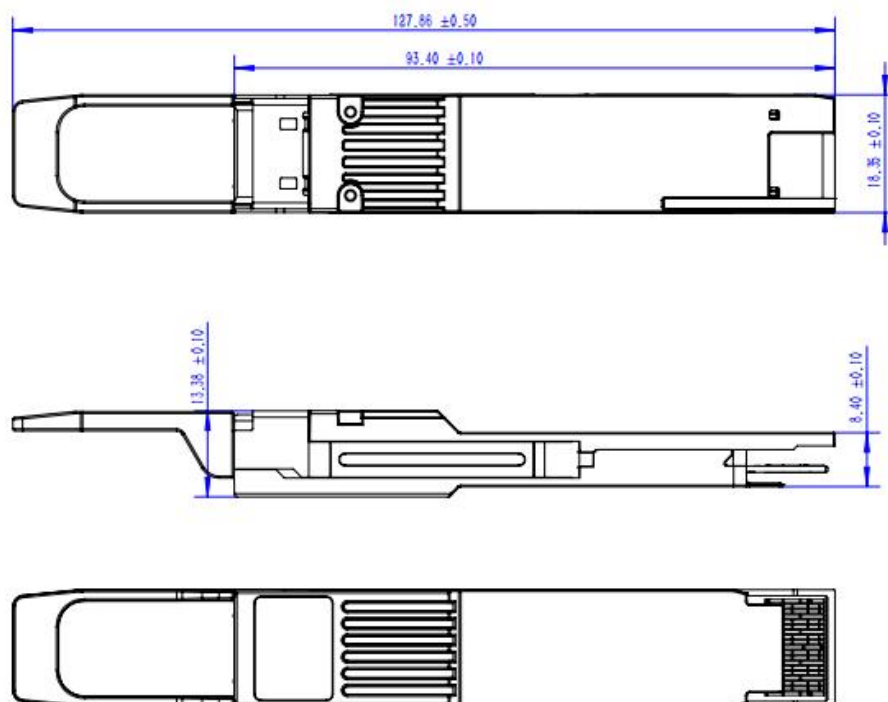


Digital Diagnostics

As Compliant with QSFP-DD CMIS Rev 5.2, Our QSFPDD Optical Engine provide digital diagnostic functions via a 2-wire serial interface, which allows real-time access to the following operating parameters:

Parameter	Unit	Accuracy	Calibration
Temperature	°C	±3	Internal
Voltage	V	±0.1	Internal
Tx Bias Current (Each Lane)	mA	10%	Internal
Tx Output Power (Each Lane)	dB	±3	Internal
Rx Power (Each Lane)	dB	±3	Internal

Mechanical Dimensions



Ordering information

Part Number	Product Description
QDD-SM31QG-DR4CA	QSFP-DD, 400GE, DR4, 500m, 0°C~+70°C, with FEC,MPO-12APC

For More Information

Tel: +86-755-23301665

E-mail : sales@fibertoptech.com

Web: <http://www.fibertopsfp.com>