

Features

- Compliant with IEEE Std 802.3bs
- Compliant with 400G-DR4 optical specifications
- Compliant with QSFP-DD MSA
- Compliant with CMIS3.0 Management interface specifications
- Parallel MPO-12 receptacle
- 4x106.25Gbps PAM4 parallel lanes
- 8x53.125Gbps PAM4 electrical interface
- Transmission distance up to 500m SMF
- Single 3.3V power supply
- Power consumption <8W



- Commercial operating temperature: 0°C to +70°C
- RoHS Compliant

Applications

- 400G BASE-DR4 Ethernet
- Data Center

1. Absolute Maximum Ratings

Stresses in excess of the absolute maximum ratings can cause permanent damage to the device. These are absolute stress ratings only. Functional operation of the device is not implied at these or any other conditions in excess of those given in the operational sections of the data sheet. Exposure to absolute maximum ratings for extended periods can adversely affect device reliability.

Parameter	Symbol	Min.	Max.	Unit
Storage Temperature	TS	-40	85	°C
Relative Humidity	RH	15	85	%
Supply Voltage	VCC	-0.5	3.6	V

2. Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit
Operating Case Temperature	TC	0	-	70	°C
Supply Voltage	VCC	3.13	3.30	3.47	V

Signaling rate per lane		53.125 ±100ppm	GBd
Modulation format		PAM4	

3. Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit
Module Supply Current	I _{cc}	-	-	2.55	A
Power Dissipation	PD	-	-	8.0	W
Transmitter					
Input Differential Impedance	Z _{IN}	-	100	-	Ω
Differential Data Input Swing	V _{IN} , P-P	180	-	900	mVP-P
Receiver					
Output Differential Impedance	Z _O	-	100	-	Ω
Differential Data Output Swing ¹	V _{OUT} , P-P	300	-	850	mVP-P
Transition Time (20% to 80%)	T _r ,T _f	9.5	-	-	ps

Notes:

1. Internally AC coupled, but requires an external 100Ω differential load termination.

4. Optical Characteristics

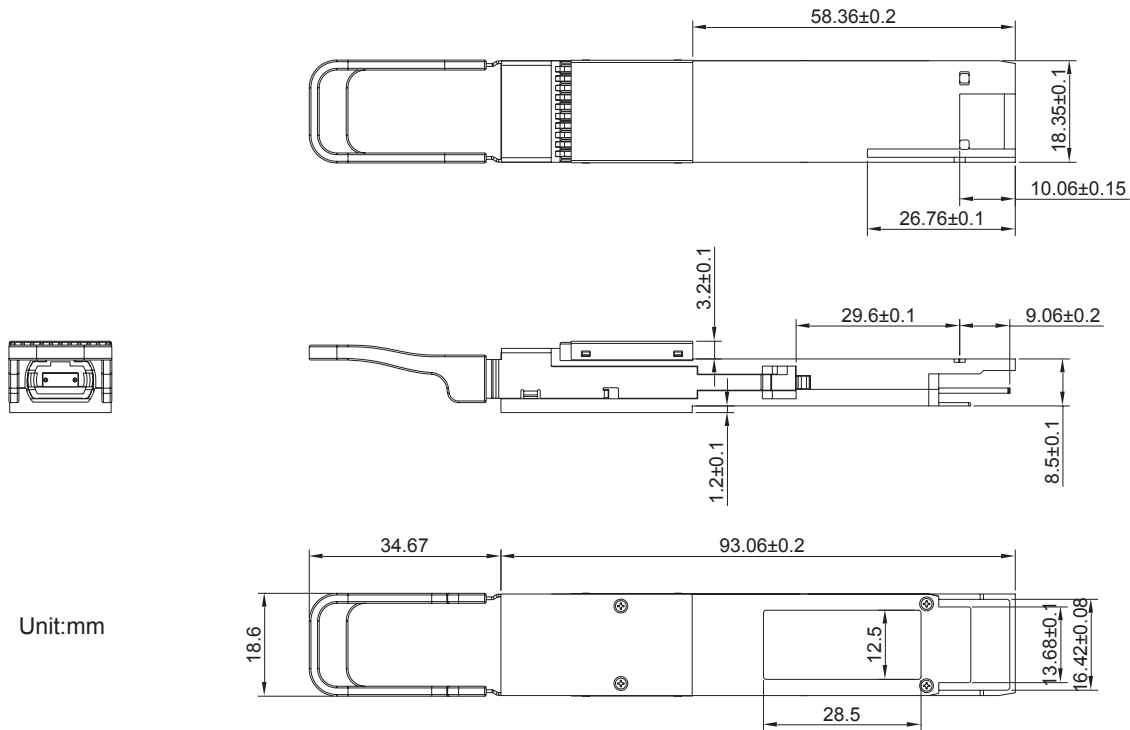
Parameter	Symbol	Min.	Typ.	Max.	Unit
Transmitter					
Lane wavelengths	λ	1304.5	1311	1317.5	nm
Side-mode suppression ratio	SMSR	30	-	-	dB
Average launch power each lane	P _{avg}	-2.9	-	4	dBm
Outer Optical Modulation Amplitude, each lane	OMA _{outer}	-0.8	-	4.2	dBm
OMA minus TDECQ		-2.2	-	-	dBm
Transmitter and dispersion penalty eye closure for PAM4, each lane	TDECQ	-	-	3.4	dB
Extinction Ratio	ER	3.5	-	-	dB
Average launch power of OFF transmitter	P _{off}	-	-	-15	dBm
Optical Return Loss Tolerance	ORL	-	-	21.4	dB
RIN _{21.4OMA(max)}				-136	dB/Hz
Transmitter reflectance		-	-	-26	dB

Receiver					
Lane wavelengths	λ	1304.5	1311	1317.5	nm
Receiver Sensitivity each lane (OMA _{outer}) ¹		-	-	-4.4	dBm
Average receive power (P _{avg})	P _{avg}	-5.9	-	4	dBm
Receive power, each lane (OMA _{outer})	OMA	-	-	4.2	dBm
Optical Reflectance	ORL	-	-	-26	dB
LOS De-Assert	LOSD	-	-	-10	dBm
LOS Assert	LOSA	-16	-	-	dBm
LOS Hysteresis		0.5	-	-	dB

Notes:

1. Measured with PRBS31Q test pattern, 53.125GBd, PAM4, BER<2.4E-4.

5. Mechanical Diagram



Note: External physical characteristics are subject to variation. This may include, but is not limited to, external case designs, pull tab colors and/or shapes, removal latch styles or colors, and label sizes and placement. These variations do not affect the function or characteristics of the transceivers.

6. Ordering Information

OEM	Part Number	OEM	Part Number
Juniper	QDD-400G-DR4-A		

7. Contact Information

Tel: 800.590.9535

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