

## Features

- Supports 425Gbps
- Single 3.3V Power Supply
- Power dissipation < 10W
- Up to 500m over SMF
- RoHS compliant
- QSFP-DD MSA Compliant
- 8x53.125Gbps (PAM4) electrical interface
- MPO-12 connector
- Commercial case temperature range: 0°C to 70° C
- PIN and TIA array on the receiver side
- I2C interface with integrated Digital Diagnostic Monitoring



- Safety Certification: TUV/UL/FDA

## Applications

- 4 x 100G-DR applications
- Data center
- Infiniband interconnects

## 1. Absolute Maximum Ratings

Exceeding any one of these values may damage the device permanently.

Parameter	Symbol	Min.	Max.	Unit
Storage Temperature	TS	-40	85	°C
Supply Voltage	VCC	-0.5	3.6	V
Damage Threshold	Rxdmg	5		dBm

## 2. Recommended Operating Conditions

Power Supply specifications, Instantaneous, sustained and steady state current compliant with QSFP-DD MSA Power Classification.

Parameter	Symbol	Min.	Typ.	Max.	Unit
Operating Case Temperature	Tc	0	70	C	
Power Supply Voltage	Vcc	3.135	3.3	3.465	V

Operating Relative Humidity	RH	5	85	%	
Power Dissipation	P <sub>D</sub>			10	W

### 3. Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max	Unit	Notes
<b>Transmitter</b>						
Differential data input swing per lane		900			mVp-p	1
Differential input impedance	Z <sub>in</sub>	90	100	110	ohm	
<b>Stressed Input Parameters</b>						
Eye width		0.265			UI	2
DC common mode voltage		-350		2850	mV	3
<b>Receiver</b>						
Differential output amplitude				900	mVp-p	
Differential output impedance	Z <sub>out</sub>	90	100	110	ohm	
Output Rise/Fall Time	tr/tf	9.5			ps	4
Eye width		0.265			UI	
Eye height differential		70			mV	2

#### Notes:

1. With the exception to IEEE 802.3bs 120E.3.1.2 that the pattern is PRBS31Q or scrambled idle.
2. @TP4, all 3 PAM4 eyes, 1E-5
3. DC common mode voltage is generated by the host. Specification includes effects of ground offset voltage.
4. 20%~80%

### 4. Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
<b>Transmitter</b>						
Signaling speed per lane			53.125		GBd	
Modulation format		PAM4				
Center wavelength	λ <sub>C</sub>	1304.5	1311	1317.5	nm	
Side-mode Suppression Ratio	SMSR	30			dB	
Average launch power, each lane	TxAVG	-2.9		4	dBm	1
Transmit OMAouter, each lane	TxOMA	-0.8		4.2	dBm	2

Launch power in OMAouter minus TDECQ, each lane		-2.2			dBm	
Transmitter and dispersion eye closure, each lane	TDECQ			3.4	dB	
Average launch power of OFF transmitter, each lane				-15	dBm	
Extinction Ratio	ER	3.5			dB	
RIN21.4OMA				-136	dB/Hz	
Optical return loss tolerance				21.4	dB	
Transmitter reflectance				-26	dB	3
<b>Receiver</b>						
Signaling speed per lane			53.125		GBd	
Modulation format		PAM4				
Center wavelength	λC	1304.5	1311	1317.5	nm	
Damage threshold each lane		5			dBm	4
Average receive power each lane	RxAVG	-5.9		4	dBm	5
Receive Power (OMAouter) each lane	RxOMA			4.2	dBm	
Receiver reflectance				-26	dB	
Receiver sensitivity (OMAouter), each lane	SenOMA			-4.4	dBm	6
Stressed Receiver sensitivity (OMAouter), each lane				-1.9	dBm	7
<b>Conditions of Stressed Receiver Sensitivity Test:</b>						
Stressed eye closure for PAM4 (SECQ), lane under test			3.4		dB	8
OMAouter of each aggressor lane			4.2		dBm	8
LOS Assert	LOSA	-15			dBm	8
LOS De-Assert	LOSD			-10	dBm	8
LOS Hysteresis		0.5			dB	8

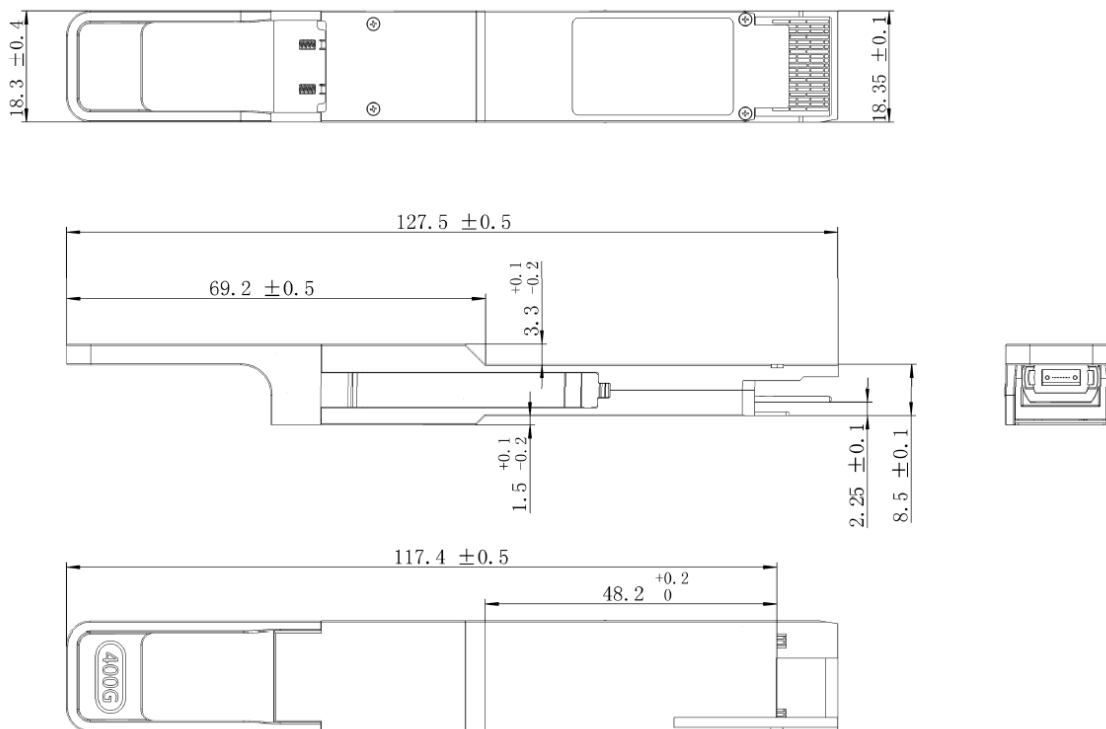
## Notes:

1. Average launch power, each lane (min) is informative and not the principal indicator of signal strength. A transmitter with launch power below this value cannot be compliant; however, a value above this does not ensure compliance.
2. Even if the TDECQ < 1.4 dB, the OMAouter (min) must exceed these values. Note9: Transmitter reflectance is defined looking into the transmitter.
3. Transmitter reflectance is defined looking into the transmitter.
4. The receiver shall be able to tolerate, without damage, continuous exposure to an optical input signal having this

average power level. The receiver does not have to operate correctly at this input power.

5. Average receive power, each lane (min) is informative and not the principal indicator of signal strength. A received power below this value cannot be compliant; however, a value above this does not ensure compliance
6. Receiver sensitivity (OMA<sub>outer</sub>), each lane (max) is informative and is defined for a transmitter with SECQ of 0.9 dB.
7. Measured with conformance test signal at TP3 for the BER specified in IEEE Std 802.3bs clause 124.1.1.
8. These test conditions are for measuring stressed receiver sensitivity. They are not characteristics of the receiver.

## 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
Arista	QDD-400G-DR4-AN-A	MSA	AN-QSFP400G-DR4
Cisco	QDD-400G-DR4-S-A	MSA Champion ONE	400GQSFPDDE-DR4
Juniper	QDD-400G-DR4-JN-A	Nvidia	MMS1V00-WM-A

## 7. Contact Information

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