

Features:

- Compliant with IEEE802.3bs standard: 400GAUI-8 electrical interface
- Compliant with IEEE 802.3cu standards: 4x 100GBASE-FR1 optical interface
- Compliant with QSFP-DD MSA HW Rev 5.1 Type 2 housing with MPO-12 connector
- Compliant with QSFP-DD CMIS Rev 4.0
- Maximum power consumption 10W
- Case operating temperature: Commercial: 0°C to 70°C
- Two wire serial Interface with digital diagnostic monitoring
- Complies with EU Directive 2011/65/EU (RoHS compliant) Class 1 Laser



1. Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit	Notes
Storage Temperature	TS	-40	85	°C	
Supply Voltage	VCC	-0.5	3.6	V	
Relative Humidity (non-condensing)	RH	5	95	%	
Control Input Voltage	VI	-0.3	VCC+0.5	V	

2. Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Operating Case Temperature	TOPR	0	-	70	°C	
Power Supply Voltage	VCC	3.135	3.3	3.465	V	
Instantaneous peak current at hot plug	ICC_IP	-	-	4000	mA	
Sustained peak current at hot plug	ICC_SP	-	-	3300	mA	
Maximum Power Dissipation	PD	-	-	10	W	
Maximum Power Dissipation, Low Power Mode	PDLP	-	-	1.5	W	
Signalling Rate per Lane	SRL	-	53.125	-	GBd	PAM4
Two Wire Serial Interface Clock Rate	-	-	-	400	kHz	

Power Supply Noise Tolerance (10Hz - 10MHz)	-	-	-	66	mV	
Rx Differential Data Output Load	-	-	100	-	Ohm	
Operating Distance	-	2	-	2000	m	

3. Transmitter Optical Specifications

The following table lists the performance specifications for the various functional blocks of the integrated optical transceiver module.

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Wavelength	λ_C	1304.5	1311	1317.5	nm	
Side Mode Suppression Ratio	SMSR	30	-	-	dB	
Average Launch Power, each lane	AOPL	-3.1	-	4	dBm	1
Outer Optical Modulation Amplitude (OMA _{outer}), each lane	T _{OMA}	-	-	4.2	dBm	
Outer Optical Modulation Amplitude (OMA _{outer}) each lane: for TDECQ <1.4dB for 1.4 ≤ TDECQ ≤ 3.4dB	T _{OMA}	-0.1 -1.5 + TDECQ	-	-	dBm	
Transmitter and Dispersion Eye Closure for PAM4 (TDECQ), each lane	TDECQ	-	-	3.4	dB	
Transmitter eye closure for PAM4 (TECQ)	TECQ	-	-	3.4	dB	
TDECQ - TECQ	-	-	-	2.5	dB	
Over/under-shoot	-	-	-	22	%	
Transmitter power excursion	-	-	-	2	dBm	
Average Launch Power of OFF Transmitter, each lane	TOFF	-	-	-15	dBm	
Extinction Ratio, each lane	ER	3.5	-	-	dB	
RIN _{OMA}	RIN	-	-	-136	dB/ Hz	
Optical Return Loss Tolerance	ORL	-	-	17.1	dB	
Transmitter Reflectance	TR	-	-	-26	dB	
Transmitter Transition Time	T _t	-	-	17	ps	

Note:

1. Average launch power, each lane (min) is informative and not the principal indicator of signal strength.

4. Receiver Optical Specifications

The following table lists the performance specifications for the various functional blocks of the integrated optical transceiver module.

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Wavelength	λC	1304.5	1311	1317.5	nm	
Damage Threshold, each lane	AOP _D	5	-	-	dBm	
Average Receive Power, each lane	AOP _R	-7.1	-	4	dBm	1
Receive Power (OMA _{outer}), each lane	OMAR	-	-	4.2	dBm	
Receiver Reflectance	RR	-	-	-26	dB	
Receiver Sensitivity (OMA _{outer}), each lane for TECQ <1.4dB for 1.4 ≤ TECQ ≤ 3.4dB	S _{OMA}	-	-	-4.5 -5.9+TECQ	dBm	
Stressed Receiver Sensitivity (OMA _{outer}), each lane	SRS	-	-	-2.5	dBm	2
Conditions of stressed receiver sensitivity test	-	-	-	-		
Stressed eye closure for PAM4 (SECQ)	-	-	3.4	-	dB	

Notes:

1. Average receive power, (min) is informative and not the principal indicator of signal strength;
2. Measured with conformance test signal at TP3 for the BER = 2.4x10⁻⁴.

5. Electrical Specification High Speed Signal

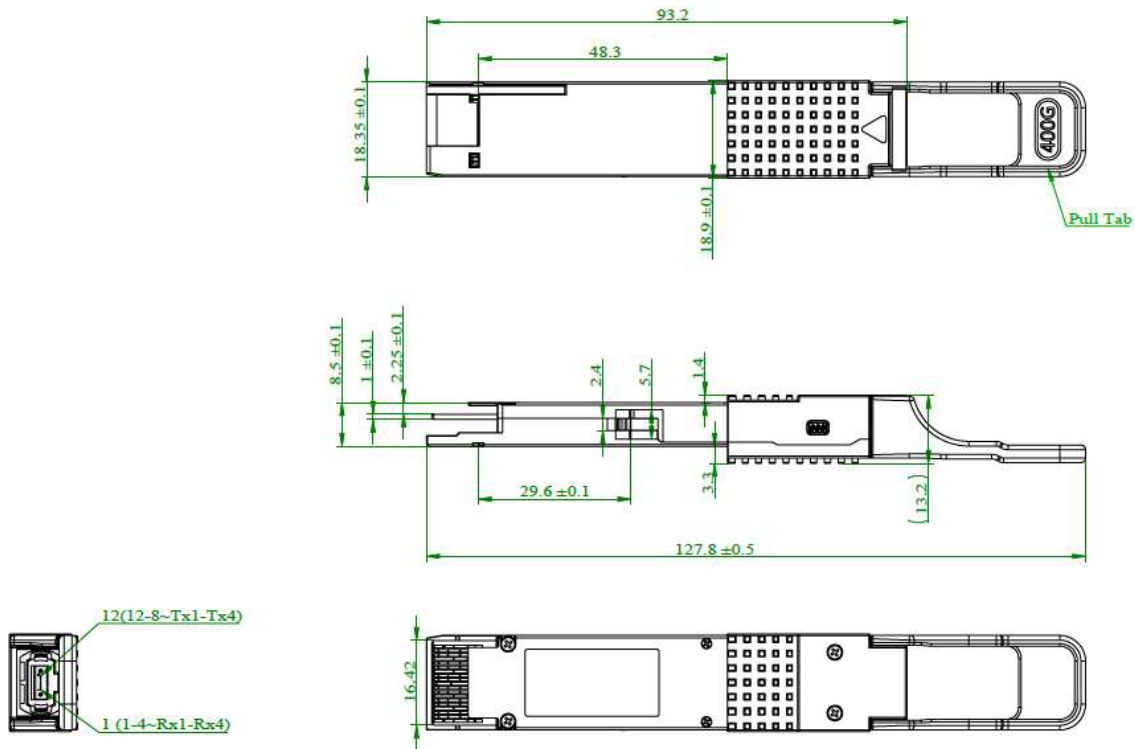
Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Receiver (Module Output)						
AC common-mode output Voltage (RMS)		-	-	17.5	mV	
Differential output Voltage		-	-	900	mV	
Near-end Eye height, differential		70	-	-	mV	
Far-end Eye height, differential		30	-	-	mV	
Far end pre-cursor ratio		-4.5	-	2.5	%	
Differential Termination Mismatch		-	-	10	%	
Transition Time (min, 20% to 80%)		9.5	-	-	ps	
DC common mode Voltage		-350	-	2850	mV	
Transmitter (Module Input)						
Differential pk-pk input Voltage tolerance		900	-	-	mV	
Differential termination mismatch		-	-	10	%	

Single-ended voltage tolerance range		-0.4	-	3.3	V	
DC common mode Voltage		-350	-	2850	mV	

6. Electrical Specification Low Speed Signal

Parameter	Symbol	Min.	Max.	Unit	Condition
Module output SCL and SDA	VOL	0	0.4	V	
Module Input SCL and SDA	VIL	-0.3	VCC*0.3	V	
	VIH	VCC*0.7	VCC+0.5	V	
InitMode, ResetL and ModSelL	VIL	-0.3	0.8	V	
	VIH	2	VCC+0.3	V	
IntL	VOL	0	0.4	V	
	VOH	VCC-0.5	VCC+0.3	V	

7. 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.

8. Ordering Information

OEM	Part Number	OEM	Part Number
Arista	QDD-400G-XDR4-A	MSA	AN-QSFPDD-XDR4
Cisco	QDD-400G-DR4-S-2-A	MSA Champion ONE	400GQSFPDDE-DR4+
Juniper	QDD-4X100G-FR-A		

9. Contact Information

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