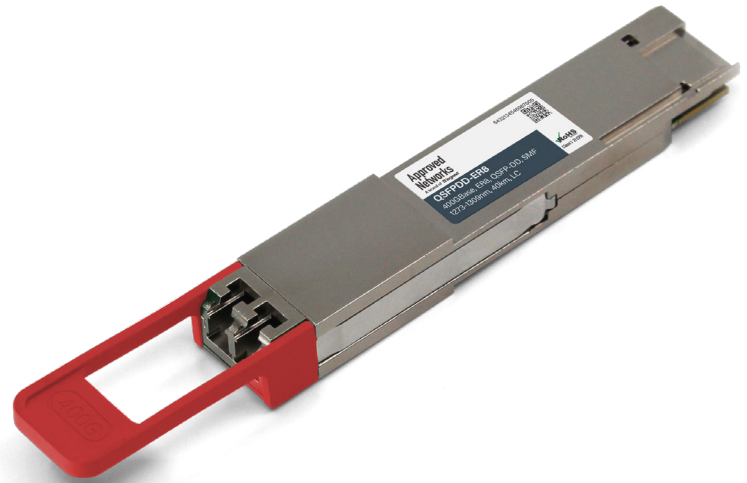


Features:

- Compliant with IEEE std 802.3cnTM-2019:
 - 400GBASE-ER8 optical interface
 - 400GAUI-8 electrical interface
- Compliant with QSFP-DD MSA HW Rev 5.1 with duplex LC connector
- Compliant with QSFP-DD CMIS Rev 4.0
- Case operating temperature 0°C to 70°C
- Two wire serial Interface with digital diagnostic monitoring
- Complies with EU Directive 2011/65/EU (RoHS compliant)
- Class 1/1M Laser



1. Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Storage Temperature	TS	-40	85	°C
Supply Voltage	VCC	-0.5	3.6	V
Relative Humidity (non-condensing)	RH	5	95	%
Data Input Voltage Differential	IVDIP-VDINI	-	1	V
Control Input Voltage	VI	-0.3	VCC+0.5	V
Control Output Current	IO	-20	20	mA

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	-	-	5600	mA	
Sustained peak current at hot plug	ICC_SP	-	-	4620	mA	
Maximum Power Dissipation	PD	-	-	14	W	
Maximum Power Dissipation, Low Power Mode	PDLP	-	-	1.5	W	
Signalling Speed per Lane	DRL	-	26.5625	-	GBd	

Control Input Voltage High	VIH	VCC*0.7	-	VCC+0.3	V	
Control Input Voltage Low	VIL	-0.3	-	VCC*0.3	V	
Two Wire Serial Interface Clock Rate	-	-	-	400	kHz	
Power Supply Noise	-	-	-	66	mVpp	
Rx Differential Data Output Load	-	-	100	-	Ohm	
Operating Distance	-	0.002	-	40	km	1

Notes:

1. Channel insertion loss is 18dB for 40km.

3. Transmitter Optical Specifications

Parameter	Symbol	Min.	Typ.	Max.	Unit
Wavelength L0	$\lambda C0$	1272.55	1273.55	1274.54	nm
Wavelength L1	$\lambda C1$	1276.89	1277.89	1278.89	nm
Wavelength L2	$\lambda C2$	1281.25	1282.26	1283.27	nm
Wavelength L3	$\lambda C3$	1285.65	1286.67	1287.68	nm
Wavelength L4	$\lambda C4$	1294.53	1295.56	1296.59	nm
Wavelength L5	$\lambda C5$	1299.02	1300.06	1301.09	nm
Wavelength L6	$\lambda C6$	1303.54	1304.59	1305.63	nm
Wavelength L7	$\lambda C7$	1308.09	1309.14	1310.19	nm
Side Mode Suppression Ratio	SMSR	30	-	-	dB
Total Average Launch Power	AOPT	-	-	14.6	dBm
Average Launch Power, each lane ¹	AOPL	-0.6	-	5.6	dBm
Outer Optical Modulation Amplitude (OMA _{outer}), each Lane	TOMA	2.4	-	6.4	dBm
Difference in Launch Power between any two Lanes (OMA _{outer})	DT_OMA	-	-	4	dB
Launch Power in OMA _{outer} minus TDECQ, each lane	TOMA-TDECQ	1	-	-	dBm
Transmitter and Dispersion Eye Closure for PAM4 (TDECQ), each lane	TDECQ	-	-	3.4	dB
TDECQ -10log ₁₀ (Ceq)	-	-	-	3.4	dB
Average Launch Power of OFF Transmitter, each lane	TOFF	-	-	-30	dBm
Extinction Ratio	ER	6	-	-	dB
RIN _{15OMA}	RIN	-	-	-132	dB/Hz

Optical Return Loss Tolerance	ORL	-	-	15	dB
Transmitter Reflectance ²	TR	-	-	-26	dB

Notes:

1. Average launch power, each lane (min) is informative and not the principal indicator of signal strength
2. Transmitter reflectance is defined looking into the transmitter

4. Receiver Optical Specifications

Parameter	Symbol	Min.	Typ.	Max.	Unit
Wavelength L0	$\lambda C0$	1272.55	1273.55	1274.54	nm
Wavelength L1	$\lambda C1$	1276.89	1277.89	1278.89	nm
Wavelength L2	$\lambda C2$	1281.25	1282.26	1283.27	nm
Wavelength L3	$\lambda C3$	1285.65	1286.67	1287.68	nm
Wavelength L4	$\lambda C4$	1294.53	1295.56	1296.59	nm
Wavelength L5	$\lambda C5$	1299.02	1300.06	1301.09	nm
Wavelength L6	$\lambda C6$	1303.54	1304.59	1305.63	nm
Wavelength L7	$\lambda C7$	1308.09	1309.14	1310.19	nm
Damage Threshold, each Lane	AOPD	-3.4	-	-	dBm
Average Receive Power, each Lane	AOPR	-18.6	-	-4.4	dBm
Receive Power (OMA _{outer}), each Lane	OMAR	-	-	-3.6	dBm
Difference in Receive Power between any two Lanes (OMA _{outer})	DR_OMA	-	-	5.8	dB
Receiver Reflectance	RR	-	-	-26	dB
Receiver Sensitivity (OMA _{outer}), each Lane ¹	SOMA	-	-	(-16.1, SECQ -17.5)	dBm
Stressed Receiver Sensitivity (OMA _{outer}), each Lane ²	SRS	-	-	-14.1	dBm
Conditions of stressed receiver sensitivity test:					
Stressed eye closure for PAM4 (SECQ), lane under test	-	-	3.4	-	dB
SECQ - 10log ₁₀ (C _{eq}), lane under test	-	-	-	3.4	dB
OMA _{outer} of each aggressor lane	-	-	-8.3	-	dBm

Notes:

1. Receiver sensitivity (OMA_{outer}), each lane (max) is informative and is defined for a transmitter with SECQ of 1.4 dB.
2. Measured with conformance test signal at TP3 for the BER = 2.4x10⁻⁴

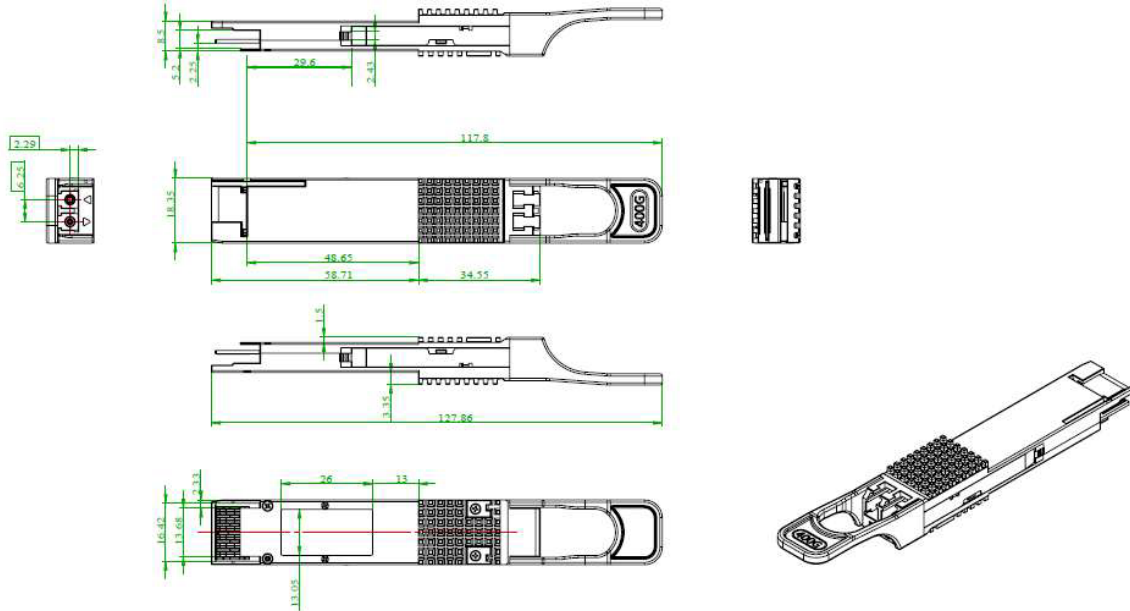
5. Electrical Specification High Speed Signal (compliant with IEEE 802.3 400GAUI-8)

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	-	-	UI	
Far-end Eye height, differential		30	-	-	UI	
Far end pre-cursor ratio		-	-	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 (compliant with QSFP-DD HW Rev 5.1)

Parameter	Symbol	Min.	Max.	Unit
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
MSA	AN-QSFPDD-ER8	Juniper	JNP-QDD-400G-ER8
MSA Champion ONE	400GQSFPDDE-ER8		

9. Contact Information

Tel: 800.590.9535

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