

Features

- Supports 206 G bps
- Single 3.3V Power Supply
- Power dissipation < 8.0 W
- Up to 2km over SMF
- QSFPDD MSA Compliant
- 8x25G electrical interface
- Dual CS connector
- Commercial case temperature range of 0°C to 70 °C
- 8*25 Gbps DFB based CWDM transmitter
- PIN and TIA array on the receiver side
- I2C interface with integrated Digital Diagnostic Monitoring



- Safety Certification: TUV/UL/FDA 1
- RoHS compliant

Applications

- 2x100G QSFP-DD CWDM4 applications with FEC

1. Absolute Maximum Ratings ⁴

Exceeding the absolute maximum ratings table may cause permanent damage to the device. This is just an emphasized rating, and does not involve the functional operation of the device that exceeds the specifications of this technical specification under these or other conditions. Long term operation under absolute maximum ratings will affect the reliability of the device.

Parameter	Symbol	Min	Typical	Max	Units
Storage Temperature	Ts	-40		85	°C
3.3 V Power Supply Voltage	Vcc	-0.5	3.3	3.6	V
Data Input Voltage – Single Ended		-0.5		Vcc+0.5	V
Data Input Voltage – Differential ⁵			0.8	V	
Operating Relative Humidity	RH	5	85	%	
Receiver Damage Threshold, per Lane	Rxdmg	3.5			dBm

Notes:

4. Exceeding any one of these values may damage the device permanently.
5. This is the maximum voltage that can be applied across the differential inputs without damaging the input circuitry. The damage threshold of the module input shall be at least 1600 mV peak to peak differential

2. Recommended Operating Conditions ⁶

Parameter	Symbol	Min	Typical	Max	Units
Operating case temperature ⁷	Tc	0	25	70	°C
Power supply voltage	Vcc	3.135	3.3	3.465	V
Power dissipation	PD			8	W
Electrical Signal Rate per Channel ⁸		25.78125		GBd	
Optical Signal Rate per Channel ⁹		25.78125		GBd	
Power Supply Noise ¹⁰				66	mVpp
Receiver Differential Data Output Load		100			Ohm

Notes:

6. Power Supply specifications, Instantaneous, sustained and steady state current compliant with QSPF DD MSA Power Classification.
7. The position of case temperature measurement is shown in Figure 9. Continuous operation at the maximum Recommended Operating Case Temperature should be avoided in order not to degrade reliability.
8. CAUI 4 operation with Host generated FEC. The transmitter must receive pre coded FEC signals from the host ASIC.
9. 2x 100G FR4 operation with Host generated FEC. The transmitter must receive pre coded FEC signals from the host ASIC.
10. Power Supply Noise is defined as the peak to peak noise amplitude over the frequency range at the host supply side of the recommended power supply filter with the module and recommended filter in place. Voltage levels including peak to peak noise are limited to the recommended operating range of the associated power supply.

3. Electrical Characteristics

Parameters	Test Point	Min.	Typ.	Max.	Unit	Conditions
Transceiver Power Consumption				8	W	
Transceiver Power Supply Current, Total				2560	mA	
High Speed Input						
Signaling Rate, Per Lane	TP1		25.78125		GBd	+/- 100 ppm
Differential pk-pk Input Voltage Tolerance	TP1a	900			mV	
Differential Return Loss (min)	TP1	Equation(83E-5)			dB	802.3bm
Differential to common mode input return loss (min)	TP1	Equation(83E-6)			dB	802.3bm
Differential termination mismatch	TP1			10	%	

Module stressed input test	TP1a					
Single-ended voltage tolerance range	TP1a	-0.4		3.3	V	
DC common-mode output voltage ¹²	TP1	-350		2850	mV	
Module stressed input test ¹³						
Eye width			0.46		UI	
Applied pk-pk sinusoidal jitter		Table 88-13				802.3bm
Eye height			95		mV	
High Speed Output						
Signaling Rate, Per Lane (range)	TP4	25.78125 ± 100 ppm			GBd	
Differential output voltage	TP4		900	mV		
Differential output return loss (Min)	TP4	Equation (83E-2)			dB	
Common to differential mode conversion return loss (min)	TP4	Equation (83E-3)			dB	
Differential termination mismatch	TP4			10	%	
DC common mode voltage	TP4	-0.35		2.85	V	
Transition Time (20% to 80%)	TP4	12			ps	
Eye width	TP4	0.57			UI	
Eye height differential	TP4	228			mV	
Vertical eye closure	TP4		5.5		dB	

Notes:

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

13. Module stressed input tolerance is measured using the procedure defined in 83E.3.4.1.1.

4. Optical Characteristics

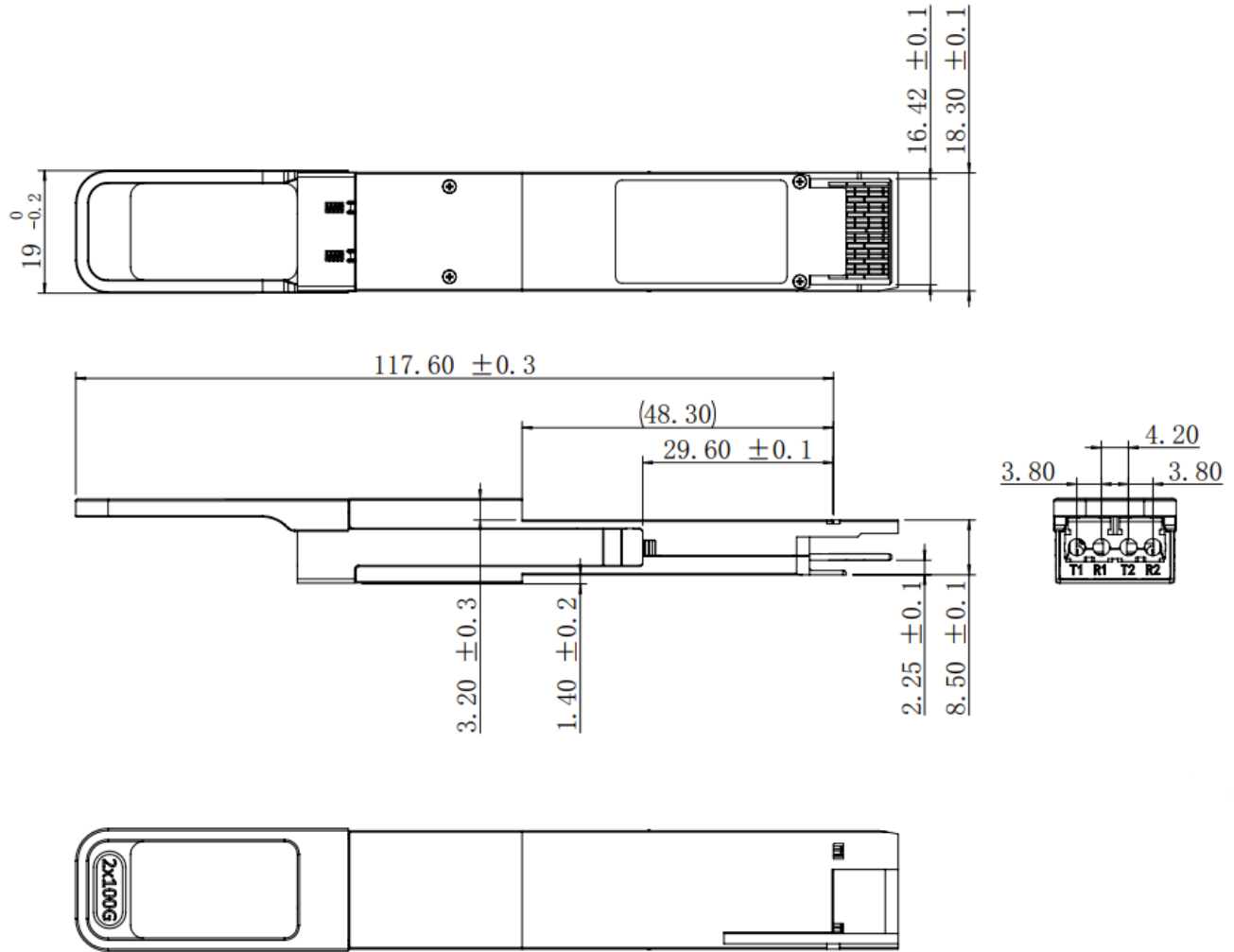
Parameters	Symbol	Min.	Typ.	Max.	Unit
Transmitter					
Signaling speed per lane	BRAVE	25.78125			Gbps
Data Rate Variation		-100		100	ppm
Modulation format		NRZ		1317.5	nm
Lane_0/4 Center Wavelength	$\lambda C0$	1264.5		1277.5	nm
Lane_1/5 Center Wavelength	$\lambda C1$	1284.5		1297.5	nm
Lane_2/6 Center Wavelength	$\lambda C2$	1304.5		1317.5	nm
Lane_3/7 Center Wavelength	$\lambda C3$	1324.5		1337.5	nm
Total Average Output Power	Po			8.5	dBm
Side Mode Suppression Ratio	SMSR	30			dB
Extinction Ratio	ER	3.5			dB
Average Launch Power each Lane ¹⁴	Peach	-6.5		2.5	dBm
Transmit OMA each Lane ¹⁵	TxOMA	-4.0		2.5	dBm
Launch power in OMA minus TDP, each lane	OMA-TDP	-5.0			dBm
Transmitter and Dispersion Penalty per Lane ¹⁶	TDP			3	dB
Average launch power of OFF transmitter				-30	dBm
Optical Return Loss Tolerance				20	dB
Transmitter Reflectance ¹⁷				-12	dB
Transmitter eye mask definition {X1, X2, X3, Y1, Y2, Y3} ¹⁸		{0.31, 0.4, 0.45, 0.34, 0.38, 0.4}			
Receiver					
Signaling Speed per Lane	BRAVE	25.78125			Gbps
Data Rate Variation		-100		100	ppm
Lane_0/4 Center Wavelength	$\lambda C0$	1264.5		1277.5	nm
Lane_1/5 Center Wavelength	$\lambda C1$	1284.5		1297.5	nm
Lane_2/6 Center Wavelength	$\lambda C2$	1304.5		1317.5	nm
Lane_3/7 Center Wavelength	$\lambda C3$	1324.5		1337.5	nm
Damage threshold	Rxdmg	3.5			dBm
Average receive power each lane ¹⁹	Rxpow	-11.5		2.5	dBm
Receive Power (OMA) per Lane	RxOMA			2.5	dBm
Unstressed Receiver Sensitivity (OMA) per Lane ²⁰	Rxsens			-10	dBm

Stressed Receiver Sensitivity (OMA) per Lane ²¹	RXSRS			-7.3	dBm
Vertical Eye Closure Penalty ²²	VECP		1.9		dB
Stressed J2 Jitter ²²	J2		0.33		UI
Stressed J4 Jitter ²²	J4		0.48		UI
SRS eye mask definition {X1, X2, X3, Y1, Y2, Y3} ²²		{0.39, 0.5, 0.5, 0.39, 0.39, 0.4}			
LOS Assert	LOSA		-25		dBm
LOS De-Assert	LOSD			-12	dBm
LOS Hysteresis			0.5		dB
RSSI accuracy			-3	3	dB
Receiver reflectance				-26	dB

Notes:

- 14. 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.
- 15. Even if the TDP < 1.0dB, the OMA (min) must exceed this value.
- 16. TDP does not include a penalty for multi-path interference (MPI).
- 17. Transmitter reflectance is defined looking into the transmitter.
- 18. Hit ratio of 5×10^{-5}
- 19. 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.
- 20. Sensitivity is specified at 5×10^{-5} BER.
- 21. Measured with conformance test signal at TP3 for BER = 5×10^{-5} .
- 22. Vertical eye closure penalty, stressed eye J2 Jitter, stressed eye J4 Jitter, and SRS eye mask definition are test conditions 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
Juniper	QDD-2X100G-CWDM4-A	MSA	AN-QDD2X100G-CWDM4-3

7. Contact Information

Tel: 800.590.9535

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