



O224-CLT-1.6T-2DR4-5

1.6TBASE, OSFP, 2xDR4, SMF TRANSCEIVER
1304, 1310, 1318nm, 500m REACH, DUAL MPO CONNECTOR

Features

- 8x200G PAM4 Siphon-based transmitter
- Dual MPO-12 APC connector receptacle optical interface compliant
- Single +3.3V power supply
- DDM function implemented
- Hot-pluggable OSFP1600 form factor
- Maximum link length of 500m on SMF fiber
- Power dissipation: 26W
- International class 1 laser safety certified
- Operating temperature range: 0°C - 70°C
- Compliant with ROHS2.0

Applications

- 1600GBASE-2xDR4 Ethernet links
- Switch & Router Connections
- Data Centers
- Other 1600G Interconnect Requirements

Standards

- IEEE P802.3dj™-D2p0
- OSFP MSA Rev 5.2
- CMIS Rev 5.2 or later

Absolute Maximum Ratings

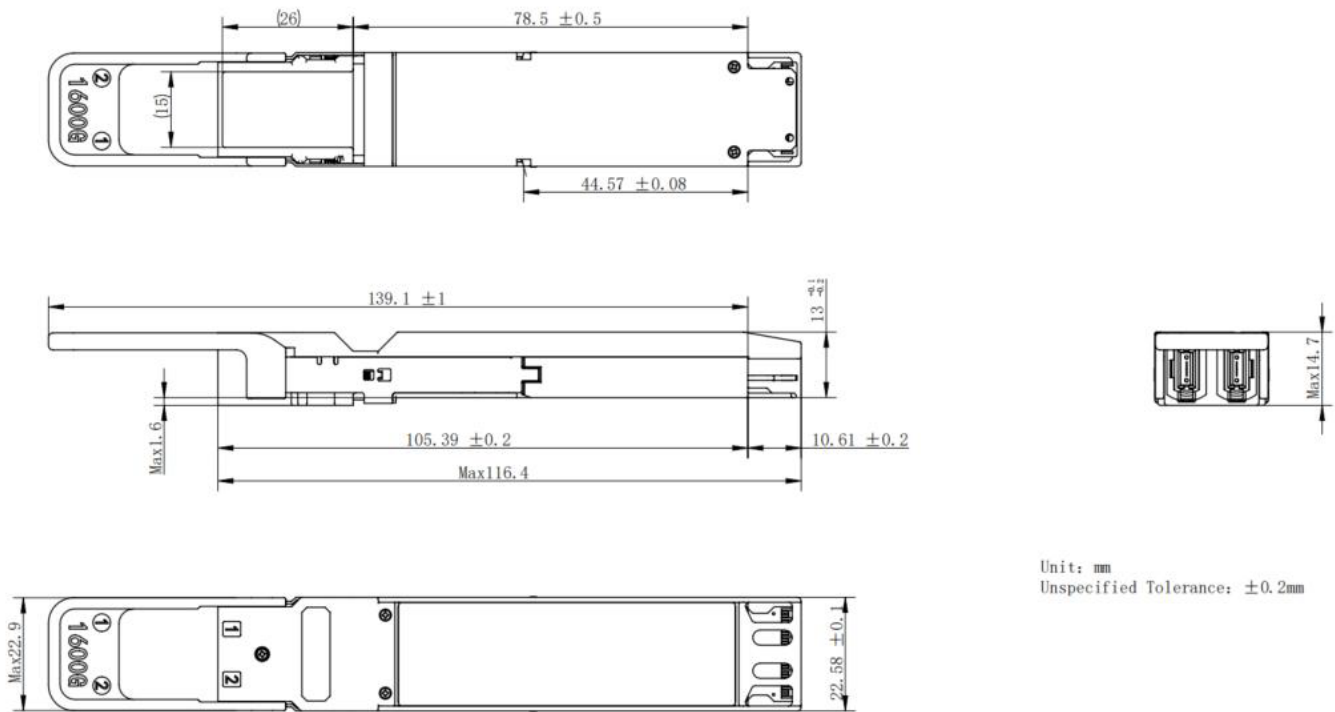
Parameter	Symbol	Units	Minimum	Maximum
Storage Temperature	Ts	°C	-40	85
Relative Humidity	RH	%	5	85
Power Supply Voltage	Vcc	V	-0.3	3.6

Recommended Operating Conditions					
Parameter	Symbol	Units	Minimum	Typical	Maximum
Operating Case Temperature	Tc	oC	0		70
Power Supply Voltage	Vcc	V	3.135	3.3	3.465
Power Consumption	Pc	W			26

Optical Characteristics				
Parameter	Minimum	Typical	Maximum	Unit
Transmitter				
Signaling Rate	106.2-50ppm	106.25	106.2+50ppm	GBd
Modulation Format		PAM4		
Wavelength	1304.5	1311	1317.5	nm
Side-mode Suppression Ratio (SMSR)	30			dB
Average Launch Power	-3.3		4	dBm
Outer Optical Modulation Amplitude (OMA _{outer})			4.2	dBm
Outer Optical Modulation Amplitude (OMA _{outer}) for TDECQ < 0.9 dB for 0.9 dB ≤max (TECQ,TDECQ) ≤ 3.4 dB	-0.3 -1.2 + max (TECQ, TDECQ)			dBm
Transmitter and Dispersion Eye Closure for PAM4 (TDECQ)			3.4	dB
Transmitter Eye Closure for PAM4 (TECQ)			3.4	dB
TDECQ - TECQ , each Lane			2.5	dB
Transmitter Overshoot and Undershoot			22	%
Transmitter Power Excursion, each Lane			2.3	dB
Extinction Ratio	3.5			dB
Transmitter Transition Time			8	ps
Average Launch Power of OFF Transmitter			-15	dBm
RIN _{21.4OMA}			-139	dB/Hz
Optical Return Loss Tolerance			21.4	dB
Transmitter Reflectance			-26	dB
Receiver				
Signaling Rate	106.25-50ppm	106.25	106.25+50ppm	GBd
Modulation Format		PAM4		
Wavelength	1304.5	1311	1317.5	nm
Damage Threshold	5	dBm		
Average Receive Power	-6.3		4	dBm
Receive Power (OMA _{outer})			4.2	dBm
Receiver Reflectance			-26	dB
Receiver Sensitivity (OMA _{outer}) for TECQ < 0.9 dB for 0.9 dB ≤ TECQ ≤ SECQ			-3.4 -4.3+TECQ	dBm
Stressed Receiver Sensitivity (OMA _{outer})			-0.9	dBm
Conditions of Stressed Receiver Sensitivity Test:				
Stressed Eye Closure for PAM4 (SECQ)		3.4		dB
OMA _{outer} of each Aggressor Lane		4.2		dBm

Electric Ports Definition					
Parameter	Minimum	Typical	Maximum	Unit	Notes
Supply Voltage	3.135		3.465	V	
Signaling Rate, each Lane	106.25-50ppm	106.25	106.25+50ppm	GBd	
Module Input Characteristics					
Single-ended Voltage Tolerance	-0.4		1.4	V	TP1a
DC Common-mode Voltage Tolerance	0.15		1.05	V	TP1a
Peak-to-peak AC Common-mode Voltage Tolerance	0.032 0.08			V	TP1a
Low-frequency, VCMLF					
Full-band, VCMFB					
Differential-mode to Common-mode Return Loss	See IEEE P802.3dj™/D2.0 Equation (179–27)			dB	TP1a
Effective Return Loss	8.5			dB	TP1
Amplitude Tolerance			0.5	V	TP1a
Interference Tolerance	See IEEE P802.3dj™/D2.0 Table 176D–10				TP1a
Jitter Tolerance	See IEEE P802.3dj™/D2.0 Table 176D–11				TP1a
Module Output Characteristics					
AC Common-mode Peak-to-peak Voltage (max)			15 60	mV	TP4
Low-frequency, VCMLF					
Full-band, VCMFB					
Differential peak-to-peak Output Voltage (max)			30 1000	mV	TP4
Output Disabled					
Output Enabled					
DC Common-mode Voltage	0.15		1.05	V	
Effective Return Loss	8.5			dB	TP4
Common-mode to Common-mode Return Loss (min)	See IEEE P802.3dj™/D2.0 Equation (179–19)			dB	TP4
Common-mode to Differential-mode Return Loss (min)	See IEEE P802.3dj™/D2.0 Equation (179–20)			dB	TP4
Transmitter Steady-state Voltage	0.4		0.5	V	TP4
Linear Fit Pulse Peak Ratio (min)	0.567				TP4
Level Separation Mismatch Ratio (min)	0.95				TP4
Transmitter Output Waveform					
Absolute Value of Step Size for All Taps	0.005		0.025		
Value at Minimum State for c(–3)			-0.06		
Value at Maximum State for c(–2)	0.12				
Value at Minimum State for c(–1)			-0.34		
Value at Minimum State for c(0)			0.5		
Value at Minimum State for c(1)			-0.2		
Difference Signal-to-noise-and-distortion Ratio	0			dB	TP4
Signal-to-residual-intersymbol-interference Ratio	28			dB	TP4
Output Jitter			0.023 0.025 0.118	UI	TP4
JRMS					
EOJ03					
J4u03					
IIC communication					
IIC Clock Frequency	100		1000	kHz	
Clock Stretching			500	us	
Data In Hold Time	0			us	
Data In Setup Time	0.1			us	

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.

Ordering Information			
OEM	Part Number	OEM	Part Number
Nvidia	MMS4A00-A	MSA	AN-O224-CLT-1.6T-2DR4-5

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