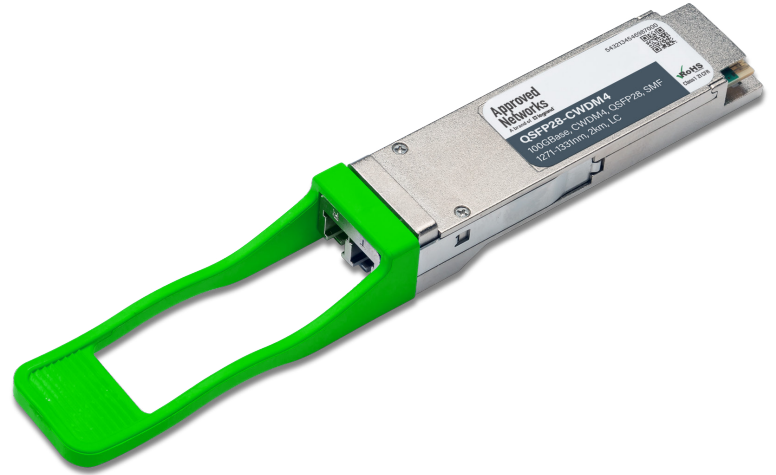


Features

- 103.125 Gbit/s Single Rate Capability
- Compliant to CWDM4 MSA [1]
- 25.78125 Gbit/s x 4 channel Electrical Interface (CAUI-4) [2]
- Transmission length up to 2km
- Compliant to QSFP+ 28Gb/s 4X Pluggable Transceiver Specifications (SFF-8665) [3]
- Optical light source: 4 channel x 1310 nm un-cooled DFB LD
- Optical receiver: 4 channel x PIN photo detector
- Low power consumption: 3.5 W max
- Operating case temperature: 0 to 70 deg C
- Compact size: 18.4 mm x 72 (122) mm x 8.5 mm
- Hot Z-Pluggable to 38-pin electrical connector
- Latching mechanism: Pull tab
- Two-wire common management interface (SFF-8636) [4]



- RoHS6 compliant
- 3.3V power supply voltage
- RoHS 6 compliant (lead free)

References

- CWDM4 MSA Technical Specification Rev 1.0
- IEEE Std 802.3bm-2015
- SFF-8665 Rev 1.8 May 10, 2013
- SFF-8636 Rev 2.5 April 18, 2015

1. Absolute Maximum Ratings

Stresses in excess of the Absolute Maximum Ratings can cause permanent damage to the device.

Parameter	Symbol	Min.	Max.	Unit	Notes
Supply Voltage	Vcc	0	+3.6	V	+3.3 V
Storage Temperature		-40	85	°C	
Optical Receiver Input		-	+3.5	dBm	Average

2. Operating Environments

Electrical and optical characteristics below are defined under this operating environment, unless otherwise specified.

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Supply Voltage	Vcc	3.135	3.3	3.465	V	
Supply Voltage Noise Tolerance	PSNR	-	-	66	mV	10 Hz -10 MHz
Power Consumption		-	-	3.5	W	
Supply Current	-	-	-	1010.1	mA	Steady state
Case Temperature	TC	0	25	70	°C	

3. Electrical Characteristics

Parameter	Min.	Typ.	Max.	Unit	Notes
Transmitter (Each lane)					
Differential pk-pk input voltage tolerance (min)	900	-	-	mV	at TP1a
Differential termination mismatch	-	-	10	%	at TP1
Single-ended input voltage tolerance range	-0.4 to 3.3	-	-	V	at TP1a
DC common mode voltage	-350	-	2850	mV	at TP1
Receiver (Each lane, at TP4)					
AC Common-mode output voltage (RMS)	-	-	17.5	mV	
Differential output voltage	-	-	900	mV	
Eye width	0.57	-	-	UI	
Eye height, differential	228	-	-	mV	
Vertical eye closure	-	-	5.5	dB	
Differential termination mismatch	-	-	10	%	
Transition time (20% to 80%)	12	-	-	ps	
DC common mode voltage	-350	-	2850	mV	

Note: Electrical Rx output is squelched for loss of optical input signal.

4. Optical Characteristics

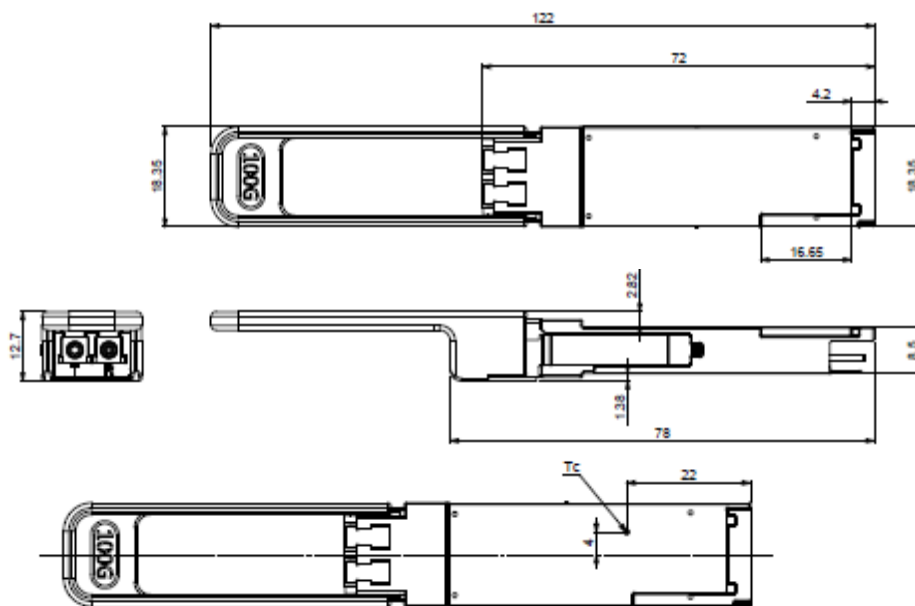
Parameter	Min.	Typ.	Max.	Unit	Notes
Signaling speed (nominal)	-	103.125	-	Gbit/s	
Signal speed variation from nominal	-100	-	100	ppm	
Center wavelength	1264.5	-	1277.5	nm	L0
	1284.5	-	1297.5	nm	L1
	1304.5	-	1317.5	nm	L2
	1324.5	-	1337.5	nm	L3
Transmitter Requirement					
Side-mode suppression ratio	30	-	-	dB	
Total average launch power	-	-	8.5	dBm	
Average launch power, each lane	-6.5	-	2.5	dBm	Min. is informative
Optical Modulation Amplitude (OMA), each lane	-4.0	-	2.5	dBm	Note 1
Launch power in OMA minus TDP, each lane	-5.0	-	-	dBm	
Transmitter and dispersion penalty (TDP), each lane	-	-	3.0	dB	Note 2
Average launch power of OFF transmitter, each lane	-	-	-30	dB	
Extinction ratio	3.5	-	-	dB	
Optical return loss tolerance	-	-	20	dB	
Transmitter reflectance	-	-	-12	dB	Note 3
Transmitter eye mask definition {X1, X2, X3, Y1, Y2, Y3}	{0.31, 0.4, 0.45, 0.34, 0.38, 0.4}				Hit ratio 5×10 ⁻⁵ per sample
Receiver Requirement					
Damage threshold each lane	3.5	-	-	dB	
Average receiver power, each lane	-11.5	-	2.5	dBm	Min. is informative
Receive power, each lane	-	-	2.5	dBm	
Receiver reflectance	-	-	-26	dB	
Receiver sensitivity (OMA), each lane at 5 × 10 ⁻⁵ BER	-	-	-10.0	dBm	Normative
Stressed receiver sensitivity (OMA), each lane at 5 × 10 ⁻⁵ BER	-	-	-7.3	dBm	At TP3

Conditions of stressed receiver sensitivity test:					
Vertical eye closure penalty, each lane	1.9			dB	Note 4
Stressed eye J2 jitter, each lane	0.33			UI	Note 4
Stressed eye J4 jitter, each lane	0.48			UI	Note 4
SRS eye mask definition {X1, X2, X3, Y1, Y2, Y3}	{0.39, 0.5, 0.5, 0.39, 0.39, 0.4}				Note 4
LOS Characteristics					
LOS Assert Level	-30	-	-	dBm	
LOS De-assert Level	-	-	-15	dBm	
LOS Hysteresis	0.5	-	-	dB	

Notes:

1. Even if the TDP < 1.0 dB, the OMA (min) must exceed this value.
2. TDP does not include a penalty for multi-path interference (MPI).
3. Transmitter reflectance is defined looking into the transmitter.
4. Test conditions for stressed receiver sensitivity, not characteristics of receiver.

5. Mechanical Diagram



Case Temperature measurement point

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
Adtran	1445512F1C-A	Finisar	FTLC1152RGPL-A
Arista	QSFP-100G-CWDM4-A	Huawei	02311MNN-A
Brocade-Foundry	100G-QSFP28-CWDM4-2KM-A	Intel	SPTSBP3CLCXX-A
Ciena	160-9403-900-A	Juniper	JNP-QSFP-100G-CWDM4-A
Cisco	QSFP-100G-CWDM4-S-A	Juniper	QSFP-100GBASE-CWDM-A
Cisco	QSFP-100G-SM-SR-A	Mellanox	MMA1L30-CM-A
Cisco	100GEQ-CW4-CSC	MSA	AN-QSFP28-CWDM4
Cisco	QSFP-100G-SM-SR-C1	MSA Champion ONE	100GQSFP28E-CW4
Cisco	QSFP-100G-CWDM4-S-C1	MSA OnePort	OP-QSFP28-CWDM4
Dell	407-BBVO-A	Oclaro	TRQ5E10CNF-LM000-A
Dell	Q28-100G-CWDM4-A	Oclaro	TRQ5E11ENF-LF000-A
Extreme	10404-A	Plexxi	PX-CBL-QSFP28-CWDM4-2KM-A
Finisar	FTLC1155RGPL-A	Transition Networks	TN-QSFP-100G-CWDM4-A

7. Contact Information

Tel: 800.590.9535

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