

QSFP-100G-CWDM4

100GBase-CWDM4 QSFP28 Transceiver

Hot Pluggable, +3.3V, Duplex LC, 1310nm, 500m, SMF, Commercial Temperature

FEATURES

- Hot-Pluggable QSFP28 form factor
- Supports 103.1Gb/s bit rate per channel
- Maximum link length of 500m on Single Mode Fibre (SMF)
- 4x26G retimed electrical interface
- Duplex LC receptacles
- I2C management interface
- Power Supply: +3.3V
- Power consumption < 3.5W
- Commercial Operating Temperature Range: 0 to 70°C
- RoHS-6 compliant

APPLICATIONS

- 100GBase-CWDM4 100G Ethernet
- 100G Data Centre

Description

ATGBICS QSFP-100G-CWDM4 QSFP28 transceiver modules are designed for use in 100 Gigabit Ethernet links on up to 500m of single mode fibre. They are compliant with the QSFP28 MSA1, IEEE 802.3ba 100GBASE-LR42 and IEEE 802.3bm CAUI-46. Digital diagnostic functions are available via the I2C interface, as specified by the QSFP28 MSA. The transceiver is RoHS-6 compliant per Directive 2011/65/EC3.

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Maximum Supply Voltage	V _{cc}	-0.5	-	3.6	V	
Storage Temperature	T _s	-40	-	+85	°C	
Case Operating Temperature	T _{op}	0	-	70	°C	
Relative Humidity	RH	5	-	90	%	

RECOMMENDED OPERATING ENVIRONMENT

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Maximum Supply Voltage	V _{cc}	3.1	3.3	3.5	V	
Data Rate per Lane	f _d	-	25.78125	-	Gbps	
Case Operating Temperature	T _{op}	0	-	70	°C	
Relative Humidity	RH	5	-	85	%	

ELECTRICAL CHARACTERISTICS (VCC = 3.135 to 3.465 Volts)

Parameter	Symbol	Min	Typical	Max	Unit	Note
Supply Voltage	Vcc	3.135	-	3.465	V	
Supply Current	Icc	-	-	1.12	A	
Module total power	P	-	-	3.5	W	1
TRANSMITTER						
Signaling rate per lane		25.78125 ± 100 ppm			Gbps	
Differential data input voltage per lane	Vin,pp	-	-	900	mV	
Differential input return loss (min)	RLd(f)	9.5 – 0.37f, 0.01≤f<8 4.75 – 7.4log10(f/14), 8 ≤f<19			dB	
Differential to common mode input return loss (min)	RLdc(f)	22-20(f/25.78), 0.01≤f<12.89 15-6(f/25.78), 12.89≤f<19			dB	
Differential termination mismatch		-	-	10	%	
Eye width		-	0.46	-	UI	
Applied pk-pk sinusoidal jitter		Per IEEE 802.3bm Table 88-13				
Eye height		-	95	-	mV	
DC common mode voltage		-350	-	2850	mV	
RECEIVER						
Signaling rate per lane		25.78125 ± 100 ppm			Gbps	
Differential data output swing	Vout,pp	100	-	400	mVpp	2
		300	-	600		
		400	-	800		
		600	-	1200		
Eye width		0.57	-	-	UI	
Vertical eye closure		-	-	5.5	dB	
Differential output return loss (min)	RLd(f)	9.5 – 0.37f, 0.01≤f<8 4.75 – 7.4log10(f/14), 8 ≤f<19			dB	
Common to differential mode conversion return loss (min)	RLdc(f)	22-20(f/25.78), 0.01≤f<12.89 15-6(f/25.78), 12.89≤f<19			dB	
Differential termination mismatch		-	-	10	%	
Transition time, 20% to 80%	t _r t _f	12	-	-	ps	

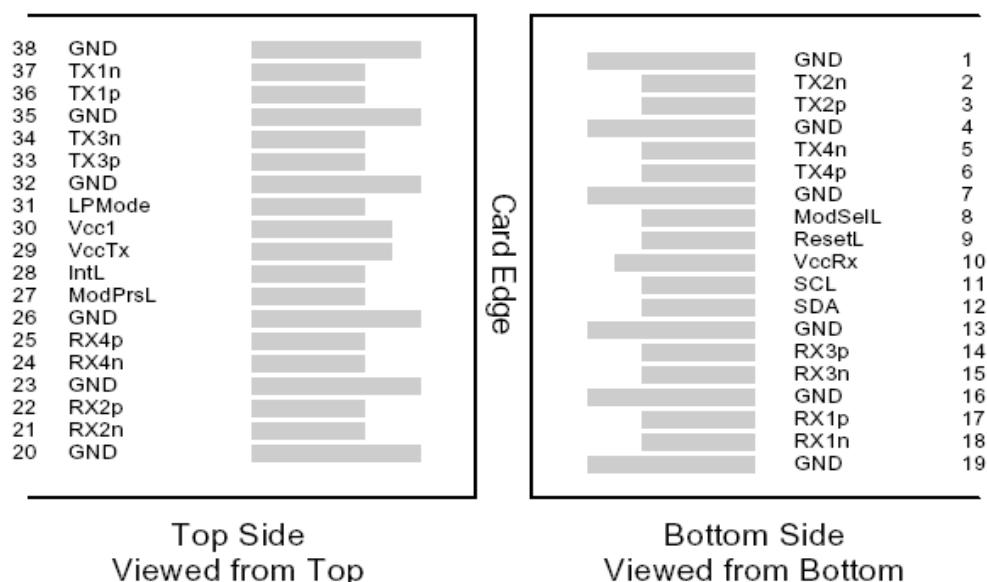
Note:

1. Maximum total power value is specified across the full temperature and voltage range.
2. Output voltage is settable in 4 discrete ranges via I2C. Default range is Range 2 (400 – 800mV).

OPTICAL PARAMETERS (VCC = 3.135 to 3.465 Volts)

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
TRANSMITTER						
Centre Wavelength Lane 0	λ0	1267	1270	1273	nm	
Centre Wavelength Lane 1	λ1	1287	1290	1293	nm	
Centre Wavelength Lane 2	λ2	1307	1310	1313	nm	
Centre Wavelength Lane 3	λ3	1327	1330	1333	nm	
Total Launch Power, 100GE	PALL	-	-	10.5	dBm	
Average Launch Power per Lane, 100GE	PTX_LANE	-4.3	-	4.5	dBm	
OMA per Lane, 100GE	OMA	-1.3	-	4.5	dBm	
Difference in launch power between lanes	PTX_DELTA_LANE	-	-	3.6	dB	
Total Launch Output Power, OTU4	PALL	-	-	TBD	dBm	
Average Launch Power per Lane, OTU4	PTX_LANE	-4.3	-	TBD	dBm	
Average Output Power (Laser Turn off)	P0UT-OFF	-	-	-30	dBm	
Side Mode Suppression Ratio	SMSR	30	-	-	dB	
Extinction Ratio, 100GE	ER	4	-	-	dB	
Transmitter and Dispersion Penalty per lane	TDP	-	-	2.2	dB	
Optical Return Loss Tolerance	ORLT	-	-	20	dB	
Optical Eye Mask, 100GE	Compliant with IEEE 802.3ba					
Optical Eye Mask, OTU4	Compliant with ITU-T G.695					
RECEIVER						
Centre Wavelength Lane 0	λ0	1267	1270	1273	nm	
Centre Wavelength Lane 1	λ1	1287	1290	1293	nm	
Centre Wavelength Lane 2	λ2	1307	1310	1313	nm	
Centre Wavelength Lane 3	λ3	1327	1330	1333	nm	
Average Rx Power per Lane, 100GE	PRX_LANE	-10.6	-	4.5	dBm	
OMA Sensitivity per Lane, 100GE	POMA_LANE	-	-	-8.6	dBm	
Average Rx Power per Lane, OTU4	PRX_AVE_LANE	TBD	-	TBD	dBm	
Sensitivity per Lane, OTU4	P_OMA_LANE	-	-	TBD	dBm	
Receiver Overload	PIN-OL	4.5	-	-	dBm	
Reflectance	Ref	-	-	-26	dB	
LOS Assert per lane	LOSA	TBD	-	-	dBm	
LOS De-assert	LOSD	-	-	TBD	dBm	
LOS Hysteresis	LOSH	0.5	-	4.0	dB	

PIN DESCRIPTION



PIN DESCRIPTION

Pin	Symbol	Name/Description	Note
1	GND	Ground	1
2	Tx2n	Transmitter Inverted Data Input	
3	Tx2p	Transmitter Non-Inverted Data Input	
4	GND	Ground	1
5	Tx4n	Transmitter Inverted Data Input	
6	Tx4p	Transmitter Non-Inverted Data Input	
7	GND	Ground	1
8	ModSelL	Module Select	
9	ResetL	Module Reset	
10	Vcc Rx	+3.3 V Power supply receiver	
11	SCL	2-wire serial interface clock	
12	SDA	2-wire serial interface data	
13	GND	Ground	1
14	Rx3p	Receiver Non-Inverted Data Output	
15	Rx3n	Receiver Inverted Data Output	
16	GND	Ground	1
17	Rx1p	Receiver Non-Inverted Data Output	
18	Rx1n	Receiver Inverted Data Output	
19	GND	Ground	1
20	GND	Ground	
21	Rx2n	Receiver Inverted Data Output	
22	Rx2p	Receiver Non-Inverted Data Output	
23	GND	Ground	1
24	Rx4n	Receiver Inverted Data Output	
25	Rx4p	Receiver Non-Inverted Data Output	
26	GND	Ground	1
27	ModPrsL	Module Present	
28	IntL	Interrupt	
29	Vcc Tx	+3.3 V Power supply transmitter	

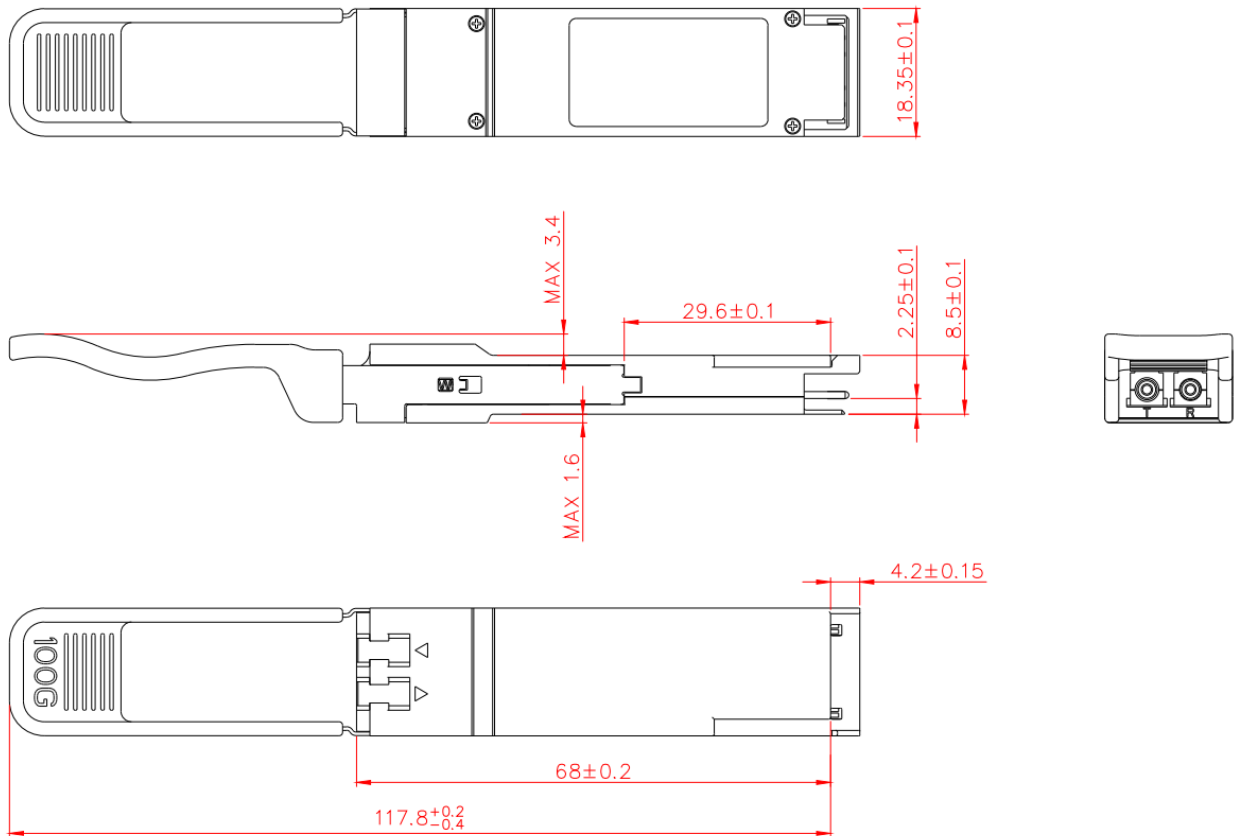
CONTINUED

30	Vcc1	+3.3 V Power Supply	
31	LPMode	Low Power Mode	
32	GND	Ground	1
33	Tx3p	Transmitter Non-Inverted Data Input	
34	Tx3n	Transmitter Inverted Data Input	
35	GND	Ground	1
36	Tx1p	Transmitter Non-Inverted Data Input	
37	Tx1n	Transmitter Inverted Data Input	
38	GND	Ground	1

Notes

1. Circuit ground is internally isolated from chassis ground.

MECHANICAL DIMENSIONS (UNIT: mm)



ESD

This transceiver is specified as ESD threshold 1kV for all electrical input pins, tested per MIL-STD-883, Method 3015.4 /JESD22-A114-A (HBM). However, normal ESD precautions are still required during the handling of this module. This transceiver is shipped in ESD protective packaging. It should be removed from the packaging and handled only in an ESD protected environment.

LASER SAFETY

This is a Class 1 Laser Product according to IEC 60825-1:1993+A1:1997+A2:2001. This product complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated (July 24, 2007)