WTQP112-LR4

QSFP28 100Gb/s LR4 10km DDM /
PRODUCT FEATURES

Part Number WTQP112-LR4	Data Rate 103.125/111.81Gbps	Temperature 0~70°C



1. Product Overview

Features

- Support line rates from 103.125 Gbps to 111.81 Gbps;
- Transmission data rate up to 25.78 and 27.95Gbps（NRZ）per channel
- Up to 10km transmission on SMF
- LAN WDM laser and PIN receiver
- High speed I/O electrical interface (CAUI-4)
- I2C interface with integrated Digital Diagnostic monitoring
- QSFP28 MSA package with duplex LC connector
- Single +3.3V power supply
- Maximum power consumption 5 W
- Operating case temperature: 0 to +70°C
- Compliant to IEEE 802.3ba, SFF-8665 and SFF-8679
- Complies with EU Directive 2015/863/EU

Applications

- 100GBASE LR4 100G Ethernet
- 100G OUT4

2. Ordering Information

Part No.	Data Rate	Laser	Fiber Type	Distance	Optical Interface	Temp	DDMI
WTQP112-LR4	103.125/111.81Gbps	LWDM	SMF	10km	LC	0~70°C	Y

3. Absolute Maximum Ratings

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Storage Temperature	TS	-40	-	+85	°C	
Supply Voltage	VCC	0.5	-	+3.6	V	
Operating Relative Humidity	RH	-	-	+85	%	

4. Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Operating Case Temperature	TC	0	-	+70	°C	
Power Supply Voltage	VCC	3.13	3.3	3.47	V	
Power Supply Current	ICC	-	-	1.44	A	
Maximum Power Dissipation	PD	-	-	5	W	
Aggregate Bit Rate	BRAVE	-	103.125/111.81	-	Gb/s	
Lane Bit Rate	BRLANE	-	25.78/27.95	-	Gb/s	
Transmission Distance	TD		-	10	km	Over SMF

5. Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Transmitter	Transmitter	Transmitter	Transmitter	Transmitter	Transmitter	Transmitter
Center Wavelength Lane 0	λ0	1294.53	1295.56	1296.59	nm	
Center Wavelength Lane 1	λ1	1299.02	1300.05	1301.09	nm	
Center Wavelength Lane 2	λ2	1303.54	1304.58	1305.63	nm	
Center Wavelength Lane 3	λ3	1308.09	1309.14	1310.19	nm	
Total Launch Power, 100GE	PALL	-	-	10.5	dBm	1
Average Launch Power per Lane, 100GE	PTX_LANE	-4.3	-	4.5	dBm	1
OMA per Lane, 100GE	OMA	-1.3	-	4.5	dBm	1
OMA–TDP per Lane, 100GE	OMA_TDP	-2.3	-	-	dBm	
Difference in launch power between lanes	PTX_Delta_LANE	-	-	5	dB	
Average Output Power (Laser Turn off)	P0UT-OFF	-	-	-30	dBm	
Side Mode Suppression Ratio	SMSR	30	-	-	dB	
Extinction Ratio, 100GE	ER	4	-	-	dB	
Optical Eye Mask, 100GE	Compliant with IEEE 802.3ba	Compliant with IEEE 802.3ba	Compliant with IEEE 802.3ba	Compliant with IEEE 802.3ba	Compliant with IEEE 802.3ba	2
Receiver	Receiver	Receiver	Receiver	Receiver	Receiver	Receiver
Center Wavelength Lane 0	λ0	1294.53	1295.56	1296.59	nm	
Center Wavelength Lane 1	λ1	1299.02	1300.05	1301.09	nm	

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Center Wavelength Lane 2	λ2	1303.54	1304.58	1305.63	nm	
Center Wavelength Lane 3	λ3	1308.09	1309.14	1310.19	nm	
Average Rx Power per Lane, 100GE	PRx _LANE	-10.6		4.5	dBm	3
OMA Sensitivity per Lane, 100GE	POMA_LANE	-	-	-8.6	dBm	3
Damage threshold	PDamage	5.5	-	-	dBm	
LOS Assert	LOSA	-30	-	-	dBm	
LOS De-Assert	LOSD	-	-	-11	dBm	
LOS Hysteresis	LOSH	0.5	-	-	dB	

6. Optical Parameters

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Transmitter	Transmitter	Transmitter	Transmitter	Transmitter	Transmitter	Transmitter
Signaling Speed per Lane			27.9525		Gbps	
Lane Wavelength	L0	1294.53	1295.56	1296.59	nm	
Lane Wavelength	L1	1299.02	1300.05	1301.09	nm	
Lane Wavelength	L2	1303.54	1304.58	1305.63	nm	
Lane Wavelength	L3	1308.09	1309.14	1310.19	nm	
Total Average Launch Power	PT			10	dBm	1
Average Launch Power per Lane,	Pavg	-0.6		4	dBm	1
Difference in launch power between any two lanes(Average and OMA) between any Two Lanes (OMA)	Ptx,diff			3	dB	
Average Output Power (Laser Turn off)	Poff			-30	dBm	
Side Mode Suppression Ratio	SMSR	30			dB	
Extinction Ratio	ER	4		7	dB	
Optical Eye Mask	{0.25,0.4, 0.45, 0.25, 0.28, 0.4}	{0.25,0.4, 0.45, 0.25, 0.28, 0.4}	{0.25,0.4, 0.45, 0.25, 0.28, 0.4}	{0.25,0.4, 0.45, 0.25, 0.28, 0.4}	%	2
Receiver	Receiver	Receiver	Receiver	Receiver	Receiver	Receiver
Signaling rate, each lane			27.9525		Gbps	
Center Wavelength Lane 0	λ0	1294.53	1295.56	1296.59	nm	
Center Wavelength Lane 1	λ1	1299.02	1300.05	1301.09	nm	
Center Wavelength Lane 2	λ2	1303.54	1304.58	1305.63	nm	

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Center Wavelength Lane 3	λ3	1308.09	1309.14	1310.19	nm	
Damage threshold , each lane	Pdamage	5.5			dBm	
Average Receive Power, each lane		-6.9		4	dBm	
Receiver sensitivity, each lane	SEN			-8.4	dBm	4
Los Assert	LosA	-30			dBm	
Los De-assert	LosDA			-12	dBm	
Los Hysteresis	LosH	0.5			dB	

7. Electrical Characteristics

Parameter	Symbol	Symbol	Min.	Typical	Max.	Unit	Notes
Transmitter (Module Input)	Transmitter (Module Input)	Transmitter (Module Input)	Transmitter (Module Input)	Transmitter (Module Input)	Transmitter (Module Input)	Transmitter (Module Input)	Transmitter (Module Input)
Differential Data Input Amplitude	Differential Data Input Amplitude	VIN,P-P	900	-	-	mVpp	
Differential Termination Mismatch	Differential Termination Mismatch		-	-	10	%	
LPMode, Reset and ModSelL / Tx dis	LPMode, Reset and ModSelL / Tx dis	VIL	-0.3	-	0.8	V	
LPMode, Reset and ModSelL / Tx dis	LPMode, Reset and ModSelL / Tx dis	VIH	2.0	-	VCC+0.3	V	
Receiver (Module Output)	Receiver (Module Output)	Receiver (Module Output)	Receiver (Module Output)	Receiver (Module Output)	Receiver (Module Output)	Receiver (Module Output)	Receiver (Module Output)
Differential Data Output Amplitude	VOUT,P-P	VOUT,P-P	-	-	900	mVpp	
Differential Termination Mismatch(1MHZ)			-	-	10	%	
Output Rise/Fall Time, 20%~80%	TR	TR	12	-	-	ps	
ModPrsL and IntL / Rx los	VOL	VOL	0	-	0.4	V	
ModPrsL and IntL / Rx los	VOH	VOH	VCC-0.5	-	VCC+0.3	V	

8. Digital Diagnostics

Parameter	Range	Accuracy	Unit	Calibration
Temperature	0 to 70	±3	ºC	Internal
Voltage	0 to VCC	±3%	V	Internal
Tx Bias Current Per Lane	0 to 100	±10%	mA	Internal
Tx Output Power Per Lane	-4.3 to 4.5	±3	dB	Internal
Rx Power (Each Lane)	-10.6 to 4.5	±3	dB	Internal

9. Pin Descriptions

PIN	Logic	Symbol	Description	Plug Seq.	Notes
1		GND	Ground	1	1
2	CML-I	Tx2n	Transmitter Inverted Data Input	3	
3	CML-I	Tx2p	Transmitter Non-Inverted Data Input	3	
4		GND	Ground	1	1
5	CML-I	Tx4n	Transmitter Inverted Data Input	3	
6	CML-I	Tx4p	Transmitter Non-Inverted Data Input	3	
7		GND	Ground	1	1
8	LVTLL-I	ModSelL	Module Select	3	
9	LVTLL-I	ResetL	Module Reset	3	
10		VccRx	+ 3.3V Power Supply Receiver	2	2
11	LVCMOS-I/O	SCL	2-Wire Serial Interface Clock	3	
12	LVCMOS-I/O	SDA	2-Wire Serial Interface Data	3	
13		GND	Ground	1	
14	CML-O	Rx3p	Receiver Non-Inverted Data Output	3	
15	CML-O	Rx3n	Receiver Inverted Data Output	3	
16		GND	Ground	1	1
17	CML-O	Rx1p	Receiver Non-Inverted Data Output	3	
18	CML-O	Rx1n	Receiver Inverted Data Output	3	
19		GND	Ground	1	1
20		GND	Ground	1	1
21	CML-O	Rx2n	Receiver Inverted Data Output	3	
22	CML-O	Rx2p	Receiver Non-Inverted Data Output	3	
23		GND	Ground	1	1
24	CML-O	Rx4n	Receiver Inverted Data Output	3	
25	CML-O	Rx4p	Receiver Non-Inverted Data Output	3	
26		GND	Ground	1	1
27	LVTTL-O	ModPrsL	Module Present	3	
28	LVTTL-O	IntL	Interrupt	3	

PIN	Logic	Symbol	Description	Plug Seq.	Notes
29		VccTx	+3.3 V Power Supply transmitter	2	2
30		Vcc1	+3.3 V Power Supply	2	2
31	LVTTL-I	LPMode	Low Power Mode	3	
32		GND	Ground	1	1
33	CML-I	Tx3p	Transmitter Non-Inverted Data Input	3	
34	CML-I	Tx3n	Transmitter Inverted Data Input	3	
35		GND	Ground	1	1
36	CML-I	Tx1p	Transmitter Non-Inverted Data Input	3	
37	CML-I	Tx1n	Transmitter Inverted Data Input	3	
38		GND	Ground	1	1

10. Pin Descriptions

Version No.	Date	Description
1.0	June 24, 2023	Preliminary datasheet

11. Revision History

Version	Date	Description	Prepared by
V6	2025	Unified WincoTek datasheet format	WincoTek
V6.1	2026-10-23	Engineering and format review	WincoTek