WTQ1HL1C(I)

100G QSFP28 Transceiver 1310nm SMF 10km

Part Number
WTQ1HL1C



1. Product Overview

WTQ1HL1C(I) is designed for 10km optical communication applications. This module contains 4-lane optical transmitter, 4-lane optical receiver and module management block including 2 wire serial inter-face. The optical signals are multiplexed to a single-mode fiber through an industry standard LC connector.

Features

- Support line rates from 103.125 Gb/s;
- Transmission data rate up to25.78（NRZ）per channel;
- Up to 10km transmission with KR4-FEC.
- LAN WDM EML laser and PIN ROSA;
- 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;
- dissipation
- Commercial：< 4W
- Industrial：<5W
- Temperature Range:

Applications

- 100GBASE-LR4 Ethernet
- 100G Datacom& Telecom connections

2. Ordering Information

Package	Part No.	Data Rate (Gbps)	Laser	Fiber Type	Distance(km)	Temp(℃)	Temp(℃)	Power Dissipation(W)
QSFP28	WTQ1HL1C	103.125	LWDM	SMF	10	0~70	Commercial	＜4
QSFP28	WTQ1HL1I	103.125	LWDM	SMF	10	-40~85	Industrial	＜5

3. Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Storage Temperature	TS	-40	+85	°C

Parameter	Symbol	Min.	Max.	Unit
Maximum 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	Top	0		+70	°C	WTQ1HL1C
Operating Case Temperature	Top	-40		+85	°C	WTQ1HL1I
Power Supply Voltage	VCC	3.13	3.3	3.47	V	
Power Supply Current	ICC			1.21	A	WTQ1HL1C
Power Supply Current	ICC			1.51	A	WTQ1HL1I
Maximum Power Dissipation	PD			4	W	WTQ1HL1C
Maximum Power Dissipation	PD			5	W	WTQ1HL1I
Aggregate Bit Rate	BRAVE		103.125		Gb/s	
Lane Bit Rate	BRLANE		25.78125		Gb/s	
Transmission Distance	TD			10	km	
Coupled fiber	Single mode fiber	Single mode fiber	Single mode fiber	Single mode fiber	Single mode fiber	9/125um SMF

5. Optical Parameters

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Transmitter	Transmitter	Transmitter	Transmitter	Transmitter	Transmitter	Transmitter
Signaling Speed per Lane			25.78125		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			10.5	dBm	1
Average Launch Power per Lane,	Pavg	-4.3		4.5	dBm	1
OMA, each Lane	POMA	-1.3		4.5	dBm	1
Difference in launch power between any two lanes (Average and OMA) between any Two Lanes (OMA)	Ptx,diff			3	dB	

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Average Output Power (Laser Turn off)	Poff			-30	dBm	
Side Mode Suppression Ratio	SMSR	30			dB	
Extinction Ratio	ER	4			dB	
RIN20OMA	RIN			-130	dB/Hz	
Optical Return Loss Tolerance	TOL			20	dB	
Transmitter Reflectance	RT			-12	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			25.78125		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	
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		-10.6		4.5	dBm	
Receiver Sensitivity (OMA) per Lane	SEN			-8.6	dBm	3
Los Assert	LosA	-30			dBm	
Los De-assert	LosDA			-12	dBm	
Los Hysteresis	LosH	0.5			dB	

6. Electrical Characteristics

Parameter	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)
Data Rate, each lane			25.78125		Gbps	
Differential Voltage pk-pk	Vpp			900	mV	1
Common Mode Voltage	Vcm	-350		2850	mV	
Transition time	Trise/Tfall	10			ps	2
Receiver (Module Output)	Receiver (Module Output)	Receiver (Module Output)	Receiver (Module Output)	Receiver (Module Output)	Receiver (Module Output)	Receiver (Module Output)
Data Rate, each lane			25.78125		Gbps	

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Common Mode Noise, RMS	Vrms			17.5	mV	
Differential output voltage swing	Vout, pp			900	mV	
Eye width	EW15	0.57			UI	
Eye height	EH15	228			mV	
Differential Termination Resistance Mismatch				10	%	1
Transition time	Trise/Tfall	12			ps	

7. Digital Diagnostics

Parameter	Range	Unit	Accuracy	Calibration
Temperature	-40 to +85	°C	±3°C	Internal / External
Voltage	3.0 to 3.6	V	±3%	Internal / External
Bias Current	30 to 100	mA	±10%	Internal / External
TX Power	-4.3 to 4.5	dBm	±3dB	Internal / External
RX Power	-10.6 to 4.5	dBm	±3dB	Internal / External

8. 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 output	3	
4		GND	Ground	1	1
5	CML-I	Tx4n	Transmitter Inverted Data Input	3	
6	CML-I	Tx4p	Transmitter Non-Inverted Data output	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	

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

9. Pin Assignment

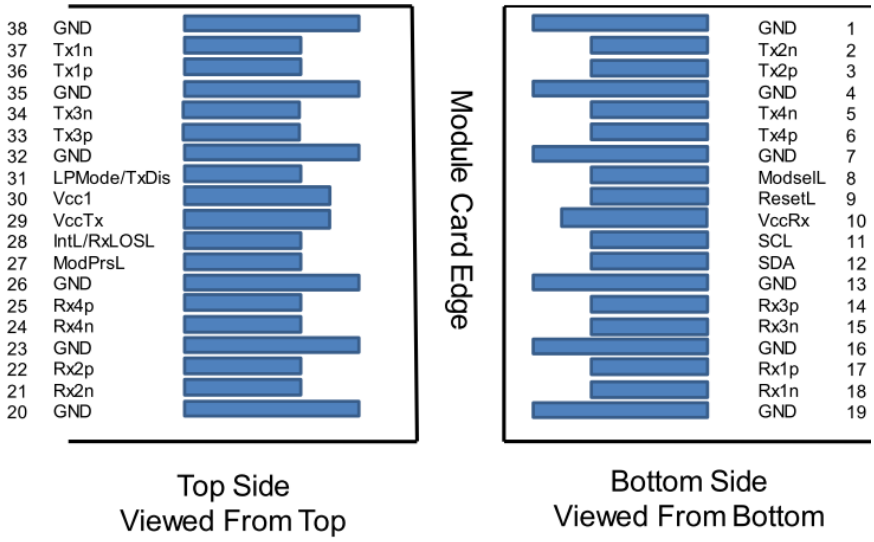
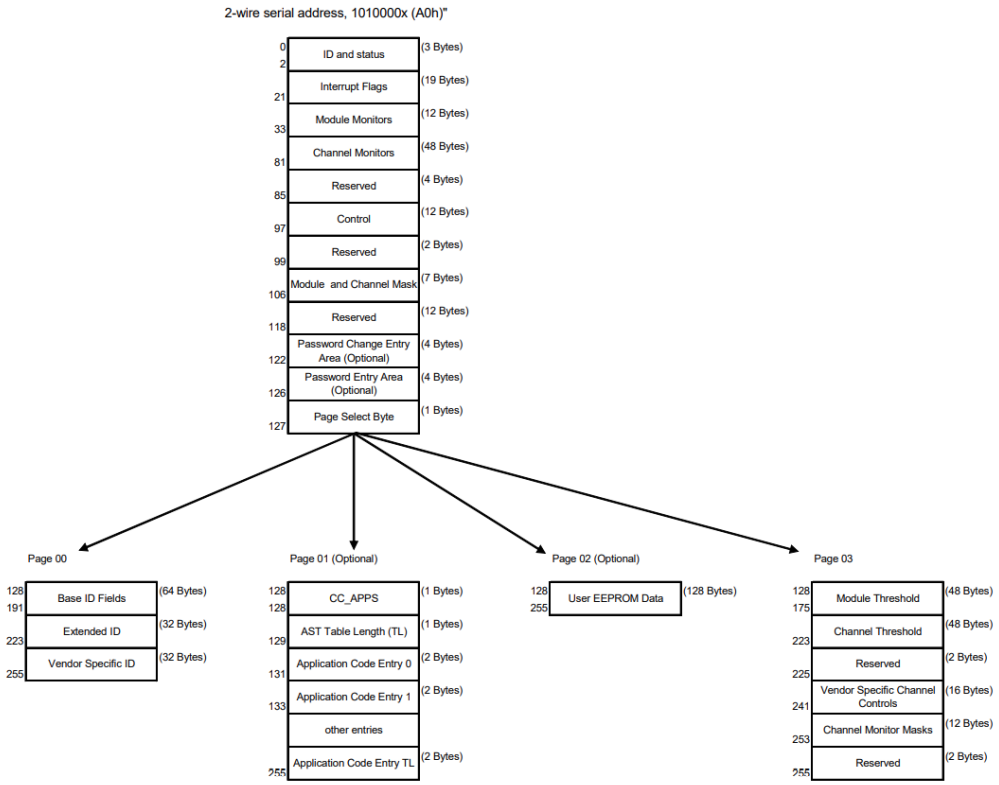
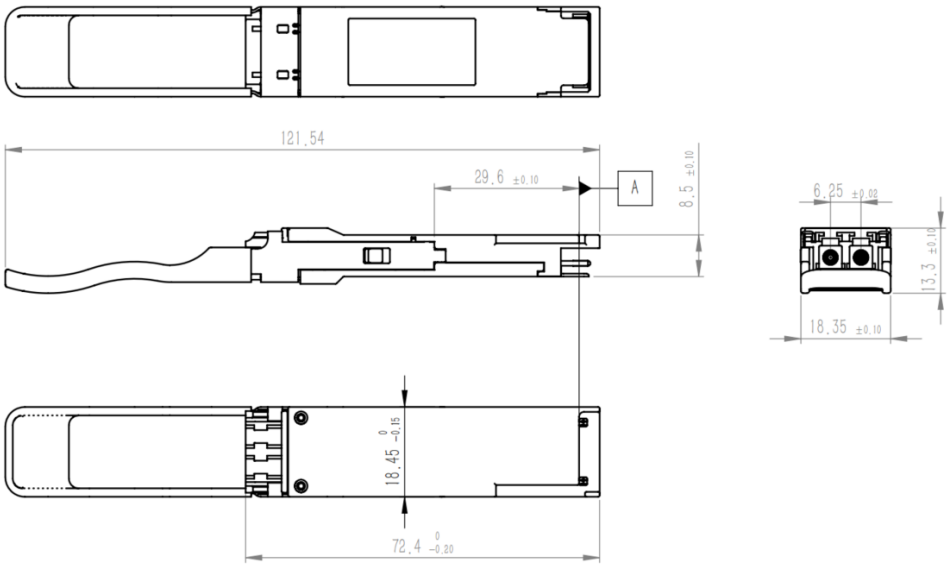


FIGURE 5-1 MODULE PAD LAYOUT

10. Digital Diagnostics Memory Map



11. Mechanical Specifications



12. Revision History

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