WTQ1HE4C(I)

100G QSFP28 Transceiver 1310nm SMF 40km LC

Reach 40



1. Product Overview

WTQ1HE4C(I) is designed for 40km 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 to 25.78125Gbps per channel;
- Up to 40km transmission on single mode fiber;
- LAN WDM EML laser and APD;
- Support multi-pin function with IntL/RxLOSL and LPMode/TxDIS;
- 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：< 5W
- Industrial：<5.5W

Applications

- 100GBASE-ER4 Ethernet
- 100G Datacom& Telecom connections

2. Ordering Information

Package	Product part NO.	Data Rate (Gbps)	Media	Transmission Distance(km)	Temperature Range（℃）	Temperature Range（℃）	Laser	Power Dissipation（W）
QSFP28	WTQ1HE4C	103.125	SMF	40	0~70	Commercial	LWDM	＜5
QSFP28	WTQ1HE4I	103.125	SMF	40	-40~85	Industrial	LWDM	＜5.5

3. Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit	Notes
Storage Temperature	TS	-40	+85	°C	
Supply Voltage	VCC	-0.5	+4.0	V	
Operating Relative Humidity	RH	-	+85	%	

4. Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Operating Case Temperature	Top	0		+70	°C	WTQ1HE4C
Operating Case Temperature	Top	-40		+85	°C	WTQ1HE4I
Power Supply Voltage	VCC	3.13	3.3	3.47	V	WTQ1HE4C
Power Supply Current	ICC			1.44	A	WTQ1HE4I
Power Supply Current	ICC			1.67	A	
Maximum Power Dissipation	PD			5	W	WTQ1HE4C
Maximum Power Dissipation	PD			5.5	W	WTQ1HE4I
Aggregate Bit Rate	BRAVE		103.125		Gb/s	
Lane Bit Rate	BRLANE		25.78125		Gb/s	
Transmission Distance	TD			40	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			12.5	dBm	1
Average Launch Power per Lane,	Pavg	-1		6.5	dBm	1
OMA, each Lane	POMA	0		6.5	dBm	1

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
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	7			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	-2.5			dBm	
Average Receive Power, each lane		-23		-3.5	dBm	
Receiver sensitivity Average, each lane	SEN			-18	dBm	3
Los Assert	LosA	-30			dBm	
Los De-assert	LosDA			-22	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

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
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	
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	Accuracy	Unit	Calibration
Commercial Temperature	0 to +70	±3°C	°C	Internal / External
Industrial Temperature	-40 to +85	±3°C	°C	Internal / External
Voltage	3.0 to 3.6	±3%	V	Internal / External
Bias Current	30 to 100	±10%	mA	Internal / External
TX Power	-1 to 6.5	±3dB	dBm	Internal / External
RX Power	-23 to -3.5	±3dB	dBm	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	

PIN	Logic	Symbol	Description	Plug Seq.	Notes
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	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

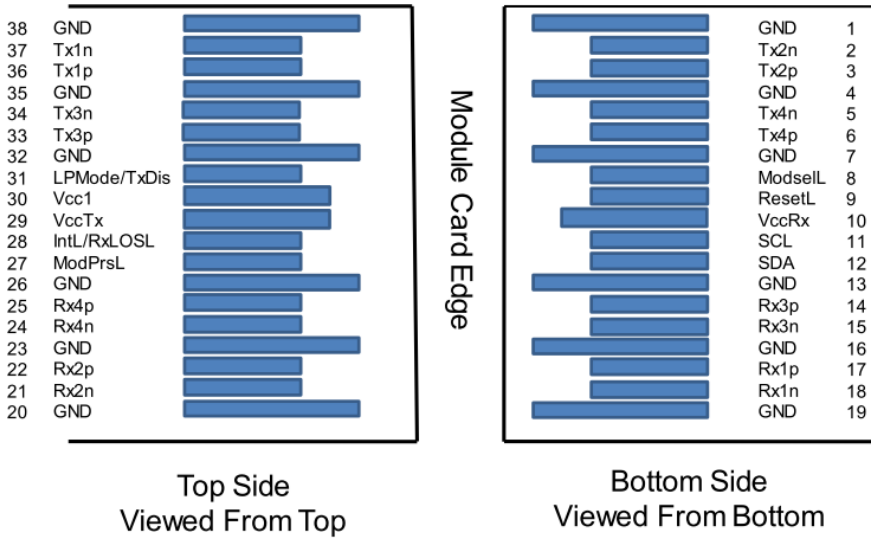
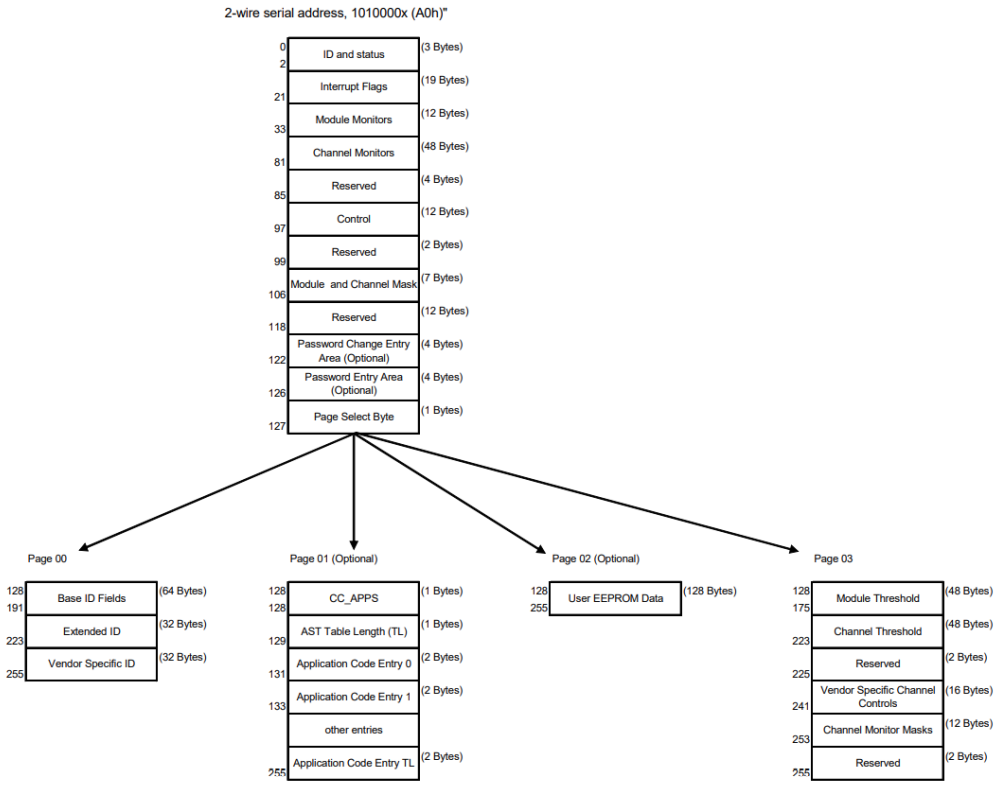
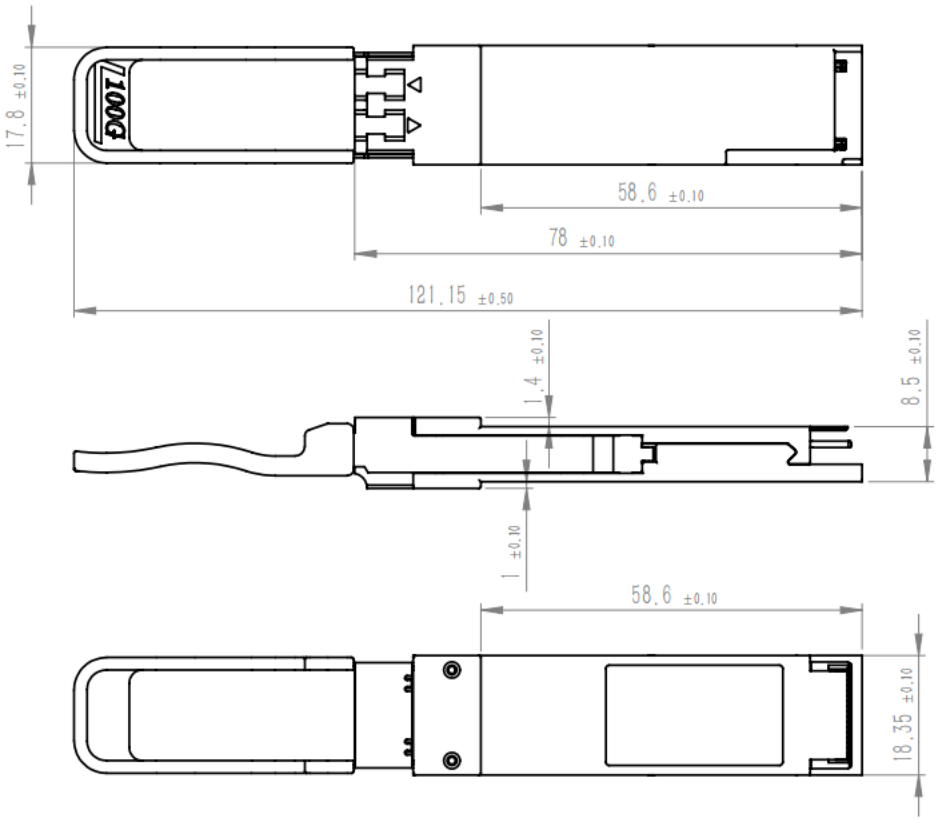


FIGURE 5-1 MODULE PAD LAYOUT

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