WTQ40E4

40G QSFP Transceiver 1310nm SMF 40km LC

Part Number WTQ40E4	Data Rate 40Gbps	Temperature 0℃~+70℃



1. Product Overview

Features

- Compliant with 40G Ethernet IEEE802.3ba and 40GBASE-ER4 Standard
- QSFP+ MSA compliant
- Compliant with QDR/DDR InfiniBand data rates
- Up to 11.2Gb/s data rate per wavelength
- 4 CWDM lanes MUX/DEMUX design
- Up to 40km transmission on single mode fiber (SMF)
- Operating case temperature: 0 to 70°C
- Maximum power consumption 4W
- LC duplex connector
- RoHS compliant

Applications

- 40GBASE-ER4 Ethernet Links
- InfiniBand QDR and DDR interconnects
- Client-side 40G Telecom connections

2. Ordering Information

Part No.	Bit Rate (Gbps)	Distance	Fiber Type	DDMI	Connector	Temp
WTQ40E4	40Gbps	40KM	SMF	YES	LC	0℃~+70℃

3. Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit	Notes
Storage Temperature	TS	-40	85	°C	
Operating Case Temperature	TOP	0	70	°C	
Power Supply Voltage	VCC	-0.5	3.6	V	
Relative Humidity (non-condensation)	RH	0	85	%	

Parameter	Symbol	Min	Max	Unit	Notes
Damage Threshold, each Lane	THd	3.8		dBm	

4. Recommended Operating Conditions

Parameter	Symbol	Min	Typical	Max	Unit	Notes
Operating Case Temperature	TOP	0		70	°C	
Power Supply Voltage	VCC	3.135	3.3	3.465	V	
Data Rate, each Lane			10.3125		Gb/s	
Control Input Voltage High		2		VCC	V	
Control Input Voltage Low		0		0.8	V	
Link Distance with G.652	D	0.002		40	km	

5. Optical Parameters

Parameter	Symbol	Min	Typical	Typical	Max	Unit	Notes
Wavelength Assignment	L0	1264.5	1271	1271	1277.5	nm	
Wavelength Assignment	L1	1284.5	1291	1291	1297.5	nm	
Wavelength Assignment	L2	1304.5	1311	1311	1317.5	nm	
Wavelength Assignment	L3	1324.5	1331	1331	1337.5	nm	
Transmitter	Transmitter	Transmitter	Transmitter	Transmitter	Transmitter	Transmitter	Transmitter
Side Mode Suppression Ratio	SMSR	30				dB	
Total Average Launch Power	PT				10.5	dBm	
Average Launch Power, each Lane	PAVG	-2.7			4.5	dBm	
Optical Modulation Amplitude (OMA), each Lane	POMA	-0.3			5	dBm	1
Difference in Launch Power between any Two Lanes (OMA)	Ptx,diff				4.7	dB	
Launch Power in OMA minus Transmitter and Dispersion Penalty (TDP), each Lane		-0.5				dBm	
TDP, each Lane	TDP				2.6	dB	
Extinction Ratio	ER	5.5				dB	
Relative Intensity Noise	RIN				-128	dB/Hz	12dB reflection

Parameter	Symbol	Min	Typical	Typical	Max	Unit	Notes
Optical Return Loss Tolerance	TOL				20	dB	
Transmitter Reflectance	RT				-12	dB	
Transmitter Eye Mask Definition {X1, X2, X3, Y1, Y2, Y3}		{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}		
Average Launch Power OFF Transmitter, each Lane	Poff			-30	-30	dBm	
Receiver	Receiver	Receiver	Receiver	Receiver	Receiver	Receiver	Receiver
Damage Threshold, each Lane	THd	3.8				dBm	2
Average Receive Power, each Lane		-19			-4.5	dBm	
Receiver Reflectance	RR				-26	dB	
Receive Power (OMA), each Lane					-4	dBm	
Receiver Sensitivity (OMA), each Lane	SEN				-19	dBm	3
Difference in Receive Power between any Two Lanes (OMA)	Prx,diff				7.5	dB	
LOS Assert	LOSA	-35				dBm	
LOS Deassert	LOSD				-23	dBm	
LOS Hysteresis	LOSH	0.5				dB	
Receiver Electrical 3 dB upper Cutoff Frequency, each Lane	FC				12.3	GHz	
Conditions of Stress Receiver Sensitivity Test (Note 5)	Conditions of Stress Receiver Sensitivity Test (Note 5)	Conditions of Stress Receiver Sensitivity Test (Note 5)	Conditions of Stress Receiver Sensitivity Test (Note 5)	Conditions of Stress Receiver Sensitivity Test (Note 5)	Conditions of Stress Receiver Sensitivity Test (Note 5)	Conditions of Stress Receiver Sensitivity Test (Note 5)	Conditions of Stress Receiver Sensitivity Test (Note 5)
Vertical Eye Closure Penalty, each Lane			2.2	2.2		dB	4
Stressed Eye J2 Jitter, each Lane		Per OTL3.4, G.8251	Per OTL3.4, G.8251	Per OTL3.4, G.8251	Per OTL3.4, G.8251	UI	
Stressed Eye J9 Jitter, each Lane		Per OTL3.4, G.8251	Per OTL3.4, G.8251	Per OTL3.4, G.8251	Per OTL3.4, G.8251	UI	

6. Electrical Characteristics

Parameter	Test Point	Min	Typical	Max	Unit	Notes
Power Consumption				4	W	
Supply Current	ICC			1.21	A	
Transceiver Power-on Initialization Time				2000	ms	1

Parameter	Test Point	Min	Typical	Max	Unit	Notes
Transmitter (each Lane)	Transmitter (each Lane)	Transmitter (each Lane)	Transmitter (each Lane)	Transmitter (each Lane)	Transmitter (each Lane)	Transmitter (each Lane)
Single-ended Input Voltage Tolerance (Note 2)		-0.3		4.0	V	Referred to TP1 signal common
AC Common Mode Input Voltage Tolerance		15			mV	RMS
Differential Input Voltage Swing Threshold		50			mVpp	LOSA Threshold
Differential Input Voltage Swing	Vin,pp	190		700	mVpp	
Differential Input Impedance	Zin	90	100	110	ohm	
Differential Input Return Loss		See IEEE 802.3ba 86A.4.11	See IEEE 802.3ba 86A.4.11	See IEEE 802.3ba 86A.4.11	dB	10MHz- 11.1GHz
J2 Jitter Tolerance	Jt2	0.17			UI	
J9 Jitter Tolerance	Jt9	0.29			UI	
Data Dependent Pulse Width Shrinkage (DDPWS) Tolerance		0.07			UI	
Eye Mask Coordinates {X1, X2, Y1, Y2}		0.11, 0.31 95, 350	0.11, 0.31 95, 350	0.11, 0.31 95, 350	UI mV	Hit Ratio = 5x10-5
Receiver (each Lane)	Receiver (each Lane)	Receiver (each Lane)	Receiver (each Lane)	Receiver (each Lane)	Receiver (each Lane)	Receiver (each Lane)
Single-ended Output Voltage		-0.3		4.0	V	Referred to signal common
AC Common Mode Output Voltage				7.5	mV	RMS
Differential Output Voltage Swing	Vout,pp	300		850	mVpp	
Differential Output Impedance	Zout	90	100	110	ohm	
Termination Mismatch at 1MHz				5	%	
Differential Output Return Loss		See IEEE 802.3ba 86A.4.2.1	See IEEE 802.3ba 86A.4.2.1	See IEEE 802.3ba 86A.4.2.1	dB	10MHz- 11.1GHz
Common Mode Output Return Loss		See IEEE 802.3ba 86A.4.2.2	See IEEE 802.3ba 86A.4.2.2	See IEEE 802.3ba 86A.4.2.2	dB	10MHz- 11.1GHz
Output Transition Time		28			Ps	20% to 80%
J2 Jitter Output	Jo2			0.42	UI	
J9 Jitter Output	Jo9			0.65	UI	
Eye Mask Coordinates {X1, X2, Y1, Y2}		0.29, 0.5, 150, 425	0.29, 0.5, 150, 425	0.29, 0.5, 150, 425	UI mV	Hit Ratio = 5x10-5

7. Digital Diagnostics

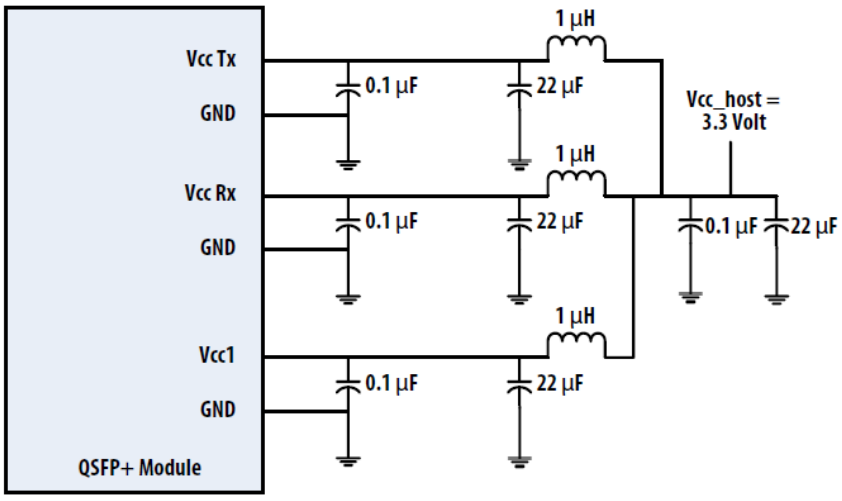
Parameter	Symbol	Min	Max	Unit	Notes
Temperature monitors absolute error	DMI_Temp	-3	+3	°C	Over operating temperature range
Supply voltage monitor absolute error	DMI_VCC	-0.1	+0.1	V	Over full operating range
Channel RX power monitor absolute error	DMI_RX_Ch	-2	+2	dB	1
Channel Bias current monitor	DMI_Ibias_Ch	-10%	+10%	mA	
Channel TX power monitor absolute error	DMI_TX_Ch	-2	+2	dB	1

8. Pin Descriptions

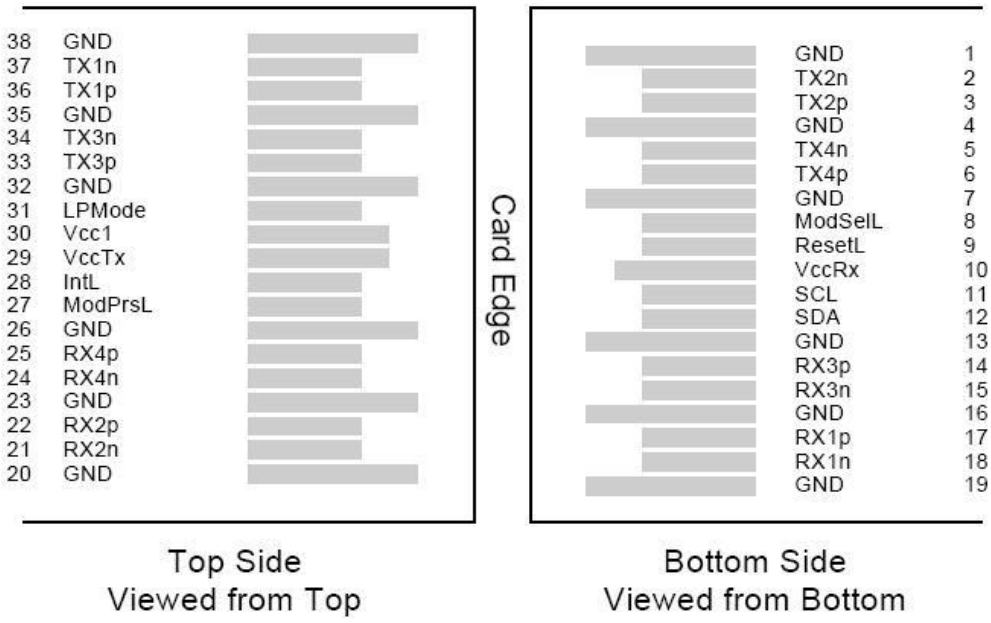
PIN	Logic	Symbol	Description	Notes
1		GND	Ground	1
2	CML-I	Tx2n	Transmitter Inverted Data Input	
3	CML-I	Tx2p	Transmitter Non-Inverted Data output	
4		GND	Ground	1
5	CML-I	Tx4n	Transmitter Inverted Data Input	
6	CML-I	Tx4p	Transmitter Non-Inverted Data output	
7		GND	Ground	1
8	LVTLL-I	ModSelL	Module Select	
9	LVTLL-I	ResetL	Module Reset	
10		VccRx	+3.3V Power Supply Receiver	2
11	LVCMOS-I/O	SCL	2-Wire Serial Interface Clock	
12	LVCMOS-I/O	SDA	2-Wire Serial Interface Data	
13		GND	Ground	
14	CML-O	Rx3p	Receiver Non-Inverted Data Output	
15	CML-O	Rx3n	Receiver Inverted Data Output	
16		GND	Ground	1
17	CML-O	Rx1p	Receiver Non-Inverted Data Output	
18	CML-O	Rx1n	Receiver Inverted Data Output	
19		GND	Ground	1
20		GND	Ground	1

PIN	Logic	Symbol	Description	Notes
21	CML-O	Rx2n	Receiver Inverted Data Output	
22	CML-O	Rx2p	Receiver Non-Inverted Data Output	
23		GND	Ground	1
24	CML-O	Rx4n	Receiver Inverted Data Output	1
25	CML-O	Rx4p	Receiver Non-Inverted Data Output	
26		GND	Ground	1
27	LVTTL-O	ModPrsL	Module Present	
28	LVTTL-O	IntL	Interrupt	
29		VccTx	+3.3 V Power Supply transmitter	2
30		Vcc1	+3.3 V Power Supply	2
31	LVTTL-I	LPMode	Low Power Mode	
32		GND	Ground	1
33	CML-I	Tx3p	Transmitter Non-Inverted Data Input	
34	CML-I	Tx3n	Transmitter Inverted Data Output	
35		GND	Ground	1
36	CML-I	Tx1p	Transmitter Non-Inverted Data Input	
37	CML-I	Tx1n	Transmitter Inverted Data Output	
38		GND	Ground	1

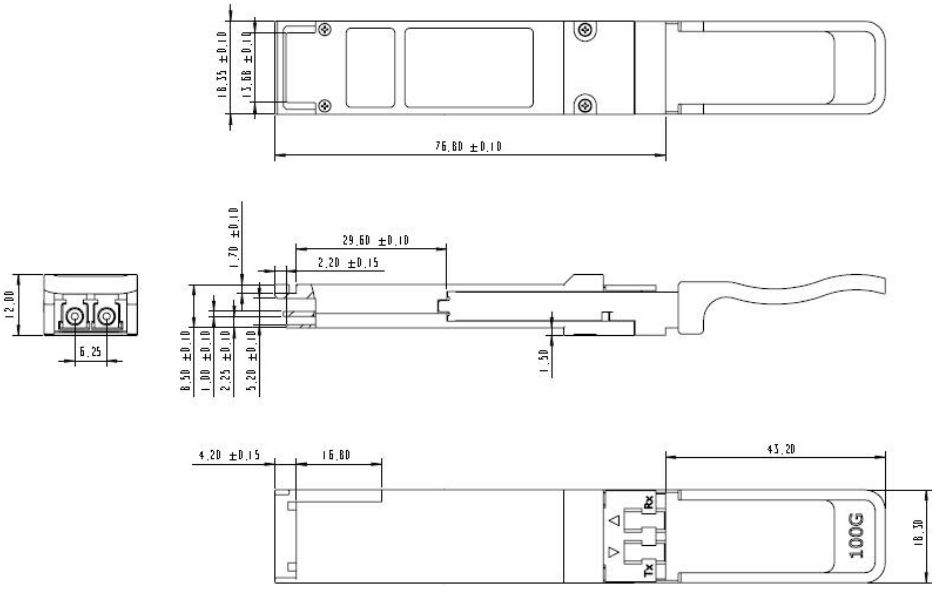
9. Power Supply Filtering



10. Pin Assignment



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