WTQ2813002C0CN1 QSFP28 PSM4 Transceiver

100Gb/s Parallel SMF 2km / Product Overview 3



Part Number	Temperature
WTQ2813002C0CN1	0°C~+70°C

1. Product Overview

General Description

This product is a parallel 100Gb/s Quad Small Form-factor Pluggable (QSFP28) optical module. It provides increased port density and total system cost savings. The QSFP28 full-duplex optical module offers 4 independent transmit and receive channels, each capable of 25Gb/s operation for an aggregate data rate of 100Gb/s on 2km of single mode fiber.

An optical fiber ribbon cable with an MTP/MPO connector can be plugged into the QSFP28 module receptacle. Proper alignment is ensured by the guide pins inside the receptacle. The cable usually cannot be twisted for proper channel to channel alignment. Electrical connection is achieved through an MSA-compliant 38-pin edge type connector.

The module operates with single +3.3V power supply. LVCMOS/LVTTL global control signals, such as Module Present, Reset, Interrupt and Low Power Mode, are available with the modules. A 2-wire serial interface is available to send and receive more complex control signals, and to receive digital diagnostic information. Individual channels can be addressed and unused channels can be shut down for maximum design flexibility.

The product is designed with form factor, optical/electrical connection and digital diagnostic interface according to the QSFP28 Multi-Source Agreement (MSA). It has been designed to meet the harshest external operating conditions including temperature, humidity and EMI interference. The module can be managed through the I2C two-wire serial interface.

Features

- 4 independent full-duplex channels
- Up to 28Gb/s data rate per channel
- QSFP28 MSA compliant
- Compliant to IEEE 802.3bm 100GBASE PSM4
- Up to 2km reach for G.652 SMF
- Maximum power consumption 3.5W
- Single +3.3V power supply
- Operating case temperature: 0 to 70℃
- RoHS-6 compliant

Applications

- 100G Ethernet links
- InfiniBand QDR and DDR interconnects
- Datacenter and Enterprise networking

2. Ordering Information

Part Number	Data Rate (Gbps)	Wavelength (nm)	Transmission Distance(m)	Temperature (oC) (Operating Case)
WTQ2813002C0CN1	100Gb/s	4x1310nm	2km SMF	0°C~+70°C

3. Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Units	Notes
Storage Temperature	TS	-40	85	degC	
Operating Case Temperature	TOP	0	70	degC	
Power Supply Voltage	VCC	-0.5	3.6	V	
Relative Humidity (non-condensation)	RH	0	85	%	
Damage Threshold, each Lane	THd	4.5		dBm	

4. Recommended Operating Conditions

Parameter	Symbol	Min	Typical	Max	Units
Operating Case Temperature	TOP	0		70	degC
Power Supply Voltage	VCC	3.135	3.3	3.465	V
Data Rate, each Lane			25.78125		Gb/s
Control Input Voltage High		2		Vcc	V
Control Input Voltage Low		0		0.8	V
Link Distance with G.652	D			2	km

5. Recommended Operating Conditions

Parameter	Symbol	Min	Typical	Max	Units	Notes
Power Consumption				3.5	W	
Supply Current	Icc			1.1	A	
Transceiver Power-on Initialization Time				2000	ms	1
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	

Parameter	Symbol	Min	Typical	Max	Units	Notes
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	

6. Recommended Operating Conditions

Parameter	Symbol	Min	Max	Units	Notes
Temperature monitors absolute error	DMI_Temp	-3	3	degC	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

7. Optical Parameters

Parameter	Symbol	Min	Min	Typical	Max	Units	Notes
Transmitter	Transmitter	Transmitter	Transmitter	Transmitter	Transmitter	Transmitter	Transmitter
Center Wavelength	λC	1295	1295	1310	1325	nm	
Side Mode Suppression Ratio	SMSR	30	30			dB	
Total Average Launch Power	PT				8.0	dBm	
Average Launch Power, each Lane	PAVG	-5.5	-5.5		2.0	dBm	
Optical Modulation Amplitude (OMA), each Lane	POMA	-3.5	-3.5		2.2	dBm	1
Difference in Launch Power between any Two Lanes (OMA)	Ptx,diff				5	dB	
Launch Power in OMA minus Transmitter and Dispersion Penalty (TDP), each Lane		-4.3	-4.3			dBm	
TDP, each Lane	TDP				2.9	dB	
Extinction Ratio	ER	3.5	3.5			dB	
Relative Intensity Noise	RIN				-128	dB/Hz	

Parameter	Symbol	Min	Min	Typical	Max	Units	Notes
Optical Return Loss Tolerance	TOL				20	dB	
Transmitter Reflectance	RT				-12	dB	
Average Launch Power OFF Transmitter, each Lane	Poff				-30	dBm	
Transmitter Eye Mask Definition {X1, X2, X3, Y1, Y2, Y3}		{0.31, 0.4, 0.45, 0.34, 0.38, 0.4}	{0.31, 0.4, 0.45, 0.34, 0.38, 0.4}	{0.31, 0.4, 0.45, 0.34, 0.38, 0.4}	{0.31, 0.4, 0.45, 0.34, 0.38, 0.4}		2
Receiver	Receiver	Receiver	Receiver	Receiver	Receiver	Receiver	Receiver
Center Wavelength	λC	1295	1310	1310	1325	nm	
Damage Threshold, each Lane	THd	4.5				dBm	3
Average Receive Power, each Lane		-10.2			2.0	dBm	
Receive Power (OMA), each Lane					2.2	dBm	
Receiver Sensitivity (OMA), each Lane	SEN1				-9.0	dBm	4
Receiver Sensitivity (OMA), each Lane	SEN2				-12.0	dBm	5
Receiver Reflectance	RR				-26	dB	
Difference in Receive Power between any Two Lanes (OMA)	Prx,diff				5.5	dB	
LOS Assert	LOSA		-20	-20		dBm	
LOS Deassert	LOSD		-18	-18		dBm	
LOS Hysteresis	LOSH	0.5				dB	
Receiver Electrical 3 dB upper Cutoff Frequency, each Lane	Fc				31	GHz	

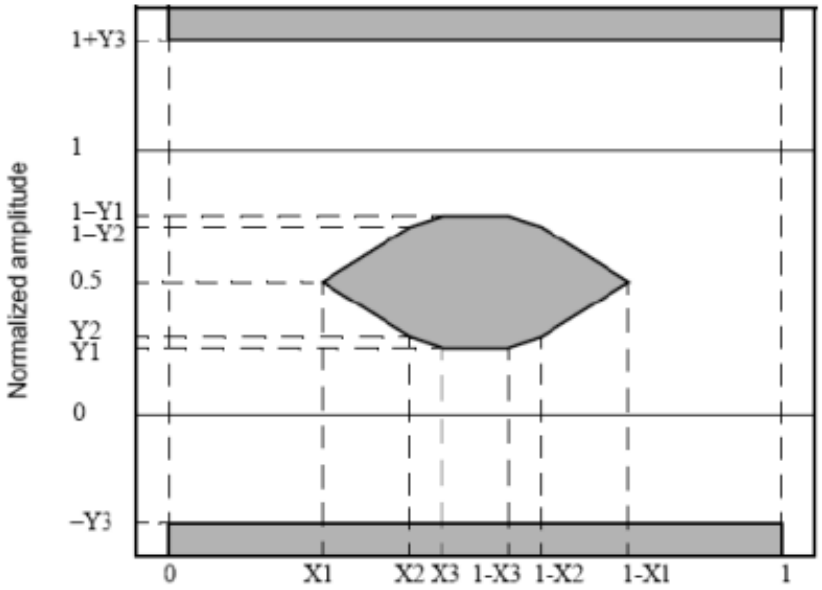
8. Pin Descriptions

PIN	Logic	Symbol	Name/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	

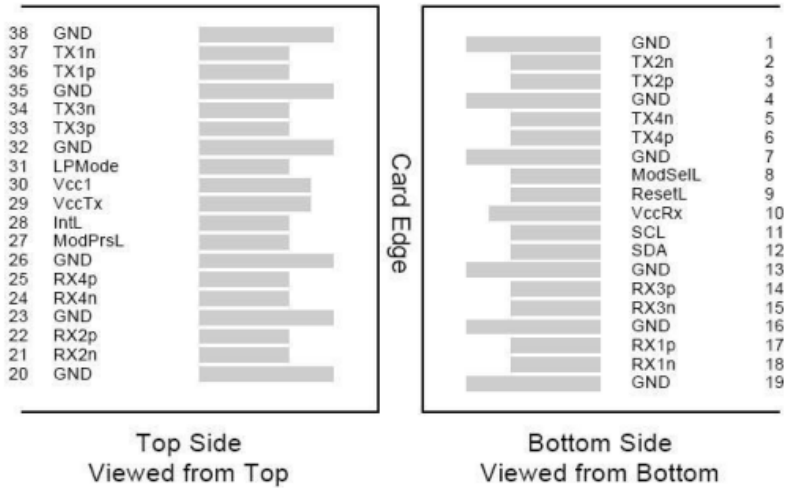
PIN	Logic	Symbol	Name/Description	Notes
7		GND	Ground	1
8	LVTLL-I	ModSelL	Module Select	
9	LVTLL-I	ResetL	Module Reset	
10		VccRx	+3.3V Power Supply Receiver	2
11	LVCMOS-I/O	SCL	2-Wire Serial Interface Clock	
12	LVCMOS-I/O	SDA	2-Wire Serial Interface Data	
13		GND	Ground	
14	CML-O	Rx3p	Receiver Non-Inverted 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
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	

PIN	Logic	Symbol	Name/Description	Notes
37	CML-I	Tx1n	Transmitter Inverted Data Output	
38		GND	Ground	1

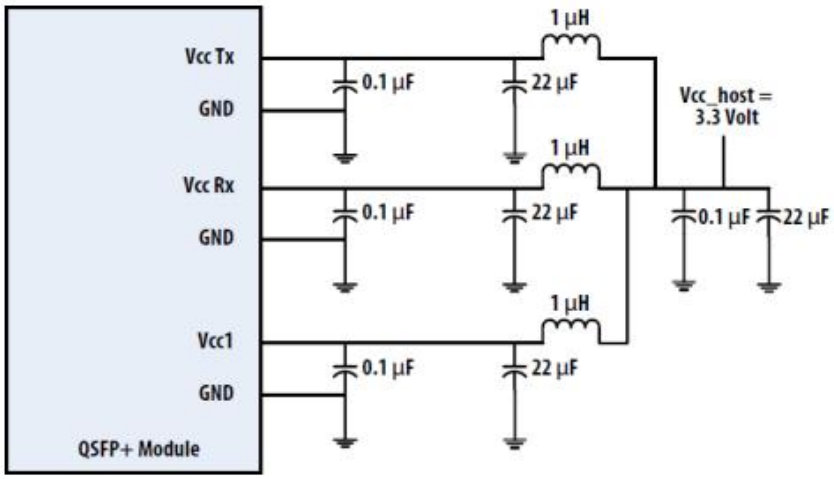
9. Optical Eye Mask



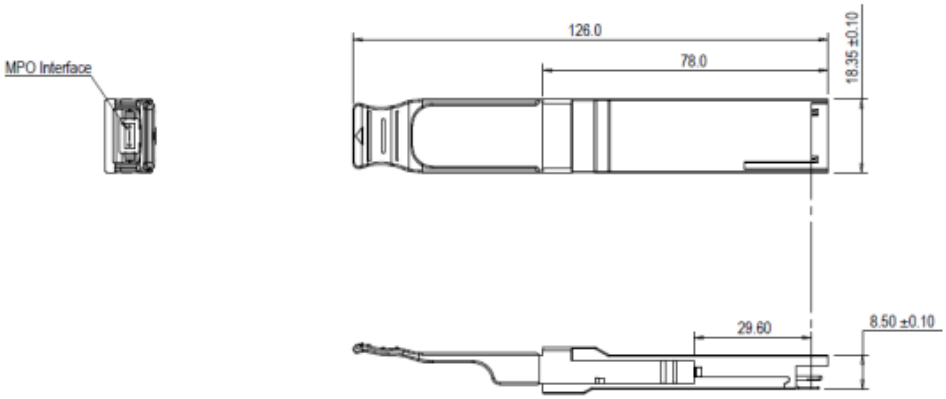
10. Pin Assignment



11. Power Supply Filtering Circuit



12. Mechanical Specifications



13. Revision History

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