WTOS400-DR4-500C-CM

OSFP 400Gb/s DR4, MPO12 APC, 1310nm SMF, 500m / OSFP Hot-pluggable form factor



Part Number WTOS400-DR4-500C-CM	Data Rate 425	Wavelength 1311

1. Product Overview

Features

- OSFP Hot-pluggable form factor
- Maximum link length of 500m on SMF with FEC
- Single 3.3V power supply
- Power dissipation 8W
- Support DDMI
- Operating case temp: 0°C to +70 °C
- Single APC MPO-12 connector
- Compliant with CMIS 5.2
- Anti-sulphuration Compliant
- RoHS 6 Compliant

Applications

- 400GBASE-DR4
- 200GBASE-DR2
- 100GBASE-DR1
- Order Information
- Table 1-Order Information
- Note1: SMF with FEC. Note2: Case Temperature.
- Absolute Maximum Ratings
- Table2- Absolute Maximum Ratings
- Note1: No condensation.
- Recommended Operating Conditions
- Table 3- Recommended operating Conditions
- Note:1 No condensation.

2. Ordering Information

Part No.	Bit Rate (Gbps)	Laser (nm)	Distance *1	Fiber Type	DDMI	Connector	Temp*2
WTOS400-DR4-500C-CM	425	1311	500m	SMF	YES	APC MPO12	0℃~+70℃

3. Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Supply Voltage	VCC	-0.5	-	+3.6	V	
Storage Temperature	Ts	-40	-	+85	°C	
Operating Case Temperature	TC	-5	-	+75	°C	
Operating Humidity	RH	5	-	85	%	1
Control Input Voltage	Vcontrol	-0.3	-	VCC+0.3	V	1

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Optical Receiver Damage Threshold, each lane	Rdamage	5	5	5	dBm	

4. Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Operating Case Temperature	TC	0	-	+70	°C	
Power Supply Voltage	Vcc	3.135	3.3	3.465	V	
Power Dissipation	Pd	-	-	8	W	
Operating Humidity	RH	5	-	85	%	1

5. Electrical Characteristics

Parameter	Symbol	Min.	Min.	Typ.	Max.	Unit	Notes
Host to Module Side	Host to Module Side	Host to Module Side	Host to Module Side	Host to Module Side	Host to Module Side	Host to Module Side	Host to Module Side
Data Rate, each lane	DR	53.125	53.125	53.125	53.125	GBd	
Data Rate Variation	-	-100	-	-	+100	ppm	
Modulation Format	-	PAM4	PAM4	PAM4	PAM4	-	
Differential Input Peak-peak Voltage Tolerance	Vin-diff	750	750	-	-	mVpp	
Differential Input Termination Mismatch	-	-	-	-	10	%	
Single-ended Voltage Tolerance	-	-0.4	-0.4	-	3.3	V	
DC Common-mode Voltage Tolerance	-	-0.35	-0.35	-	2.85	V	
Module to Host Side	Module to Host Side	Module to Host Side	Module to Host Side	Module to Host Side	Module to Host Side	Module to Host Side	Module to Host Side
Data Rate, each lane	DR	53.125	53.125	53.125	53.125	GBd	
Data Rate Variation	-	-100	-	-	+100	ppm	
Modulation Format	-	PAM4	PAM4	PAM4	PAM4	-	
Differential Output Peak-to-peak Voltage (Short mode)	Vout-diff,short	-	-	-	600	mVpp	
Differential Output Peak-to-peak Voltage (Long mode)	Vout-diff,Long	-	-	-	845	mVpp	
Transition Time (20% to 80%)	Tr/tf	8.5	8.5	-	-	ps	
Eye Height	EH	-	-	-	15	mV	

Parameter	Symbol	Min.	Min.	Typ.	Max.	Unit	Notes
Vertical Eye Closure	VEC	-	-	-	12	dB	
Differential Output Termination Mismatch	-	-	-	-	10	%	
DC Common-mode Voltage Tolerance	-	-0.35	-0.35	-	2.85	V	

6. Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Optical Transmitter	Optical Transmitter	Optical Transmitter	Optical Transmitter	Optical Transmitter	Optical Transmitter	Optical Transmitter
Data Rate, each lane	DR	53.125±100 ppm	53.125±100 ppm	53.125±100 ppm	GBd	
Data Rate Variation	-	-100	-	+100	ppm	
Modulation Format	-	PAM4	PAM4	PAM4	-	
Center Wavelength Lane0	L0	1304.5	1311	1317.5	nm	
Center Wavelength Lane1	L1	1304.5	1311	1317.5	nm	
Center Wavelength Lane2	L2	1304.5	1311	1317.5	nm	
Center Wavelength Lane3	L3	1304.5	1311	1317.5	nm	
Single-mode Suppression Ration , each lane	SMSR	30	30	30	dB	
Average Launch Power, each lane	PTxAOP	-2.9	-	4	dBm	1
Outer Optical Modulation Amplitude, each lane	TxOMA	-0.8	-	4.2	dBm	2
Extinction Ration, each lane	ER	3.5	4.5	-	dB	
Launch Power in OMA minus TDECQ, each lane	-	-2.2	-	-	dBm	
Transmitter and Dispersion Eye Closure for PAM4, each lane	TDECQ	-	-	3.4	dB	
RIN OMA	RIN	-	-	-136	dB/Hz	
Optical Return Loss Tolerance	ORL	-	-	21.4	dB	
Transmitter Reflectance	-	-	-	-26	dB	
Average Launch Power of OFF Transmitter, each lane	-	-	-	-15	dBm	
Optical Receiver	Optical Receiver	Optical Receiver	Optical Receiver	Optical Receiver	Optical Receiver	Optical Receiver
Data Rate, each lane	DR	53.125±100 ppm	53.125±100 ppm	53.125±100 ppm	GBd	
Data Rate Variation	-	-100	-	+100	ppm	

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Modulation Format	-	PAM4	PAM4	PAM4	-	
Receiver Wavelength Range Lane0	L0	1304.5	1311	1317.5	nm	
Receiver Wavelength Range Lane1	L1	1304.5	1311	1317.5	nm	
Receiver Wavelength Range Lane2	L2	1304.5	1311	1317.5	nm	
Receiver Wavelength Range Lane3	L3	1304.5	1311	1317.5	nm	
Average Receiver Power, each lane	PRxAOP	-5.9	-	4	dBm	
Receive Power(OMAouter), each lane	RxOMA	-	-	4.2	dBm	
Receiver Reflectance	-	-	-	-26	dB	
Receiver Sensitivity(OMAouter), each lane	OMASen	-	-	-4.5	dBm	3
Stressed Receiver Sensitivity(OMAouter), each lane	-	-	-	-1.9	dBm	
Stressed Eye Closure fo PAM4(SECQ),lane under test	-	-	-	3.4	dB	
OMAouter of each Aggressor Lane	-	-	-	4.2	dBm	
Los Assert	LOSAssert	-14	-	-11.5	dBm	
Los De-assert	LOSDe-assert	-11	-	-8	dBm	
LOS Hysteresis	LOSHys	0.5	-	4	dB	

7. Pin Descriptions

Pin	Symbol	Name/Description	Notes
1	GND	Ground	1
2	TX2p	Transmitter Data Non-Inverted	
3	TX2n	Transmitter Data Inverted	
4	GND	Ground	1
5	TX4p	Transmitter Data Non-Inverted	
6	TX4n	Transmitter Data Inverted	
7	GND	Ground	1
8	NC	NC,unsued	2
9	NC	NC,unsued	2
10	GND	Ground	1
11	NC	NC,unsued	2
12	NC	NC,unsued	2
13	GND	Ground	1

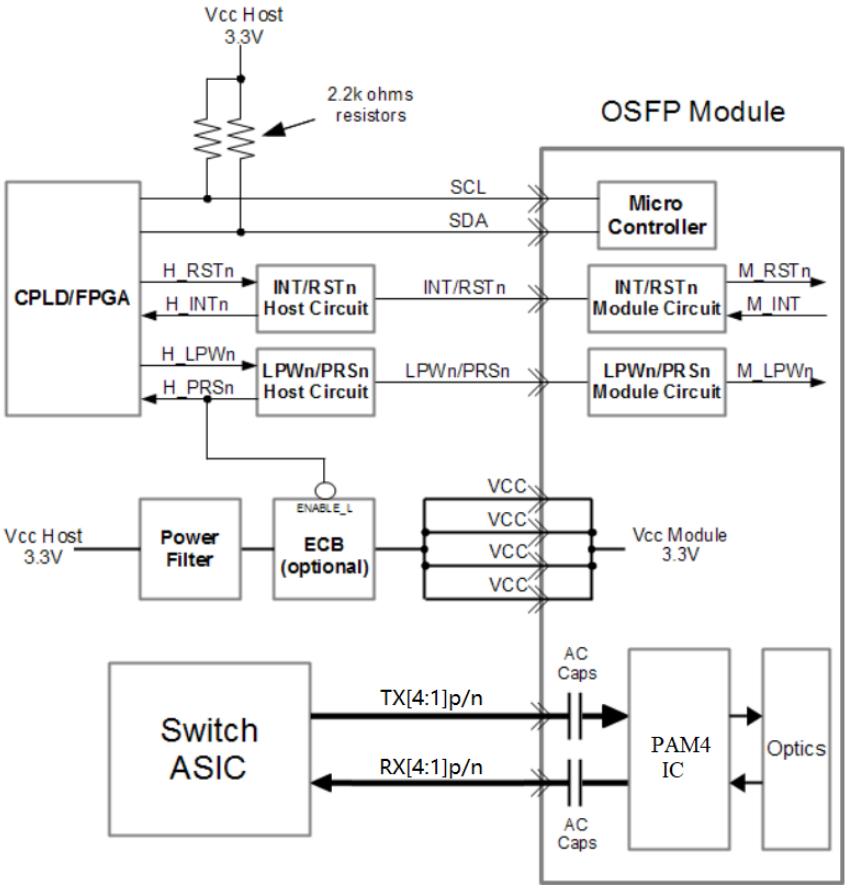
Pin	Symbol	Name/Description	Notes
14	SCL	2-wire Serial interface clock	3
15	VCC	+3.3V Power	
16	VCC	+3.3V Power	
17	LPWn/PRSn	Low-Power Mode/Module Present	4
18	GND	Ground	1
19	NC	NC,unsued	2
20	NC	NC,unsued	2
21	GND	Ground	1
22	NC	NC,unsued	2
23	NC	NC,unsued	2
24	GND	Ground	1
25	RX3n	Receiver Data Inverted	
26	RX3p	Receiver Data Non-Inverted	
27	GND	Ground	1
28	RX1n	Receiver Data Inverted	
29	RX1p	Receiver Data Non-Inverted	
30	GND	Ground	1
31	GND	Ground	1
32	RX2p	Receiver Data Non-Inverted	
33	RX2n	Receiver Data Inverted	
34	GND	Ground	1
35	RX4p	Receiver Data Non-Inverted	
36	RX4n	Receiver Data Inverted	
37	GND	Ground	1
38	NC	NC,unsued	2
39	NC	NC,unsued	2
40	GND	Ground	1
41	NC	NC,unsued	2
42	NC	NC,unsued	2
43	GND	Ground	1
44	INT/RSTn	Module Interrupt / Module Reset	5
45	VCC	+3.3V Power	
46	VCC	+3.3V Power	
47	SDA	2-wire Serial interface data	3
48	GND	Ground	1
49	NC	NC,unsued	2
50	NC	NC,unsued	2
51	GND	Ground	1
52	NC	NC,unsued	2

Pin	Symbol	Name/Description	Notes
53	NC	NC,unsued	2
54	GND	Ground	1
55	TX3n	Transmitter Data Inverted	
56	TX3p	Transmitter Data Non-Inverted	
57	GND	Ground	1
58	TX1n	Transmitter Data Inverted	
59	TX1p	Transmitter Data Non-Inverted	
60	GND	Ground	1

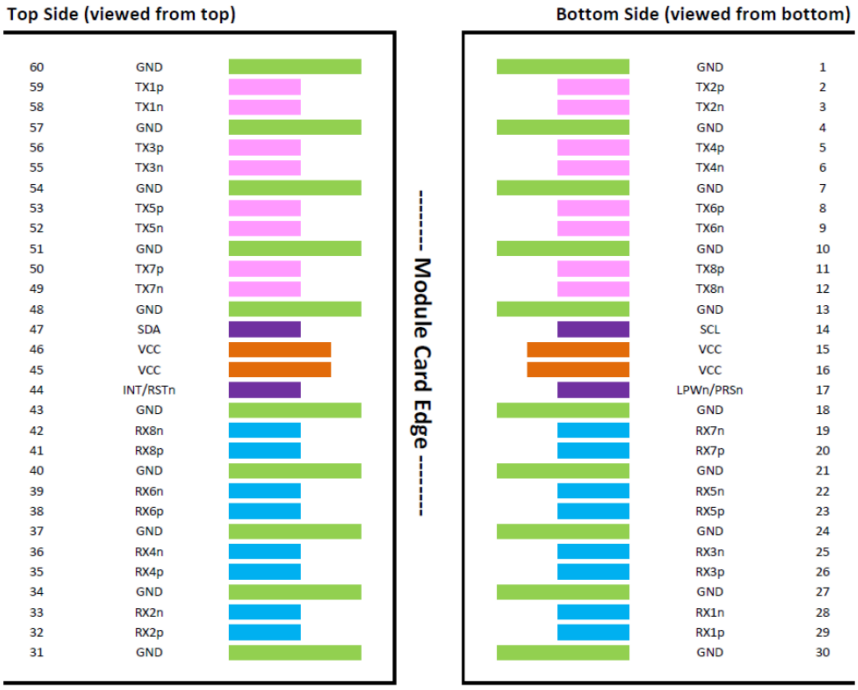
8. Revision History

Version	Initiated	Reviewed	Revision	Release Date
A0	Lu Deng	Yang Xiongwen	New Release	2024-1-22

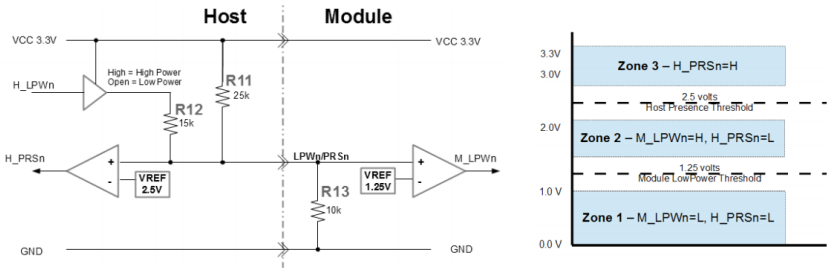
9. Recommended Host Interface Circuit



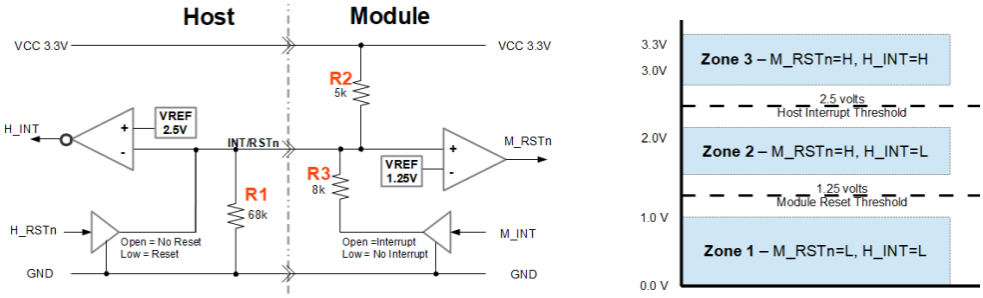
10. Pin Assignment



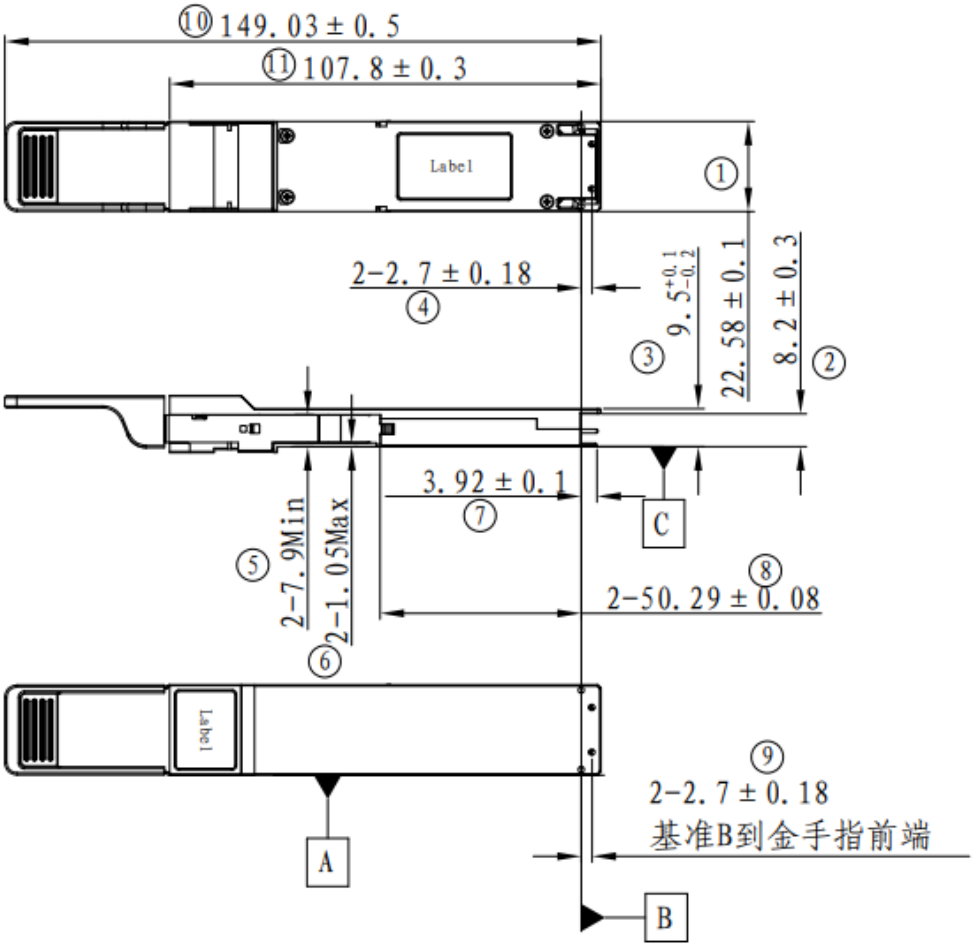
11. Low-Speed Control Signal Interface



12. Recommended Interface Circuit



13. Mechanical Specifications



14. Revision History

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