WTWSMB31-S50C

QSFP-DD 400Gb/s DR4,MPO12 APC, 1310nm SMF, 500m / PRODUCT FEATURES

Data Rate 425	Wavelength 1310



1. Product Overview

Features

- Supports 400Gb/s aggregate bit rate
- 8x50G PAM4 retimed 400GAUI-8 electrical interface
- Up to 500m on SMF with FEC
- Hot-pluggable QSFP-DD form factor
- MPO-12 connector with 8°angled end-face
- QSFP-DD MSA compliant
- Compliant with CMIS5.2
- IEE802.3bs 400GBASE-DR4 Specification compliant
- Low power Consumption < 10.5W
- Case operating temperature
- Commercial: 0°C to +70°C

Applications

- 400Gb/s Ethernet
- Data Center
- InfiniBand interconnects

2. Ordering Information

Part NO.	Bit Rate (Gbps)	Laser (nm)	Distance(m)	Media	DDMI	Connector	Temp（℃）
WTWSMB31-S50C	425	1310	500	SMF	YES	MPO-12（APC）	0~70

3. Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Ref.
Storage Temperature	TS	-40		85	ºC	
Storage Relative Humidity	HA	0		85	%	1
Supply Voltage	VCC	0		3.6	V	
Receiver Damage Threshold,per Lane	PRdmg			5.0	dBm	

4. Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Ref.
Case Operating Temperature	Top	0		70		

5. Recommended Operating Conditions

Data Rate Spcifications	Symbol	Min.	Typ.	Max.	Unit	Ref.
Power Supply Voltage	Vcc	3.135	3.3	3.465	V	
Bit Rate	BR			425	Gbps	
Operating Case Temperature	Tc	0		70	℃	
Relative Humidity	HA	5		85	%	1
Supply Current	Icc			3182	mA	
Total Power Consumption	PC			10.5	W	

6. Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Max.	Unit	Ref.
Transmitter(per lane)	Transmitter(per lane)	Transmitter(per lane)	Transmitter(per lane)	Transmitter(per lane)	Transmitter(per lane)	Transmitter(per lane)	Transmitter(per lane)
Channel data rate	FDC	106.25	106.25	106.25	106.25	Gb/s	
Optical signaling rate per lane	FSG	53.125	53.125	53.125	53.125	GBd	PAM4
Center Wavelength	λC	1304.5	1311	1317.5	1317.5	nm	
RMS Spectral Width	σ			0.6	0.6	nm	1
Receiver(per lane)	Receiver(per lane)	Receiver(per lane)	Receiver(per lane)	Receiver(per lane)	Receiver(per lane)	Receiver(per lane)	Receiver(per lane)
Damage threshold		5				dBm	2
Average receive power, each lane		–5.9		4.0	4.0	dBm	3
Receiver reflectance	Rr			-26	-26	dB	
Receiver sensitivity(OMA outer), each lane	SEN	Max(-3.9,SECQ-5.3)	Max(-3.9,SECQ-5.3)	Max(-3.9,SECQ-5.3)	Max(-3.9,SECQ-5.3)	dBm	4
Stressed receiver sensitivity (OMA outer), each lane	SRS				-1.9	dBm	
Receiver Loss of Signal Indicator Assert Level	LOSA	-15		-7.9	-7.9	dBm	
Receiver Loss of Signal Indicator De-assert Level	LOSD			-7.5	-7.5	dBm	
Hysteresis	LOSH	0.5		5	5	dB	

7. Recommended Operating Conditions

Parameter	Accuracy	Unit
Internally Measured Transceiver Temperature	+/-3	℃

Parameter	Accuracy	Unit
Internally Messured Transceiver Supply Voltage	+/-3	%
Measured Tx Bias Current	+/-10	%
Measured Tx Output Power	+/-3	dB
Measured Rx Received Average Optical Power	+/-3	dB

8. Optical Parameters

Parameter	Symbol	Min.	Typ.	Max.	Unit	Ref.
Supply Voltage	VCC1, VCCTX, VCCRX	3.135		3.465	V	
Power Dissipation	Pd			10.5	W	
Transmitter(per Lane)	Transmitter(per Lane)	Transmitter(per Lane)	Transmitter(per Lane)	Transmitter(per Lane)	Transmitter(per Lane)	Transmitter(per Lane)
Input different impedance	Rin	90	100	110	Ω	
Input Logic Level High	-	2		Vcc	V	
Input Logic Level Low	-	0		0.8	V	
Differential data input swing	Vin,pp			880	mVpp	
Receiver (per Lane)	Receiver (per Lane)	Receiver (per Lane)	Receiver (per Lane)	Receiver (per Lane)	Receiver (per Lane)	Receiver (per Lane)
Error Bit Rate	BER			2.4E-4		
Output different impedance	Rout	90	100	110	Ω	
Output Logic Level High	-	Vcc-0.5		Vcc	V	
Output Logic Level Low	-	0		0.4	V	
Differential data Output swing	Vout,pp			900	mVpp	

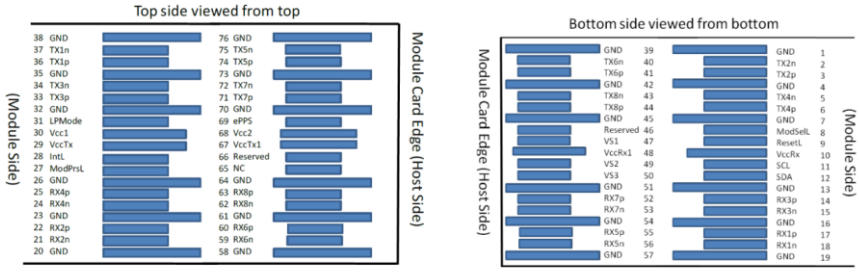
9. Pin Descriptions

Pad	Symbol	Description	Ref.
1	GND	Ground	
2	Tx2n	Transmitter Inverted Data Input	
3	Tx2p	Transmitter Non-Inverted Data Input	
4	GND	Ground	
5	Tx4n	Transmitter Inverted Data Input	
6	Tx4p	Transmitter Non-Inverted Data Input	
Pad	Symbol	Description	Ref.
7	GND	Ground	
8	ModSelL	Module Select	

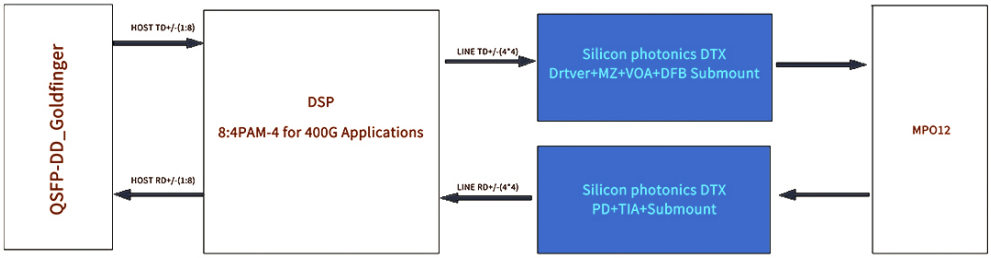
Pad	Symbol	Description	Ref.
9	ResetL	Module Reset	
10	VccRx	+3.3V Power Supply Receiver	
11	SCL	2-wire serial interface clock	
12	SDA	2-wire serial interface data	
13	GND	Ground	
14	Rx3p	Receiver Non-Inverted Data Output	
15	Rx3n	Receiver Inverted Data Output	
16	GND	Ground	
17	Rx1p	Receiver Non-Inverted Data Output	
18	Rx1n	Receiver Inverted Data Output	
19	GND	Ground	
20	GND	Ground	
21	Rx2n	Receiver Inverted Data Output	
22	Rx2p	Receiver Non-Inverted Data Output	
23	GND	Ground	
24	Rx4n	Receiver Inverted Data Output	
25	Rx4p	Receiver Non-Inverted Data Output	
26	GND	Ground	
27	ModPrsL	Module Present	
28	IntL	Interrupt	
29	VccTx	+3.3V Power supply transmitter	
30	Vcc1	+3.3V Power supply	
31	LPMode	Low Power mode;	
32	GND	Ground	
33	Tx3p	Transmitter Non-Inverted Data Input	
34	Tx3n	Transmitter Inverted Data Input	
35	GND	Ground	
36	Tx1p	Transmitter Non-Inverted Data Input	
37	Tx1n	Transmitter Inverted Data Input	
38	GND	Ground	
39	GND	Ground	
40	Tx6n	Transmitter Inverted Data Input	
41	Tx6p	Transmitter Non-Inverted Data Input	
42	GND	Ground	
43	Tx8n	Transmitter Inverted Data Input	

Pad	Symbol	Description	Ref.
44	Tx8p	Transmitter Non-Inverted Data Input	
Pad	Symbol	Description	Ref.
45	GND	Ground	
46	Reserved	For future use	
47	VS1	Module Vendor Specific 1	
48	VccRx1	3.3V Power Supply	
49	VS2	Module Vendor Specific 2	
50	VS3	Module Vendor Specific 3	
51	GND	Ground	
52	Rx7p	Receiver Non-Inverted Data Output	
53	Rx7n	Receiver Inverted Data Output	
54	GND	Ground	
55	Rx5p	Receiver Non-Inverted Data Output	
56	Rx5n	Receiver Inverted Data Output	
57	GND	Ground	
58	GND	Ground	
59	Rx6n	Receiver Inverted Data Output	
60	Rx6p	Receiver Non-Inverted Data Output	
61	GND	Ground	
62	Rx8n	Receiver Inverted Data Output	
63	Rx8p	Receiver Non-Inverted Data Output	
64	GND	Ground	
65	NC	No Connect	
66	Reserved	For future use	
67	VccTx1	3.3V Power Supply	
68	Vcc2	3.3V Power Supply	
69	Reserved	For future use	
70	GND	Ground	
71	Tx7p	Transmitter Non-Inverted Data Input	
72	Tx7n	Transmitter Inverted Data Input	
73	GND	Ground	
74	Tx5p	Transmitter Non-Inverted Data Input	
75	Tx5n	Transmitter Inverted Data Input	
76	GND	Ground	

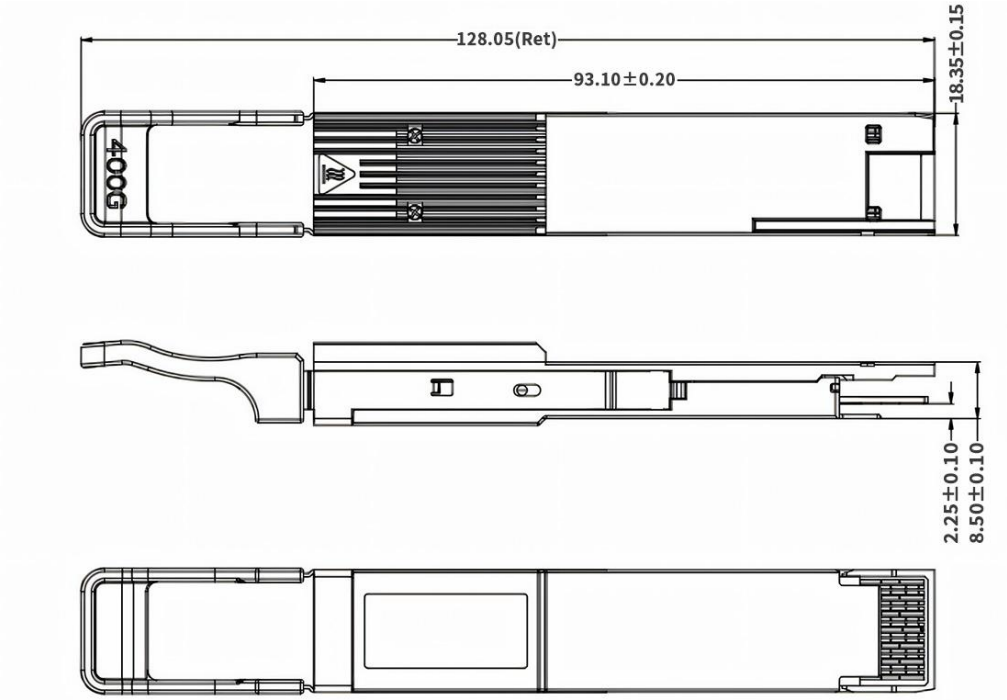
10. Pin Assignment



11. Functional Block Diagram



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