

LPOSML31-S50C

QSFP112, 400G DR4, MPO-12, 1310nm SMF, 500m

Features

- 4x106.25 Gbps electrical interface
- Silicon photonics integrated solution with optical DSP CDR inside
- Hot-pluggable QSFP112 form factor
- Maximum link length 500m on SMF fiber with FEC
- +3.3V single power supply
- Power dissipation <12W
- MPO-12 APC connector
- Operating case temp Commercial: 0°C to +70 °C
- RoHS compliant

Applications

- 400G Ethernet
- Data centers and cloud networks

Order Information

Part No.	Bit Rate	Laser	Distance *1	Fiber Media	DDMI	Connector	Temp *2
LPOSML31-S50C	425.Gbps	1310nm	500m	SMF	YES	MPO 1x12 APC	0 ~ 70°C

Note: 1. on SMF , with FEC; 2. Case Temperature.

I. Absolute Maximum Ratings

Param	Symbol	Min.	Typical	Max.	Unit	Notes
Supply Voltage	V _{CC3}	-0.5	-	+3.6	V	
Storage Temperature	T _s	-40	-	+85	°C	
Operating Humidity	RH	5	-	85	%	No condensation
RX damage threshold, per Lane	P _{Rdmg}	5	-	-	dBm	each lan

II. Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Operating Case Temperature	T _c	0	-	+70	°C	
Power Supply Voltage	V _{CC}	3.135	3.3	3.465	V	
Power Dissipation	P _d	-	-	12	W	
Link distance	d	2		500	meters	SMF, with FEC

III. Optical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Transmitter						
Signaling Rate per Lane		53.125 ± 100 ppm			GBd	
Modulation Format		PAM4				
Lane Center Wavelengths (range)	λ _C	1304.5		1317.5	nm	
Side-mode Suppression ratio (SMSR)	SMSR	30			dB	
Average Launch Power, each lane		-2.9		4	dBm	
Outer Optical Modulation Amplitude, (OMA outer), each Lane	OMA	-0.8		4.2	dB	
Launch power in OMA outer minus TDECQ		-2.2			dB	
Transmitter and dispersion eye closure for PAM4 (TDECQ), each lane				3.4	dBm	
Optical Extinction Ratio	ER	3.5			dB	
Optical Return Loss Tolerance				21.4	dB	
Receiver						
Signaling Rate per Lane		53.125 ± 100 ppm			GBd	
Modulation Format		PAM4				
Lane Center Wavelengths (Range)	λ _C	1304.5		1317.5	nm	

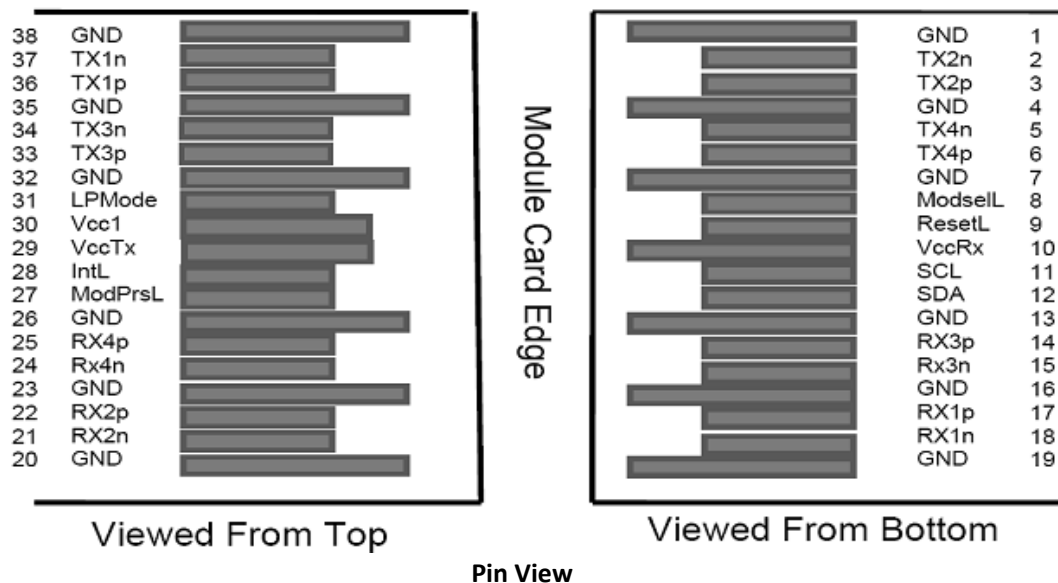
Average Receive Power, each Lane		-5.9		4	dBm	
Receive Power (OMA outer), each Lane				4.2	dBm	
Receiver Reflectance				-26	dB	
Stressed Receiver Sensitivity (OMA outer), each Lane				-1.9	dBm	
Receiver Sensitivity (OMA outer), each Lane				-4.4	dBm	
Los Assert	LOS _{Assert}	-14	-	-11.5	dBm	
Los De-assert	LOS _{De-}	-11	-	-8	dBm	
LOS Hysteresis	LOS _{Hys}	0.5	-	4	dB	

IV. Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Supply Voltage	V _{CC}	3.135		3.465	V	
Power Dissipation	P _d			12	W	
Transmitter(per Lane)						
Data Rate, each lane	DR	53.125			GBd	
Signaling rate per lane (range)	-	-100ppm	53.125	+100ppm	GBd	PAM4
Modulation Format	-	PAM4			-	
Differential Input Peak-peak Voltage Tolerance	V _{in-diff}	750	-	-	mVpp	
Differential Input Termination Mismatch	-	-	-	10	%	
Single-ended Voltage Tolerance	-	-0.4	-	3.3	V	
DC Common-mode Voltage Tolerance	-	-0.35	-	2.85	V	
Receiver (per Lane)						
Data Rate, each lane	DR	53.125			GBd	
Data Rate Variation	-	-100	-	+100	ppm	
Modulation Format	-	PAM4			-	
Differential Output Peak-to-peak Voltage (Short mode)	V _{out-diff,short}	-	-	600	mVpp	
Differential Output Peak-to-peak Voltage (Long mode)	V _{out-diff,Long}	-	-	845	mVpp	
Transition Time (20% to 80%)	Tr/tf	8.5	-	-	ps	
Eye Height	EH	-	-	15	mV	
Vertical Eye Closure	VEC	-	-	12	dB	

Differential Output Termination Mismatch	-	-	-	10	%	
DC Common-mode Voltage Tolerance	-	-0.35	-	2.85	V	

V. Pin arrangement



Pin Function Definitions

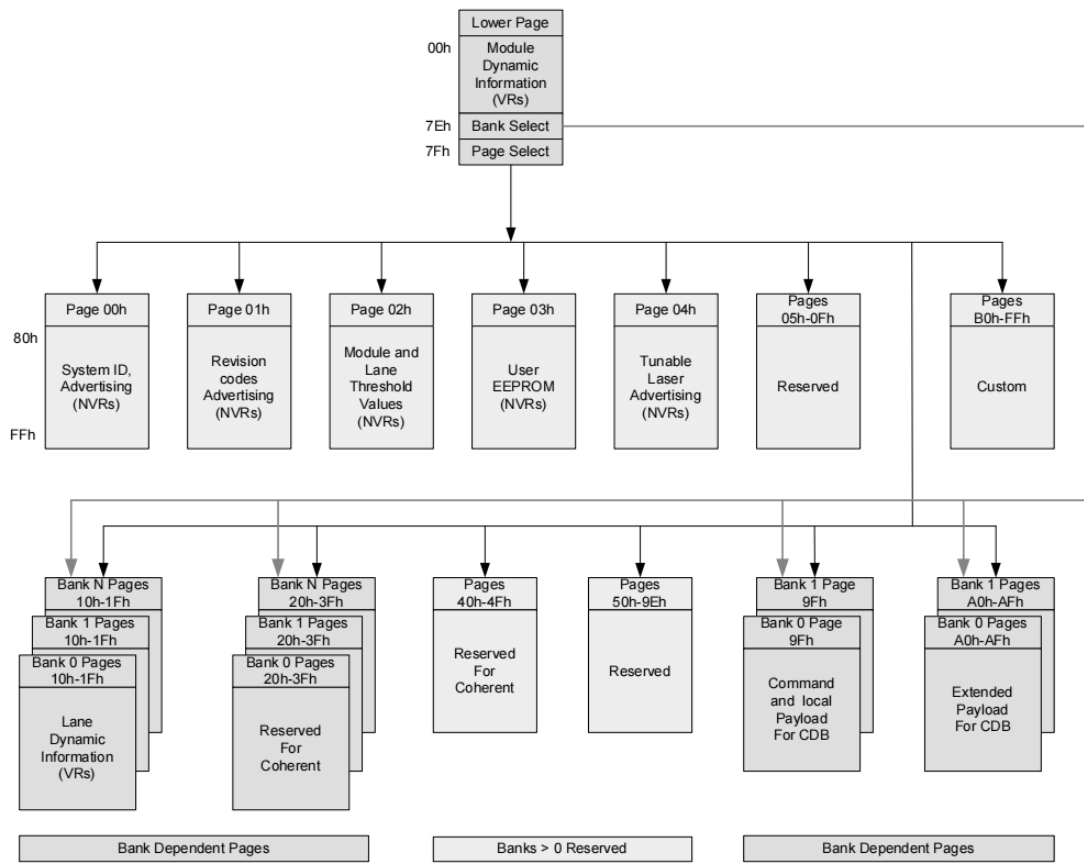
Pin	Symbol	Name/Description	Notes
1	GND	Ground	1
2	Tx2n	Transmitter Inverted Data Input	
3	Tx2p	Transmitter Non-Inverted Data Input	
4	GND	Ground	1
5	Tx4n	Transmitter Inverted Data Input	
6	Tx4p	Transmitter Non-Inverted Data Input	
7	GND	Ground	1
8	ModSelL	Module Select	
9	ResetL	Module Reset	
10	Vcc Rx	+3.3V Power Supply Receiver	
11	SCL	2-wire serial interface clock	
12	SDA	2-wire serial interface data	
13	GND	Ground	1
14	Rx3p	Receiver Non-Inverted Data Output	
15	Rx3n	Receiver Inverted Data Output	
16	GND	Ground	1
17	Rx1p	Receiver Non-Inverted Data Output	
18	Rx1n	Receiver Inverted Data Output	

19	GND	Ground	1
20	GND	Ground	1
21	Rx2n	Receiver Inverted Data Output	
22	Rx2p	Receiver Non-Inverted Data Output	
23	GND	Ground	1
24	Rx4n	Receiver Inverted Data Output	
25	Rx4p	Receiver Non-Inverted Data Output	
26	GND	Ground	1
27	ModPrsL	Module Present	
28	IntL	Interrupt	
29	Vcc Tx	+3.3V Power supply transmitter	
30	Vcc1	+3.3V Power supply	
31	LPMODE	Low Power Mode	
32	GND	Ground	1
33	Tx3p	Transmitter Non-Inverted Data Input	
34	Tx3n	Transmitter Inverted Data Input	
35	GND	Ground	1
36	Tx1p	Transmitter Non-Inverted Data Input	
37	Tx1n	Transmitter Inverted Data Input	
38	GND	Ground	1

Note: 1. Circuit ground is internally isolated from chassis ground

VI. Memory Map

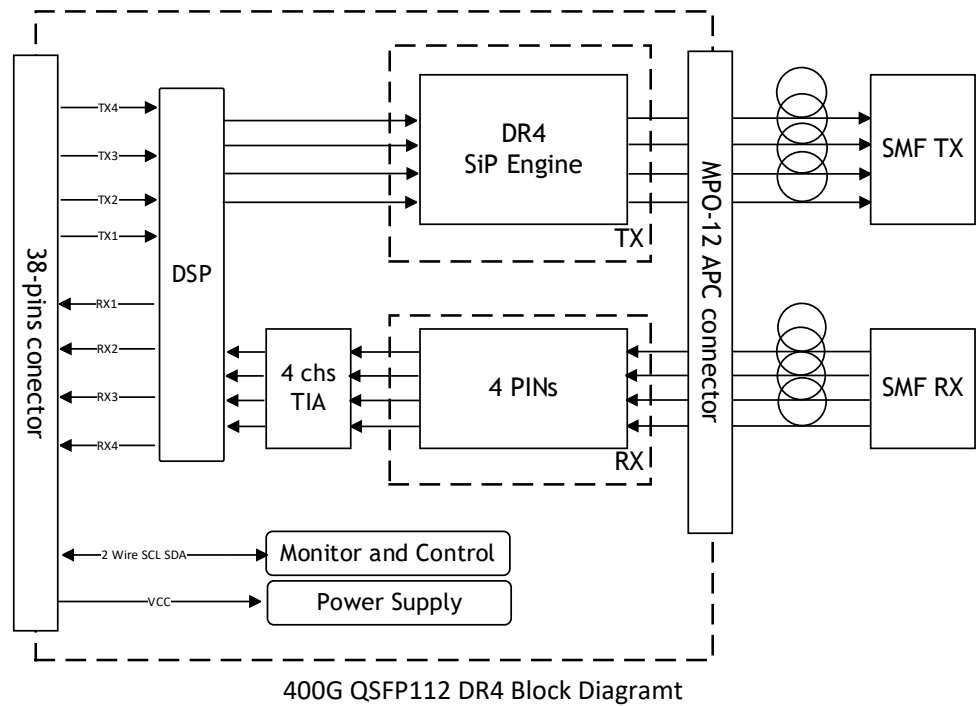
Compatible with CMIS rev 4.0 and upper.



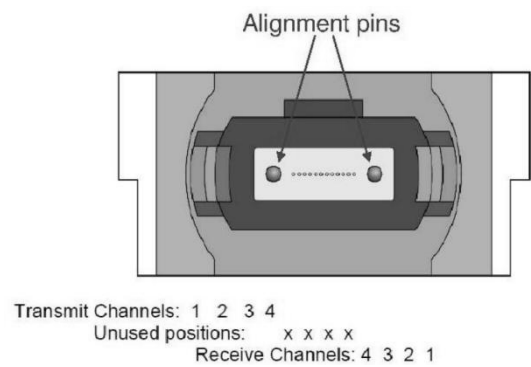
VII. Digital Diagnostic Monitor Accuracy

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

VIII. Functional Description



IX. Optical interface arrangement

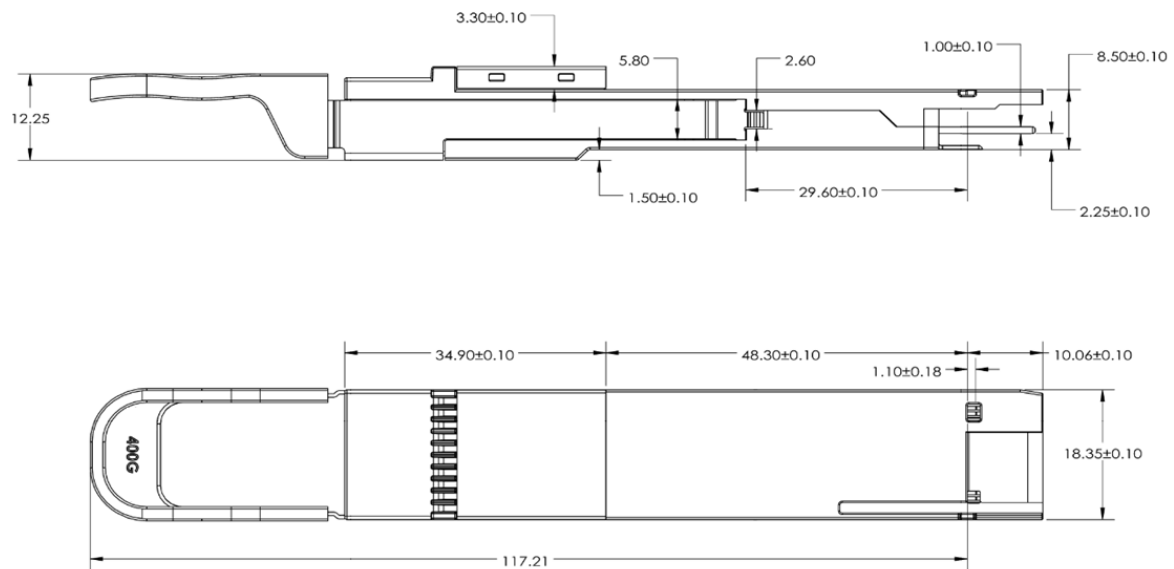


Optical interface arrangement ,MPO-12 .

X. Mechanical

compatible with QSFP112 MSA Specification Rev1.0

Unit mm



Mechanical Diagram