LPXSMB31-S50C

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

Features

- Data rate up to 425Gbps (4xPAM4 53.125 GBd）
- Silicon photonics integrated solution with optical DSP CDR inside
- 400GAUI-4 High speed I/O electrical interface
- OSFP Hot-pluggable form factor
- Maximum link length of 500m on SMF with FEC
- Single 3.3V power supply
- Power dissipation : < 12W
- Single MPO-12(APC) connector
- Operating case temp: 0°C to +70 °C
- RoHS 6 Compliant

Applications

- 400GBASE-DR4
- 200GBASE-DR2
- 100GBASE-DR1

Order Information

Part NO.	Bit Rate	Laser	Distance *1	Fiber Media	DDMI	Connector	Temp *2
LPXSMB31-S50C	425.Gbps	1310nm	500m	SMF	YES	1×MPO-12（APC）	0 ~ +70℃

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

I. Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Supply Voltage	VCC	-0.5	-	+3.6	V	
Storage Temperature	T_s	-40	-	+85	°C	
Operating Humidity	RH	5	-	85	%	No condensation
Optical Receiver Damage Threshold	Rin_{dam}	5			dBm	each lane

II. Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Operating Case Temperature	T_C	0	-	+70	°C	
Power Supply Voltage	Vcc	3.135	3.3	3.465	V	
Power Dissipation	Pd	-	-	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)	λC	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 eyeclosure 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				

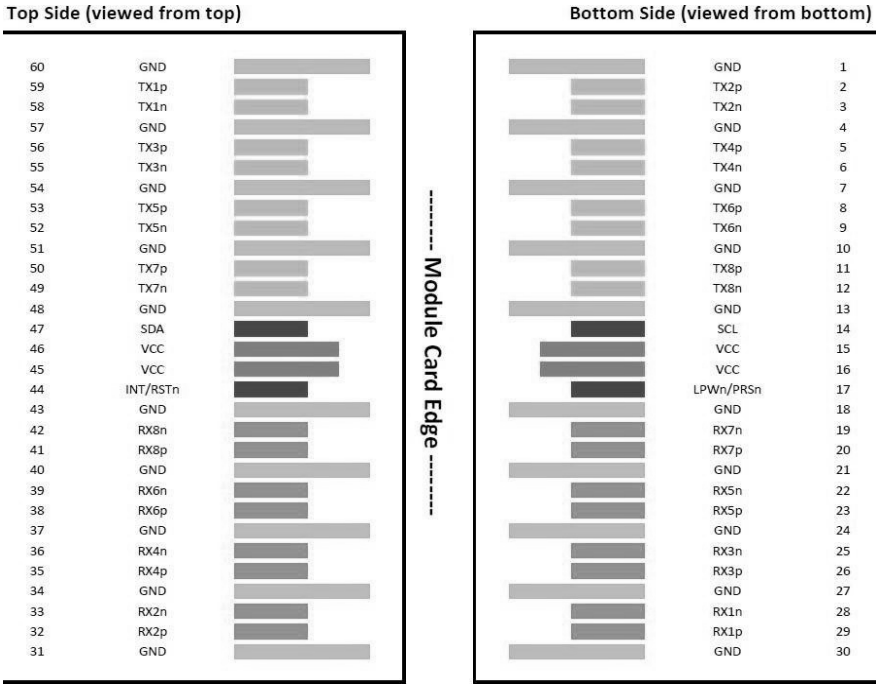
Lane Center Wavelengths (Range)	λC	1304.5		1317.5	nm	
Average Receive Power, each Lane		-5.9		4	dBm	
Receive Power (OMA outer), each Lane				4.2	dBm	
Receiver Reflectance				-26	dB	
Stressed Receiver Sensitivity (OMA outer), each Lane				-1.9	dBm	
Receiver Sensitivity (OMA outer), each Lane				-4.4	dBm	
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	Pd			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 Diagram



Pin Function Definitions

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
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	
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	
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
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

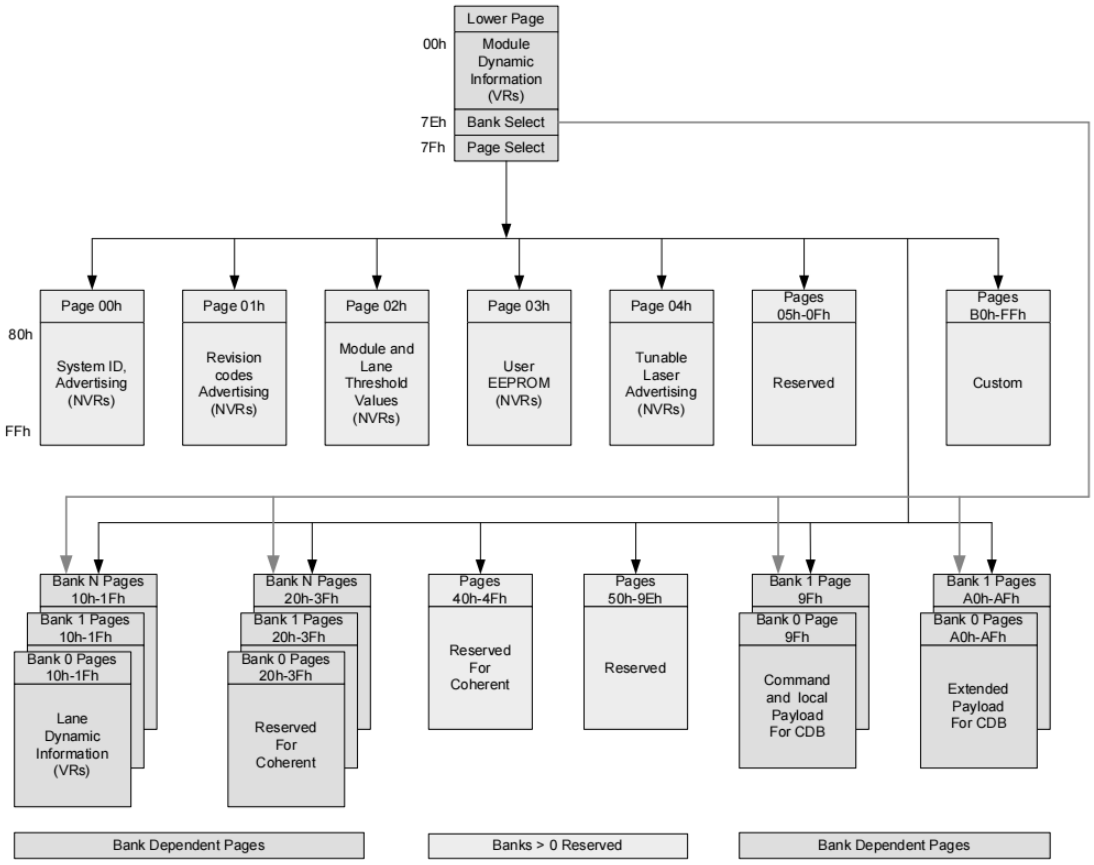
Note 1. Circuit ground is internally isolated from chassis ground.

Note 2. 400G DR4 unused PINs, NC.

Note 3. Open-Drain with pull up resistor on Host.

VI. Memory Map

Compatible with CMIS rev4.0 and upper

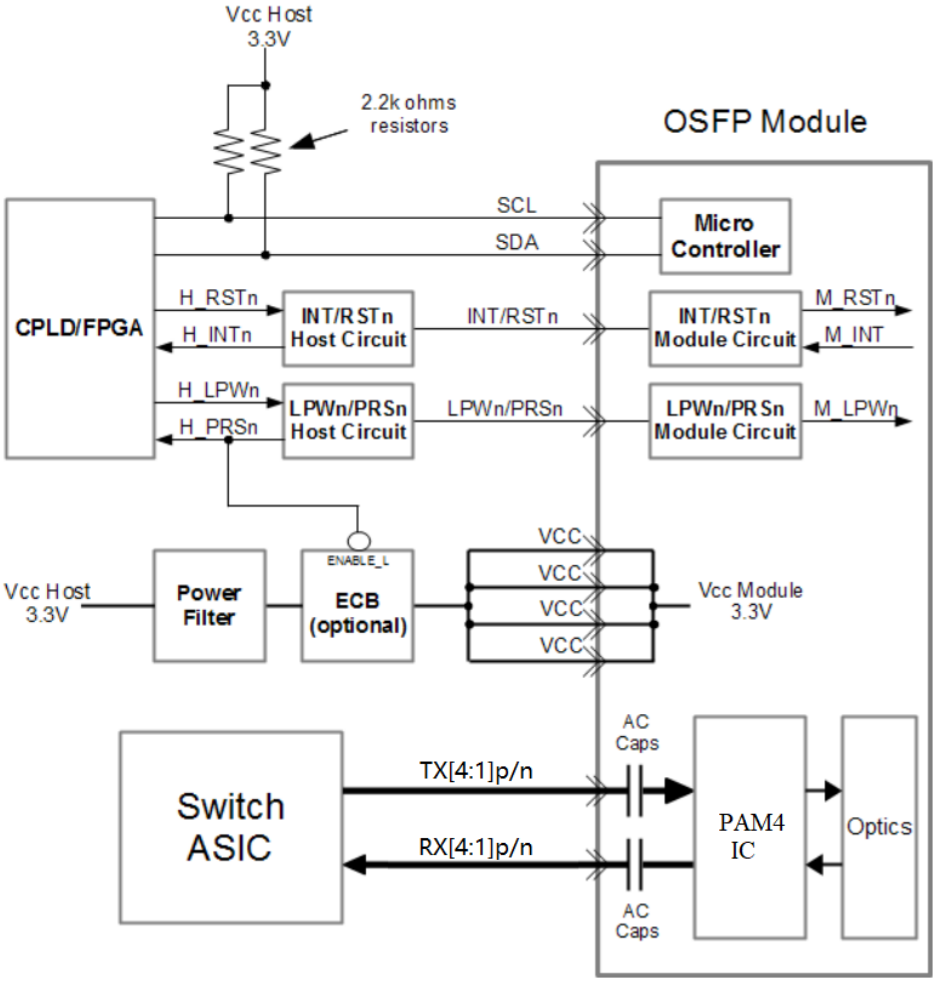


VII. Digital Diagnostic Monitor Accuracy

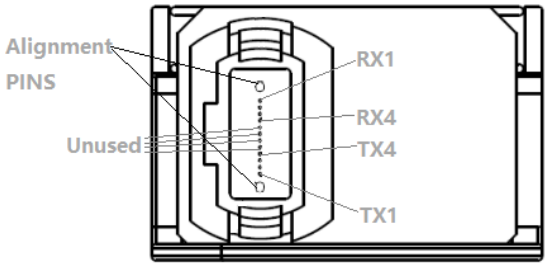
.Parameter	Symbol	Unit	Min	Max	Notes
Temperature monitor absolute error	DMI_Temp	degC	-3	3	Over operating temperature range
Supply voltage monitor absolute error	DMI _VCC	V	-0.1	0.1	Over full operating range
Channel Bias current monitor	DMI_Ibias_Ch	mA	-10%	10%	
Channel TX power monitor absolute error	DMI_TX_Ch	dB	-3	3	1
Channel RX power monitor absolute error	DMI_RX_Ch	dB	-3	3	1

Note1: Due to measurement accuracy of different multi-mode fibers, there could be an additional +/-1 dB fluctuation, or a +/- 3 dB total accuracy

VIII. Recommended Interface



I. Optical interface arrangement



The optical port is a male MPO connector receptacle

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IX. Mechanical Specifications

(Unit: mm)