LPJMLB23(B32)-K40C(I)

SFP28 25Gb/s BIDI 40km DDM

PRODUCT FEATURES

- Operating data rate up to 25.78Gbps
- 1270nm DFB Laser and APD/TIA receiver for ESJMLB23-K40C(I)

  1310nm DFB Laser and APD/TIA receiver for ESJMLB32-K40C(I)
- Maximum link length of 40km on

  Single Mode Fiber (SMF)
- Hot pluggable 20pin connector
- Minimum guaranteed optical budget of 18 dB
- LC single connector
- Single +3.3V±5% power supply
- Maximum power dissipation < 1.5W
- Specifications compliant with SFF 8472
- Fully RoHS Compliant
- Case operating temperature range:

  Commercial: 0°C to +70°C

  Industrial: -40°C to +85°C

APPLICATIONS

- 25GBASE-LR 25G Ethernet
- CPRI 10

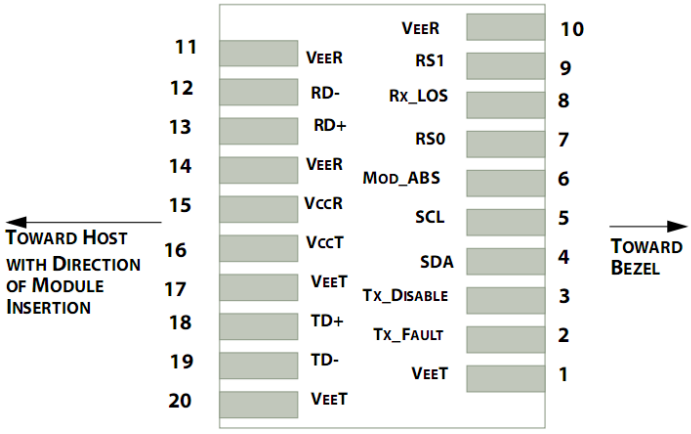
Compliance

- SFF-8431.
- IEEE802.3cc
- SFP28 MSA
- RoHS

Ordering information

Part No.	Bit Rate (Gbps)	Laser (nm)	Distance	Fiber Type	DDMI	Connector	Temp
LPJMLB23-K40C	25.78125	1270	40km	SMF	YES	LC	0℃~+70℃
LPJMLB32-K40C	25.78125	1310	40km	SMF	YES	LC	0℃~+70℃
LPJMLB23-K40I	25.78125	1270	40km	SMF	YES	LC	-40℃~+85℃
LPJMLB32-K40I	25.78125	1310	40km	SMF	YES	LC	-40℃~+85℃

I. Pin Diagram



Pin out of Connector Block on Host Board

II. Pin Descriptions

Pin	Symbol	Name/Description	Ref.
1	V_{EET}	Transmitter Ground (Common with Receiver Ground)	1
2	T_{FAULT}	Transmitter Fault.	2
3	T_{DIS}	Transmitter Disable. Laser output disabled on high or open.	3
4	SDA	2-wire Serial Interface Data Line	4
5	SCL	2-wire Serial Interface Clock Line	4
6	MOD_ABS	Module Absent. Grounded within the module	4
7	RS0	Rate Select 0	6
8	LOS	Loss of Signal indication. Logic “0” indicates normal operation.	5
9	RS1	Rate select 1	6
10	V_{EER}	Receiver Ground (Common with Transmitter Ground)	1
11	V_{EER}	Receiver Ground (Common with Transmitter Ground)	1

12	RD-	Receiver Inverted DATA out. AC Coupled	
13	RD+	Receiver Non-inverted DATA out. AC Coupled	
14	V_{EER}	Receiver Ground (Common with Transmitter Ground)	1
15	V_{CCR}	Receiver Power Supply	
16	V_{CCT}	Transmitter Power Supply	
17	V_{EET}	Transmitter Ground (Common with Receiver Ground)	1
18	TD+	Transmitter Non-Inverted DATA in. AC Coupled.	
19	TD-	Transmitter Inverted DATA in. AC Coupled.	
20	V_{EET}	Transmitter Ground (Common with Receiver Ground)	1

Notes:

1. Circuit ground is internally isolated from chassis ground.

2. TFAULT is an open collector/drain output, which is pulled up with a 4.7kΩ – 10kΩ resistor on the host board if intended for use. Pull up voltage should be between 2.0V to Vcc + 0.3V. A high output indicates a transmitter fault caused by either the TX bias current or the TX output power exceeding the preset alarm threshold. A low output indicates normal operation. In the low state, the output is pulled to <0.8V.

3. Laser output disabled on TDIS >2.0V or open, enabled on TDIS <0.8V.

4. Should be pulled up with 4.7kΩ – 10kΩ on host board to a voltage between 2.0V and 3.6V. MOD_ABS pulls line low to indicate module is plugged in.

5. LOS is open collector output. Should be pulled up with 4.7kΩ – 10kΩ on host board to a voltage between 2.0V and 3.6V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.

6. Internally pulled down per SFF-8431 Rev 4.1.

III. Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Ref.
Maximum Supply Voltage	Vcc	-0.5		3.6	V	
Storage Temperature	TS	-40		85	℃	
Relative Humidity	RH	0		85	%	

IV. Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
Transmitter						
Signaling rate(range)	Sr		25.7825±100ppm		GBd	
Center Wavelength	λc	1260	1270	1280	nm	ESJMLB23-K40C(I)
		1300	1310	1320	nm	ESJMLB32-K40C(I)
Spectral Width(-20dB)	Pm			1	nm	
Average Output Power	Pavg	0		6	dBm	
Extinction Ratio	ER	3.5			dB	
Side Mode Suppression Ratio	SMSR	30			dB	
Transmitter OFF Output Power	POff			-30	dBm	
Relative Intensity Noise	RIN	dB/Hz		-128	dB/Hz	
Transmitter eye mask definition {X1, X2, X3, Y1, Y2, Y3} Hit ratio 5×10E-5 hits		{0.31, 0.4, 0.45, 0.34, 0.38, 0.4}				
Receiver						
Signaling rate(range)	Sr		25.7825±100ppm		GBd	
Center Wavelength	λc	1300	1310	1320	nm	ESJMLB23-K40C(I)
		1260	1270	1280	nm	ESJMLB23-K40C(I)
Receiver Sensitivity(OMA)	RSENSE			-18	dBm	1
Receiver Overload (OMA)	Pmax	-5			dBm	
Receiver Reflectance	Rfl			-12	dBm	
Loss of Signal Assert	P_A	-30			dBm	
Loss of Signal De-assert	P_D			-21	dBm	
LOS Hysteresis	P_D- P_A	0.5			dB	

Note:

1. Measured at 25.78125Gb/s, ER>3.5dBm, PRBS 2^{31}-1 and BER better than or equal to $5x10^{-5}$.

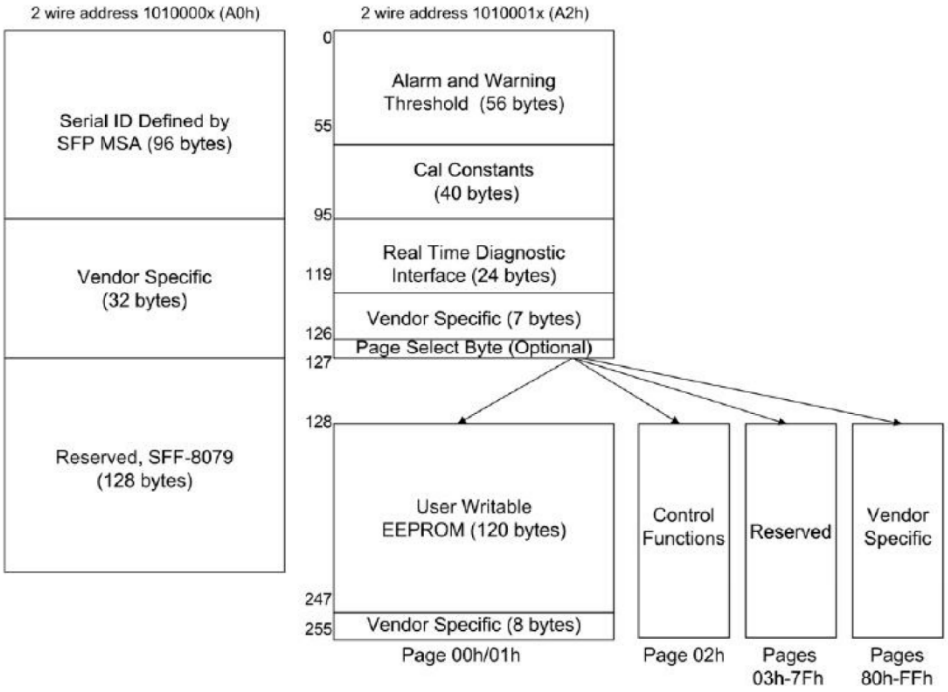
V. Electrical Interface Characteristics

Parameter	Symbol	Min	Type	Max	Unit	Ref.
Supply Voltage	Vcc	3.14	3.3	3.46	V	
Power dissipation	Pd			1.5	W	
Bite rate	BR		25.78		Gb/s	
Bit Error Ratio	BER			$5*10^{-5}$		
Transmitter						
Input differential impedance	Rin		100			1
Differential data input swing	Vin, pp	90		450	mV	
Transmit Disable Voltage	V_D	2		VccHOST	V	
Transmit Enable Voltage	V_{EN}	Vee		Vee+0.8	V	
Transmit Fault Assert Voltage	VFA	2		VccHOST	V	
Transmit Fault De-Assert	VFDA	Vee		Vee+0.8	V	
Receiver						
Differential data output swing	Vout, pp	200		450	mV	2
LOS Fault	V_{LOS_fault}	2		VccHOST	V	3
LOS Normal	V_{LOS_norm}	Vee		Vee+0.8	V	3

Notes:

1. Connected directly to TX data input pins.AC coupling from pins into laser driver IC.
2. Into 100Ω differential termination.
3. LOS is an open collector output. Should be pulled up with 4.7kΩ – 10kΩ on the host board. Normal operation is logic 0; loss of signal is logic 1. Maximum pull-up voltage is 5.5V.

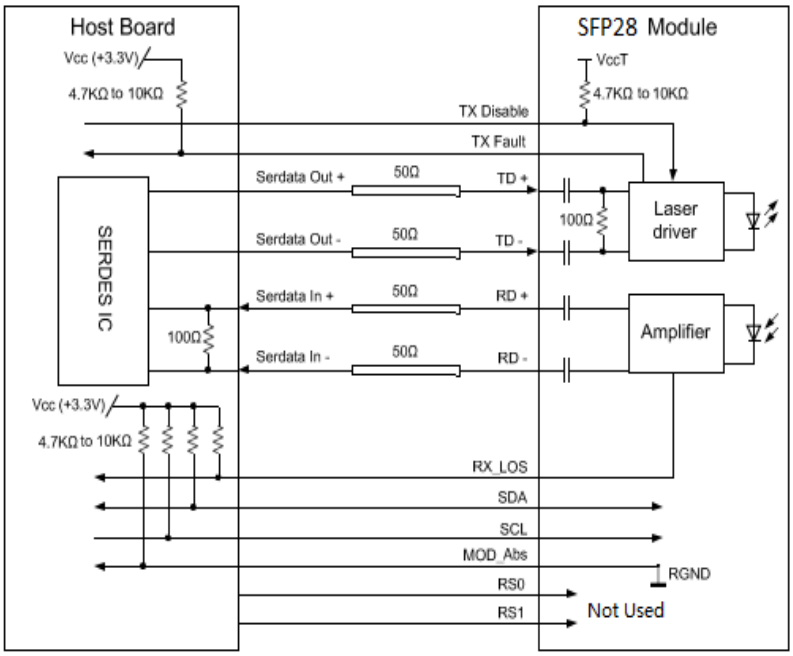
VI. Digital Diagnostic Memory Map



VII. Digital Diagnostic Specifications

Parameter	Unit	Accuracy
Case Temperature	℃	±3
Supply Voltage	V	±3%
Tx Bias Current	mA	±10%
Tx Optical Power	dB	±3
Rx Optical Power	dB	±3

VIII. Recommended Interface Circuit



IX. Mechanical Specifications (Unit: mm)