LSP-B2731(3127)-40DI

SFP28 BiDi 25Gb/s TX1270nm DML/RX1310nm(TX1310nmDML/RX1270nm) 40km DDM Transceiver

PRODUCT FEATURES

- Supports 25GBASE-ER (25Gb/s)
- Lane bit rate 25.78 Gb/s
- Up to 40km transmission on SMF
- DML laser and APD receiver
- High speed I/O electrical interface (25GAUI)
- I2C interface with integrated Digital Diagnostic monitoring
- SFP28 MSA package with single LC connector
- Single +3.3V power supply
- Maximum power consumption 2 W
- Operating case temperature: -40 to +85 °C
- Compliant to IEEE 802.3cc, SFF-8402 and SFF-8419
- Complies with EU Directive 2015/863/EU

APPLICATIONS

- 25GBASE ER
- Other Optical Links

Ordering information

Part No.	Data Rate	Laser	Fiber Type	Distance	Optical Interface	Temp	DDMI
LSP-B2731-40DI	25.78Gbps	1270nm DML	SMF	40KM	LC	-40~85C	Y
LSP-B3127-40DI	25.78Gbps	1310nm DML	SMF	40KM	LC	-40~85C	Y

I. Absolute Maximum Ratings

Parameter	Symbol	Min.	Typical	Max.	Unit
Storage Temperature	T_S	-40		85	°C
Supply Voltage	V_{CC}	-0.5		4	V
Operating Relative Humidity	RH	5		95	%

II. Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Operating Case Temperature	T_C	-40	-	+85	°C	
Power Supply Voltage	V_{CC}	3.13	3.3	3.47	V	
Power Supply Current	I_{CC}	-	-	576	mA	
Maximum Power Dissipation	P_D	-	-	2	W	
Bit Rate	BR		25.78	-	Gb/s	
Transmission Distance	TD		-	40	km	Over SMF

III. Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Transmitter						
Center Wavelength	λ_0	1260	1270	1280	nm	Rx 1310nm
Center Wavelength	λ_0	1300	1310	1320	nm	Rx 1270nm
Optical Modulation Amplitude	OMA	0	-	6	dBm	1
Launch power in OMA minus TDP (min)	OMA - TDP	-1	-	-	dBm	
Average Output Power (Laser Turn off)	$P_{0UT-OFF}$	-	-	-30	dBm	
Side Mode Suppression Ratio	SMSR	30	-	-	dB	
Extinction Ratio	ER	4	-	-	dB	
Transmitter and dispersion penalty (TDP)	TDP	-	-	2.7	dB	
Optical Return Loss Tolerance	ORLT	-	-	20	dB	
Transmitter reflectance	Tref	-	-	-26	dB	
Optical Eye Mask	{0.31, 0.4, 0.45, 0.34, 0.38, 0.4}					2
Receiver						
Center Wavelength	λ_0	1300	1310	1320	nm	Tx 1270nm
Center Wavelength	λ_0	1260	1270	1280	nm	Tx 1310nm
Receiver sensitivity (OMA)	P_{OMA}	-	-	-19	dBm	3
Damage threshold	P_{damage}	-3	-	-	dBm	

Overload	Pol	-4	-	-	dBm	
Reflectance	Ref	-	-	-26	dB	
LOS Assert per lane	LOS_A	-30	-	-	dBm	
LOS De-assert	LOS_D	-	-	-22	dBm	
LOS Hysteresis	LOS_H	0.5	-	5	dB	

Notes:

1. The optical power is launched into SMF.
2. Measured with a PRBS 2^{31}-1 test pattern @25.78125, Hit ratio≤5E-5.
3. Measured with a PRBS 2^{31}-1 test pattern @25.78125 Gb/s, BER≤5E-5.

IV. Electrical Characteristics

High-Speed Signal: Compliant to CEI-28G-VSR

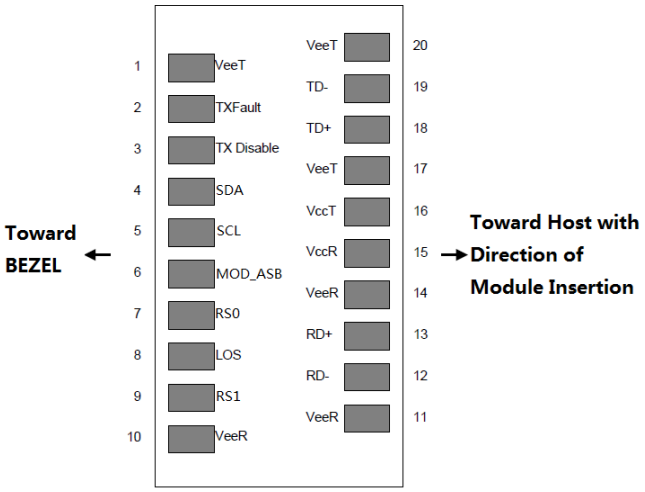
Low-Speed Signal: Compliant to SFF-8419

Parameter		Symbol	Min.	Typical	Max.	Unit	Notes
Transmitter (Module Input)							
Differential Data Input Amplitude		$V_{IN,P-P}$	-	-	900	mVpp	
Differential Termination Mismatch			-	-	10	%	
Tx_Disable	Normal Operation	V_{IL}	-0.3	-	0.8	V	
	Laser Disable	V_{IH}	2.0	-	V_{CC}+0.3	V	
Receiver (Module Output)							
Differential Data Output Amplitude		$V_{OUT,P-P}$	-	-	900	mVpp	
Differential Termination Mismatch （1MHZ）			-	-	10	%	
Output Rise/Fall Time, 20%~80%		T_R	12	-	-	ps	
Rx_LOS	Normal Operation	V_{OL}	0	-	0.4	V	
	Lose Signal	V_{OH}	V_{CC}-0.5	-	V_{CC}+0.3	V	

V. Digital Diagnostic

Parameter	Range	Accuracy	Unit	Calibration
Temperature	-40 to 85	±3	ºC	Internal
Voltage	0 to V_{CC}	0.1	V	Internal
Tx Bias Current Per Lane	0 to 100	10%	mA	Internal
Tx Output Power Per Lane	-3 to 6	±3	dBm	Internal
Rx Power	-21 to -4	±3	dBm	Internal

VI. Pin Diagram



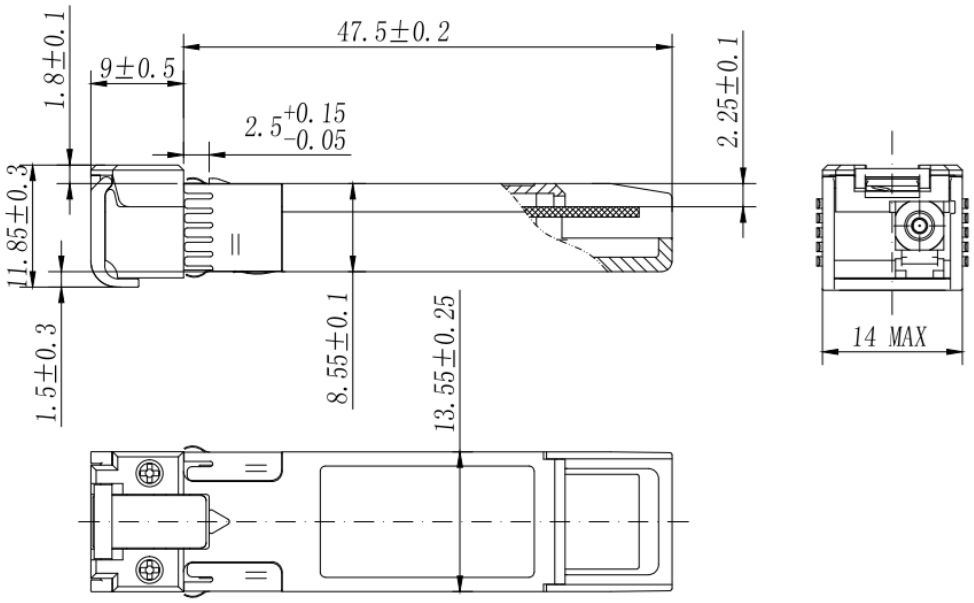
VII. Pin Descriptions

PIN	Symbol	Name/Description	Notes
1	VeeT	Transmitter Ground	1
2	Tx_Fault	Transmitter Fault - High indicates a fault condition	2
3	Tx_Disable	Transmitter Disable – High or open disables the transmitter	
4	SDA	2-wire Serial Interface Data Line (MOD-DEF2)	3
5	SCL	2-wire Serial Interface Clock (MOD-DEF1)	3
6	MOD_ABS	Module Absent, connected to VeeT or VeeR in the module	
7	RS0	Rate Select 0 – Not used, Presents high input impedance	5
8	RX_LOS	Receiver Loss of Signal(LVTTL-O). Logic 0 indicates normal operation	4
9	RS1	Rate Select 1 – Not used, Presents high input impedance	5
10	VeeR	Receiver Ground	1
11	VeeR	Receiver Ground	1
12	RD-	Inverse Received Data out (CML-O), AC Coupled	
13	RD+	Receiver Non-inverted DATA out. AC Coupled	
14	VeeR	Receiver Ground	1
15	VccR	Receiver Power Supply	
16	VccT	Transmitter Power Supply	
17	VeeT	Transmitter Ground	1
18	TD+	Transmitter Non-Inverted DATA in. AC Coupled.	
19	TD-	Transmitter Inverted DATA in. AC Coupled.	
20	VeeT	Transmitter Ground	1

Notes:

1. Module ground pins GND are isolated from the module case.
2. Tx_Fault is an open collector/drain output, which should be pulled up with a 4.7k – 10k Ohms resistor on Host board.
3. Should be pulled up with 4.7k–10kohms on host board to a voltage between 2.0V and 3.6V.
4. LOS is open collector output. Should be pulled up with 4.7k–10kohms on host board to a voltage between 2.0V and 3.6V.
5. RS0 and RS1 pins are pulled low to GND with a resistor > 30KΩ in module.

VIII.Mechanical Dimensions(Unit: mm)



Revision History

Version No.	Date	Description
1.0	June 24, 2020	Preliminary datasheet