Spec No.: EAVN05

TECHNICAL SPECIFICATION

ZMKP-1xxLRNC

Version	Date	Prepared Designer	Reviewed Supervisor	Approved Branch manager	Accepted
V1.0	2026-5-25	Yang Ying	Li Huangong	Zheng Qifei	

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1. General

The SFP+ transceiver provides 10G Base-LR throughput up to 10km over single-mode fiber (SMF) using a wavelength of CWDM via duplex LC connector. Digital Diagnostic monitoring (DDM) support is present to allow access to real-time operating parameters.The transmitter input and receiver output impedance is 100 Ohms differential. Data lines are internally AC coupled. The module provides differential termination and reduce differential to common mode conversion for quality signal termination and low EMI.

2. Features

- Duplex LC interface, Duplex operation
- Applicable for 10km SMF connection
- Operating data rate up to 10.3125Gbps
- Single 3.3V Power supply
- Power consumption ≤ 1.5W
- Hot-Pluggable SFP+ footprint
- CWDM DFB transmitter, PIN receiver
- Case Operating temperature ranges: 0 ℃ to 70 ℃
- RoHS 6 compliance

3. Applications

- 10G BASE-LR/LW
- 10G Ethernet
- CPRI Opt 1~8
- 10G OTU2f

4. Standards

- Compliant to IEEE 802.3ae
- Compliant to SFF-8431
- Compliant to SFF-8472
- Compliant to SFF-8432

5. Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit	Notes
Storage Temperature	T_{stg}	-40	85	ºC	
Case Operating Temperature	T_C	0	70	ºC	
Relative Humidity - Storage	RH_S	5	95	%	
Relative Humidity - Operating	RH_O	5	85	%	
DC Supply Voltage	V_{CC}	-0.3	4.0	V	

6. Recommended Operating Conditions

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Case Operating Temperature	T_C	0	-	70	°C	
DC Supply Voltage	V_{CC}	3.135	3.3	3.465	V	
Module Supply Current	I_{CC}	-	-	350	mA	
Maximum Power Dissipation	P_D	-	-	1.5	W	
Data Rate	DR	0.61	-	11.3	Gb/s	

7. Electrical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	Notes
TX Differential Input Amplitude	V_{IN}	180	-	700	mVpp	
TX Differential Input Impendence	Z_{IN}	-	100	-	Ω	
RX Differential Output Amplitude	V_{OUT}	300	-	850	mVpp	
RX Differential Output Impendence	Z_{OUT}	-	100	-	Ω	
TX_fault /LOS output (TTL)	V_{OH}	2.4	-	Vcc	V	
	V_{OL}	0	-	0.4	V	
TX_disable input (TTL)	V_{IH}	2.0	-	Vcc	V	
	V_{IL}	0	-	0.8	V	

8. Transmitter Optical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Data Rate	DR	-	10.3125	-	Gbps	-
Average Optical Power	Po	-1	-	+6	dBm	1
Wavelength	λ	1384.5	1391	1397.5	nm	ZMKP-139LRNC
		1404.5	1411	1417.5		ZMKP-141LRNC
		1424.5	1431	1437.5		ZMKP-143LRNC
		1444.5	1451	1457.5		ZMKP-145LRNC
		1464.5	1471	1477.5		ZMKP-147LRNC
		1484.5	1491	1497.5		ZMKP-149LRNC
		1504.5	1511	1517.5		ZMKP-151LRNC
		1524.5	1531	1537.5		ZMKP-153LRNC
		1544.5	1551	1557.5		ZMKP-155LRNC
		1564.5	1571	1577.5		ZMKP-157LRNC
		1584.5	1591	1597.5		ZMKP-159LRNC
		1604.5	1611	1617.5		ZMKP-161LRNC
Extinction Ratio	ER	3.5	-	-	dB	2
Spectral width(@-20dB)	Δλ	-	-	1	nm	-
Side Mode Suppression Ratio	SMSR	30	-	-	dB	-
Optical Return Loss Tolerance	ORLT	-	-	12	dB	-
Average launch power of OFF transmitter	Poff	-	-	-30	dBm	1
$RIN_{12}OMA$	RIN	-	-	-128	dB/Hz	
Transmitter Reflectance	T_R	-	-	-12	dB	
Eye Mask {X1, X2, X3, Y1, Y2, Y3}	{0.25, 0.40, 0.45, 0.25, 0.28, 0.40}					

Notes :

1.The optical power is launched into SMF.

2.Measured with a PRBS 2^{31}-1 test pattern @10.3125 Gb/s.

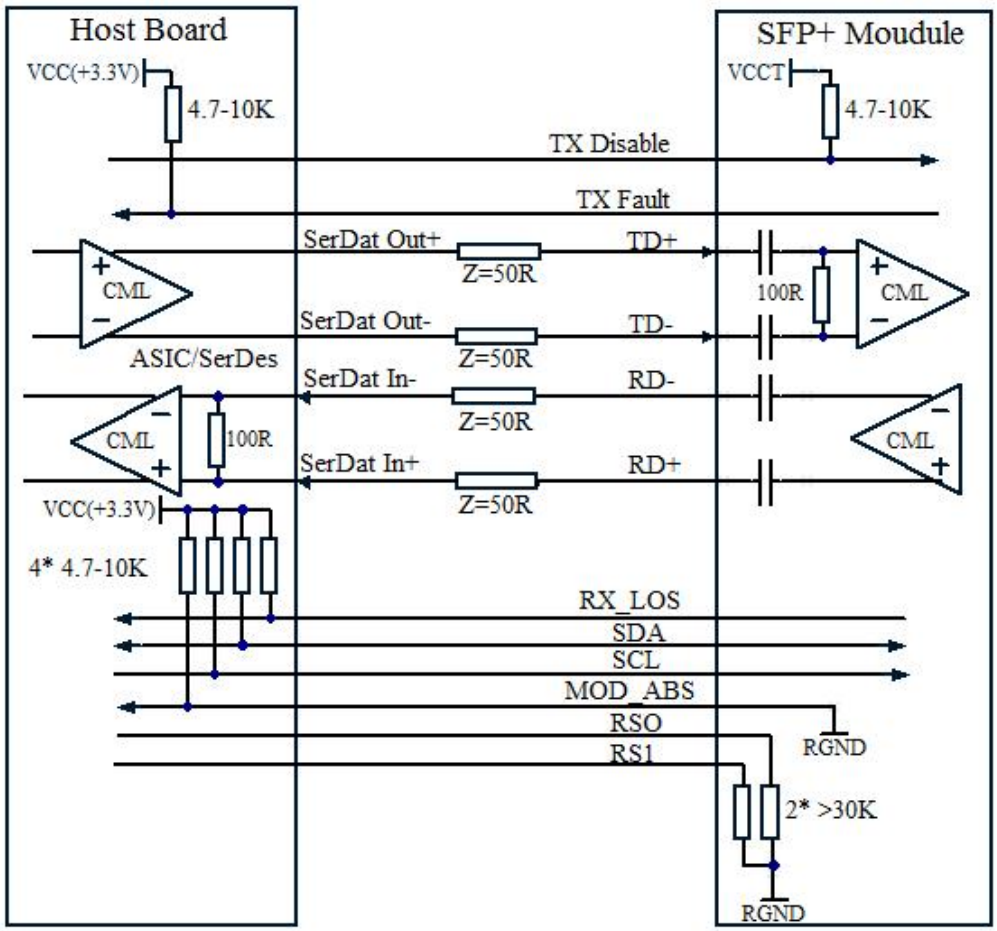
9. Receiver Optical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Data Rate	DR	-	10.3125	-	Gbps	-
Wavelength	λ	1391	-	1611	nm	-
Average Sensitivity	Sen	-	-	-14.4	dBm	1
Optical Power Overload	Psat	0.5	-	-	dBm	1
Receiver Reflectance	Rfl	-	-	-12	dB	-
LOS De-Assert	LOSD	-	-	-15	dBm	1
LOS Assert	LOSA	-30	-	-	dBm	1
LOS Hysteresis	-	0.5	-	5	dB	1

Notes :

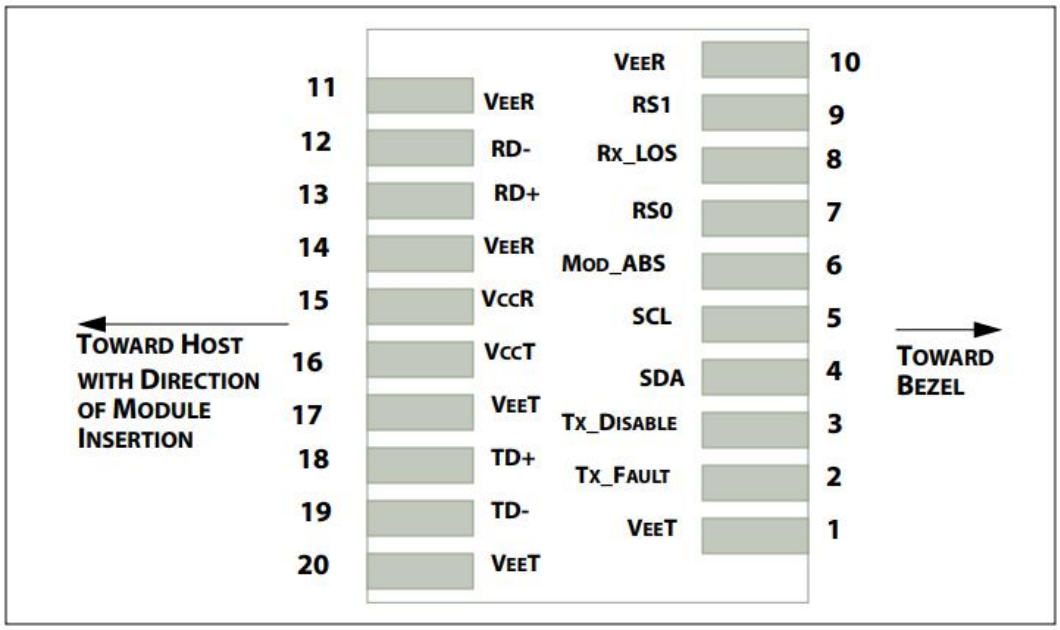
1. Measured with a PRBS 2^{31}-1 test pattern, @10.3125Gb/s, ER=4.5dB, BER<10^{-12}.

10. Typical Application Circuit



Recommended Application Interface Block Diagram

11. Pin Description



SFP+ pad assignment top view

Pin	Name	Function/Description	Notes
1	VeeT	Transmitter Ground	1
2	TX_Fault	Transmitter Fault (LVTTL-O) - High indicates a fault condition	2
3	TX_Disable	Transmitter Disable (LVTTL-I) – High or open disables the transmitter	3
4	SDA	Two wire serial interface Data Line (LVTTL-I/O) (MOD-DEF2)	4
5	SCL	Two wire serial interface Clock Line (LVTTL-I/O) (MOD-DEF1)	4
6	MOD_ABS	Module Absent (Output), connected to VeeT or VeeR in the module	5
7	RS0	Rate Select 0 – Not used, Presents high input impedance	6
8	RX_LOS	Receiver Loss of Signal (LVTTL-O)	2
9	RS1	Rate Select 1 – Not used, Presents high input impedance	6
10	VeeR	Receiver Ground	1
11	VeeR	Receiver Ground	
12	RD-	Inverse Received Data out (CML-O), AC Coupled	
13	RD+	Received Data out (CML-O), AC Coupled	
14	VeeR	Receiver Ground	
15	VccR	Receiver Power - +3.3V	
16	VccT	Transmitter Power - +3.3 V	
17	VeeT	Transmitter Ground	1

18	TD+	Transmitter Data In (CML-I), AC Coupled	
19	TD-	Inverse Transmitter Data In (CML-I), AC Coupled	
20	VeeT	Transmitter Ground	1

Notes:

1. The module signal grounds are isolated from the module case.

2. This is an open collector/drain output that on the host board requires a 4.7KΩ to 10KΩ pull-up resistor to Vcc Host.

3.This input is internally biased high with a 4.7KΩ to 10KΩ pull-up resistor to VccT.

4.Two-Wire Serial interface clock and data lines require an external pull-up resistor dependent on the capacitance load.

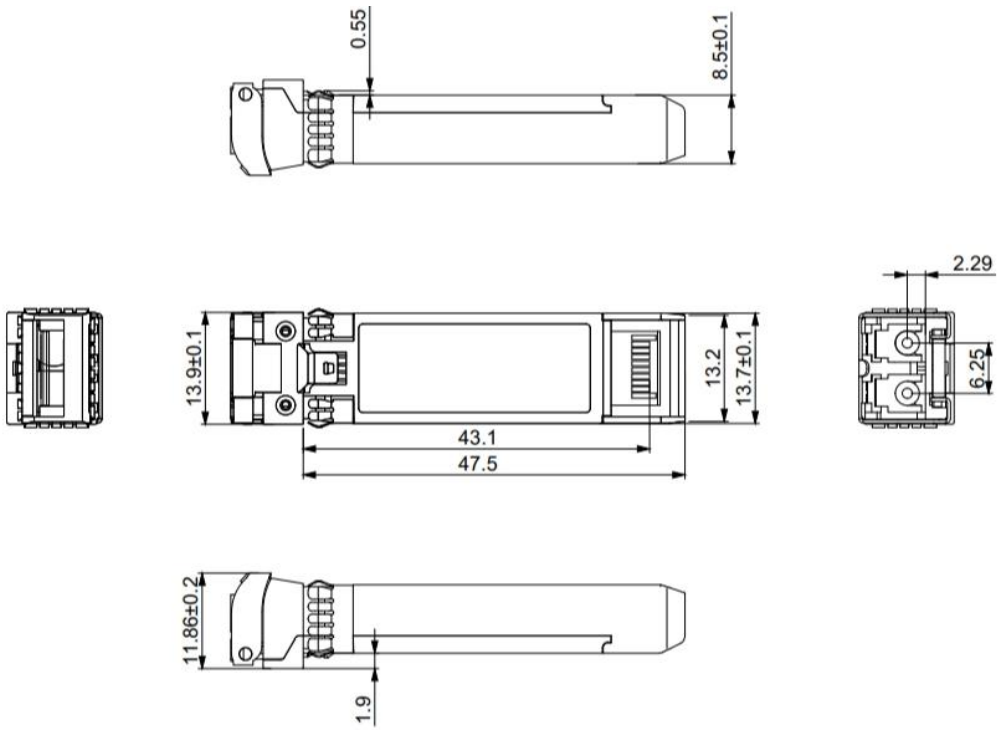
5.This is a ground return that on the host board requires a 4.7KΩ to 10KΩ pull-up resistor to Vcc Host.

6.Rate select can also be set through the 2-wire bus in accordance with SFF-8472 v. 10.2.

Rx Rate Select is set at Bit 3, Byte 110, Address A2h. Tx Rate Select is set at Bit 3, Byte 118, Address A2h.

Writing a “1” selects maximum bandwidth operation. Rate select is the logic OR of the input state of Rate Select Pin and 2-wire bus.

12. Mechanical Dimensions(Unit: mm)



Outline Drawing

Notes:

1.Tolerance: +/-0.1mm.

2.Light port according with fiber connector SPEC.

3.The housing is made of zinc alloy, and the pull ring is made of stainless steel.

13. Ordering Information

Part Number	Specifications						
	Pack	Rate (Gbps)	Tx (nm)	Po (dBm)	Rx	Sen (dBm)	Tc (℃)
ZMKP-139LRNC	SFP+	10.3125	1391	-1 ~ +6	PIN	-14.4	0 ~ 70
ZMKP-141LRNC	SFP+	10.3125	1411	-1 ~ +6	PIN	-14.4	0 ~ 70
ZMKP-143LRNC	SFP+	10.3125	1431	-1 ~ +6	PIN	-14.4	0 ~ 70
ZMKP-145LRNC	SFP+	10.3125	1451	-1 ~ +6	PIN	-14.4	0 ~ 70
ZMKP-147LRNC	SFP+	10.3125	1471	-1 ~ +6	PIN	-14.4	0 ~ 70
ZMKP-149LRNC	SFP+	10.3125	1491	-1 ~ +6	PIN	-14.4	0 ~ 70
ZMKP-151LRNC	SFP+	10.3125	1511	-1 ~ +6	PIN	-14.4	0 ~ 70
ZMKP-153LRNC	SFP+	10.3125	1531	-1 ~ +6	PIN	-14.4	0 ~ 70
ZMKP-155LRNC	SFP+	10.3125	1551	-1 ~ +6	PIN	-14.4	0 ~ 70
ZMKP-157LRNC	SFP+	10.3125	1571	-1 ~ +6	PIN	-14.4	0 ~ 70
ZMKP-159LRNC	SFP+	10.3125	1591	-1 ~ +6	PIN	-14.4	0 ~ 70
ZMKP-161LRNC	SFP+	10.3125	1611	-1 ~ +6	PIN	-14.4	0 ~ 70

14. Revision History

Revision	Date	Change information
V1.0	2026-5-25	New Release

15. Warnings

Handing Precautions:

This device is susceptible to damage as a result of electrostatic discharge (ESD). A static free environment is highly recommended. Please follow guidelines according to proper ESD procedures.

Laser Safety:

Radiation emitted by laser devices can be dangerous to human eyes. Avoid eye exposure to direct or indirect radiation.

Notice:

The information provided on this page contains the product target specifications which are subject to change without notice. For more information ,please check with your ZTT Sales Office for product updates, changes in specifications, sample availability and products release dates.