LinkPro™

LPHKLCxx-K80C(I)

SFP+ 10Gb/s CWDM 80km DDMI With CDR

PRODUCT FEATURES

- Up to 11.3Gbps Data Links
- Cooled CWDM EML laser transmitter and APD/TIA receiver
- Maximum link length of 80km on 9/125um SMF
- Hot-pluggable SFP+ footprint
- Duplex LC receptacles
- Low power dissipation
- RoHS compliant and lead-free
- Support Digital Diagnostic Monitor interface
- Single +3.3V power supply
- Compliant with SFF-8472
- With CDR supported 9.95 to 11.3Gb/s reference-free
- Case operating temperature

  Commercial: 0°C to +70°C

  Industrial: -40°C to +85°C

APPLICATIONS

- 10GBASE-ZR/ZW Ethernet
- 10Gb/s Fibre Channel
- CPRI option 2 through 8

Compliance

- SFF-8431 and SFF-8432
- SFF-8472
- ROHS

LinkPro™

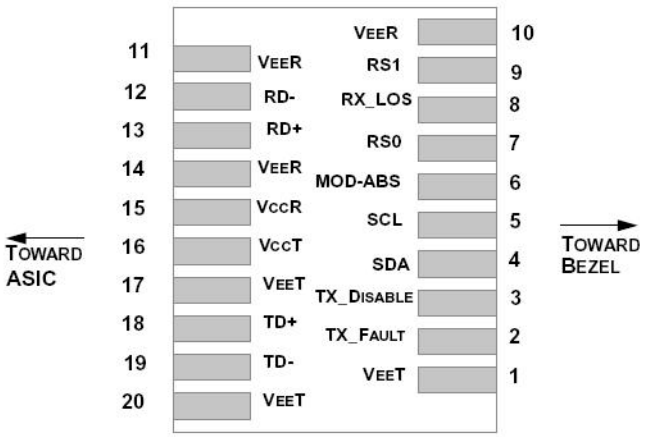
Ordering information

Part No.	Bit Rate (Gbps)	Laser (nm)	Distance（km）	Fiber Type	DDMI	Connector	Temp
LPHKLCxx-K80C	10.3125	CWDM	80	SMF	YES	LC	0℃~70℃
LPHKLCxx-K80I	10.3125	CWDM	80	SMF	YES	LC	-40℃~85℃

xx: It's for Channel

xx	Wavelength(nm)	Clasp Color	xx	Wavelength(nm)	Clasp Color
47	1470	Gray	55	1550	Yellow
49	1490	Purple	57	1570	Orange
51	1510	Blue	59	1590	Red
53	1530	Green	61	1610	Brown

I. Pin Diagram



II. Pinout of Connector Block on Host Board

III. 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	MOD_DEF(2)	Module Definition 2. Data line for Serial ID.	4
5	MOD_DEF(1)	Module Definition 1. Clock line for Serial ID.	4
6	MOD_DEF(0)	Module Definition 0. Grounded within the module.	4

7	Rate Select	No connection required	
8	LOS	Loss of Signal indication. Logic “0” indicates normal operation.	5
9	V_{EER}	Receiver Ground (Common with Transmitter Ground)	
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 (CML). AC Coupled	
13	RD+	Receiver Non-inverted DATA out (CML). 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. T_{FAULT} is an open collector/drain output, which is pulled up with a 4.7kΩ – 10kΩ resistor on the host board, but is grounded inside the SFP+ cable plug.
3. Laser output disabled on T_{DIS} >2.0V or open, enabled on T_{DIS} <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 pull 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.

IV. Absolute Maximum Ratings

Parameter	Symbol	Min	Type	Max	Unit	Ref.
Maximum Supply Voltage	Vcc	-0.5		3.6	V	
Storage Temperature	TS	-40		85	℃	
Case Operating Temperature	TOP	0		70	℃	Commercial
		-40		85		Industrial
Relative Humidity	RH	0		85	%	

Notes1: Non-condensing.

V. Optical Characteristics (TOP = 0°C to 70°C, VCC = 3.3 ± 5% Volts)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
Transmitter						
Center Wavelength	λ_C	λ-6.5		λ+6.5	nm	
Spectral Width(-20dB)	Pm			1	nm	
Side-mode Suppression Ratio	SMSR	30			dB	
Average Output Power	Pavg	0		4	dBm	
Extinction Ratio	ER	9			dB	
Return Loss		12			dB	
Transmitter OFF Output Power	Poff			-30	dBm	
Transmitter and Dispersion Peralty	TDP			2	dB	
Receiver						
Center Wavelength	λc	1260		1600	nm	
Receiver Sensitivity, Average Power	S			-24	dBm	
Receiver Saturation Power	Psat			-9	dBm	
Loss of Signal Assert	P_A	-35			dBm	
Loss of Signal De-assert	P_D			-26	dBm	
LOS Hysteresis	P_D- P_A	0.5			dB	

VI. Electrical Characteristics (TOP = 0°C to 70°C, VCC = 3.3 ± 5% Volts)

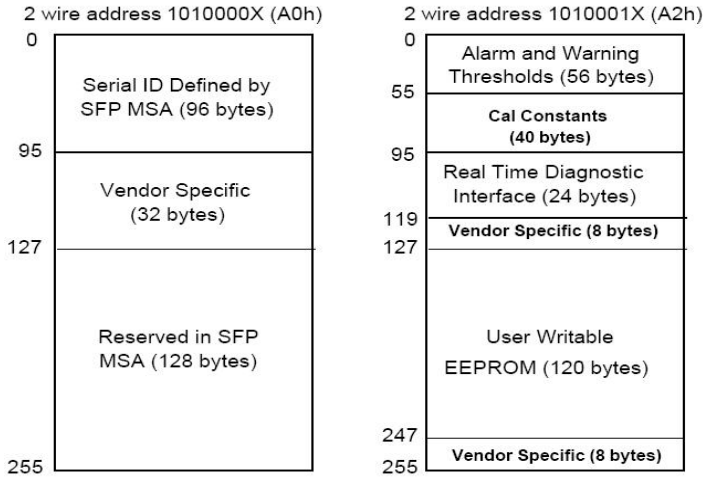
Parameter	Symbol	Min	Type	Max	Unit	Ref.
Supply Voltage	Vcc	3.135	3.3	3.465	V	
Supply Current	Icc			480	mA	With
Transmitter						
Input differential impedance	Rin		100			1
Differential data input swing	Vin, pp	200		1000	mV	
Transmit Disable Voltage	V_D	2		V_{CC}	V	
Transmit Enable Voltage	V_{EN}	Vee		Vee+0.8	V	
Receiver						
Differential data output swing	Vout, pp	400		800	mV	2
LOS Fault	V_{LOS_fault}	2		Vcc	V	3

LOS Normal	V_{LOS_norm}	Vee		Vee+0.8	V	3
Power Supply Noise Tolerance	V_{CCT}/V_{CCR}	Per SFF-8431			mVpp	

Notes:

1. Connected directly to TX data input pins.AC coupling from pins into laser driver IC.
2. Into 100Ω differential termination.
3. Loss Of Signal is LVTTL. Logic 0 indicates normal operation; logic 1 indicates no signal detected.

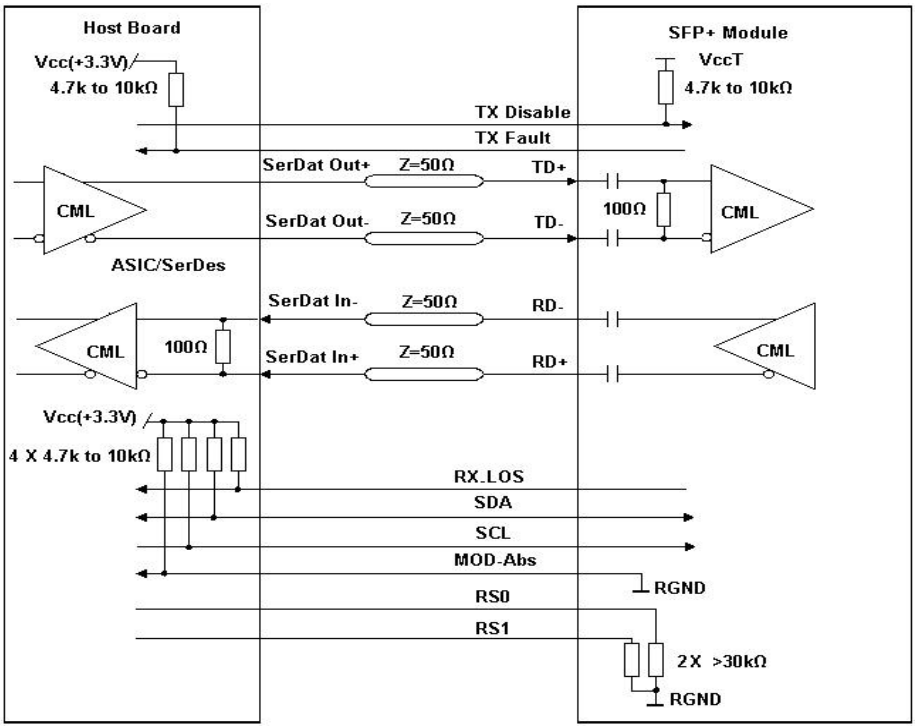
VII. Digital Diagnostic Memory Map



VIII.Digital Diagnostic Monitoring Information

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

IX. Recommended Interface Circuit



Mechanical Dimensions