

LPKKLDxx-K80C

XFP 10Gb/s 80km DWDM DDMI

PRODUCT FEATURES

- Support multi protocol from 9.95Gb/s to 11.3Gb/s
- DWDM EML laser transmitter and APD receiver
- Maximum link length of 80km on 9/125um SMF
- Hot-pluggable 30 pin XFP footprint
- Duplex LC receptacles
- 100GHz ITU Grid, C Band
- XFI electrical interface with AC coupling
- Support Digital Diagnostic Monitor interface
- Power supply voltages : +3.3V, +5V
- Low power dissipation <3.5W
- RoHS compliant and lead-free
- Compliant with XFP-MSA
- Temperature range : 0°C to 70°C



APPLICATIONS

- 10GBASE-ZR/ZW Ethernet
- 80km 10Gb/s Fibre Channel
- SONET OC-192 /SDH STM-64
- DWDM Networks

Compliance

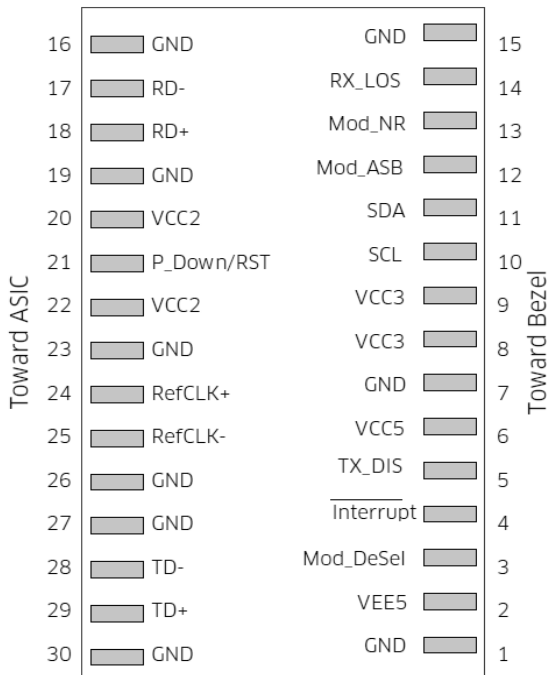
- XFP MSA
- INF-8077i
- IEEE802.3ae
- ROHS

Ordering information

*Part No.	Bit Rate (Gbps)	Laser (nm)	Distance (km)	Fiber Type	DDMI	Connector	Temp
LPKKLDxx-K80C	10.3125	DWDM (for C Band)	80	SMF	YES	LC	0°C~70°C

* "xx" in the Part No. means the C band channel number

I. Pin Diagram



Pinout of Connector Block on Host Board

II. Pin Descriptions

Pin	Symbol	Name/Description	Ref.
1	GND	Module Ground	1
2	VEE5	Optional -5.2V Power Supply (Not required)	
3	MOD_DESEL	Module De-select; When held low allows the module to respond to 2-wire serial interface	
4	Interrupt	Interrupt; Indicates presence of an important condition which can be read via the 2-wire serial interface	2
5	TX_DIS	Transmitter Disable; Turns off transmitter laser output	
6	VCC5	+5V Power Supply (Not required)	

7	GND	Module Ground	1
8	VCC3	+3.3V Power Supply	
9	VCC3	+3.3V Power Supply	
10	SCL	2-Wire Serial Interface Clock	2
11	SDA	2-Wire Serial Interface Data Line	2
12	MOD_Abs	Indicates Module is not present. Grounded in the Module	2
13	MOD_NR	Module Not Ready; Indicating Module Operational Fault	2
14	RX_LOS	Receiver Loss Of Signal Indicator	2
15	GND	Module Ground	1
16	GND	Module Ground	1
17	RDN	Receiver Inverted Data Output	
18	RDP	Receiver Non-Inverted Data Output	
19	GND	Module Ground	1
20	VCC2	+1.8V Power Supply (Not required).	
21	P_DOWN/RST	Power down; when high, the module limits power consumption to 1.5 W or below. Serial interface is functional in the low power mode. Reset: the falling edge initiates a complete reset of the module including the serial interface, equivalent to a power cycle.	
22	VCC2	+1.8V Power Supply (Not required)	
23	GND	Module Ground	1
24	REFCLK+	Not used, internally terminated to 50ohm (100ohm diff).	3
25	REFCLK-	Not used, internally terminated to 50ohm (100ohm diff).	3
26	GND	Module Ground	1
27	GND	Module Ground	1
28	TD-	Transmitter Inverted Data Input	
29	TD+	Transmitter Non-Inverted Data Input	
30	GND	Module Ground	1

Notes:

1. Module circuit ground is isolated from module chassis ground within the module.
2. Open collector; should be pulled up with 4.7k – 10k ohms on host board to a voltage between 3.15V and 3.6V.
3. A Reference Clock input is not required.

III. Absolute Maximum Ratings

Parameter	Symbol	Min	Type	Max	Unit	Ref.
Maximum Supply Voltage 1 (3.3V)	Vcc	-0.5		+4.0	V	
Maximum Supply Voltage 2 (5 V)	Vcc	-0.5		+6.0	V	
Storage Temperature	TS	-40		85	°C	
Case Operating Temperature	TOP	0		70	°C	
Relative Humidity	RH	0		85	%	1

Notes1:..Non-condensing.

IV. Optical Characteristics (Condition: Ta=TOP)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remark
Transmitter						
Operating Data Rate	BR	9.95		11.3	Gb/s	
Bit Error Rate	BER			10- 12		
Maximum Launch Power	PMAX	0		+5	dBm	1
Optical Wavelength-End Of Life	λ	X- 100	X	X+100	pm	
Optical Wavelength-Beginning Of Life	λ	X-25	X	X+25	pm	
Optical Extinction Ratio	ER	8.2			dB	
Spectral Width@-20dB	$\Delta\lambda$			1	nm	
Side-mode Suppression ratio	SMSRmin	30			dB	
Rise/Fall Time (20%~80%)	Tr/Tf			35	ps	
Average Launch power of OFF Transmitter	POFF			-30	dBm	
Tx Jitter	Txj	Compliant with each standard requirements				
Optical Eye Mask		IEEE802.3ae				2
Receiver						
Operating Data Rate	BR	9.95		11.3	Gb/s	
Receiver Sensitivity	Sen			-23	dBm	2
Maximum Input Power	PMAX	-7			dBm	2
Optical Center Wavelength	λ_C	1260		1600	nm	
Receiver Reflectance	Rrx			-27	dB	
LOS De-Assert	LOSD			-24	dBm	
LOS Assert	LOSA	-34			dBm	
LOS Hysteresis	LOSH	0.5		5	dB	

Notes:

1. The optical power is launched into SMF.

2. Measured with a PRBS 231- 1 test pattern @10.3125Gbps BER<10- 12 .

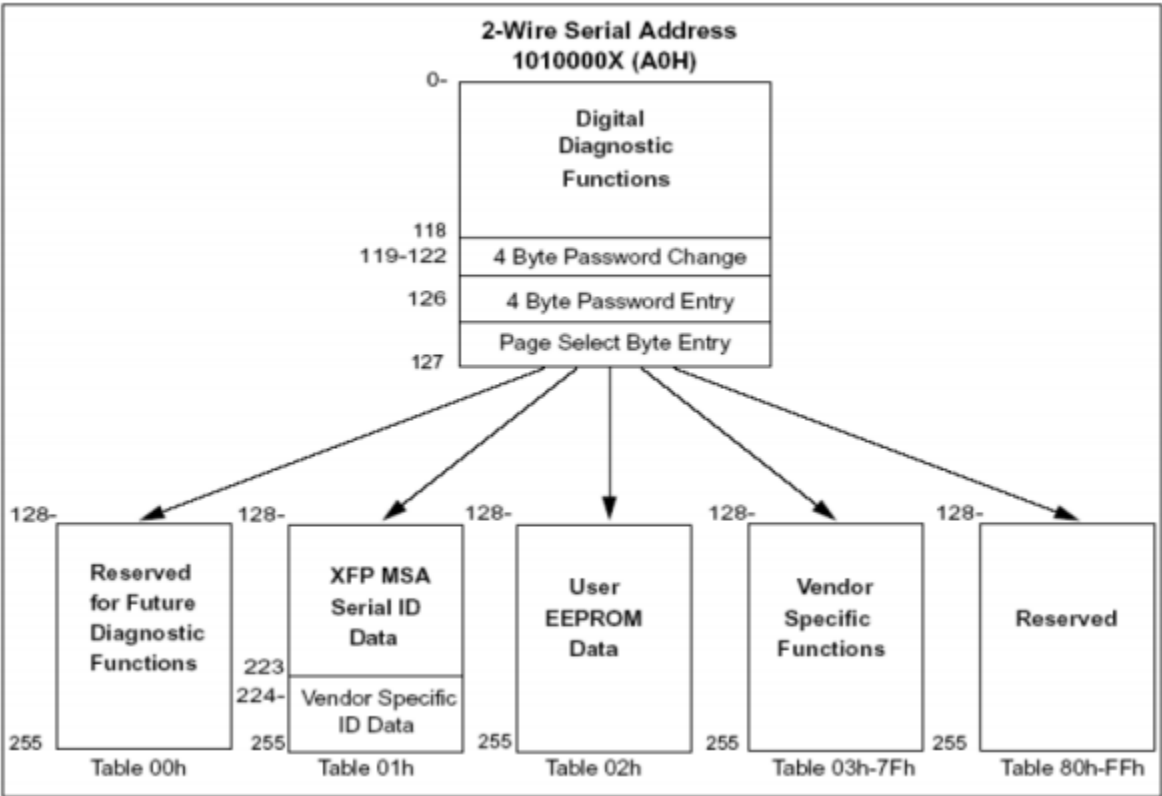
V. Electrical Characteristics (TOP = 0°C to 70°C, VCC = 3.3 ± 5% Volts)

Parameter	Symbol	Min	Type	Max	Unit	Ref.
Supply Voltage	Vcc3	3.13	3.3	3.45	V	
	Vcc5	4.75		5.25		
Supply Current	Icc3			550	mA	
	Icc5			200		
Transmitter						
Input differential impedance	Rin		100		Ω	1
Differential data input swing	Vin,pp	150		820	mV	
Transmit Disable Voltage	V _D	2.0		V _{CC}	V	
Transmit Enable Voltage	V _{EN}	V _{ee}		V _{ee} +0.8	V	
Transmit Disable Assert Time	T _{off}			100	ms	
Tx Enable Assert Time	T _{on}			100	ms	
Receiver						
Differential data output swing	Vout,pp	300	500	850	mV	
Data output rise time	tr			35	ps	2
Data output fall time	tf			35	ps	2
LOS Fault	V _{LOS fault}	V _{CC} -0.5		V _{CC} HOST	V	3
LOS Normal	V _{LOS norm}	GND		GND+0.5	V	3
Power Supply Rejection	PSR	See Note 4 below				4

Notes:

1. After internal AC coupling.
2. 20 – 80 %
3. Loss Of Signal is open collector to be pulled up with a 4.7k – 10kohm resistor to 3.15 – 3.6V. Logic 0 indicates normal operation; logic 1 indicates no signal detected.
4. Per Section 2.7.1. in the XFP MSA Specification.

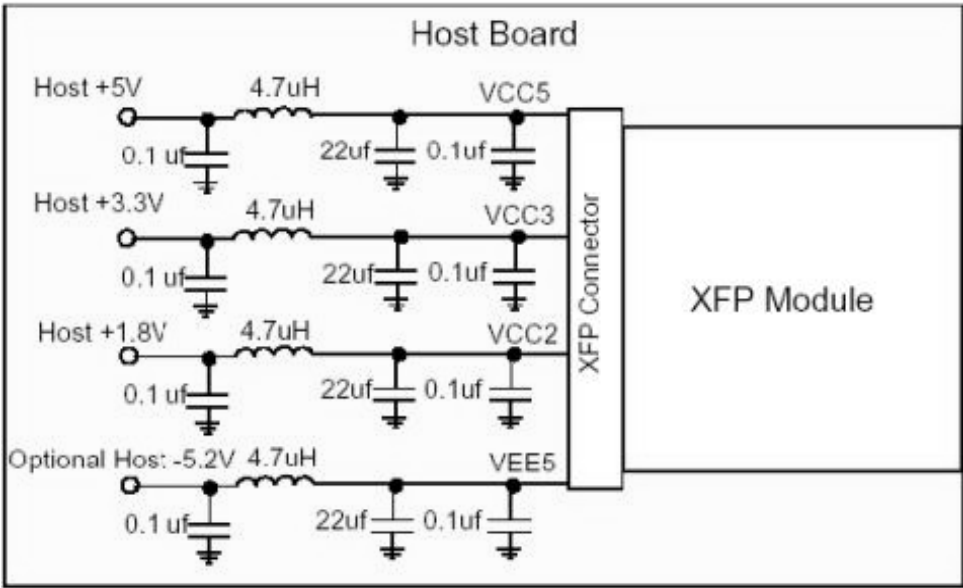
VI. Digital Diagnostic Memory Map



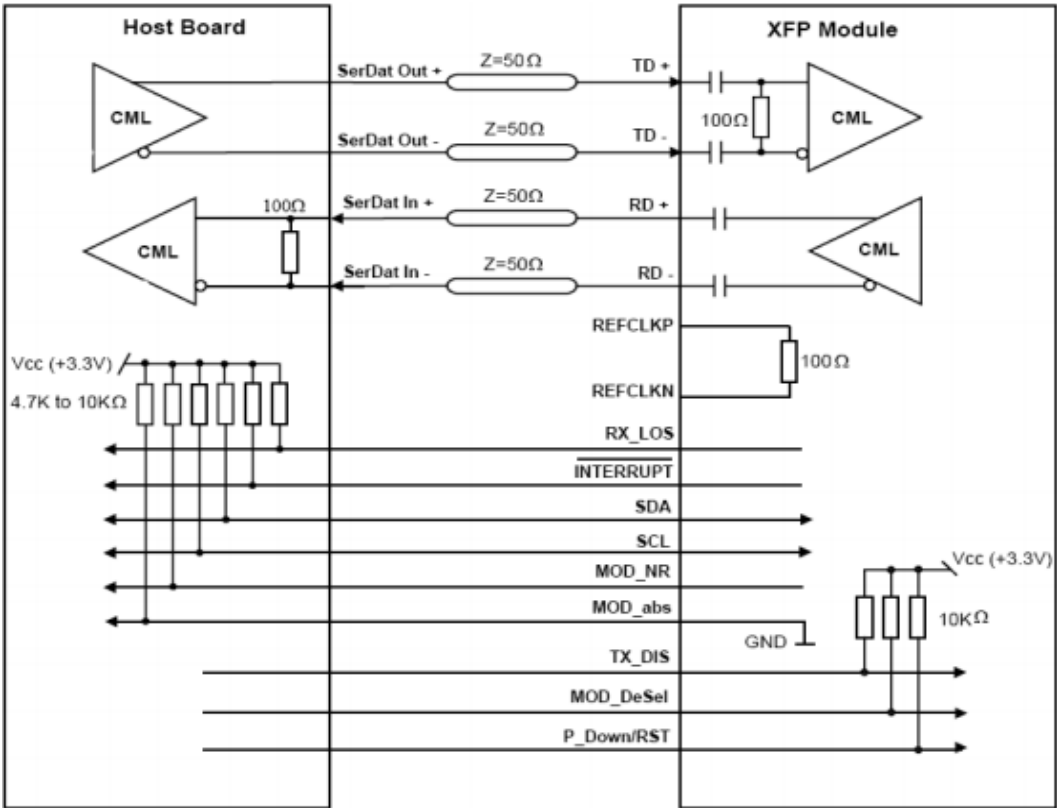
VII. Digital Diagnostic Monitoring Information

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

VIII. Recommended Interface Circuit

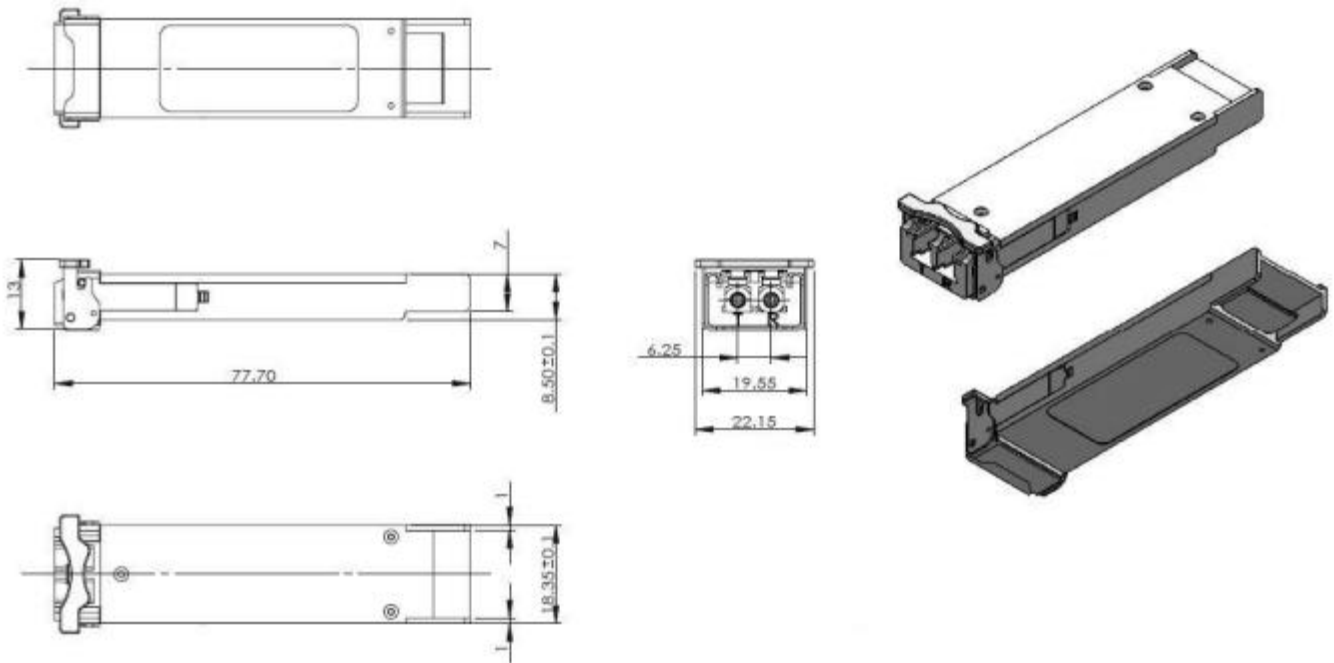


Recommended Host Board Power Supply Circuit



Recommended High-speed Interface Circuit

IX. Mechanical Dimensions



SFP wire mechanical drawing (Unit: mm)

Appendix A.

The C band channel number comparison with Part NO.

Part No.	Central Wavelength(nm)	Frequency (THZ)
LPKKLD61-K80C	1528.77	196.1
LPKKLD60-K80C	1529.55	196.0
LPKKLD59-K80C	1530.33	195.9
LPKKLD58-K80C	1531.12	195.8
LPKKLD57-K80C	1531.90	195.7
LPKKLD56-K80C	1532.68	195.6
LPKKLD55-K80C	1533.47	195.5
LPKKLD54-K80C	1534.25	195.4
LPKKLD53-K80C	1535.04	195.3
LPKKLD52-K80C	1535.82	195.2
LPKKLD51-K80C	1536.61	195.1
LPKKLD50-K80C	1537.40	195.0
LPKKLD49-K80C	1538.19	194.9
LPKKLD48-K80C	1538.98	194.8
LPKKLD47-K80C	1539.77	194.7
LPKKLD46-K80C	1540.56	194.6
LPKKLD45-K80C	1541.35	194.5
LPKKLD44-K80C	1542.14	194.4
LPKKLD43-K80C	1542.94	194.3
LPKKLD42-K80C	1543.73	194.2
LPKKLD41-K80C	1544.53	194.1
LPKKLD40-K80C	1545.32	194.0
LPKKLD39-K80C	1546.12	193.9
LPKKLD38-K80C	1546.92	193.8
LPKKLD37-K80C	1547.72	193.7
LPKKLD36-K80C	1548.51	193.6
LPKKLD35-K80C	1549.32	193.5
LPKKLD34-K80C	1550.12	193.4
LPKKLD33-K80C	1550.92	193.3
LPKKLD32-K80C	1551.72	193.2
LPKKLD31-K80C	1552.52	193.1
LPKKLD30-K80C	1553.33	193.0
LPKKLD29-K80C	1554.13	192.9
LPKKLD28-K80C	1554.94	192.8
LPKKLD27-K80C	1555.75	192.7
LPKKLD26-K80C	1556.55	192.6