LinkPro™

LPGCLCxx-K80C

SFP 1.25Gb/s CWDM Single-mode 80km DDM

PRODUCT FEATURES

- Up to 1.25Gb/s data links
- The DFB laser transmitter and PIN/TIA receiver
- Up to 80km on 9/125μm SMF
- Hot-pluggable SFP footprint
- Duplex LC/UPC type pluggable optical interface
- Low power dissipation
- Metal enclosure, for lower EMI
- RoHS compliant and lead-free
- Support Digital Diagnostic Monitor interface
- Single +3.3V power supply
- Compliant with SFF-8472
- Case operating temperature

  Commercial: 0°C to +70°C

  Extended: -20°C to +85°C

  Industrial: -40°C to +85°C

APPLICATIONS

- Switch to Switch Interface
- Fast Ethernet
- Switched Backplane Applications
- Router/Server Interface
- Other Optical Links

Compliance

- SFP MSA
- SFF-8472
- IEEE802.3z
- RoHS

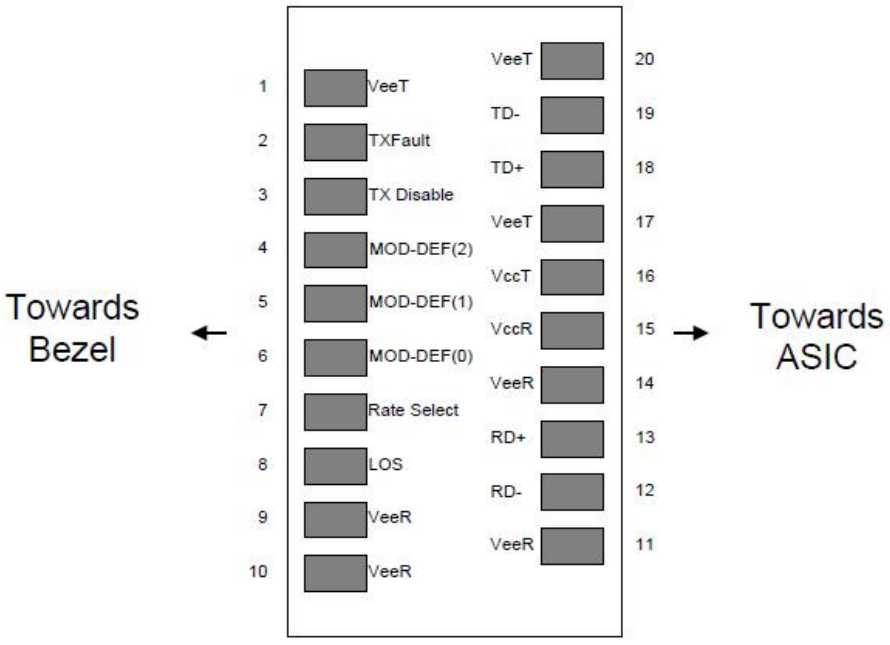
Ordering information

Package	Product part NO.	Data Rate (Gbps)	Media	Wavelength (nm)	Transmission Distance(km)	Temperature Range（℃）	
SFP	LPGCLCxx-K80C	1.25	single-mode fiber	1xx0	80	0~70	Commercial
SFP	LPGCLCxx-K80E	1.25	single-mode fiber	1xx0	80	-20~85	Extended
SFP	LPGCLCxx-K80I	1.25	single-mode fiber	1xx0	80	-40~85	Industrial

ESGCLCxx-K80C:

Wavelength(nm)	xx	Clasp	Wavelength	xx	Clasp	Wavelength	xx	Clasp Color
1270	27	Gray	1390	39	Yellow	1510	51	Blue
1290	29	Gray	1410	41	Orange	1530	53	Green
1310	31	Gray	1430	43	Red	1550	55	Yellow
1330	33	Purple	1450	45	Brown	1570	57	Orange
1350	35	Blue	1470	47	Gray	1590	59	Red
1370	37	Green	1490	49	Purple	1610	61	Brown

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.Open Drain. Logic “0” indicates normal operation.	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. Open Drain. Logic “0” indicates normal operation.	5
9	V_{EER}	Receiver Ground (Common with Transmitter Ground)	1
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. TX Fault is an open drain output, which should be pulled up with 4.7K – 10KΩ resistor on the host board. Pull up voltage between 2.0V to VccT/R+0.3V. When high, output indicates a laser fault of some kind. Low indicates normal operation. In the low state, the output will be pulled to < 0.8V. When sensing an improper power level in the laser driver, the SFP sets this signal high and turns off the laser. TX-FAULT can be reset with the TX-DISABLE line. The signal is in LVTTL level.
3. TX disable is an input that is used to shut down the transmitter optical output. It is pulled up within the module with 4.7K – 10KΩ resistor. Its states are: Low (0 – 0.8V): Transmitter on; (>0.8, < 2.0V): Undefined; High (2.0V to VccT/R+0.3V): Transmitter Disabled; Open: Transmitter Disabled. The TX-DISABLE signal is high (LVTTL logic “1”) to turn off the laser output. The laser will turn on when TX-DISABLE is low (LVTTL logic “0”).
4. Should be pulled up with 4.7K - 10KΩ on host board to a voltage between 2.0V to VccT/R+0.3V. MOD_DEF (0) pulls line low to indicate module is plugged in.

5. LOS (Loss of Signal) is an open collector/drain output, which should be pulled up with 4.7K – 10KΩ resistor. Pull up voltage between 2.0V to VccT/R+0.3V. When high, this output indicates the received optical power is below the worst-case receiver sensitivity (as defined by the standard in use). Low indicates normal operation. In the low state, the output will be pulled to < 0.8V.

The RX-LOS is high (LVTTL logic “1”) when there is no incoming light from the companion transceiver. This signal is normally used by the system for the diagnostic purpose. The signal is operated in LVTTL level.

III. Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Ref.
Storage Temperature	T_S	-40		85	ºC	
Storage Ambient Humidity	H_A	5		95	%	
Power Supply Voltage	V_{CC}	-0.5		4	V	
Signal Input Voltage		-0.3		Vcc+0.3	V	
Receiver Damage Threshold		+3			dBm	

IV. Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Ref.
Case Operating Temperature	T_{case}	0		70	ºC	ESGCLCxx-K80C
		-20		85		ESGCLCxx-K80E
		-40		85		ESGCLCxx-K80I
Ambient Humidity	H_A	5		70	%	Non-condensing
Power Supply Voltage	V_{CC}	3.13	3.3	3.47	V	
Power Supply Current	I_{CC}			300	mA	
Data Rate			1250/1250		Mbps	TX Rate/RX Rate
Transmission Distance				80	km	
Coupled Fiber	Single mode fiber					9/125um G.652

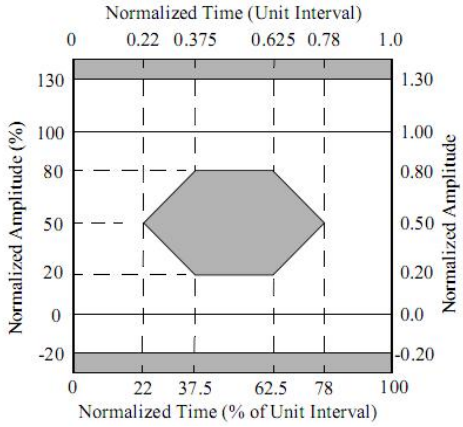
V. Specification of Transmitter

Parameter	Symbol	Min.	Typ.	Max.	Unit	Ref.
Average Output Power	P_{OUT}	0		+5	dBm	
Extinction Ratio	ER	9			dB	
Center Wavelength	λ_C	-6.5		+6.5	nm	ESGCLCxx-K80 Note (1)
Side Mode Suppression Ratio	SMSR	30			dBm	DFB Laser
Spectrum Bandwidth(-20dB)	σ			1	nm	
Transmitter OFF Output Power	P_{Off}			-45	dBm	
Jitter p-p	t_J			0.1	UI	Note (2)
Output Eye Mask	Compliant with IEEE802.3z (class 1 laser safety)					Note (3)

Note (1): “XX” is: 27,29,31,33,35,37,39,41,43,45,47,49,51,53,55,57,59 and 61

Note (2): Measure at 2^7-1 NRZ PRBS pattern.

Note (3): Transmitter eye mask definition.



VI. Specification of Receiver

Parameter	Symbol	Min.	Typ.	Max.	Unit	Ref.
Input Optical Wavelength	λ_{IN}	1270		1610	nm	PIN/TIA
Receiver Sensitivity	P_{IN}			-26	dBm	1
InputSaturation Power (Overload)	P_{SAT}			-3	dBm	
Loss of Signal Assert	P_A	-45			dBm	
Loss of Signal De-assert	P_D			-27	dBm	2
LOS Hysteresis	P_D-P_A	0.5			dB	

Notes：

1.Measured with Light source 1xx0nm, ER=9dB; BER =<10^-12 @PRBS=2^7-1 NRZ

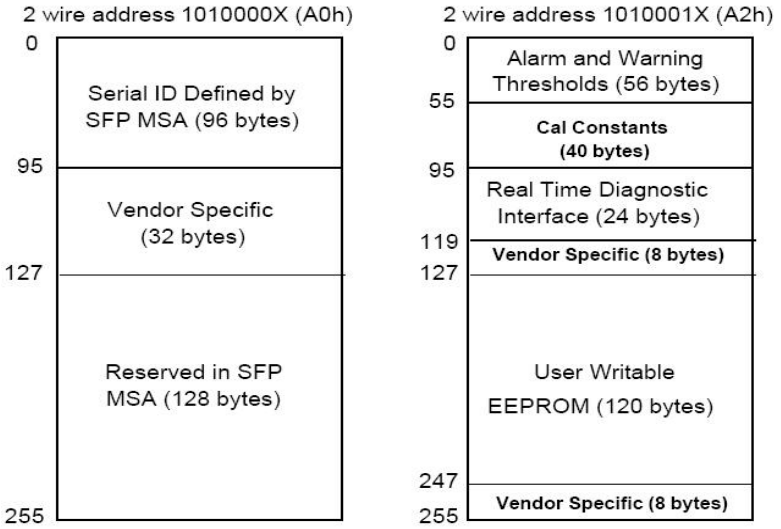
2. When LOS De-asserted, the RX data+/- output is signal output.

VII. Electrical Interface Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Ref.
Transmitter						
Total Supply Current	I_{CC}			300	mA	1
Transmitter Disable Input-High	V_{DISH}	2		Vcc+0.3	V	LVTTL
Transmitter Disable Input-Low	V_{DISL}	0		0.8	V	
Transmitter Fault Input-High	V_{TxFH}	2		Vcc+0.3	V	
Transmitter Fault Input-Low	V_{TxFL}	0		0.8	V	
Receiver						
Total Supply Current	I_{CC}			B	mA	1
LOS Output Voltage-High	V_{LOSH}	2		Vcc+0.3	V	LVTTL
LOS Output Voltage-Low	V_{LOSL}	0		0.8	V	

Note1：. A (TX) + B (RX) = 300mA (Not include termination circuit)

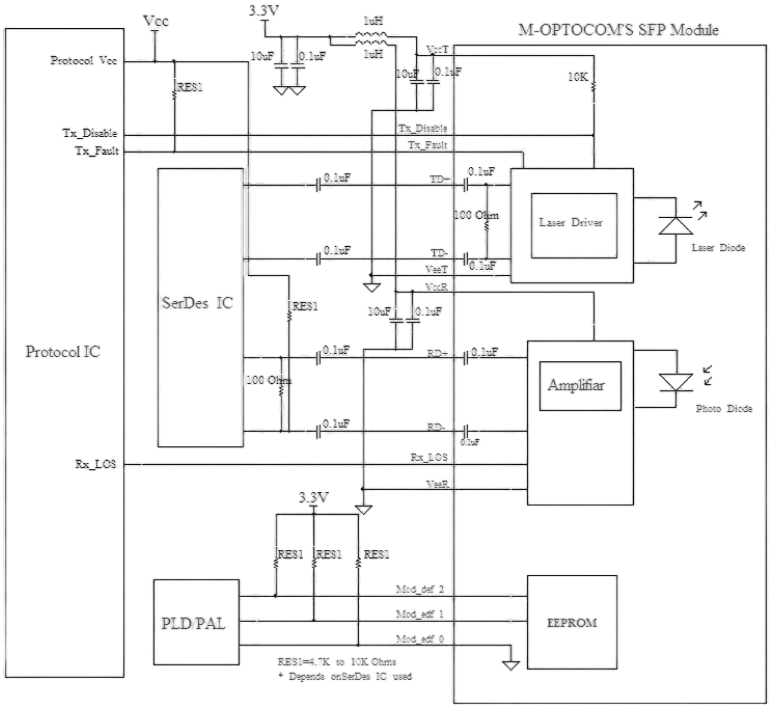
VIII. Digital Diagnostic Memory Map



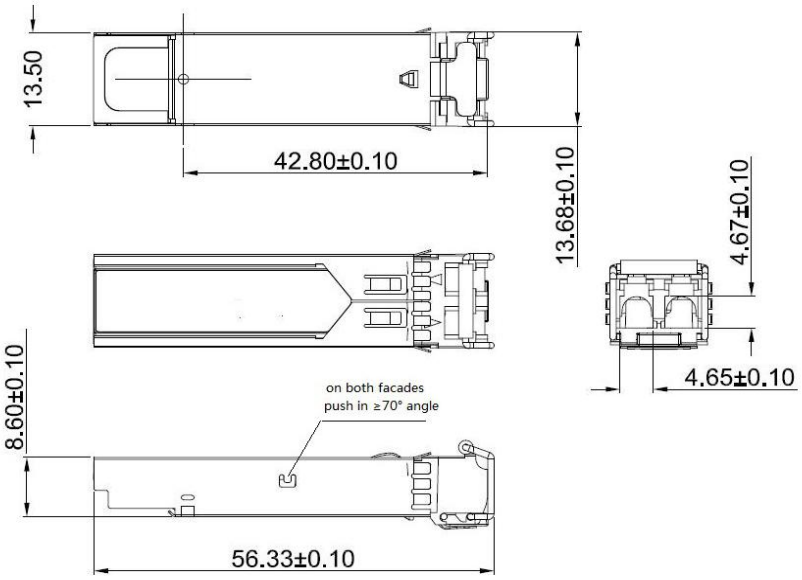
IX. Digital Diagnostic Monitoring Information

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

X. Recommend Circuit Schematic



XI. Mechanical Specifications (Unit: mm)



SFP wire mechanical drawing (Unit: mm)

Appendix A. Document Revision

Version	Initiated	Reviewed	Revision	Release Date
A0	Tomas	Luke	New Release	2017-7-1