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Innovative fiber link the world

SFP BIDI 1.25G CWDM Transceiver

SOCPB-xx12-K2D

Features：

- Duplex LC Connector
- Data Rate to 1.25G/s
- CWDM Wavelengths, uncooled DFB laser and pin photodetector for 120KM
- +3.3V single power supply
- Power consumption less than 1W
- Operating case temp

  Standard temp: 0~+70°C

  Industrial temp:-40~+85°C
- Compliant with RoHS

Absolute Maximum Ratings

Table 1- Absolute Maximum Ratings

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Supply Voltage	Vcc_3	-0.5	-	+3.6	V	
Storage Temperature	T_s	-40	-	85	°C	
Operating Humidity	RH	+5	-	+95	%	

Recommended Operating Conditions

Table 2- Recommended operating Conditions

Parameter		Symbol	Min.	Typical	Max.	Unit	Notes
Operating Case Temperature	Standard	T_C	0	-	+70	℃	
	Industrial		-40	-	+85	℃	
Power Supply Voltage		Vcc	3.13	3.3	3.47	V	
Power Supply Current		Icc	-	-	300	mA	

Power Dissipation	Pd	-	-	1	W	
Data Rate		-	1250	-	Mbps	

Electrical Characteristics

Table 3- Electrical Characteristics

Parameter	Symbol	Unit	Min.	Typ.	Max.	Notes
Electrical Characteristics						
Supply Current	I_{CC}	mA	-	-	300	
PECL Differential Data Input Swing		mV	250	-	1200	1
TxFault_Fault	Vfault	V	2	-	V_{CC}	2
TxFault_Normal	Vnormal	V	Vee	-	Vee+0.8	
Differential Data input impedance		Ω	-	100	-	1
TxDisable_Disable	Vd	V	2	-	V_{CC}	
TxDisable_Enable	Ven	V	Vee	-	Vee+0.8	

Note:
1. Internally AC coupled, input termination may be required for CML or LVPECL applications.
2. Internally AC coupled, CML differential output stage.

Optical Characteristics

Table 4-Optical Characteristics

SOCPB-xx12-K2D (CWDM DFB and PIN\APD,120KM, DDMI,0~+70°C)
SOCPB-xx12-K2ID (CWDM DFB and PIN\APD,120KM, DDMI, -40~+85°C)

Parameter	Symbol	Unit	Min.	Typ.	Max.	Notes
Optical transmitter Characteristics						
Data Rate		Mbps	-	1250	-	
Mean Wavelength	λ	nm	1xx1-6.5	1xx1	1xx1+6.5	
Average Launch power Tx_off	Poff	dBm	-	-	-45	
Launch Optical Power	P_0	dBm	0	-	+5	1

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Extinction Ratio	ER	dB	9	-	-	
Optical Jitter Random	JR	ps	-	-	147	
Optical Jitter Deterministic	JD	ps	-	-	80	
Total Jitter	Tj	ps	-	-	200	
Optical Rise/Fall time	Tr/tf	ps	-	-	260	
Eye Diagram	Compliant with Telcordia GR-253-CORE and ITU-T G.957					
Optical receive Characteristics						
Data Rate		Mbps	-	1250	-	
Receiver Sensitivity		dBm	-	-	-32	2
Overload Input Optical Power	P_{IN}	dBm	-8	-	-	2
Center Wavelength Range	λc	nm	1260	-	1625	
LOS	LOS_A	dBm	-42	-	-	
	LOS_D		-	-	--35	
LOS Hysteresis		dB	0.5	-	-	

Note:

1. **Coupled into 9/125 SMF.**
2. **Measured with PRBS 2^7-1 test pattern @1.25Gbps.BER=10E-12**

Recommended Interface Circuit

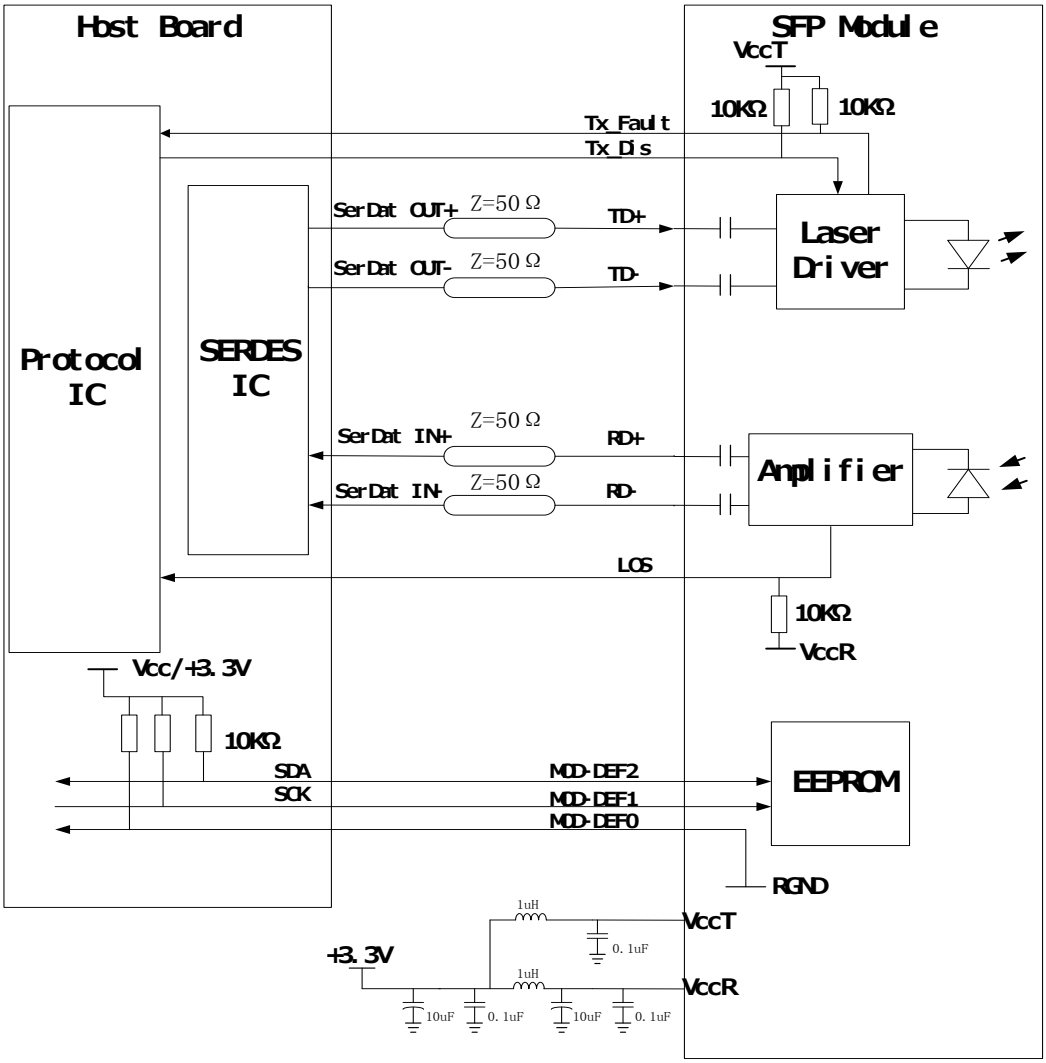

Figure 1, Recommended Interface Circuit

Recommended Host Board Power Supply Circuit

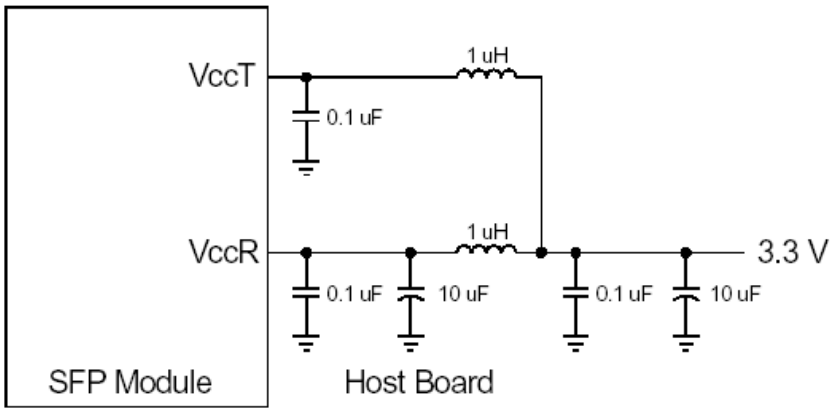

Figure 2, Recommended Host Board Power Supply Circuit

Pin arrangement

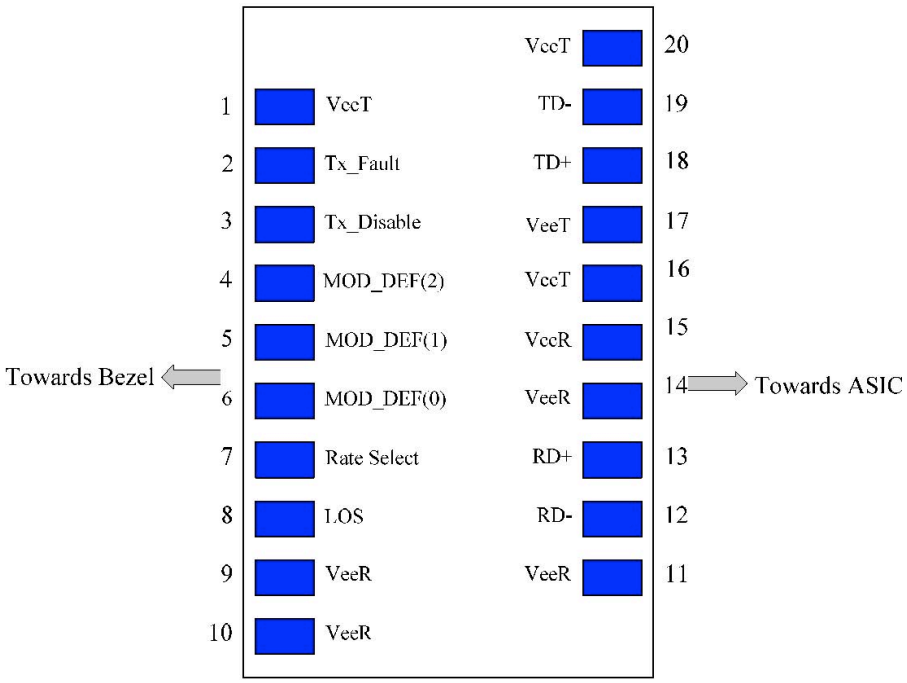

Figure 3, Pin View

Table 6-Pin Function Definitions

Pin	Name	FUNCTION	Plug Seq.	Notes
1	VeeT	Transmitter Ground	1	
2	TX Fault	Transmitter Fault Indication	3	Note 1
3	TX Disable	Transmitter Disable	3	Note 2, Module disables on high or open
4	MOD-DEF2	Module Definition 2	3	Note 3, Data line for Serial ID.
5	MOD-DEF1	Module Definition 1	3	Note 3, Clock line for Serial ID.
6	MOD-DEF0	Module Definition 0	3	Note 3, Grounded within the module.
7	Rate Select	Not Connect	3	Function not available
8	LOS	Loss of Signal	3	Note 4
9	VeeR	Receiver Ground	1	Note 5
10	VeeR	Receiver Ground	1	Note 5
11	VeeR	Receiver Ground	1	Note 5
12	RD-	Inv. Received Data Out	3	Note 6
13	RD+	Received Data Out	3	
14	VeeR	Receiver Ground	1	Note 5
15	VccR	Receiver Power	2	3.3 ± 5%
16	VccT	Transmitter Power	2	3.3 ± 5%
17	VeeT	Transmitter Ground	1	Note 5
18	TD+	Transmit Data In	3	
19	TD-	Inv. Transmit Data In	3	
20	VeeT	Transmitter Ground	1	Note 5

Note:

1. **TX Fault is open collector output which should be pulled up externally with a 4.7K ~10KΩ resistor on the host board to voltage between 2.0V and V_{CC}+0.3V. Logic 0 indicates normal operation; logic 1 indicates a laser fault of some kind. In the low state, the output will be pulled to less than 0.8V.**
2. **TX Disable input is used to shut down the laser output per the state table below. It is pulled up within the module with a 4.7~ 10K resistor.**
   Low (0- 0.8V): Transmitter on
   Between (0.8V and 2V): Undefined
   High (2.0 – VccT): Transmitter Disabled

Open: Transmitter Disabled

3. MOD-DEF 0, 1, 2. These are the module definition pins. They should be pulled up with a 4.7~10K resistor on the host board to supply less than VccT+0.3V or VccR+0.3V.
4. MOD-DEF 0 is grounded by the module to indicate that the module is present.
   MOD-DEF 1 is clock line of two wire serial interface for optional serial ID.
   MOD-DEF 2 is data line of two wire serial interface for optional serial ID.
   LOS (Loss of signal) is an open collector output, which should be pulled up with a 4.7k~10kΩ resistor on the host board to a voltage between 2.0V and Vcc+0.3V. Logic 0 indicates normal operation; logic 1 indicates loss of signal. In the low state, the output will be pulled to less than 0.8V.
5. These are the differential receiver outputs. They are AC-coupled 100Ω differential lines which should be terminated with 100Ω differential at the user SERDES. The AC coupling is done inside the module and thus not required on the host board.
6. These are the differential transmitter inputs. They are AC-coupled, differential lines with 100Ω differential termination inside the module.

Digital Diagnostic Memory Map

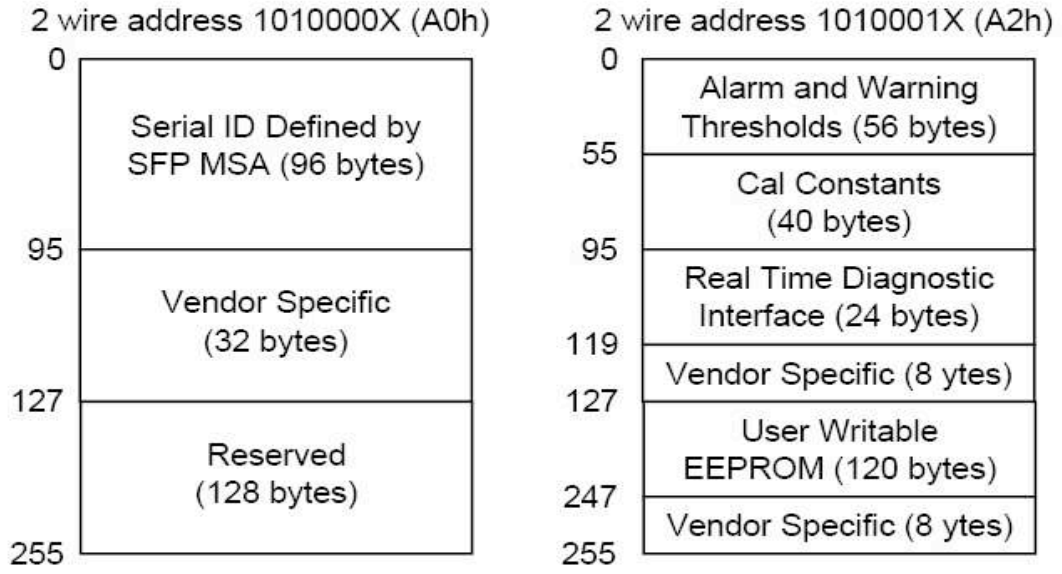

Figure 4, memory map

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Mechanical Diagram

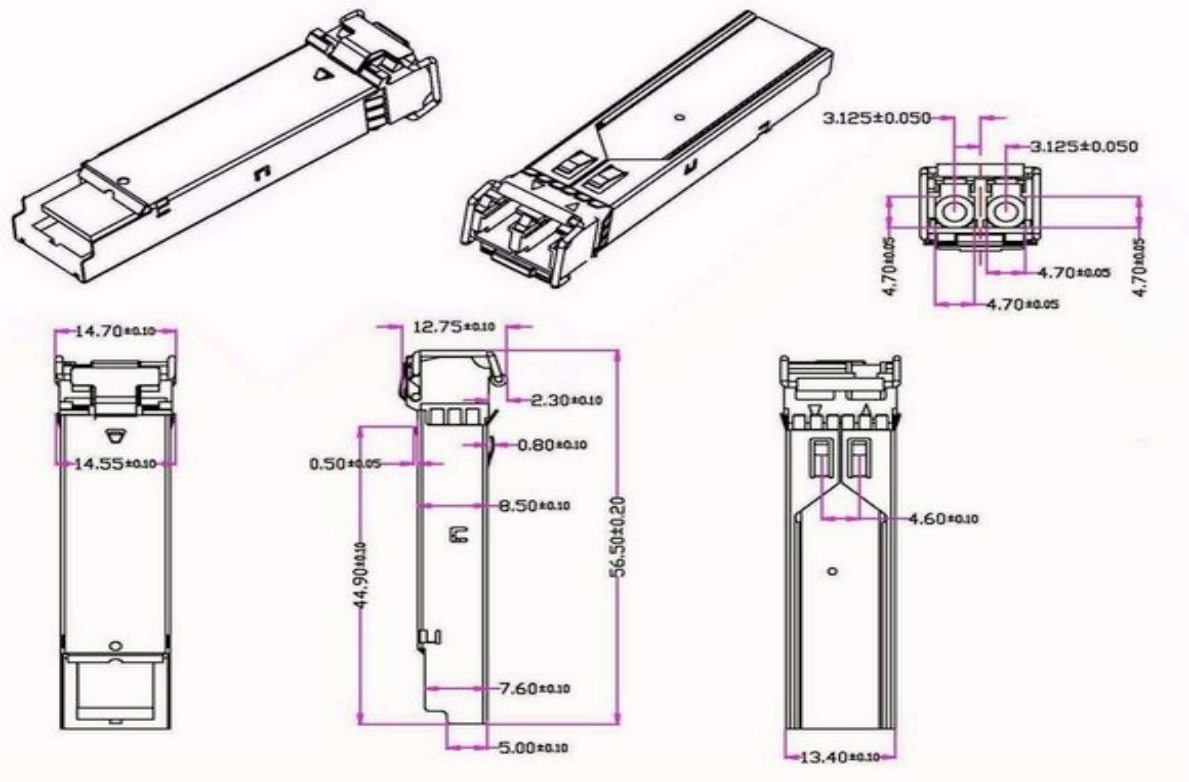

Figure 5, mechanical diagram

Order Information

SWCS-xx12-K2D (CWDM DFB and PIN\APD,120KM, DDMI,0~+70°C)
SWCS-xx12-K2ID (CWDM DFB and PIN\APD,120KM, DDMI,-40~+85°C)

Table 7-λc Wavelength Guide

λc Wavelength Guide					
Code	λc	unit	Code	λc	unit
27	1270	nm	45	1450	nm
29	1290	nm	47	1470	nm
31	1310	nm	49	1490	nm
33	1330	nm	51	1510	nm

35	1350	nm	53	1530	nm
37	1370	nm	55	1550	nm
39	1390	nm	57	1570	nm
41	1410	nm	59	1590	nm
43	1430	nm	61	1610	nm

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