



## SOCP-XX12-120    1.25G SFP    CWDM 120KM

### ● Features :

- Duplex LC Connector
- Data Rate 1.062G to 1.25G/s
- CWDM Wavelengths, uncooled DFB laser and pin photo detector 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	V <sub>cc3</sub>	-0.5	-	+3.6	V	
Storage Temperature	T <sub>s</sub>	-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 <sub>c</sub>	0	-	+70	°C	
	Industrial		-40	-	+85	°C	
Power Supply Voltage		V <sub>cc</sub>	3.13	3.3	3.47	V	
Power Supply Current		I <sub>cc</sub>	-	-	300	mA	
Power Dissipation		P <sub>d</sub>	-	-	1	W	
Data Rate			-	1250	-	Mbps	



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● **Electrical Characteristics**

**Table 3- Electrical Characteristics**

Parameter	Symbol	Unit	Min.	Typ.	Max.	Notes
<b>Electrical Characteristics</b>						
Supply Current	I <sub>cc</sub>	mA	-	-	300	
PECL Differential Data Input Swing		mV	250	-	1200	1
TxFault_Fault	V <sub>fault</sub>	V	2	-	V <sub>CC</sub>	2
TxFault_Normal	V <sub>normal</sub>	V	V <sub>ee</sub>	-	V <sub>ee</sub> +0.8	
Differential Data input impedance		Ω	-	100	-	1
TxDisable_Disable	V <sub>d</sub>	V	2	-	V <sub>CC</sub>	
TxDisable_Enable	V <sub>en</sub>	V	V <sub>ee</sub>	-	V <sub>ee</sub> +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**

**SWCS-xx12-120D (CWDM DFB and PIN/APD,120KM, DDMI,0~+70°C)**

**SWCS-xx12-120ID (CWDM DFB and PIN/APD,120KM, DDMI, -40~+85°C)**

Parameter	Symbol	Unit	Min.	Typ.	Max.	Notes
<b>Optical transmitter Characteristics</b>						
Data Rate		Mbps	-	1250	-	
Mean Wavelength	λ	nm	1xx1-6.5	1xx1	1xx1+6.5	
Average Launch power Tx_off	P <sub>off</sub>	dBm	-	-	-45	
Launch Optical Power	P <sub>0</sub>	dBm	0	-	+5	1
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	



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Eye Diagram	Compliant with Telcordia GR-253-CORE and ITU-T G.957					
<b>Optical receive Characteristics</b>						
Data Rate		Mbps	-	1250	-	
Receiver Sensitivity		dBm	-	-	-32	2
Overload Input Optical Power	$P_{IN}$	dBm	-8	-	-	2
Center Wavelength Range	$\lambda_c$	nm	1260	-	1625	
LOS	LOS <sub>A</sub>	dBm	-42	-	-	
	LOS <sub>D</sub>		-	-	--35	
LOS Hysteresis		dB	0.5	-	-	

Note:

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



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● **Recommended Interface Circuit**

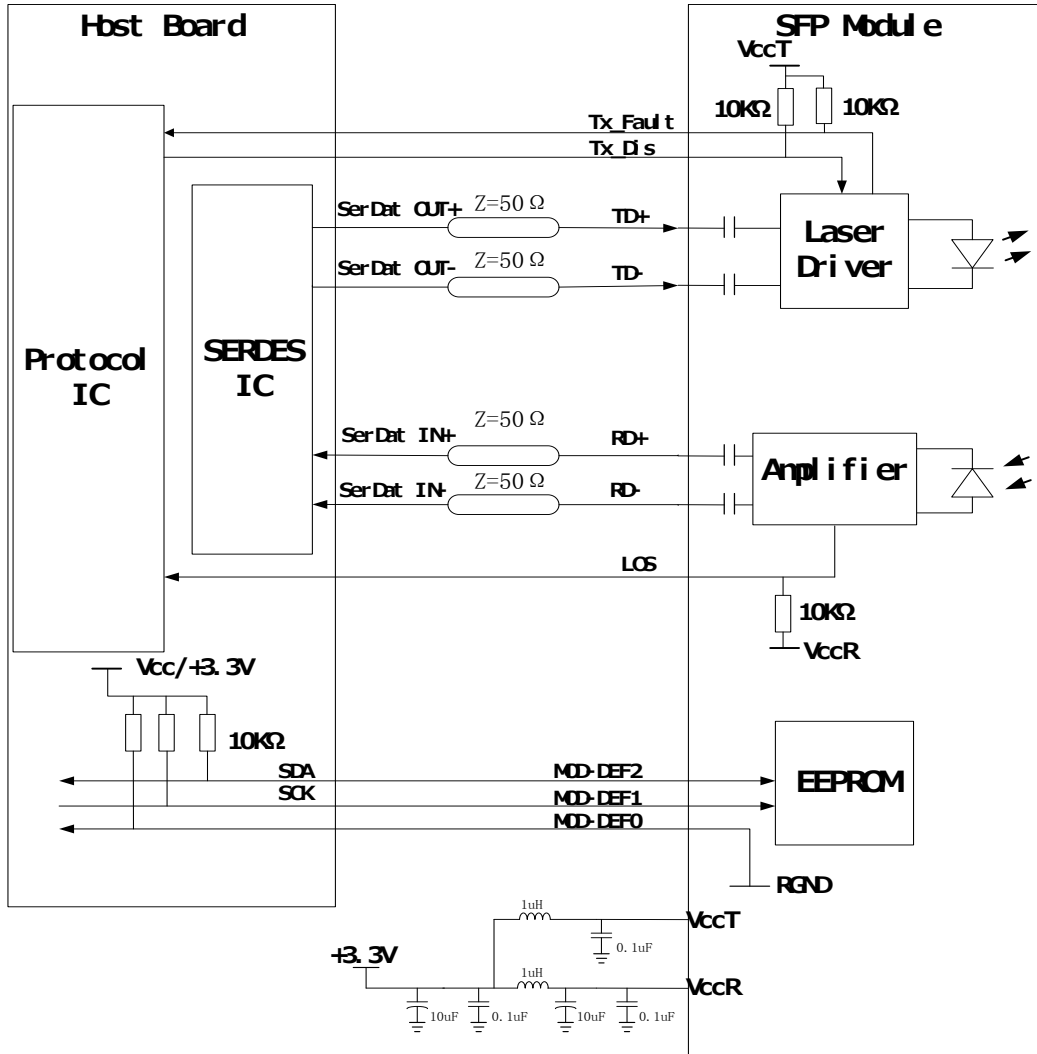


Figure 1, Recommended Interface Circuit



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● **Recommended Host Board Power Supply Circuit**

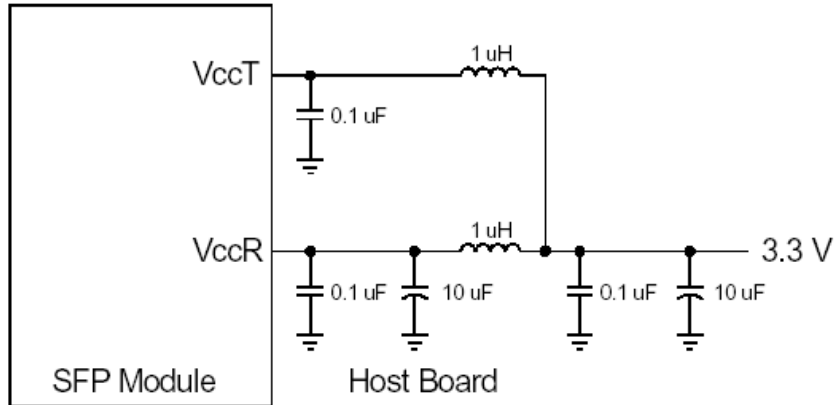


Figure 2, Recommended Host Board Power Supply Circuit

● **Pin arrangement**

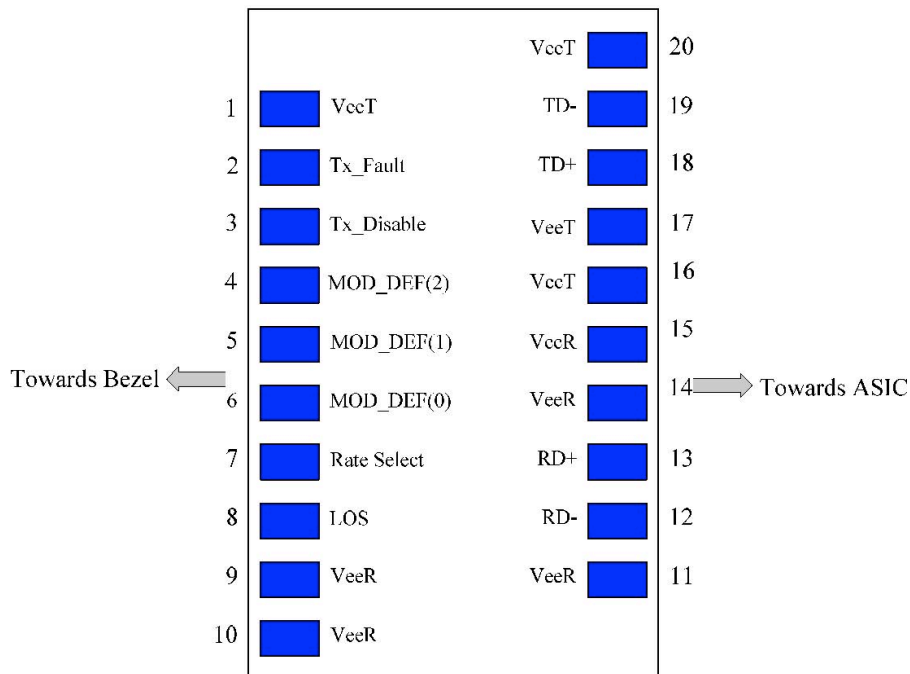


Figure 3, Pin View

Table 6-Pin Function Definitions



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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:**

- 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<sub>CC</sub>+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.
- 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 – V<sub>CC</sub>T): Transmitter Disabled  
Open: Transmitter Disabled
- 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 V<sub>CC</sub>T+0.3V or V<sub>CC</sub>R+0.3V.
- 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 V<sub>CC</sub>+0.3V. Logic 0 indicates normal



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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

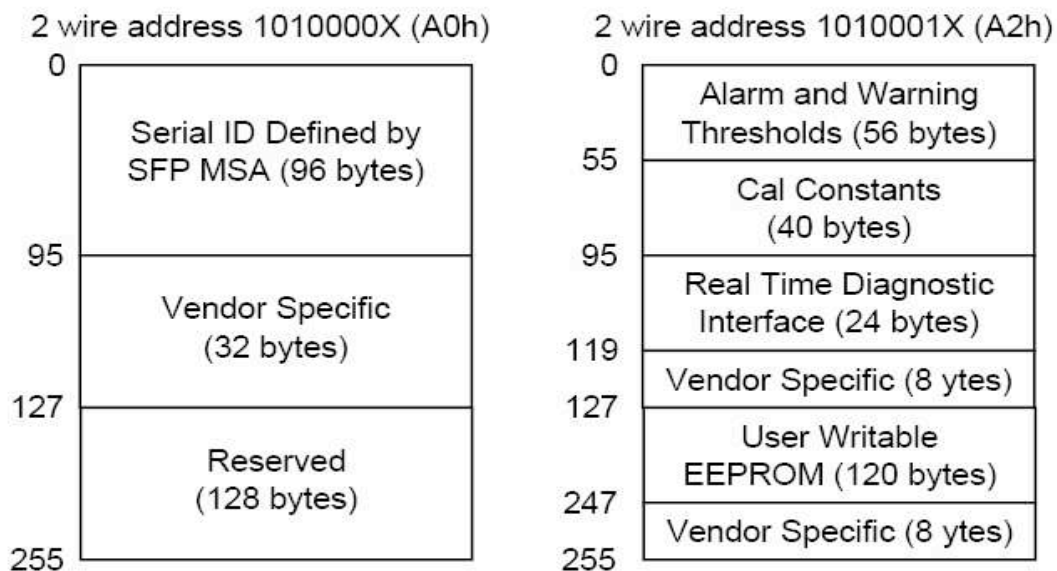


Figure 4, memory map



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● **Mechanical Diagram**

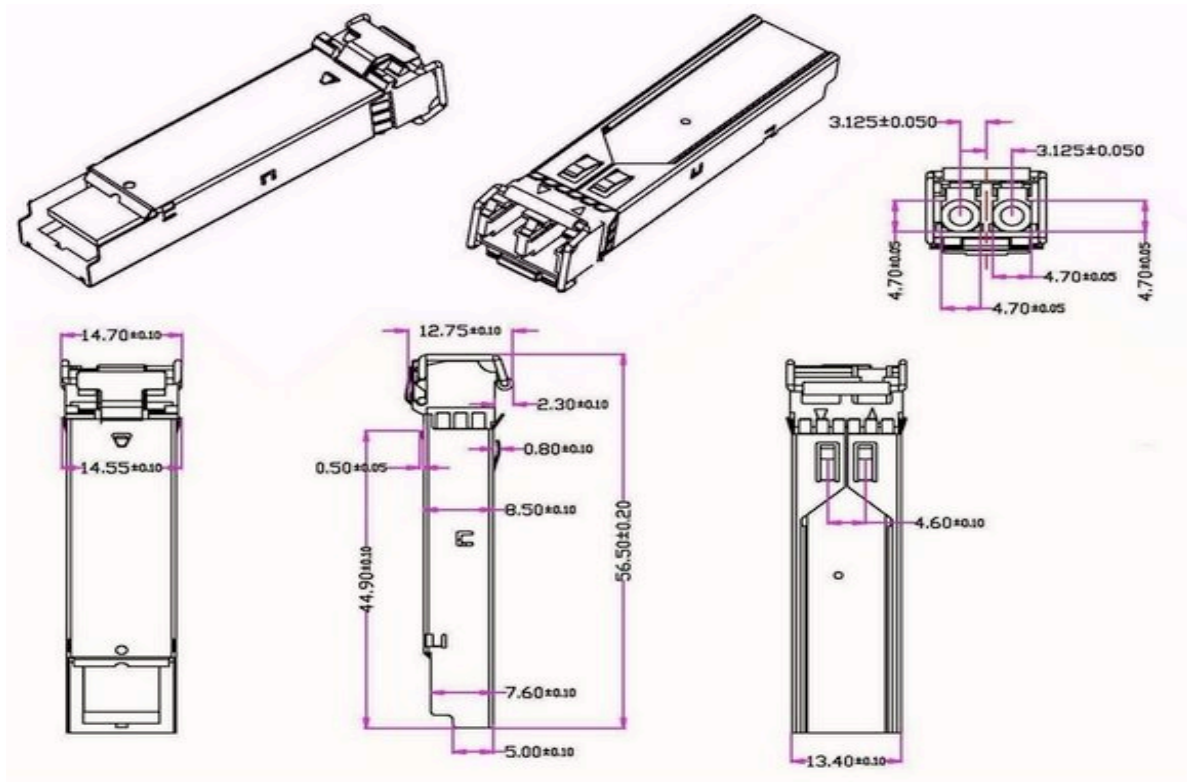


Figure 5, mechanical diagram

● **Order Information**

SOCP-xx12-120D (CWDM DFB and PIN/APD, 120KM, DDMI, 0~+70°C)

SOCP-xx12-120ID (CWDM DFB and PIN/APD, 120KM, DDMI, -40~+85°C)

See table 7 below for xx

**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





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39	1390	nm	57	1570	nm
41	1410	nm	59	1590	nm
43	1430	nm	61	1610	nm

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- **Contact**

**Shenzhen SINOVO Telecom Co., Ltd**

Tel:+86(0)0755 32959919 Fax:+86(0)755 32959918

Web:www.sinovocorp.com Email: sales@sinovocorp.com

Factory ADD: 5/F Chuang Park, Taoyuan Street, Baoan District, Shenzhen, China 518000

Head Quarter: 11/F, Taibang Technology Building, Gaoxin South 4th, Science and Technology Park South, Nanshan, Shenzhen, China 518040 g