

**Produto:** 10Gbps XFP Optical Transceiver, 300m Reach

**Modelo:** V7-XFP-SR

**Documentação:** Técnica/Datasheet

### Features

- ✓ Supports 9.95Gbps to 10.5Gbps bit rates
- ✓ Maximum link length of 300m (50um,MMF,2000MHz.Km)
- ✓ 850nm VCSEL laser and PIN receiver
- ✓ Low power consumption <1.5W
- ✓ +5V, +3.3V power supply
- ✓ XFP MSA package with duplex LC connector
- ✓ XFI electrical interface
- ✓ No reference clock required
- ✓ Compatible with RoHS
- ✓ Excellent EMI performance
- ✓ Built-in digital diagnostic functions
- ✓ Temperature range: 0°C to +70°C
- ✓ High reliability

### Applications

- ✓ 10GBASE-SR/SW 10G Ethernet
- ✓ 1200-Mx-SN-I 10G Fibre Channel
- ✓ Other optical links

## Description

V7-XFP-SR is compliant with the 10G Small Form-Factor Pluggable (XFP) Multi-Source Agreement (MSA), supporting data-rate of 10.3125Gbps(10GBASE-LR) or 9.953Gbps 10GBASE-LW), and transmission distance up to 300m on 50µm MMF (2000MHz.km).

The transceiver module comprises a transmitter with 850nm a vertical cavity surface emitting (VCSEL) laser and a receiver with a PIN photodiode. Transmitter and receiver are separate within a wide temperature range of 0°C to +70°C and offers optimum heat dissipation and excellent electromagnetic shielding thus enabling high port densities for 10 GbE systems.

## Absolute Maximum Ratings

Rating	Symbol	Min	Max	Units	Ref.
Storage Ambient Temperature Range		-40	+85	°C	
Powered case Temperature Range		0	+75	°C	
Operating Relative Humidity	<i>RH</i>		80	%	
Supply Voltage Range @ 5V	<i>Vcc5</i>	-0.5	6.0	V	
Supply Voltage Range @ 3.3V	<i>Vcc3</i>	-0.5	4.0	V	
Static Discharge Voltage on XFI High			500	V	1
Static Discharge Voltage excluding XFI High Speed Pins			2,000	V	2
Static Discharge Voltage on XFP Module			15,000 8,000	V V	3

Any stress beyond the maximum ratings can result in permanent damage. The device specifications are guaranteed only under the recommended operating conditions.

Notes:

- 1, HBM human body model per JEDEC JESD22-A114-B.
- 2, HBM human body model.
- 3, EN61000-4-2 Criterion B:Air Discharge Direct Contact discharge

## Recommended Operating Conditions

Parameter	Symbol	Min	Typ	Max	Units	Ref.
Operating Case Temperature Range	$T_c$	0		+70	°C	
Transceiver total Power Consumption	$P_{TOT}$			1.5	W	1
Power Supply Voltage @ 5V	$V_{cc5}$	4.75	5.0	5.25	V	
Power Supply Voltage @ 3.3V	$V_{cc3}$	3.13	3.3	3.47	V	

Notes:

- 1, Maximum total power value is specified across the full temperature and voltage range.

## Transmitter Electrical Characteristics

Parameter	Symbol	Min	Typ	Max	Units	Ref.
Input Differential Impedance	$R_{IND}$		100		Ω	1
Differential input Voltage Swing	$V_{ID}$	120		1000	mV	2
Transmit Disable Voltage	VDis	2.0		VCC		
Transmit Enable Voltage	VEN	GND		GND+0.8		
Transmit Disable Assert Time				10	us	

Notes:

- 1, After internal AC coupling.
- 2, Beneath this level the signal can't meet the specification

## Receiver Electrical Characteristics

Parameter	Symbol	Min	Typ	Max	Units	Ref.
Differential Output Impedance	$Z_{OD}$		100		Ω	
Differential Output Amplitude	$V_{OSPP}$	500		800	mV	1
Transition Time Low to High	$t_r$	40			ps	2
Transition Time High to Low	$t_f$	40			ps	2
LOS Fault	$L_{fault}$	Vcc-0.5		VCCHOST	V	3
LOS Normal	$L_{normal}$	GND		GND+0.5	V	3

Notes:

- 1, Into 100 ohms differential termination.
- 2, 20 – 80 %.
- 3, Loss Of Signal is open collector to be pulled up with a 4.7kΩ – 10kΩ resistor to 3.15 – 3.6V. Logic 0 indicates normal operation; logic 1 indicates no signal detected.

## Optical Characteristics

Parameter	Symbol	Min	Typ	Max	Units	Ref.
Nominal Wavelength	$\lambda_{TRP}$	840	850	860	nm	
Spectral Width	$\Delta\lambda$		0.4	0.45	nm	
Average Power	$P_{optavg}$	-7.5		-1	dBm	1
Extinction Ratio	$ER$	3.0			dB	2
Relative Intensity Noise	$RIN$			-128	dB/Hz	

Notes:

1, launched into MMF.

2, Measured with PRBS 2<sup>31</sup>-1 @10.3125Gbps.

## Optical Receiver

Parameter	Symbol	Min	Typ	Max	Units	Ref.
Center Wavelength	$\lambda_C$	840	850	860	Nm	
Receiver Sensitivity	$P_{IN}$			-9.9	dBm	1
Receiver Sensitivity in OMA	$P_{IN}$			-11.1	dBm	1
Receiver Overload	$P_{in}$	-1.0			dBm	1
Receiver Reflectance				-12	dBm	
LOS De-Assert	$LOSD$			-12	dBm	
LOS Assert	$LOSA$	-25	-15		dBm	
LOS Hysteresis		0.5			dB	

Notes:

1, Measured with PRBS 2<sup>31</sup>-1 @10.3125Gbps.

With ideal transmitter

Note: The specified characteristics are met within the recommended range of operating conditions and under the default settings of output power and modulation amplitude. A change in setting of the optical output power influences especially the dynamic behavior of the output signal. Unless otherwise noted typical data are quoted at nominal voltages and +25°C ambient temperature.

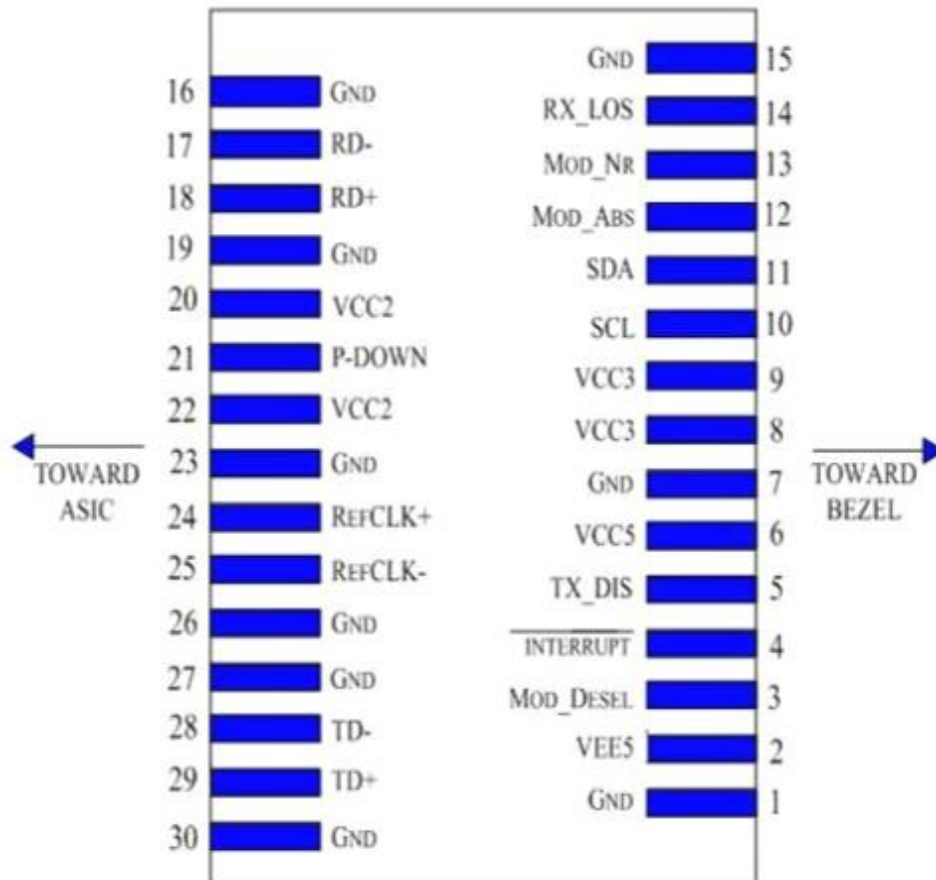
## General Specifications

Parameter	Conditions	Min Modal Bandwidth (MHz*Km)	Symbol	Min	Typ	Max	Units	Ref.
Operating Range	62.5/125µm MMF	160	$I_{OP}$	2		26	m	
	50/125µm MMF	400				66		
	62.5/125µm MMF	200				33		
	50/125µm MMF	500				82		
	50/125µm MMF	2000				300		
Bit Rate			$BR$	9.95		10.5	Gbps	1
Bit Error Ratio			$BER$			$10^{-12}$		2

Notes:

1. 10GBASE-SR/SW, 1200-Mx-SN-I
2. Tested with a 231 – 1 PRBS

## Host Board Connector Pinout



## Electrical Pin definition

PIN	Logic	Symbol	Name   Description	Note
1		GND	Module Ground	1
2		VEE5	Optional-5.2V Power Supply	
3	LVTTTL-I	Mod_DeSel	Mode De-select; When held low allows module to 2-wire serial interface commands	
4	LVTTTL-O	Interrupt	Interrupt(inverted); Indicates Presence of an important condition which can be read over the 2-wire serial interface	2
5	LVTTTL-I	TX_DS	Transmitter Disable; Turns off transmitter laser output	
6		VCC5	+5V Power Supply	
7		GND	Module Ground	1
8		VCC3	+3.3V Power Supply	
9		VCC3	+3.3V Power Supply	
10	LVTTTL-I/O	SCL	2-Wire Serial Interface Clock	2
11	LVTTTL-I/O	SDA	2-Wire Serial Interface Data Line	2
12	LVTTTL-O	Mod_Abs	Indicates Module is not present. Grounded in the module	2
13	LVTTTL-O	Mod_NR	Module Not Ready; Indicating module operational fault	2
14	LVTTTL-O	RX_LOS	Receiver Loss Of Signal Indicator	2
15		GND	Module Ground	1
16		GND	Module Ground	1
17	CML-O	RD-	Receiver Inverted Data Output	
18	CML-O	RD+	Receiver Non-Inverted Data Output	
19		GND	Module Ground	1
20		VCC2	+1.8V Power Supply	
21	LVTTTL-O	P-Down/RST	Power Down; When high; requires the module to limit power consumption to 1.5W or below. 2-Wire serial interface must be functional in the low Power mode Reset; The falling edge initiates a complete reset of the module including the 2-wire serial interface; equivalent to a power cycle	
22		VCC2	+1.8V Power Supply	
23		GND	Module Ground	1
24	PECL-I	RefCLK+	Reference Clock Non-Inverted Input; AC coupled on the host board	
25	PECL-I	RefCLK-	Reference Clock Inverted Input; AC coupled on the host board	
26		GND	Module Ground	1
27		GND	Module Ground	1
28	CML-I	TD-	Transmitter Inverted Data Input	
29	CML-I	TD+	Transmitter Non-Inverted Data Input	
30		GND	Module Ground	1

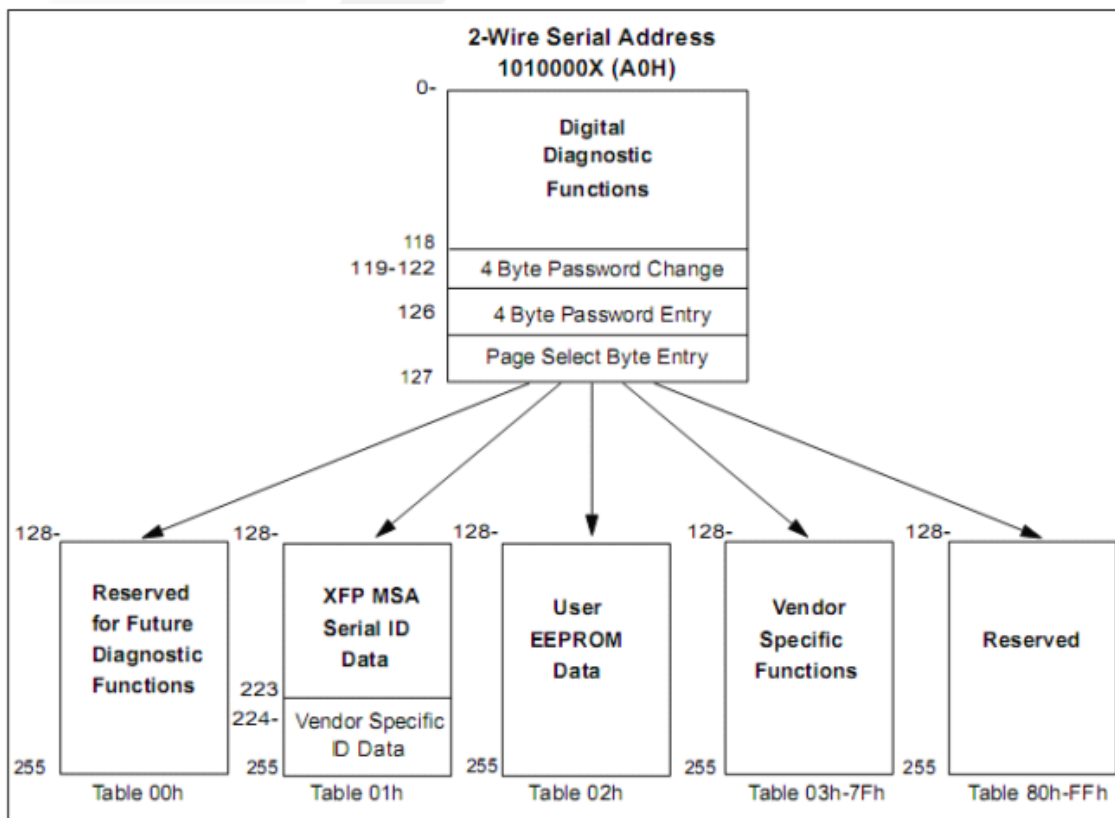
Notes:

- 1, Module ground pins GND are isolated from the module case and chassis ground within the module.
- 2, Shall be pulled up with 4.7kΩ-10 kΩ to a voltage between 3.15V and 3.45V on the host board.

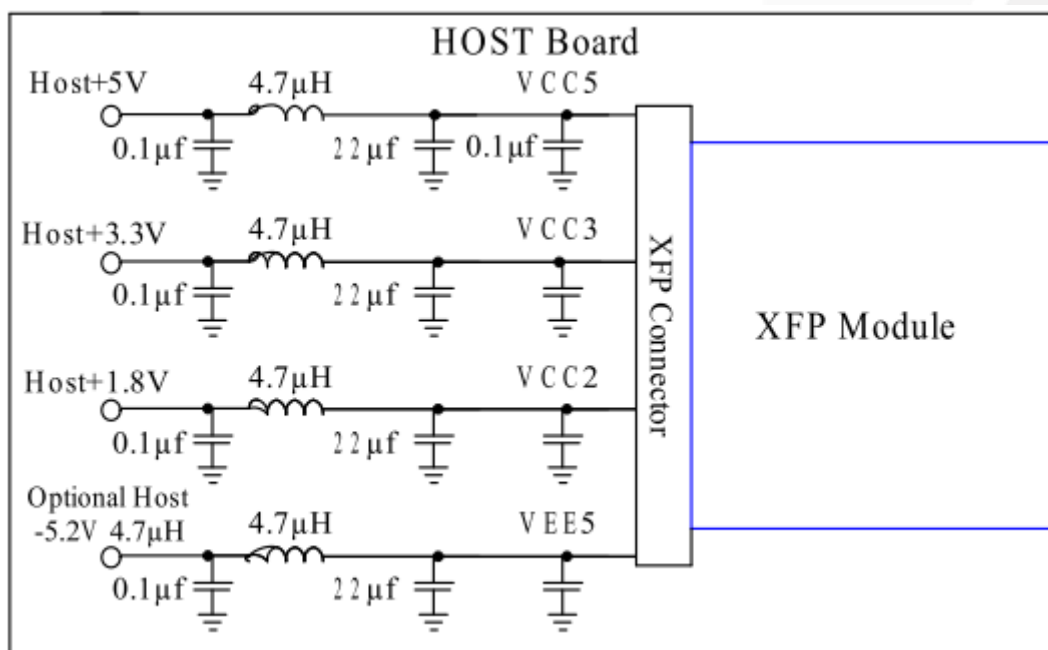
The transceivers provide serial ID memory contents and diagnostic information about the present operating conditions by the 2-wire serial interface (SCL, SDA).

The Module provides diagnostic information about the present operating conditions. The transceiver generates this diagnostic data by digitization of internal analog signals. Alarm/warning threshold data is written during device manufacture. Received power monitoring, transmitted power monitoring, bias current monitoring, supply voltage monitoring and temperature monitoring all are implemented.

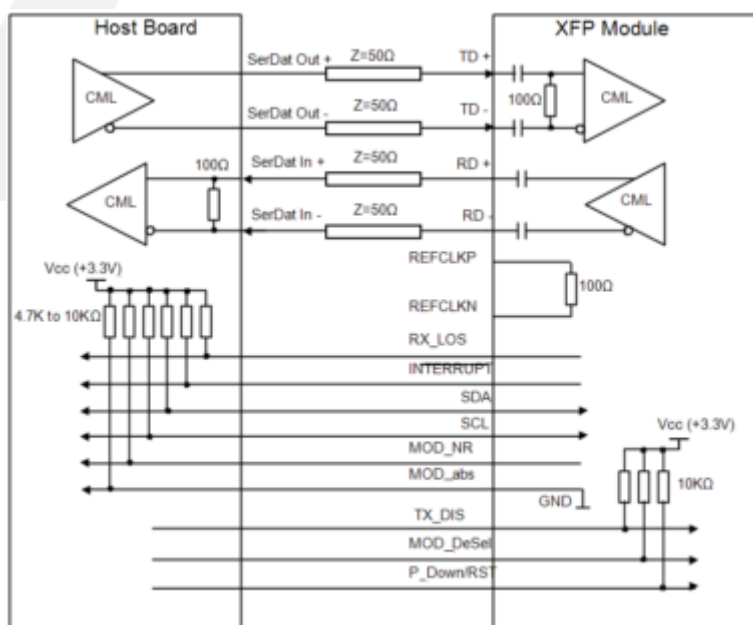
The digital diagnostic memory map specific data field defines as following.



### Recommended Host Board Power Supply Circuit



### Recommended High-Speed Interface Circuit





## XFP Dimensions

