

Produto: 10Gbps XFP Optical Transceiver, 10Km Reach

Modelo: V7-XFP-LR

Documentação: Técnica/Datasheet

Features

- ✓ Supports 9.95Gbps to 10.5Gbps bit rates
- ✓ High reliability
- ✓ Hot-pluggable XFP footprint
- ✓ Maximum link length of 10km with SMF
- ✓ 1310nm Uncooled EML laser and PIN photodiode
- ✓ XFP MSA package with duplex LC connector
- ✓ No reference clock required
- ✓ +5V, +3.V power supply
- ✓ Power dissipation <2.5W
- ✓ Compatible with RoHS
- ✓ Built-n digital diagnostic functions
- ✓ Temperature range 0°C to 70°C

Applications

- ✓ SDH STM I-64.1 at 9.53Gbps
- ✓ 10GBASE-LR/LW 10G Ethernet
- ✓ 120-SM-L-L 10G Fibre Chanel
- ✓ 10GE over G.709 at 1.09Gbps
- ✓ OC192 over FEC at 10.79Gbps
- ✓ Other opticalinks, up to 1.Gbps

Description

V7-XFP-LR 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).

The transceiver module comprises a transmitter with 1310nm 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

Parameter	Symbol	Min	Max	Unit	Ref.
Storage Ambient Temperature Range		-40	+85	°C	
Powered case Temperature Range		0	+75	°C	
Operating Relative Humidity	RH		80	%	
Supply Voltage Range @5V	Vcc5	-0.5	6.0	V	
Supply Voltage Range @ 3.3V	Vcc3	-0.5	4.0	V	

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

Transmitter Electrical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	Note	
Operating Case Temperature Range	T_c	0		+70	°C		
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		
Module total power	P			2.5	W		
Transmitter							
Input differential impedance	R_{in}		100		Ω	1	
Differential data input swing	$V_{in,pp}$	120		820	mV		
Transmit Disable Voltage	VD	2.0		V_{cc}	V		
Transmit Enable Voltage	VEN	GND		GND+ 0.8	V		
Transmit Disable Assert Time				10	us		
Receiver							
Differential data output swing	$V_{out,pp}$	500		850	mV		
Data output rise time	t_r			38	ps	2	
Data output fall time	t_f			38	ps	2	
LOS Fault	$V_{LOS\ fault}$	$V_{cc} - 0.5$		V_{ccHOST}	V	3	
LOS Normal	$V_{LOS\ norm}$	GND		GND+0.5	V	3	
Power Supply Rejection	PSR	See Note 3 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.

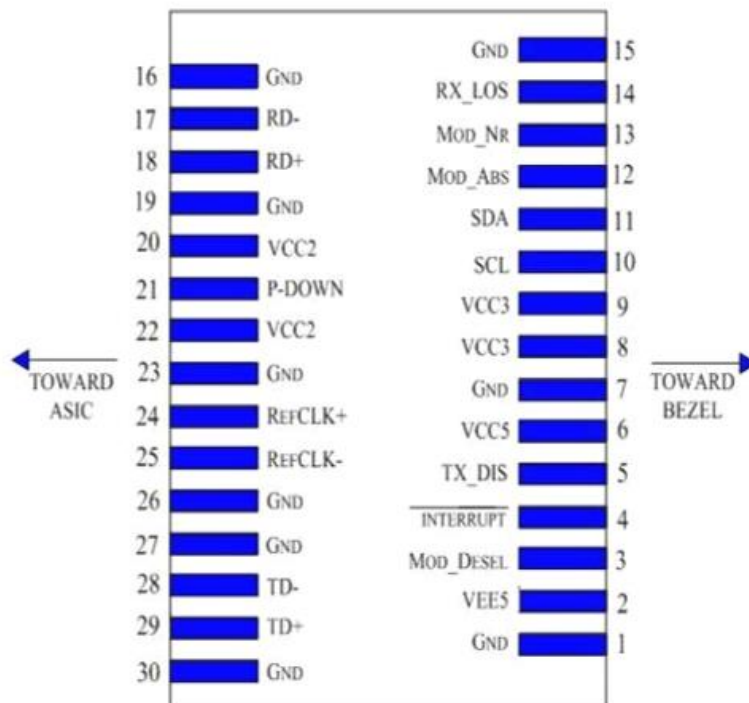
Optical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Transmitter						
Optical output Power	P	-6.5		+0.5	dBm	
Optical Wavelength	λ	1260		1355	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Optical Extinction Ratio	ER	6			dB	1
Average Launch power of OFF transmitter	POFF	-30			dBm	
Tx Jitter	T _{xj}	Compliant with each standard requirements				
Receiver						
Receiver Sensitivity	RSENS		-16	-14.5	dBm	2
Receiver Sensitivity in OMA	RSENS			-12.5	dBm	2
Maximum Input Power	P _{MAX}	+0.5			dBm	
Optical Center Wavelength	λ_C	1260		1600	nm	
LOS De-Assert	LOS _D			-15	dBm	
LOS Assert	LOS _A	-25			dBm	
LOS Hysteresis		1		4	dB	

Notes:

- 1, PRBS 2³¹-1 test pattern @10.3125Gbps.
- 2, PRBS 2³¹-1 test pattern @10.3125Gbps, BER≤10⁻¹².

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.

General Specification

Parameter	Symbol	Min	Typ	Max	Units	Ref.
Bit Rate	BR	9.95		11.1	Gb/s	1
Bit Error Ratio	BER			10 ⁻¹²		2
Max. Supported Link Length	L _{MAX}		10		km	1

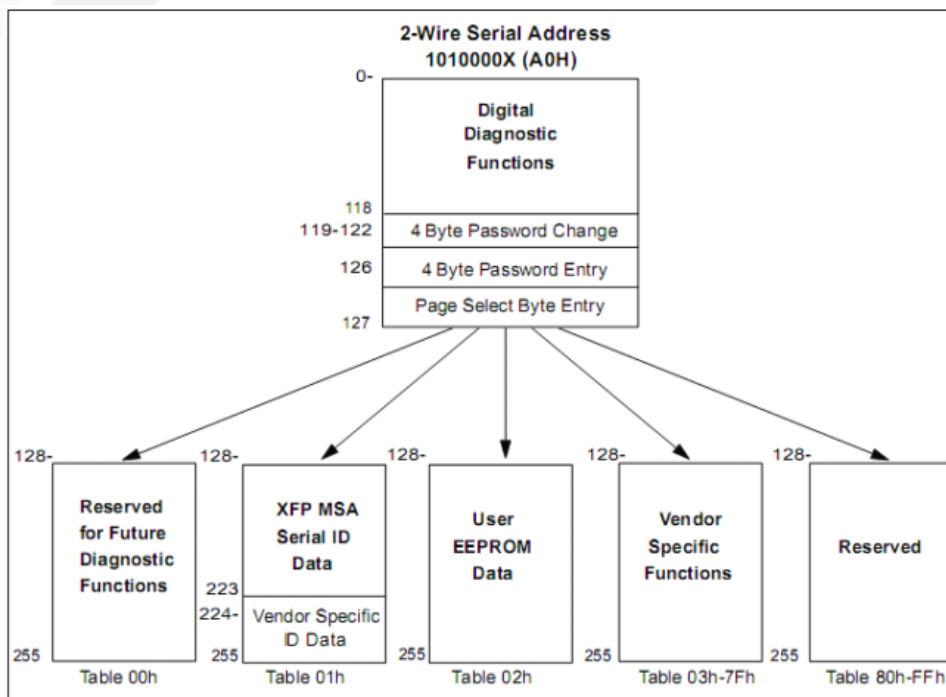
Notes:

1. SONET OC-192 SR-1, SDH STM I-64.1, 10GBASE-LR/LW, 1200-SM-LL-L
2. Tested with a 2³¹ - 1 PRBS

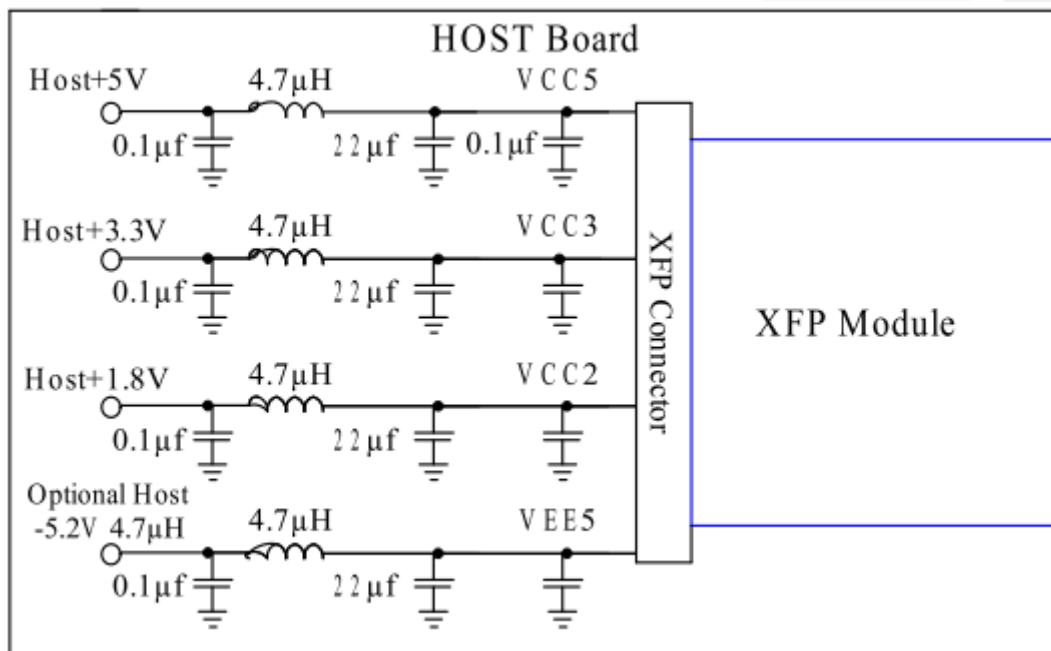
Management Interface

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.

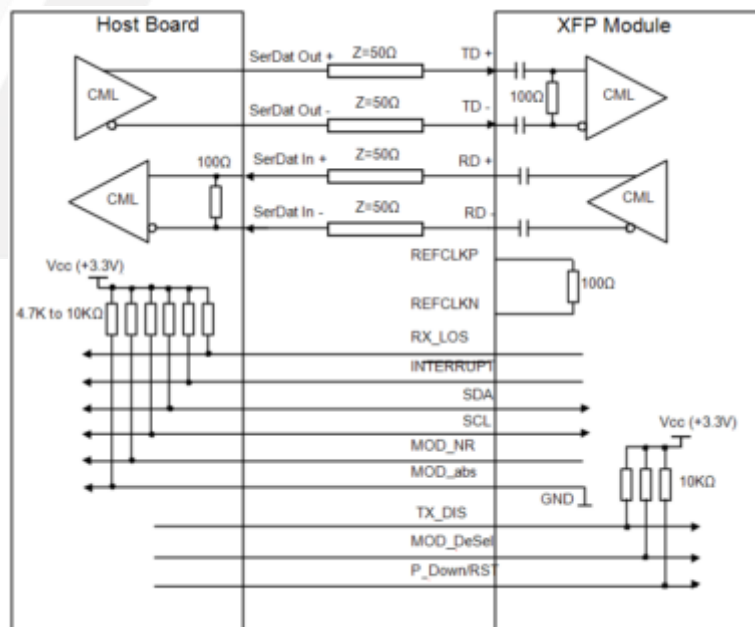
The digital diagnostic memory map specific data field defines as following.



Recommended Host Board Power Supply Circuit



Recommended High-Speed Interface Circuit



XFP Dimensions

