

## Свойства

850nm VCSEL лазер

до 300м на 50/125 мкм многомодовом оптическом кабеле

цифровая диагностика (DDMI)

дуплексный LC коннектор

## Применение

10GBase-SR

STM-16, STM-64

### ● Максимальные параметры

Parameter	Symbol	Min.	Typical	Max.	Unit
Power Supply Voltage	V <sub>CC</sub>	0		3.6	V
Storage Temperature	T <sub>c</sub>	-40		85	°C
Operating Case Temperature	T <sub>c</sub>	-5		+70	°C
Relative Humidity	RH	5		95	%
RX Input Average Power	P <sub>max</sub>	-		0	dBm

### ● Рекомендованные параметры

Parameter	Symbol	Min.	Typical	Max.	Unit
Power Supply Voltage	V <sub>CC</sub>	3.135	3.3	3.465	V
Power Supply Current	I <sub>CC</sub>			250	mA
Operating Case Temperature	T <sub>c</sub>	-5	25	+70	°C

● **Электрические характеристики**

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Data Rate		-	10.3125	-	Gbps	
Power Consumption		-	600	800	mW	
<b>Transmitter Section:</b>						
Single Ended Output Voltage Tolerance		-0.3	-	4	V	
Common mode voltage tolerance		15	-	-	mV	
Tx Input Diff Voltage	VI	90		350	mV	
Tx Fault	VoL	-0.3		0.4	V	At 0.7mA
Data Dependent Input Jitter	DDJ			0.1	UI	
Data Input Total Jitter	TJ			0.28	UI	
<b>Receiver Section:</b>						
Single Ended Output Voltage Tolerance		-0.3	-	4	V	
Rx Output Diff Voltage	Vo	150		425	mV	
Rx Output Rise and Fall Time	Tr/Tf	30			ps	20% to 80%
Total Jitter	TJ			0.7	UI	
Deterministic Jitter	DJ			0.42	UI	

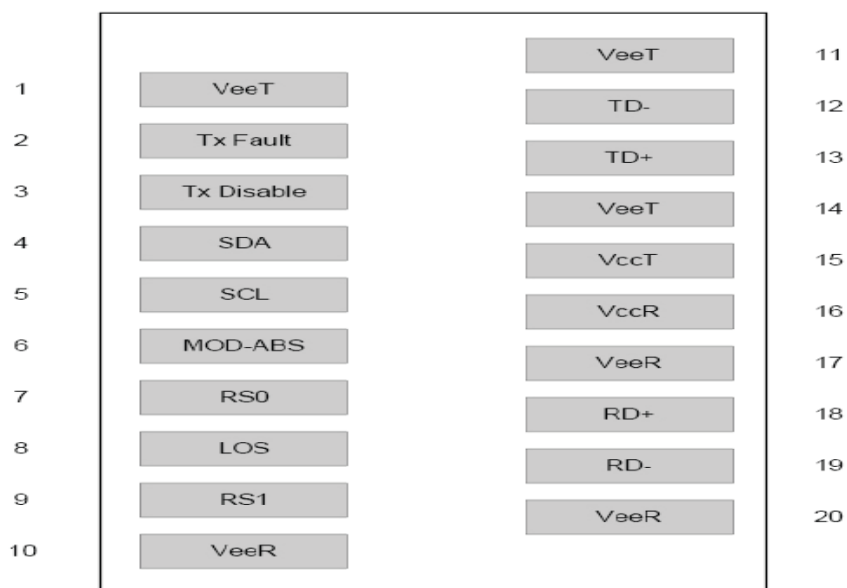
● **Оптические параметры**

◇ Parameter	Symbol	Min.	Typical	Max.	Unit	Note
<b>Transmitter Section:</b>						
Center Wavelength	$\lambda_t$	840	850	860	nm	
RMS spectral width	Pm	-	-	Note 1	nm	

Average Optical Power	Pavg	-6.5	-	-1	dBm	
Optical Power OMA	Poma	-	-	Note 1	dBm	
Laser Off Power	Poff	-	-	-30	dBm	
Extinction Ratio	ER	3.5	-	-	dB	
Transmitter Dispersion Penalty	TDP	-	-	3.9	dB	
Relative Intensity Noise	Rin	-	-	-128	dB/Hz	12dB reflect ion
Optical Return Loss Tolerance		-	-	12	dB	
<b>Receiver Section:</b>						
Center Wavelength	$\lambda_r$	840	850	860	nm	
Receiver Sensitivity (OMA)	Psens	-	-	-11.1	dBm	
Stressed Sensitivity (OMA)		-	-	-7.5	dBm	
Los Assert	LosA	-30	-	-	dBm	
Los Dessert	LosD	-	-	-12	dBm	
Los Hysteresis	LosH	0.5	-	-	dB	
Overload	Pin	-	-	-1	dBm	
Receiver Reflectance		-	-	-12	dB	

Note 1: Trade-offs are available between spectral width, center wavelength and minimum OMA, as shown in table :

● **Контакты разъема SFP slot**



● **Описание контактов**

✧ PIN #	Name	Function	Notes
1	VeeT	Module transmitter ground	Note1
2	Tx Fault	Module transmitter fault	Note 2
3	Tx Disable	Transmitter Disable; Turns off transmitter laser output	Note 3
4	SDL	2 wire serial interface data input/output (SDA)	
5	SCL	2 wire serial interface clock input (SCL)	
6	MOD-ABS	Module Absent, connect to VeeR or VeeT in the module	Note 2
7	RS0	Rate select0,optionally control SFP+ receiver. When high, input data rate >4.5Gb/ s;when low, input data rate <=4.5Gb/s	
8	LOS	Receiver Loss of Signal Indication	Note4
9	RS1	Rate select0,optionally control SFP+ transmitter. When high, input data rate	

		>4.5Gb/s;when low, input data rate <=4.5Gb/s	
10	VeeR	Module receiver ground	Note 1
11	VeeR	Module receiver ground	Note 1
12	RD-	Receiver inverted data out put	
13	RD+	Receiver non-inverted data out put	
14	VeeR	Module receiver ground	Note 1
15	VccR	Module receiver 3.3V supply	
16	VccT	Module transmitter 3.3V supply	
17	VeeT	Module transmitter ground	Note 1
18	TD+	Transmitter inverted data out put	
19	TD-	Transmitter non-inverted data out put	
20	VeeT	Module transmitter ground	Note1

Note 1) The module ground pins shall be isolated from the module case.

Note 2) This pin is an open collector/drain output pin and shall be pulled up with 4.7K-10Kohms to Host\_Vcc on the host board.

Note 3) This pin shall be pulled up with 4.7K-10Kohms to VccT in the module.

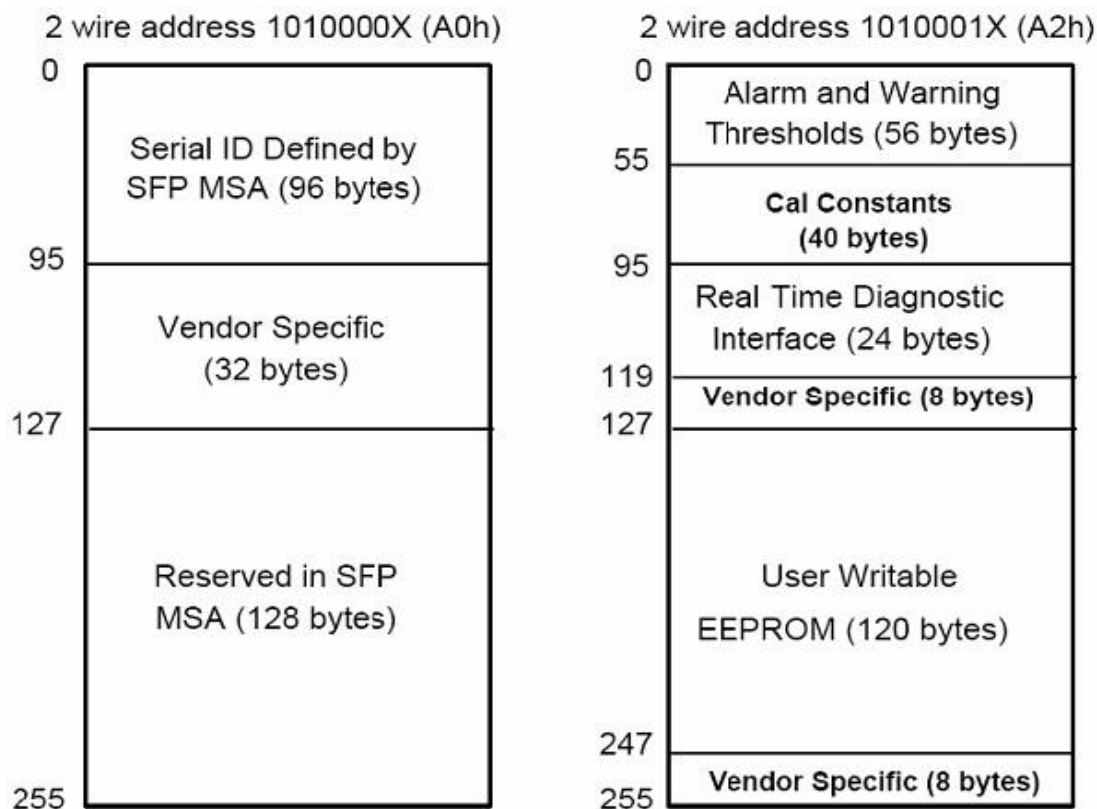
Note 4) This pin is an open collector/drain output pin and shall be pulled up with 4.7K-10Kohms to Host\_Vcc on the host board.

● **EEPROM и DDMI**

The SFP modules implement the 2-wire serial communication protocol as defined in the SFP -8472.

The serial ID information of the SFP modules and Digital Diagnostic Monitor parameters can be accessed through the I2C interface at address A0h and A2h. The memory is mapped in Table 1. Detailed ID information(A0h) is listed in Table 2. And the DDM specification at address A2h. For more details of the memory map and byte definitions, please refer to the SFF-8472, “Digital Diagnostic Monitoring Interface for Optical Transceivers”. The DDM parameters have been internally calibrated.

**Table 1.** Digital Diagnostic Memory Map (Specific Data Field Descriptions)



**Table 2 -** EEPROM Serial ID Memory Contents (A0h)

Data Address	Length (Byte)	Name of Length	Description and Contents
Base ID Fields			
0	1	Identifier	Type of Serial transceiver (03h=SFP)
1	1	Reserved	Extended identifier of type serial transceiver (04h)
2	1	Connector	Code of optical connector type (07=LC)
3-10	8	Transceiver	
11	1	Encoding	NRZ(03h)

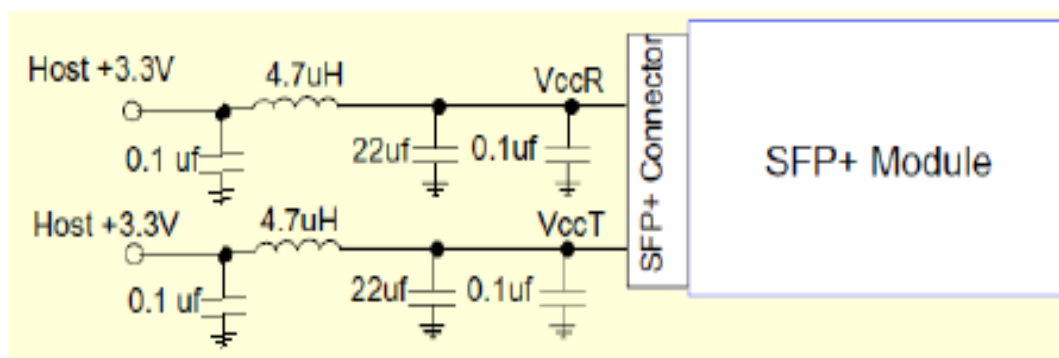
12	1	BR,Nominal	Nominal baud rate
13-14	2	Reserved	(0000h)
15	1	Length(9um)	Link length supported for 9/125um fiber, units of 100m
16	1	Length(50um)	Link length supported for 50/125um fiber, units of 10m
17	1	Length(62.5um)	Link length supported for 62.5/125um fiber, units of 10m
18	1	Length(Copper)	Link length supported for copper, units of meters
19	1	Reserved	
20-35	16	Vendor Name	SFP vendor name: OptTech
36	1	Reserved	
37-39	3	Vendor OUI	SFP transceiver vendor OUI ID
40-55	16	Vendor PN	Part Number (ASCII)
56-59	4	Vendor rev	Revision level for part number
60-62	3	Reserved	
63	1	CCID	Least significant byte of sum of data in address 0-62
Extended ID Fields			
64-65	2	Option	Indicates which optical SFP signals are implemented  (001Ah = LOS, TX_FAULT, TX_DISABLE all supported)
66	1	BR, max	Upper bit rate margin, units of %
67	1	BR, min	Lower bit rate margin, units of %
68-83	16	Vendor SN	Serial number (ASCII)

84-91	8	Date code	OptTech Manufacturing date code
92-94	3	Reserved	
95	1	CCEX	Check code for the extended ID Fields (addresses 64 to 94)
Vendor Specific ID Fields			
96-127	32	Readable	OptTech specific date, read only
128-255	128	Reserved	Reserved for SFF-8079

● Digital Diagnostic Monitor Characteristics

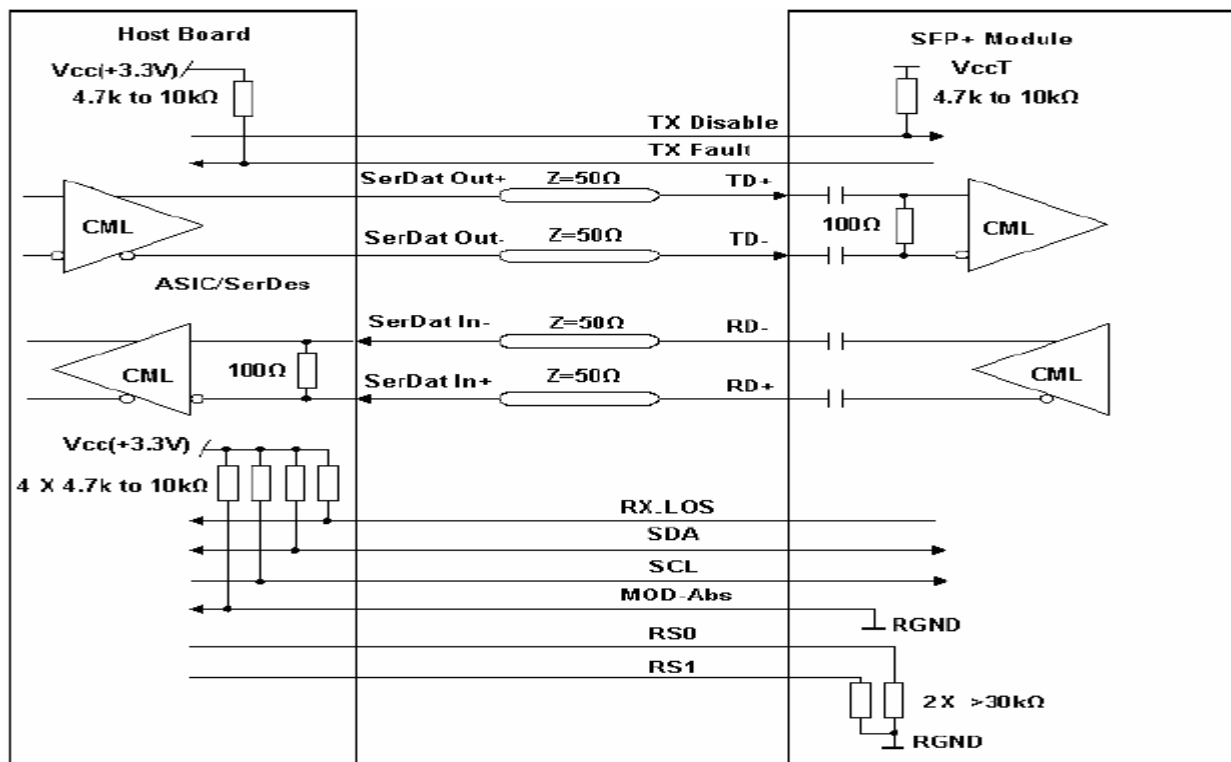
Data Address	Parameter	Range	Accuracy	Unit
96-97	Transceiver Internal Temperature	-10 to +80°C	±3.0	°C
100-101	Laser Bias Current	8 to 90mA	±10	%
100-101	Tx Output Power	-8.5 to +1dBm	±3.0	dBm
100-101	Rx Input Power	-15.5 to 0.5dBm	±3.0	dBm
100-101	VCC3 Internal Supply Voltage	+3.0V to +3.7V	±3.0	%

● Рекомендованная схема включения



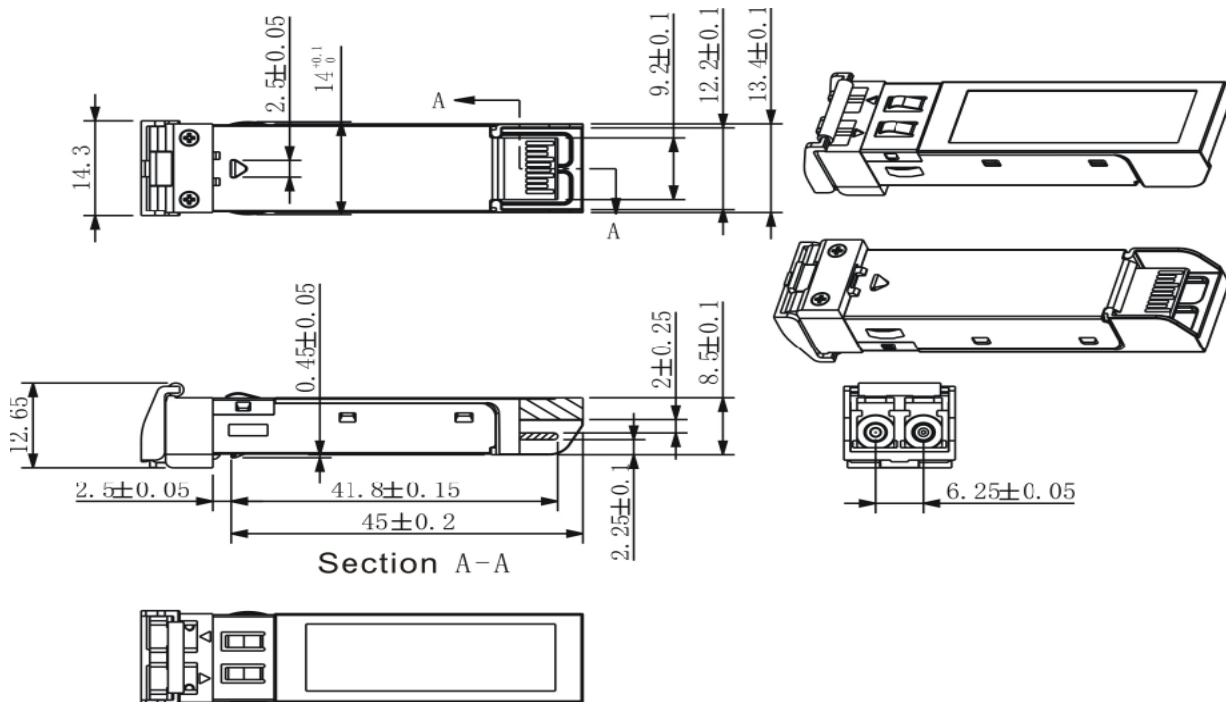
Recommended Host Board Power Supply Circuit





Recommended High-speed Interface Circuit

● Размеры



SFP+ Transceiver  
(Unit: mm View:   )