

**Особенности:**

- Industrial: -40°C ~ +85°C
- 1490nm DFB лазер + PIN фотоприемник
- возможность горячей замены
- LC разъем
- Digital diagnostic monitor interface (DDMI)
- соответствие спецификации SFP MSA и SFF-8472

**Области применения:**

- Gigabit Ethernet 10000Base-LX
- ATM
- SONT/SDH/PDH
- FDDI
- Fiber Channel

**Performance Specifications - Electrical**

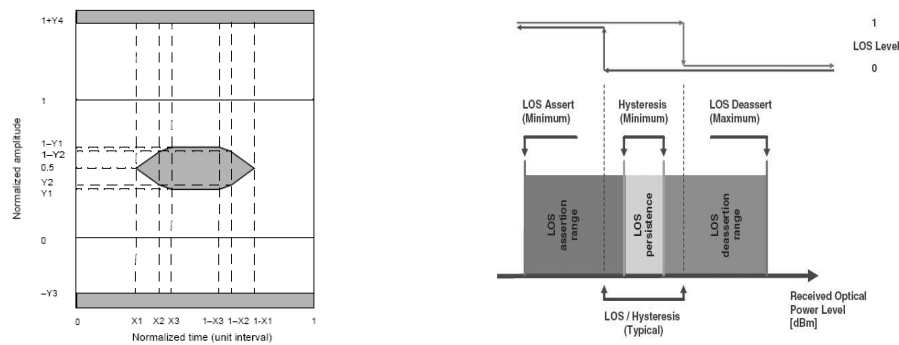
Parameter		Symbol	Min.	Typ.	Max	Unit	Notes
Transmitter							
LVPECL Inputs(Differential)		Vin	400		2000	mVpp	AC coupled inputs*(note5)
Input Impedance (Differential)		Zin	85	100	115	ohm	Rin > 100 kohm @ DC
TX_Dis	Disable		2		Vcc+0.3	V	
	Enable		0		0.8		
TX_FAULT	Fault		2		Vcc+0.3	V	
	Normal		0		0.5		
Receiver							
LVPECL Outputs (Differential)		Vout	400		2000	mVpp	AC coupled outputs*(note5)
Output Impedance (Differential)		Zout	85	100	115	ohm	
RX_LOS	LOS		2		Vcc+0.3	V	
	Normal		0		0.8	V	
MOD_DEF ( 0:2 )		VoH	2.5			V	With Serial ID
		VoL	0		0.5	V	

**Optical and Electrical Characteristics**

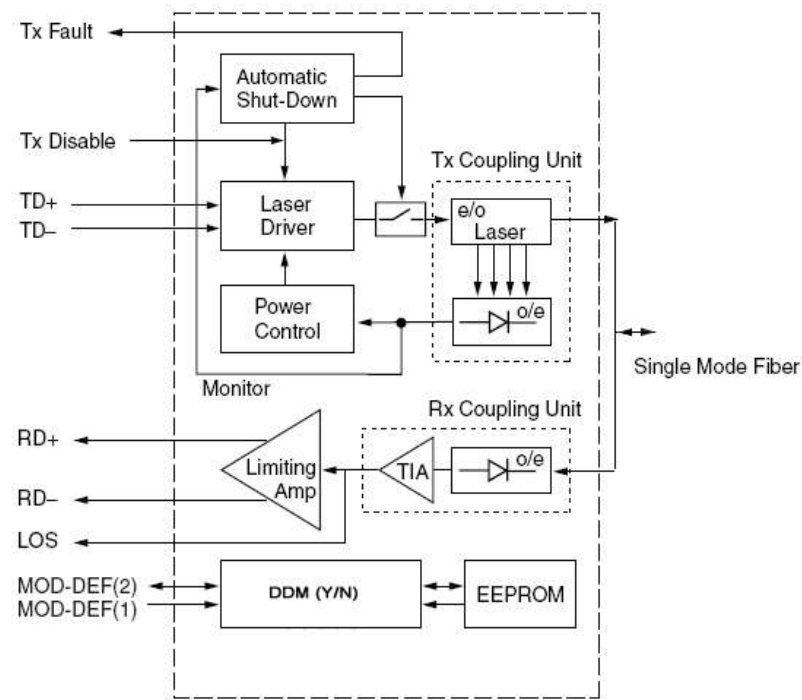
Parameter	Symbol	Min.	Typical	Max.	Unit
9µm Core Diameter SMF	L		20		km
Data Rate			1063/1250		Mbps
<b>Transmitter</b>					
Center Wavelength	$\lambda_c$	1460	1490	1520	nm
Spectral Width (RMS)	$\Delta\lambda$			3.5	nm
Average Output Power*(note3)	Pout	-8		-3	dBm
Extinction Ratio @ 1250Mbps	ER	6	9		dB
Rise/Fall Time(20% ~ 80%)	tr/tf			0.26	ns
Total Jitter	TJ			260	ps

Output Optical Eye <sup>*(note4)</sup>	Compliant with IEEE 802.3z <sup>*(note7)</sup>				
TX_Disable Assert Time	t_off			10	us
Pout@TX Disable Asserted	Pout			-45	dBm
<b>Receiver</b>					
Center Wavelength	$\lambda_c$	1260		1360	nm
Receiver Sensitivity <sup>*(note6)</sup> @1250Mbps	Pmin			-22	dBm
Receiver Overload	Pmax	-3			dBm
LOS De-Assert@1250Mbps	LOSD			-23	dBm
LOS Assert	LOSA	-45			dBm
LOS Hysteresis <sup>*(note8)</sup>		0.5			dB

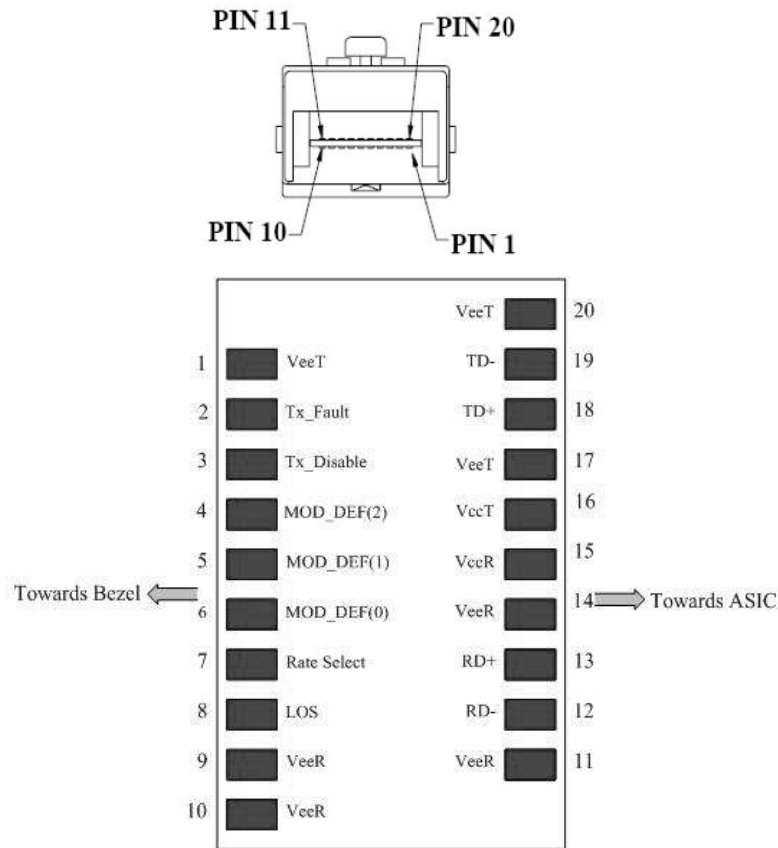
Note3: Output is coupled into a 9/125 $\mu$ m single-mode fiber.  
Note4: Filtered, measured with a PRBS 2<sup>7</sup>-1.  
Note5: LVPECL logic, internally AC coupled.  
Note6: Measured at all data rates specified in Data Rate table with ER=9 dB, 2<sup>7</sup>-1 PRBS data pattern, BER <1E-12.  
Note7: Eye Pattern Mask  
Note8: LOS Hysteresis



Functional Description of Transceiver



SFP Transceiver Electrical Pad Layout



Pin Function Definitions

Pin NO.	Name	Function	Plug Seq.	Notes
1	VeeT	Transmitter Ground	1	5)
2	TX Fault	Transmitter Fault Indication	3	1)
3	TX Disable	Transmitter Disable	3	2) Module disables on high or open
4	MOD-DEF2	Module Definition 2	3	3) Data line for Serial ID.
5	MOD-DEF1	Module Definition 1	3	3) Clock line for Serial ID.
6	MOD-DEF0	Module Definition 0	3	3) Grounded within the module.
7	Rate Select	Not Connect	3	Function not available
8	LOS	Loss of Signal	3	4)
9	VeeR	Receiver Ground	1	5)
10	VeeR	Receiver Ground	1	5)
11	VeeR	Receiver Ground	1	5)
12	RD-	Inv. Received Data Out	3	6)
13	RD+	Received Data Out	3	6)
14	VeeR	Receiver Ground	1	5)
15	VccR	Receiver Power	2	7) 3.3 ± 5%
16	VccT	Transmitter Power	2	7) 3.3 ± 5%
17	VeeT	Transmitter Ground	1	5)
18	TD+	Transmit Data In	3	8)
19	TD-	Inv. Transmit Data In	3	8)
20	VeeT	Transmitter Ground	1	5)

**Notes:**

1) TX Fault is an open collector/drain output, which should be pulled up with a 4.7K – 10KΩ resistor on the host board. Pull up voltage between 2.0V and VccT, R+0.3V. When high, output indicates a laser fault of some kind. Low indicates normal operation. In the low state, the output will be pulled to < 0.8V.

2) TX disable is an input that is used to shut down the transmitter optical output. It is pulled up within the module with a 4.7 – 10 KΩ resistor. Its states are:  
 Low (0 – 0.8V): Transmitter on  
 (>0.8, < 2.0V): Undefined  
 High (2.0 – 3.465V): Transmitter Disabled  
 Open: Transmitter Disabled

3) Modulation Absent, connected to VEET or VEER in the module.

4) LOS (Loss of Signal) is an open collector/drain output, which should be pulled up with a 4.7K – 10KΩ resistor. Pull up voltage between 2.0V and VccT, R+0.3V. When high, this output indicates the received optical power is below the worst-case receiver sensitivity (as defined by the standard in use). Low indicates normal operation. In the low state, the output will be pulled to < 0.8V.

5) VeeR and VeeT may be internally connected within the SFP module.

6) RD-/+ : 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 is thus not required on the host board.

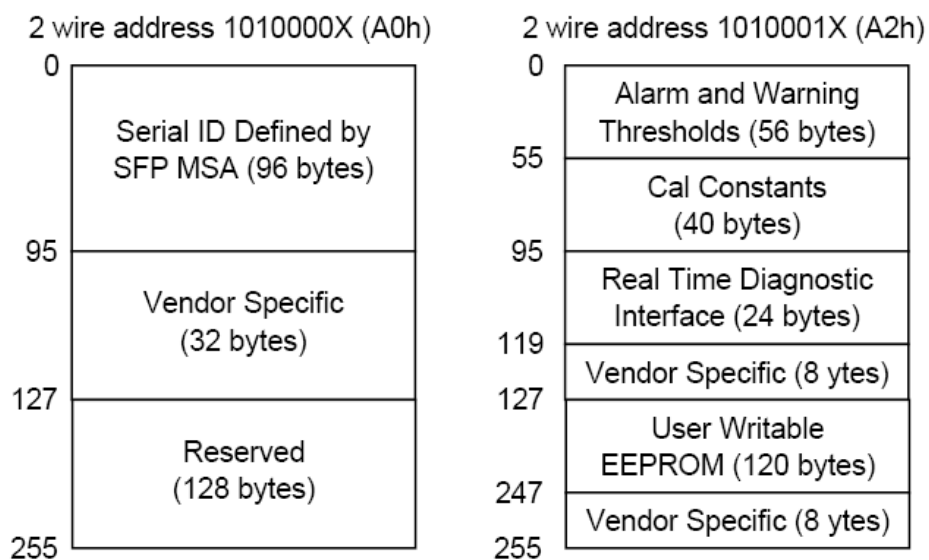
7) VccR and VccT are the receiver and transmitter power supplies. They are defined as 3.3V ±5% at the SFP connector pin. Maximum supply current is 300mA. Recommended host board power supply filtering is shown below. Inductors with DC resistance of less than 1 ohm should be used in order to maintain the required voltage at the SFP input pin with 3.3V supply voltage. When the recommended supply-filtering network is used, hot plugging of the SFP transceiver module will result in an inrush current of no more than 30mA greater than the steady state value. VccR and VccT may be internally connected within the SFP transceiver module.

8) TD-/+ : These are the differential transmitter inputs. They are AC-coupled, differential lines with 100Ω differential termination inside the module. The AC coupling is done inside the module and is thus not required on the host board.

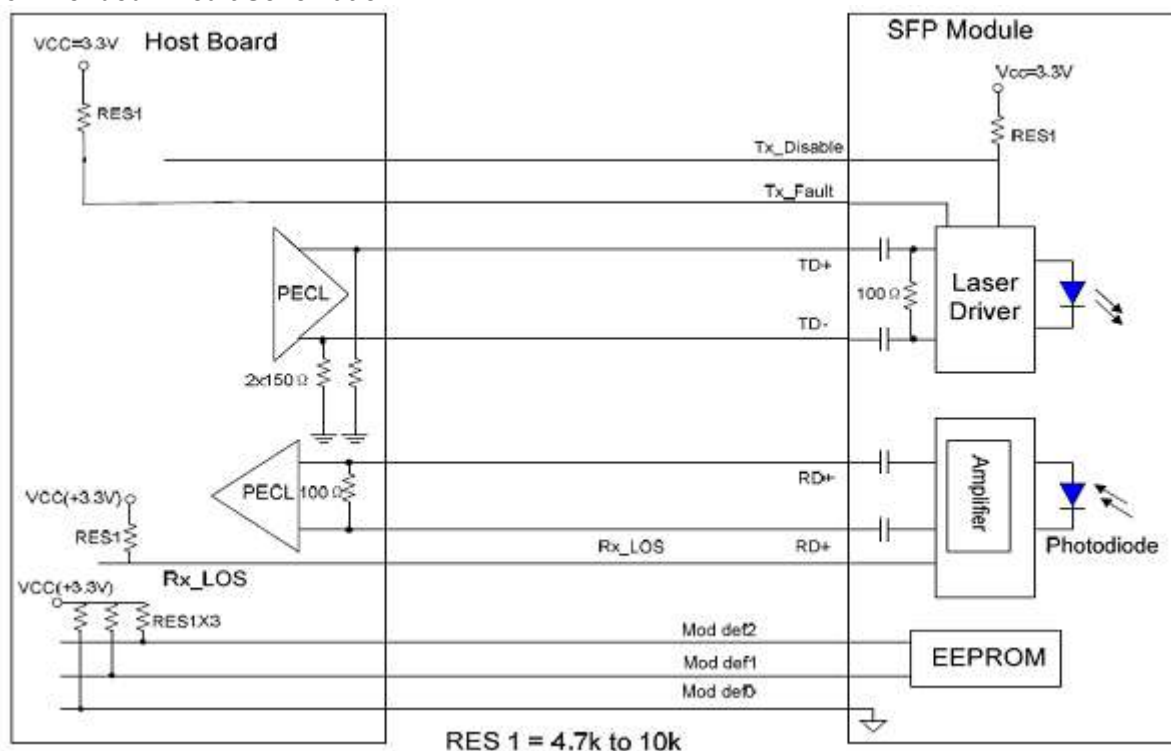
The serial interface uses the 2-wire serial CMOS EEPROM protocol defined for the ATMEL AT24C02/04 family of components. When the serial protocol is activated, the host generates the serial clock signal (SCL).  
**EEPROM** the

( ) is bi-directional for serial data transfer. The host uses SDA in conjunction with SCL to mark the start and end of serial protocol activation. The memories are organized as a series of 8-bit data words that can be addressed individually or sequentially.

The Module provides diagnostic information about the present operating conditions. The transceiver generates this diagnostic data by digitization of internal analog signals. Calibration and 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. If the module is defined as external calibrated, the diagnostic data are raw A/D values and must be converted to real world units using calibration constants stored in EEPROM locations 56 – 95 at wire serial bus address A2H. The digital diagnostic memory map specific data field define as following .For detail EEPROM information, please refer to the related document of SFF 8472 Rev 9.3.



## Recommended Circuit Schematic



Mechanical Specifications

