



- ✧ 2-wire interface for management specifications compliant with SFF 8472 digital diagnostic monitoring interface for optical transceivers
- ✧ Power Supply :+3.3V
- ✧ Low Power consumption<1W
- ✧ Operating case temperature Range:0~70 ℃
- ✧ RoHS compliant

Features:

- ✧ UP to 25.78Gb/s bit rates
- ✧ Hot-Pluggable
- ✧ Duplex LC connector
- ✧ 850nm VCSEL transmitter, PIN photo-detector
- ✧ Up to 100m on OM4 MMF, 70m on OM3 MMF

Applications:

- ✧ 25.78 Gb/s single lane 100GE SR4

Description:

OPWAY's OP3001D is a very compact optical transceiver module converts 25Gbit/s serial PECL or CML electrical data into serial optical data compliant with the 25GBASE-SR standard. The SFP28 SR module electrical interface is compliant to SFI electrical specifications. The VCSEL transmitter and PIN receiver provide superior performance for Ethernet applications at up to 100m links on OM4 MMF.

The SFP28 Module compliant with SFF-8431, SFF-8432 and IEE802.3by 25GBASE-SR. Digital diagnostics functions are available via a 2-wire serial interface, as specified in SFF-8472. The fully SFP compliant form factor provides hot pluggability, easy optical port upgrades and low EMI emission.

● **Absolute Maximum Ratings**

Parameter	Symbol	Min.	Typical	Max.	Unit
Storage Temperature	T _S	-40		+85	°C
Case Operating Temperature	T _A	0		70	°C
Maximum Supply Voltage	V _{CC}	0		3.5	V
Relative Humidity	RH	0		85	%

● **Electrical Characteristics (T_{OP} = 0 to 70 °C, V_{CC} = 3.135 to 3.465 Volts)**

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Supply Voltage	V _{CC}	3.135		3.465	V	
Supply Current	I _{CC}			300	mA	
Power Consumption	P			1	W	
Data Rate	R	-	25.78		Gb/s	
Transmitter Section:						
Input differential impedance	R _{in}		100		Ω	1
Tx Input Single Ended DC Voltage Tolerance (Ref V _{eeT})	V	-0.3		4	V	
Differential input voltage swing	V _{in,pp}	200		600	mV	2
Transmit Disable Voltage	V _D	2		V _{CC}	V	3
Transmit Enable Voltage	V _{EN}	V _{ee}		V _{ee} +0.8	V	
Receiver Section:						
Single Ended Output Voltage Tolerance	V	-0.3		4	V	
Rx Output Diff Voltage	V _O	300		900	mV	
LOS Fault	V _{LOS fault}	2		V _{CCHOST}	V	4
LOS Normal	V _{LOS norm}	V _{ee}		V _{ee} +0.8	V	4

Note:

1. Connected directly to TX data input pins. AC coupling from pins into laser driver IC.
2. Per SFF-8431 Rev 3.0
3. Into 100 ohms differential termination.
4. LOS is an open collector output. Should be pulled up with 4.7k – 10kΩ on the host board. Normal operation is logic 0; loss of signal is logic 1. Maximum pull-up voltage is 3.5V.

● **Optical Characteristics (T_{OP} = 0 to 70 °C, V_{CC} = 3.135 to 3.465 Volts)**

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Transmitter Section:						
Center Wavelength	λ _t	840	850	860	nm	
spectral width	Δλ			0.8	nm	
Average Optical Power	P _{avg}	-7.6		+2.4	dBm	1
Laser Off Power	P _{off}			-30	dBm	
Extinction Ratio	ER	2.0			dB	
Receiver Section:						
Center Wavelength	λ _r	840	850	860	nm	
Receiver Sensitivity (OMA)@25.78Gb/s	S _{en}			-10.3	dBm	2
Los Assert	LOS _A	-30		-	dBm	
Los Dessert	LOS _D			-11	dBm	
Los Hysteresis	LOS _H	0.5		5	dB	
Overload	Sat	3			dBm	3

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Note:

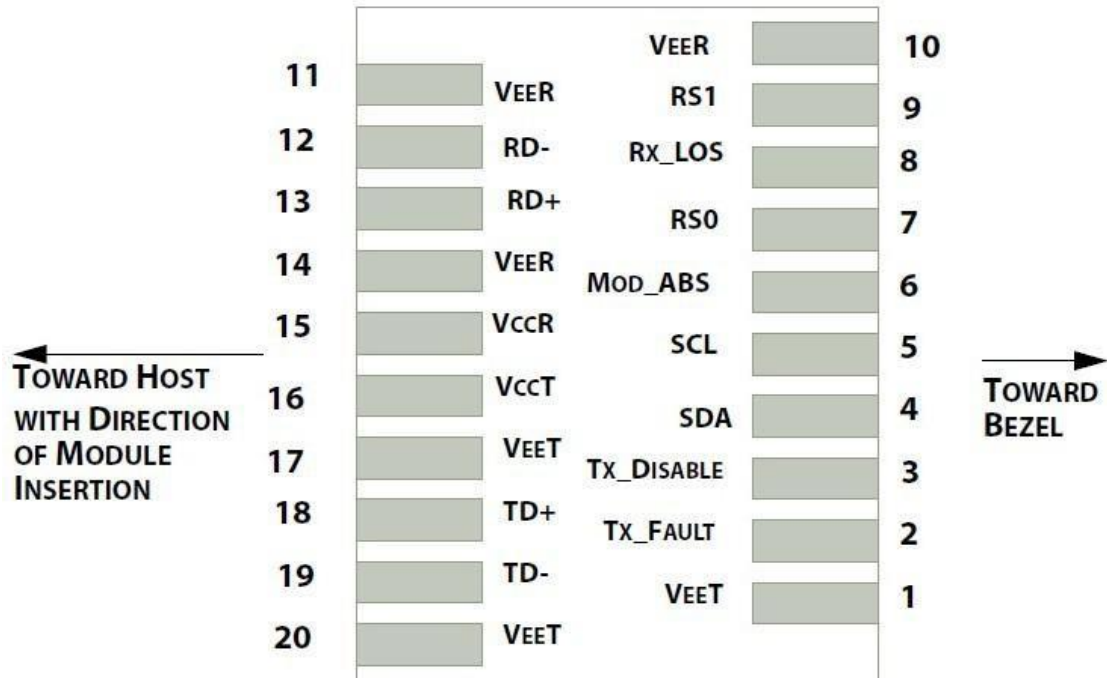
1. Average power figures are informative only, per IEEE802.3by.
2. Average Receiver Sensitivity is information. Shall be measured with conformance test signal for BER=5E-5.
3. Receiver overload specified in OMA and under the worst comprehensive stressed condition.

● **Timing Characteristics**

Parameter	Symbol	Min.	Typical	Max.	Unit
TX_Disable Assert Time	t_off			100	ms
TX_Disable Deassert Time	t_on			100	ms
Time to Initialize Include Reset of TX_FAULT	t_int			300	ms
TX_FAULT Assert Time	t_fault			100	ms
Receiver Loss of Signal Assert Time	t_Loss_on			100	ms
Receiver Loss of Signal Deassert Time	t_Loss_off			100	ms

Pin Assignment:

Diagram of Host Board Connector Block Pin Numbers and Name



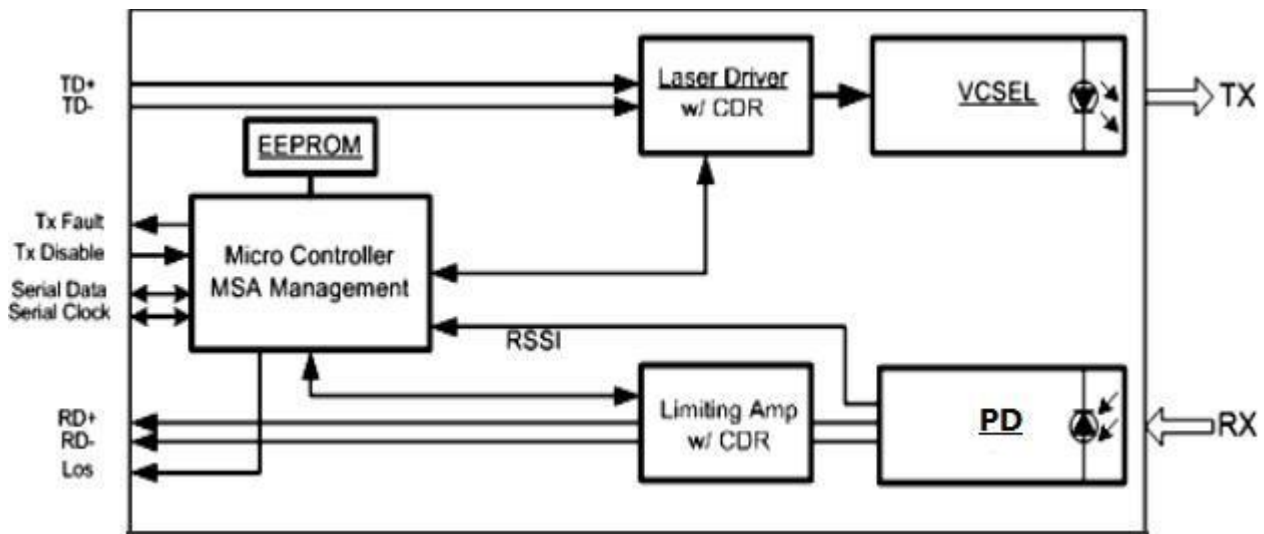
● Pin Function Definitions

PIN #	Name	Function	Notes
1	VeeT	Module transmitter ground	1
2	Tx Fault	Module transmitter fault	2
3	Tx Disable	Transmitter Disable; Turns off transmitter laser output	3
4	SDL	2 wire serial interface data input/output (SDA)	4
5	SCL	2 wire serial interface clock input (SCL)	4
6	MOD-ABS	Module Absent, connect to VeeR or VeeT in the module	2
7	RS0	Rate select0: module inputs and are pulled low to VeeT with > 30 kΩ resistors in the module	
8	LOS	Receiver Loss of Signal Indication	
9	RS1	Rate select1: module inputs and are pulled low to VeeT with > 30 kΩ resistors in the module.	
10	VeeR	Module receiver ground	1
11	VeeR	Module receiver ground	1
12	RD-	Receiver inverted data out put	
13	RD+	Receiver non-inverted data out put	
14	VeeR	Module receiver ground	1
15	VccR	Module receiver 3.3V supply	
16	VccT	Module transmitter 3.3V supply	
17	VeeT	Module transmitter ground	1
18	TD+	Transmitter non-inverted data out put	
19	TD-	Transmitter inverted data out put	
20	VeeT	Module transmitter ground	1

Note:

1. The module ground pins shall be isolated from the module case.
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.
3. This pin shall be pulled up with 4.7K-10Kohms to VccT in the module.
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.

● Transceiver Block Diagram



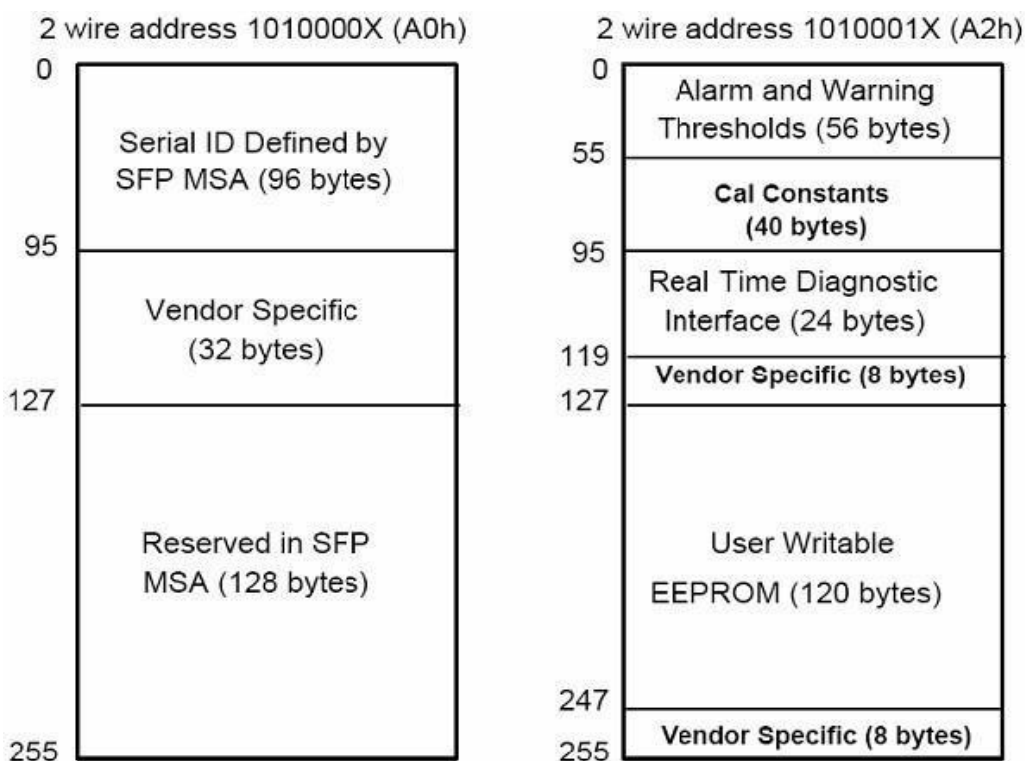
● SFP Module EEPROM Information and Management

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.

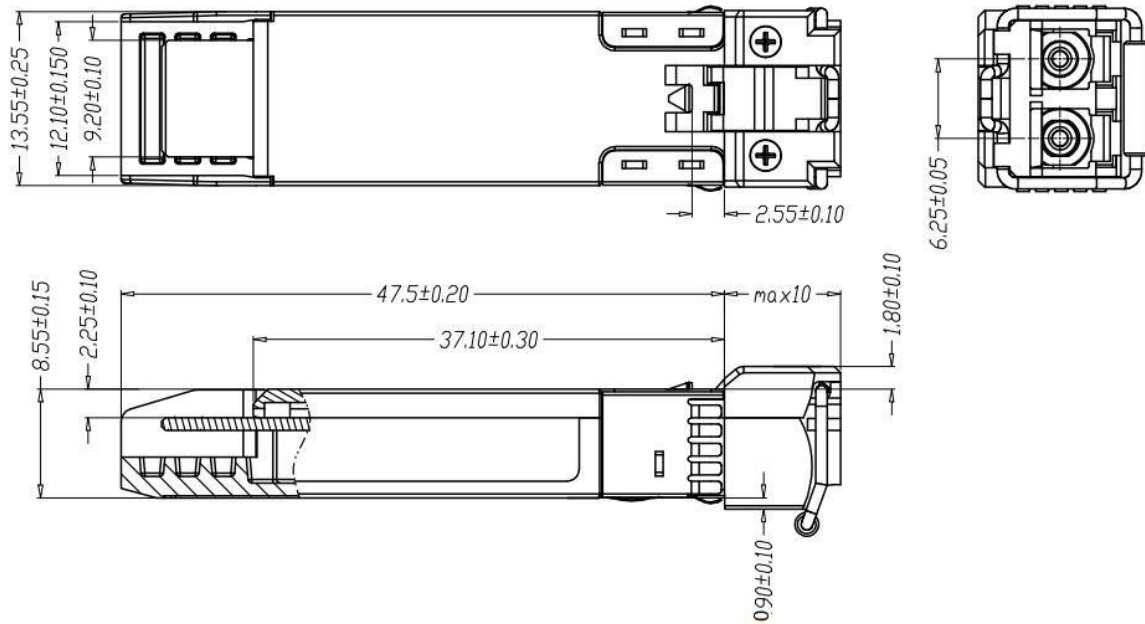
Table 1. Digital Diagnostic Memory Map (Specific Data Field Descriptions)



Digital Diagnostic Monitor Characteristics

Data Address	Parameter	Accuracy	Unit
96-97	Transceiver Internal Temperature	±5.0	℃
98-99	VCC3 Internal Supply Voltage	±3.0	%
100-101	Laser Bias Current	±10	%
102-103	Tx Output Power	±3.0	dBm
104-105	Rx Input Power	±3.0	dBm

Mechanical Dimensions:



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