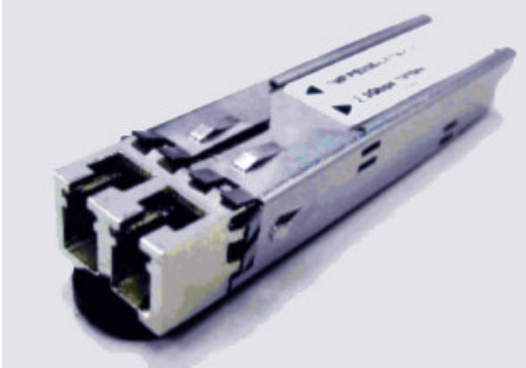


Small Form Pluggable (SFP) Loopback Module

Data Sheet

OFP2000



The OFP2000 loopback module is used in testing of SFP host ports.

Features

- Hot-pluggable SFP footprint
- Metal packaging, EMI shielding
- EEPROM with Serial ID Functionality
- Multi-Source Agreement (MSA) for Small Form Factor Pluggable (SFP) Compliant

Description

The OFP2000 loopback module effectively tests SFP ports in the host system by looping back the electrical signal (optics not included).

The module provides basic Serial ID information which describes the part number in the EEPROM. The unit is also compatible with the Small Form Factor Pluggable Multi-Sourcing Agreement (MSA).

Safety

Laser Compliance Statement

The OFP2000 is classified as a Class I Laser Product. It complies with IEC 60825-1 and FDA 21 CFR 1040.10 and 1040.11. The transceiver must be operated under recommended operating conditions. Because the transceiver is designed to be inherently eye safe, it does not require open fiber control thus eliminating complex electronics or mechanics.

Caution - use of device other than those specified herein may result in hazardous laser radiation exposure or other damage. Please embrace all customary precautions and discretion while handling this device.

Performance Specifications

Absolute Maximum Ratings

Stresses in excess of the absolute maximum ratings can cause damage to the optical device. Operations of the optical device are suggested to remain within the recommended operating conditions. Exposure to the absolute maximum ratings for extended periods can adversely affect device reliability.

SFP transceivers have a power supply voltage range of 3.15V to 3.60V and an extended operating temperature range from -10°C to +85°C.

Parameter	Symbol	Minimum	Maximum	Unit
Maximum Supply Voltage	V _{CC}	-0.5	5.0	V
Storage Temperature	T _S	-40	+85	°C
Case Operating Temperature	TOP	-10	85	°C

Electrical Characteristics (T_{OP} = -10~+85°C; V_{CC} = 3.15 to 3.60V)

Parameter	Symbol	Minimum	Typical	Maximum	Unit
Supply Voltage ¹	V _{CC}	3.15		3.60	V
Supply Current	ICC				
Transmitter					
Input Differential Impedance ²	R _{in}		100		Ω
Single Ended Data Input Swing ³	V _{in} , pp	200		1200	mV
Receiver					
Single Ended Data Output Swing	V _{out} , pp				mV
Data Output Rise Time ⁴	t _r				ps
Data Output Fall Time ⁴	t _f				ps
LOS Fault ⁵	V _{LOS} fault				V
LOS Normal	V _{LOS} norm				

Note:

1. Supply voltage is necessary only for Serial ID connection. See next section on Serial Communications Protocol.
2. Connected directly to Tx data input pins.
3. < 600 mV is recommended for best EMI performance.
4. Into 600 Ω differential termination. Receiver output is approximately one half of Transmitter input.
5. LOS pulled low internally and will indicate a received signal.

Serial Communications Protocol

SFP transceivers support the 2-wire serial communications protocol as defined in the SFP MSA. Since it is very closely related to the EEPROM defined in the GBIC standard, it also contains the same electrical specifications. The SFP serial ID provides access to sophisticated identification information that describes the transceiver’s capabilities, standard interfaces, manufacturer, and other information. The serial interface uses the 2-wire serial CMOS EEPROM protocol defined for the ATMEL AT24C01A/02/04 family of components.

When the serial protocol is activated, the serial clock signal (SCL, Mod Def 1) is generated by the host. The positive edge clocks data into the SFP transceiver into those segments of the EEPROM that are not write-protected. The negative edge clocks data from the SFP transceiver.

The serial data signal (SDA, Mod Def 2) 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.

Pin Assignment

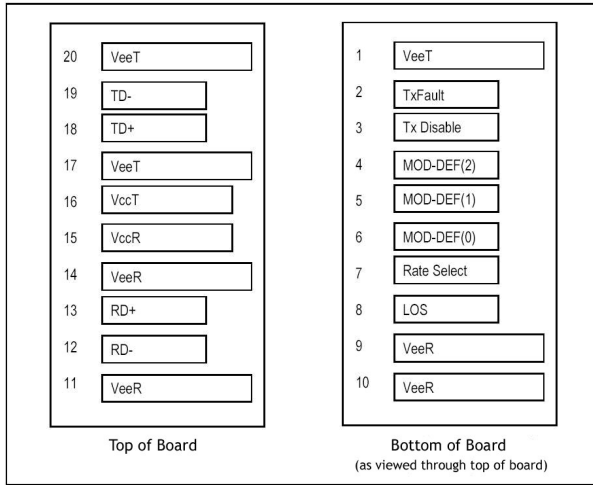


Figure 1. SFP Transceiver Electric Pad Layout

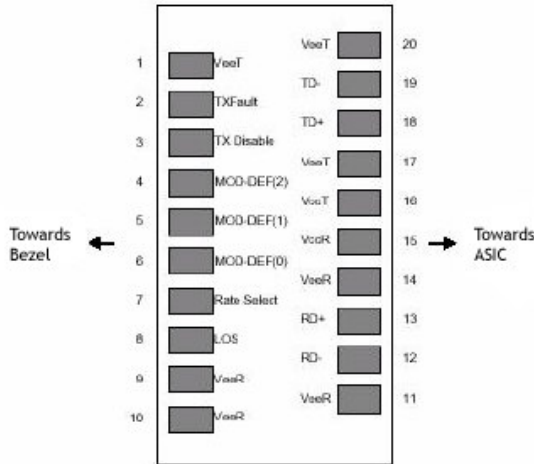


Figure 2. Diagram of Host Board Connector Block Pin

Pin Description and Plug-in Sequence¹ (1-Grd, 2-Power, 3-Signal)

Pin No.	Name	Description	Plug-in Sequence	Notes
1	VeeT	Transmitter Ground	1	
2	TX Fault	Transmitter Fault Indication	3	
3	TX Disable	Transmitter Disable	3	
4	MOD-DEF 2	Module Definition 2	3	1
5	MOD-DEF 1	Module Definition 1	3	1
6	MOD-DEF 0	Module Definition 0	3	1
7	Rate Select	Bandwidth Selection	3	
8	LOS	Loss of Signal	3	2
9	VeeR	Receiver Ground	1	
10	VeeR	Receiver Ground	1	
11	VeeR	Receiver Ground	1	

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12	RD-	Inv. Received Data Out	3	
13	RD+	Received Data Out	3	
14	VeeR	Receiver Ground	1	
15	VccR	Receiver Power	2	
16	VccT	Transmitter Power	2	
17	VeeT	Transmitter Ground	1	
18	TD+	Transmit Data In	3	
19	TD-	Inv. Transmit Data In	3	
20	VeeT	Transmitter Ground	1	

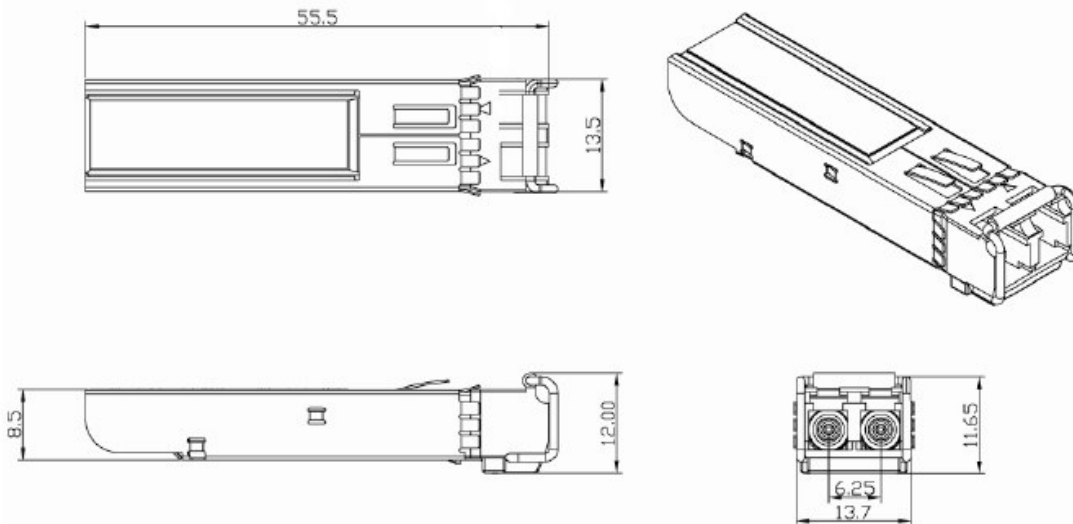
Note:

1. Should be pulled up with 4.7k – 10k Ω on host board to a voltage between 2.0V and 5.5V. MOD_DEF (0) pulls line low to indicate module is plugged in.
2. LOS is pulled low within the module and will always indicate a received signal.

Physical Characteristics

Outline Diagram

Dimensions for the device package are given in millimeters.



Additional Information

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