

25G SFP28 AOC Cable Specification

Features

- ◆ 25Gbps Serial Optical Interface
 - High quality and reliability optical device and Sub-assemblies
 - High sensitivity PIN photodiode and TIA
- ◆ SFP+ MSA Compliant
 - Compliant with SFF 8431 for electrical interface
 - SFI High Speed electrical interface
 - Tx_Disable and Rx_LOS function supported
 - Compliant with SFF 8432 for mechanical interface
 - SFP Mechanical Interface for easy removal
 - Flat, rubberized, LSZH cable
 - Compliant with SFF8742 for 2-wire interface for management and DDM
- ◆ Low Power Consumption
 - Not over 1W per cable end in temperature range of 0 to 70°C

Applications

- ◆ 25G BASE-SR Ethernet Links

1.General Description

AOC-SFP28-25G Active Optical Cables are direct-attach fiber assemblies with SFP28 connectors. They are suitable for very short distances and offer a cost-effective way to connect within racks and across adjacent racks.

The fully SFP compliant form factor provides hot pluggability, easy optical port upgrades and low EMI emission.

2.Functional Description

This module is designed to operate over multimode fiber systems using a nominal wavelength of 850nm.

Transmitter Operation

The module receives 25Gbps electrical data and transmits the data as an optical signal. The transmitter output can be turned off by TX disable signal via TX_DIS pin. When TX_DIS is asserted high, the transmitter is turned off.

Receiver Operation

The received optical signal is converted to serial electrical data signal. The RX_LOS signal indicates insufficient optical power for reliable signal reception at the receiver.

Management Interface

A 2-wire interface (SCL, SDA) is used for serial ID, digital diagnostics and other control and monitor functions.

3.Absolute Maximum Ratings and Recommended Operating Conditions

Table 3.1 Absolute Maximum Ratings

Parameter	Min	Max	Unit
Storage Temperature	-40	85	°C
Storage Relative Humidity (non-condensation)	-	85	%
Supply Voltage	-0.3	4	V

Table 3.2 Recommended Operating Conditions

Parameter	Min	Max	Unit
Operating Case Temperature	0	70	°C
Relative Humidity (non- condensation)	-	85	%
Power Supply Voltage	3.135	3.465	V
Power Supply Current per cable end	-	300	mA
Total Power Consumption per cable end	-	1.0	W

4. Electrical Specifications

Table 4.1 High Speed Electrical Specifications

Parameters	Min	Typical	Max	Unit
Transmitter				
Overload Differential Voltage pk-pk			900	mV
Differential Termination Resistance Mismatch			10%	
Differential Return Loss (SDD11)	See CEI-28G-VSR Equation			
Receiver				
Differential Voltage, pk-pk			900	mV
Common Mode Voltage (Vcm)	-350		2850	mV
Differential Termination Resistance Mismatch			10%	
Differential Return Loss (SDD22)	See CEI-28G-VSR Equation			
Common Mode Return Loss (SCC22)			-2	dB
Transition Time, 20 to 80%	9.5			ps
Vertical Eye Closure (VEC)			5.5	dB
Eye Width at 10-15 probability (EW15)	0.57			UI
Eye Height at 10-15 probability (EH15)	228			mv

5. User Interface

5.1 Management Interface

SFP 2-Wire Serial Interface Protocol

SFP 2-wire serial interface is specified in the SFF-8472. The SFP 2-wire serial interface is used for serial ID, digital diagnostics, and certain control functions. The 2-wire serial interface is mandatory for all SFP modules.

The 2-wire serial interface address of the SFP module is A0h and A2h. In order to access to a specific module on the 2-wire serial bus, the SFP has a MOD_ABS (module absent pin). This pin, which is pulled down in the module, must be held low to notify a module installation and to allow communication over 2-wire serial interface.

SFP Management Interface

The Figure 6.1 shows the structure of the memory map. The interface is an extension of the two-wire ID interface defined in the GBIC specification as well as the SFP MSA. Both specifications define a 106-byte memory map in EEPROM which is accessible over a 2 wire serial interface at the 8 bit address 1010000X (A0h) for module ID interface and 1010001X (A2h) for the digital diagnostic monitoring interface.

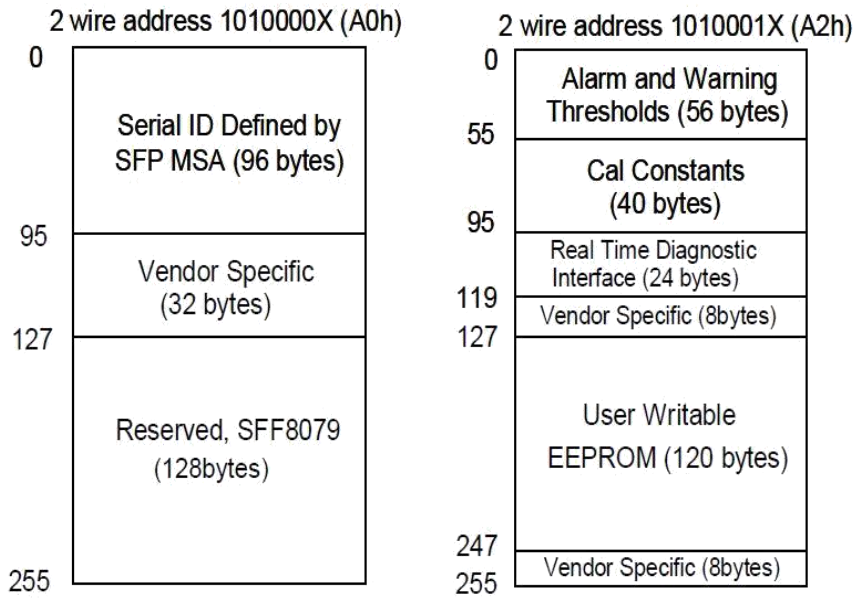


Figure 5.1 2-wire Serial Interface Memory Map

5.2 Digital Diagnostic Monitor Accuracy

The following characteristics are defined over recommended operating conditions.

Table 5.1 Digital Diagnostic Monitor Accuracy

Parameter	Accuracy	Unit
Internally Measured Transceiver Temperature	+/-3	deg.C
Internally Measured Transceiver Supply Voltage	+/-3	%
Measured Tx Bias Current	+/-10	%
Measured Tx Output Power	+/-2	dB
Measured Rx Received Average Optical Power	+/-2	dB

6.Pin Assignment and Pin Description

SFP transceiver pad layout, host PCB SFP pinout, and PIN descriptions are as follows:

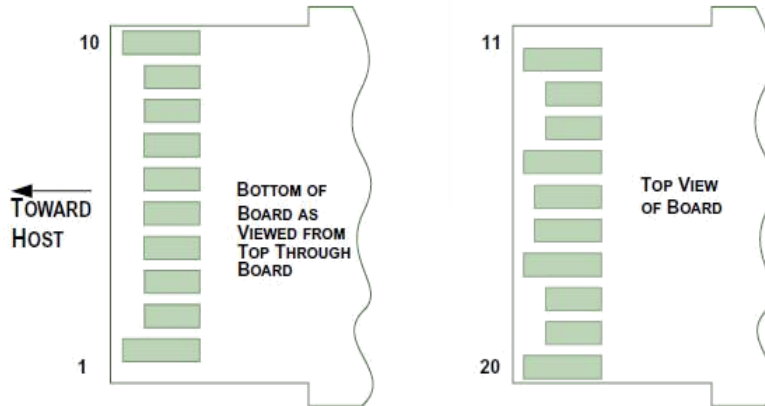


Figure 6.1 SFP Transceiver Electrical Pad layout

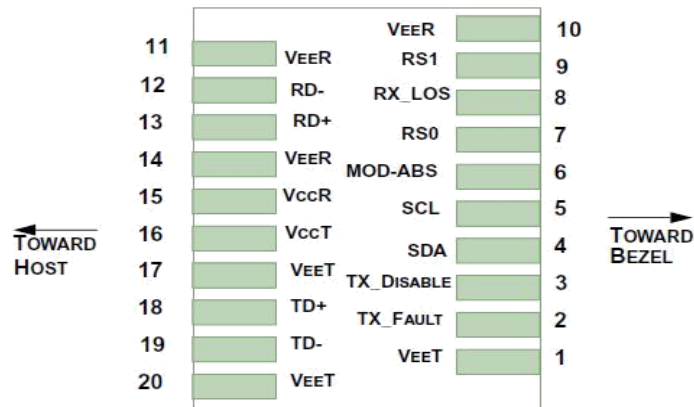


Figure 6.2 Host PCB SFP Pinout

Table 6.1 Pin Description

Pin	Name	Logic	Description
1	VeeT ^[1]		Module Transmitter Ground
2	Tx_Fault ^[2]	LVTTTL-O	Module Transmitter Fault
3	Tx_Disable ^[3]	LVTTTL-I	Transmitter Disable, Turns off transmitter laser
4	SDA	LVTTTL-I/O	2 Wire Serial Interface Data Line
5	SCL	LVTTTL-I/O	2 Wire Serial Interface Clock Line
6	MOD_ABS ^[2]		Module Absent, connected to VeeT or VeeR
7	RS0	LVTTTL-I	Rate Select 0
8	RX_LOS ^[2]	LVTTTL-O	Receiver Loss of Signal Indication
9	RS1	LVTTTL-I	Rate Select 1
10	VeeR ^[1]		Module Receiver Ground
11	VeeR ^[1]		Module Receiver Ground
12	RD-	CML-O	Receiver Inverted Data Output
13	RD+	CML-O	Receiver Non-Inverted Data Output
14	VeeR ^[1]		Module Receiver Ground
15	VccR		Module Receiver 3.3V Supply
16	VccT		Module Transmitter 3.3V Supply
17	VeeT ^[1]		Module Transmitter Ground
18	TD+	CML-I	Transmitter Non-Inverted Data Input
19	TD-	CML-I	Transmitter Inverted Data Input
20	VeeT ^[1]		Module Transmitter Ground

Notes:

1. Module ground pins are isolated from the module case and chassis ground within the module.
2. Shall be pulled up with 4.7k to 10k ohm to a voltage between 3.15V and 3.45V on the host board.
3. Pulled up with 4.7k to 10k ohm to VccT inside the module.

7. Package Dimensions

Figure 7.1 shows the package dimensions of the module. The module is designed to be compliant with SFF-8432.

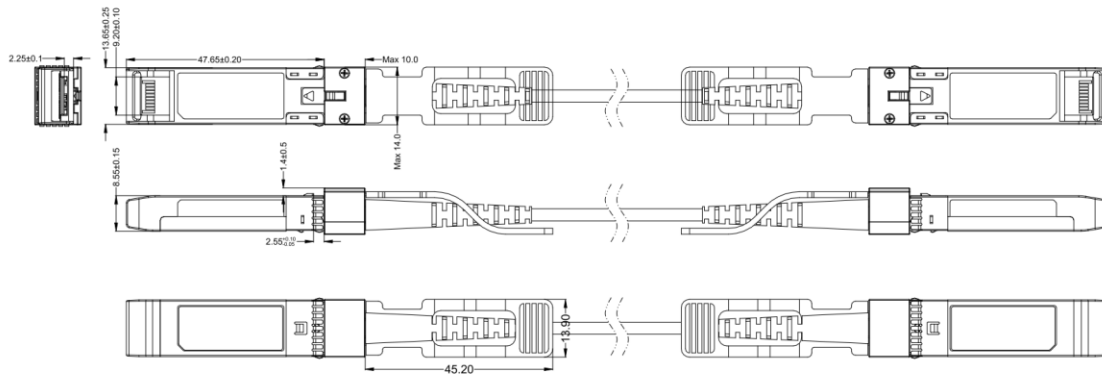


Figure 7.1 Package Dimensions

8. Laser safety and Electromagnetic Compatibility

8.1 Laser safety

The transceiver uses a semiconductor laser system that is classified as Class 1 laser products per the Laser Safety requirements of FDA/CDRH, 21 CFR1040. These products have also been tested and certified as Class 1 laser products per IEC 60825-1:2014 and International standards.

8.2 Electromagnetic Compatibility

EMI (Emission)

The transceiver is designed to meet FCC 47 CFR FCC Part 15 Subpart B limits for emissions and noise immunity per EN 55032:2015 specifications.

RF Immunity

The transceiver has an immunity to operate when tested in accordance with IEC 61000-4-3 (80- 1000MHz, Test Level 3) and GR-1089.

8.3 ESD Compatibility

The transceiver has an immunity against direct and indirect ESD when tested in accordance with IEC 61000-4-2.

9. Ordering Information

Part Number	Temperature Range	Distance	Fiber Type	E/O	O/E
AOC-SFP28-25G-01	0 to 70°C	1m	MMF	VCSEL 850nm	PIN
AOC-SFP28-25G-03	0 to 70°C	3m	MMF	VCSEL 850nm	PIN
AOC-SFP28-25G-10	0 to 70°C	10m	MMF	VCSEL 850nm	PIN
AOC-SFP28-25G-30	0 to 70°C	30m	MMF	VCSEL 850nm	PIN
AOC-SFP28-25G-xx	0 to 70°C	xxM (Up to 300M)	MMF	VCSEL 850nm	PIN