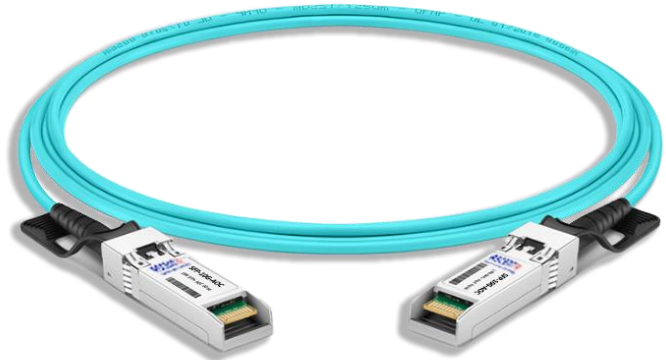


10G SFP+ Active Optical Cable

SFP+ Cable Series



- **Up to 10.3125Gbps Data Links**
- **Maximum link length of 150m on OM3 MMF**
- **Hot-pluggable SFP+ footprint**
- **Power consumption < 1W**
- **Support Digital Diagnostic Monitor interface**
- **+3.3V Single power supply**
- **RoHS compliant**

Ascent's SFP+ Active Optical Cable (AOC) assemblies use active circuits to support longer distances than standard Passive or Active SFP+ Copper Cables. They are designed for high speed, short range data link via optical fiber wire. SFP+ AOC cables provide high performance

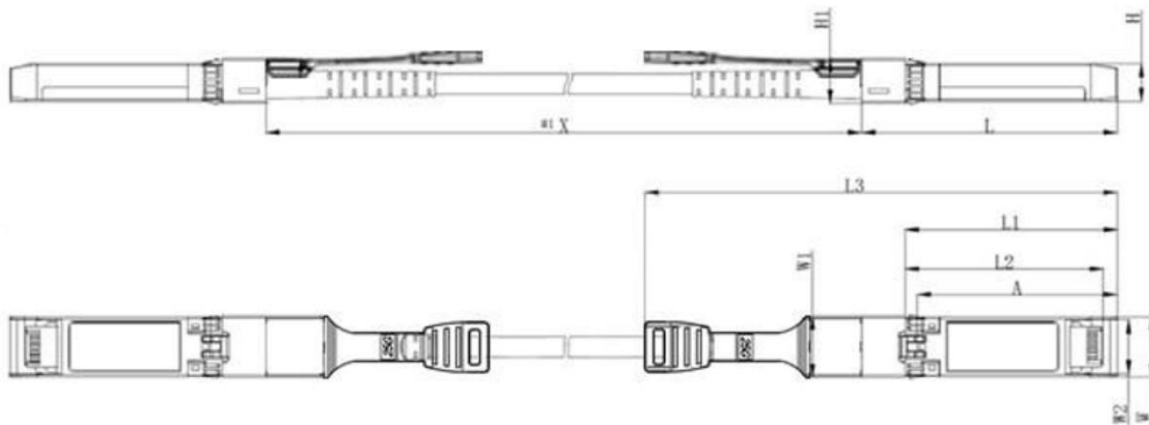
Enhanced Small Form Factor Pluggable (SFP+) interface and it is a cost effective solution for Data Center/ storage and data application.

The Active Optical Cables (AOC) can be used as an alternative solution to SFP+ passive and active copper cables, while providing improved signal integrity, longer distances, superior electromagnetic immunity and better bit error rate performance.

Key Features

- Up to 10.3125Gbps Data Links
- 850nm VCSEL laser transmitter and PIN/TIA receiver
- Maximum link length of 150m on OM3 MMF
- Hot-pluggable SFP+ footprint
- Power consumption less than 1W
- RoHS compliant and lead-free
- Support Digital Diagnostic Monitor interface
- +3.3V Single power supply
- Commercial operating temperature: 0°C to +70°C

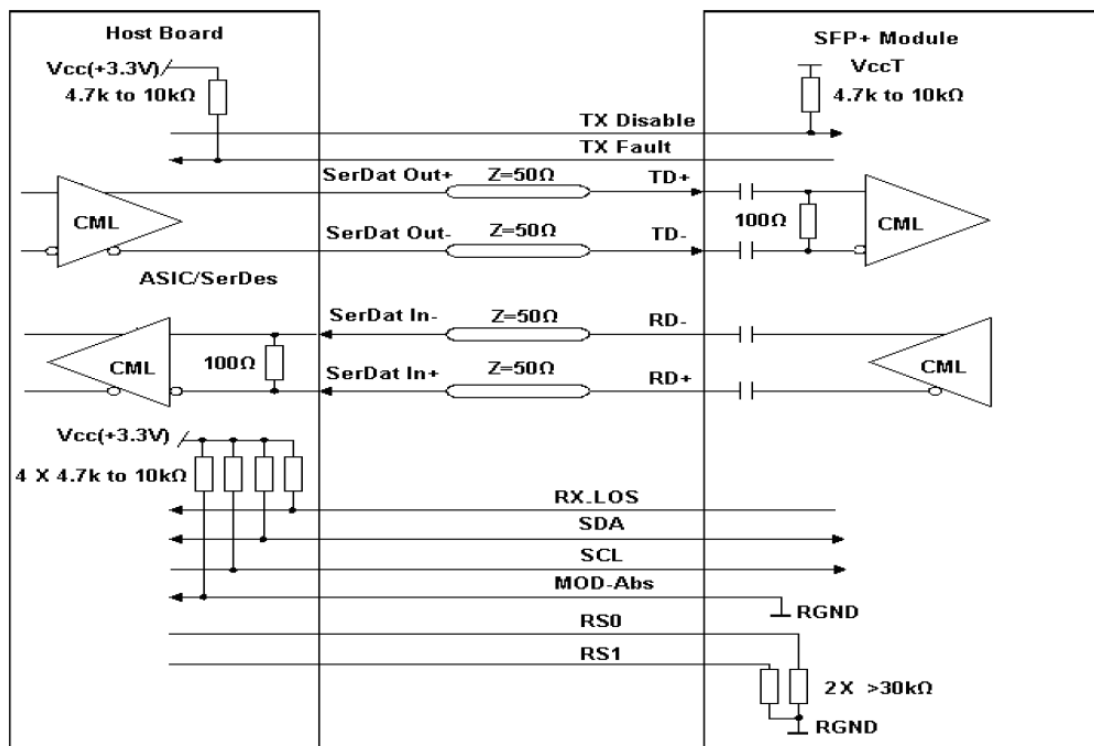
Outline Diagram



Unit: mm

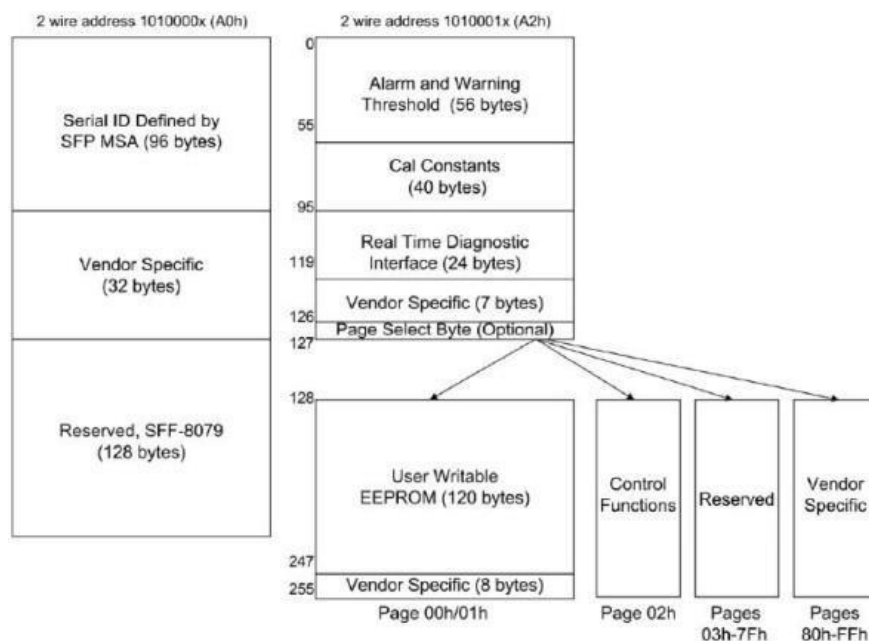
	L	L1	L2	L3	W	W1	W2	H	H1	A
MAX	57.6	47.7	44.55	92.5	13.8	14.0	12.3	8.7	10.3	45.25
Typical	57.4	47.5	44.35	91.5	13.55	13.8	12.1	8.5	10.1	45
MIN	57.2	47.3	44.15	90.5	13.3	13.6	11.9	8.4	9.9	44.65

Commended Interface Circuit



Digital Diagnostic Functions

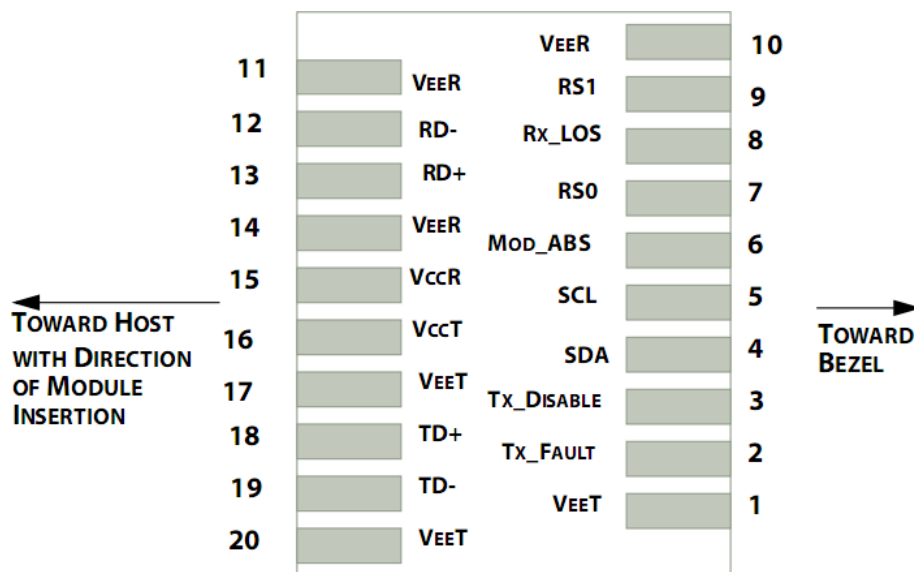
Digital Diagnostic Memory Map:



Digital Diagnostic Monitoring Information:

Parameter	Unit	Accuracy
Case Temperature	°C	±3
Supply Voltage	V	±3%
Tx Bias Current	mA	±10%
Tx Optical Power	dB	±3
Rx Optical Power	dB	±3

Pin Assignment



Pin	Symbol	Description	Ref
1	V _{EET}	Transmitter Ground (Common with Receiver Ground)	1
2	T _{FAULT}	Transmitter Fault.	2
3	T _{DIS}	Transmitter Disable. Laser output disabled on high or open.	3
4	SDA	2-wire Serial Interface Data Line	4
5	SCL	2-wire Serial Interface Clock Line	4
6	MOD_ABS	Module Absent. Grounded within the module	4
7	RS0	No connection required	
8	LOS	Loss of Signal indication. Logic "0" indicates normal operation.	5
9	RS1	No connection required	
10	V _{EER}	Receiver Ground (Common with Transmitter Ground)	1
11	V _{EER}	Receiver Ground (Common with Transmitter Ground)	1
12	RD-	Receiver Inverted DATA out. AC Coupled	
13	RD+	Receiver Non-inverted DATA out. AC Coupled	
14	V _{EER}	Receiver Ground (Common with Transmitter Ground)	1
15	V _{CCR}	Receiver Power Supply	
16	V _{CCT}	Transmitter Power Supply	
17	V _{EET}	Transmitter Ground (Common with Receiver Ground)	1
18	TD+	Transmitter Non-Inverted DATA in. AC Coupled.	
19	TD-	Transmitter Inverted DATA in. AC Coupled.	
20	V _{EET}	Transmitter Ground (Common with Receiver Ground)	1

Notes:

1. Circuit ground is internally isolated from chassis ground.
2. T_{FAULT} is an open collector/drain output, which is pulled up with a $4.7\text{k}\Omega - 10\text{k}\Omega$ resistor on the host board, but is grounded inside the SFP+ cable plug.
3. Laser output disabled on $\text{TDIS} > 2.0\text{V}$ or open, enabled on $\text{TDIS} < 0.8\text{V}$.
4. Should be pulled up with $4.7\text{k}\Omega - 10\text{k}\Omega$ on host board to a voltage between 2.0V and 3.6V . MOD_ABS pulls line low to indicate module is plugged in.
5. LOS is open collector output. Should be pulled up with $4.7\text{k}\Omega - 10\text{k}\Omega$ on host board to a voltage between 2.0V and 3.6V . Logic 0 indicates normal operation; logic 1 indicates loss of signal.

Specifications

Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ	Max.	Unit	Ref
Maximum Supply Voltage	V _{CC}	-0.5		3.6	V	
Storage Temperature	T _S	-40		85	°C	1
Case Operating Temperature	T _{OP}	0		70	°C	
Relative Humidity	RH	0		85	%	2

Notes:

- Limited by the fiber cable jacket, not the active ends.
- Non-condensing.

Electrical Characteristics (T_{OP} = 0 to 70°C, V_{CC} = 3.3 ± 5% Volts)

Parameter	Symbol	Min	Typ	Max	Unit	Ref
Supply Voltage	V _{CC}	3.15		3.45	V	
Supply Current	I _{CC}			300	mA	
Transmitter						
Input Differential Impedance	R _{in}		100		Ω	1
Differential Data Input Wwing	V _{in, pp}	200		1000	mV	
Transmit Disable Voltage	VD	2		V _{CC}	V	
Transmit Enable Voltage	VEN	V _{ee}		V _{ee} +0.8	V	
Receiver						
Differential Data Output Swing	V _{out, pp}	200		100	mV	2
LOS Fault	VLOS_fault	2		V _{CC} HOST	V	3
LOS Normal	VLOS_norm	V _{ee}		V _{ee} +0.8	V	3
Power Supply Noise Tolerance	VCCT/VCCR	Per SFF-8431 Rev 4.1	mVpp	4		

Notes:

- Connected directly to TX data input pins.AC coupling from pins into laser driver IC.
- Into 100Ω differential termination
- 20-80%.Measured with Module Compliance Test Board and OMA test pattern. Use of four 1's and four 0's in sequence in the PRBS^9 is an acceptable alternative. SFF-8431 Rev 4.1
- LOS is an open collector output. Should be pulled up with 4.7kΩ – 10kΩ on the host board. Normal operation is logic 0; loss of signal is logic 1. Maximum pull-up voltage is 5.5V
- Testing methodology per SFF-8431. Rev 4.1

Ordering Information

Product Name	Product Description
SFPP-AT-AOC-001	10G SFP+ Active Optical Cable 1m
SFPP-AT-AOC-003	10G SFP+ Active Optical Cable 3m
SFPP-AT-AOC-005	10G SFP+ Active Optical Cable 5m
SFPP-AT-AOC-007	10G SFP+ Active Optical Cable 7m
SFPP-AT-AOC-010	10G SFP+ Active Optical Cable 10m
SFPP-AT-AOC-015	10G SFP+ Active Optical Cable 15m
SFPP-AT-AOC-020	10G SFP+ Active Optical Cable 20m
SFPP-AT-AOC-025	10G SFP+ Active Optical Cable 25m
SFPP-AT-AOC-030	10G SFP+ Active Optical Cable 30m
SFPP-AT-AOC-050	10G SFP+ Active Optical Cable 50m
SFPP-AT-AOC-100	10G SFP+ Active Optical Cable 100m

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