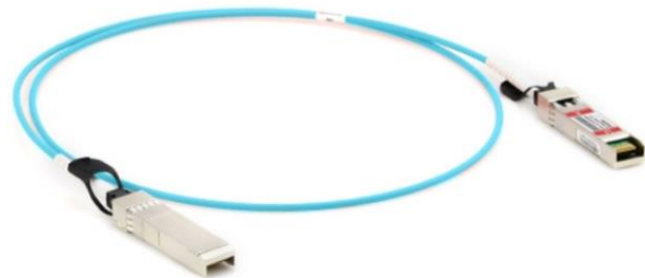


## 25 Gb/s SFP28 Active Optical Cable DDM

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### SFP28 Series



- Up to 25.7813 Gbps Data Links
- 850 nm VCSEL laser transmitter
- PIN/TIA receiver
- Maximum link length of 100m on OM3 MMF
- Hot-pluggable SFP+ footprint
- Low power consumption
- RoHS compliant and lead-free
- Supports Digital Diagnostic Monitor interface
- +3.3V Single power supply
- RoHS compliant

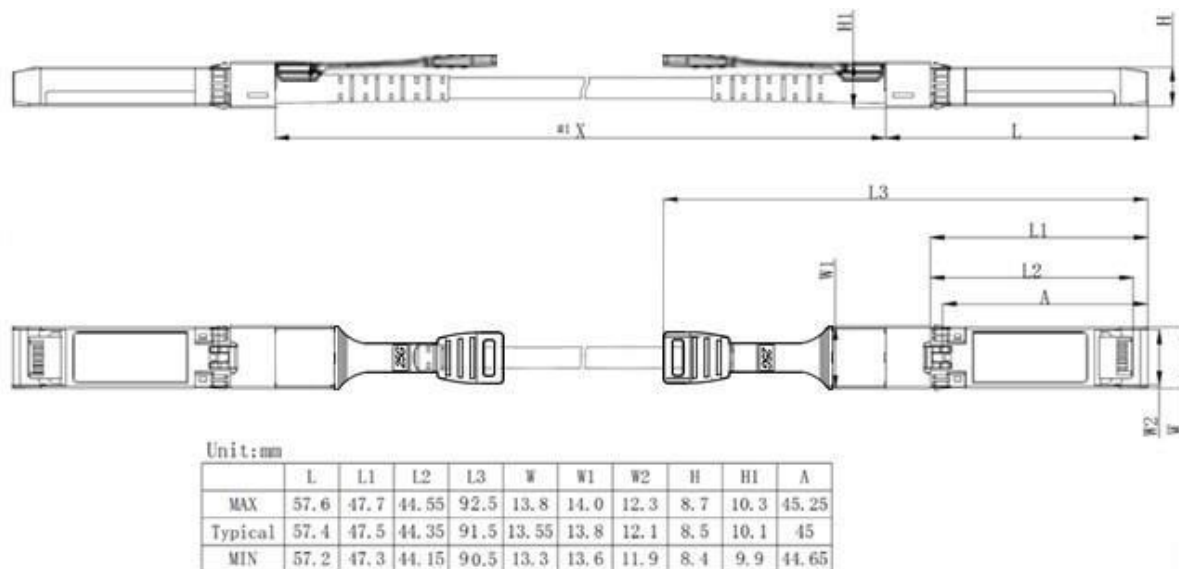
Ascent's SFP28 active optical cable assembly features provides data transmission channels at speeds up to 25.78 Gbps, and 25G Ethernet requirements. It is available in a broad range of wire gages and wire lengths. This 25G cable assembly is hot-pluggable and features low power consumption. It is suitable for 25GBASE-SR Ethernet applications, and is compliant with SFP+ MSA, SFF-8431 and SFF-8432.

Designed for applications in the data center, networking and telecommunications markets that require a high speed, reliable cable assembly, this next generation product shares the same mating interface with QSFP+ form factor, making it backward compatible with existing QSFP ports. QSFP28 can be used with current 10G and 14G applications with substantial signal integrity margin.

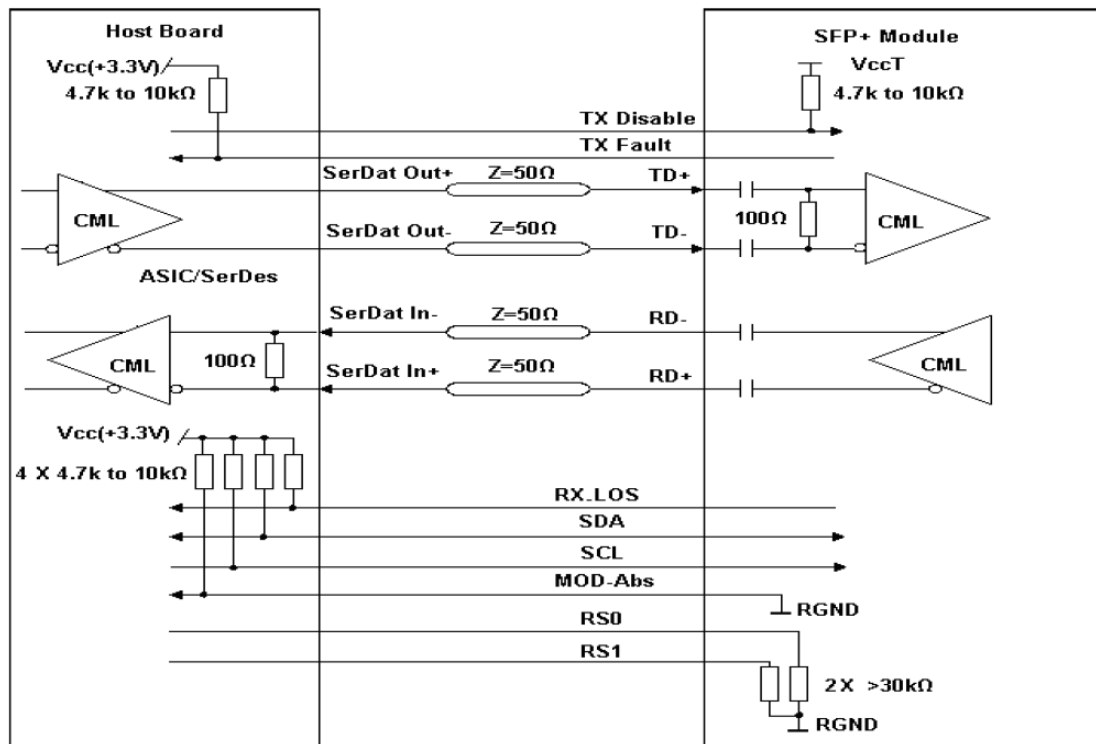
## Key Features

- Up to 25.7813 Gbps Data Links
- 850 nm VCSEL laser transmitter and PIN/TIA receiver
- Maximum link length of 100m on OM3 MMF
- Hot-pluggable SFP+ footprint
- Power consumption less than 1W
- RoHS compliant and lead-free
- Supports Digital Diagnostic Monitor interface
- +3.3V Single power supply
- Case operating temperature Commercial: 0°C to +70°C
- Compliant with SFF-8432
- RoHS compliant

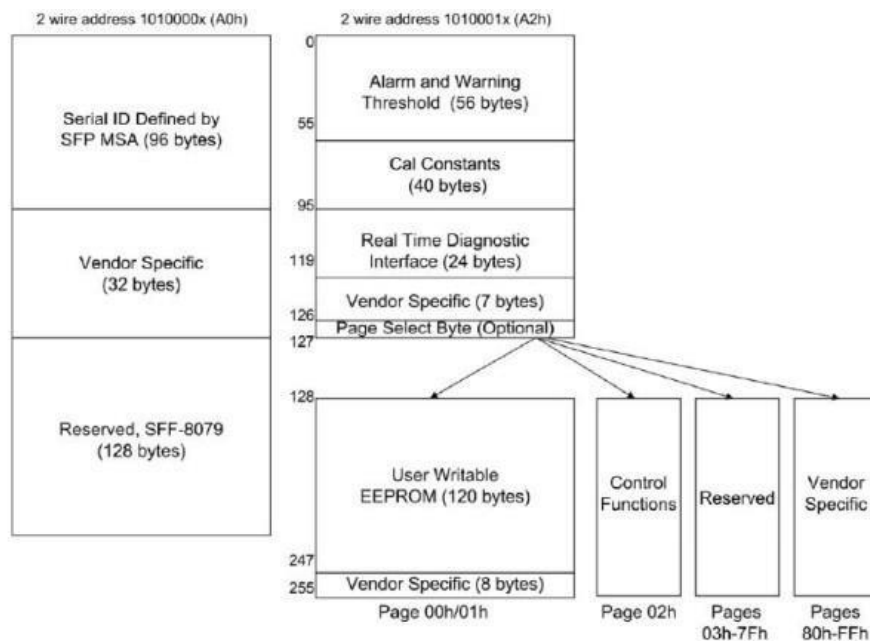
## Outline Diagram



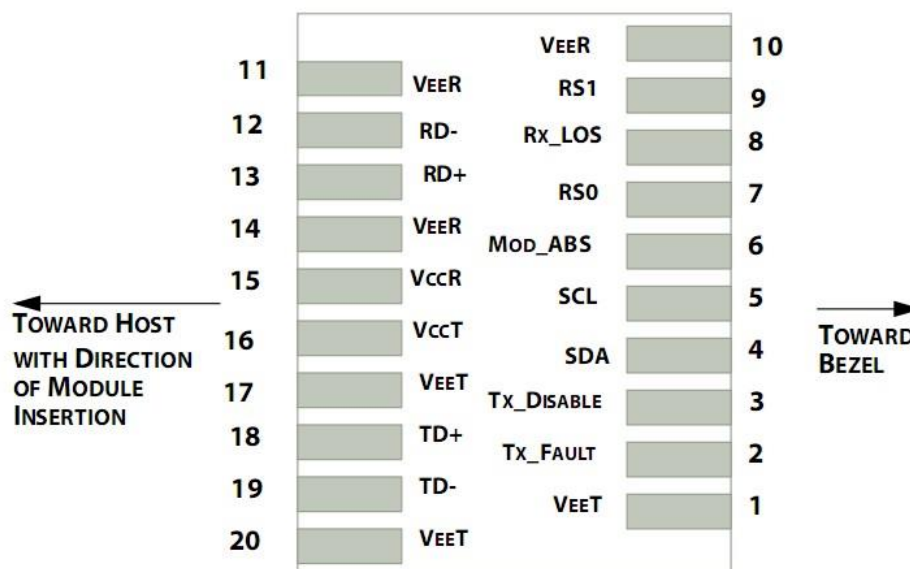
## Recommended Interface Circuit



## Digital Diagnostic Memory Map



## Pin Assignment



Pin	Symbol	Name/Description	Note
1	V <sub>EET</sub>	Transmitter Ground (Common with Receiver Ground)	1
2	T <sub>FAULT</sub>	Transmitter Fault.	2
3	T <sub>DIS</sub>	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 <sub>EER</sub>	Receiver Ground (Common with Transmitter Ground)	1
11	V <sub>EER</sub>	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 <sub>EER</sub>	Receiver Ground (Common with Transmitter Ground)	1
15	V <sub>CCR</sub>	Receiver Power Supply	
16	V <sub>CCT</sub>	Transmitter Power Supply	
17	V <sub>EET</sub>	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 <sub>EET</sub>	Transmitter Ground (Common with Receiver Ground)	1

### Notes:

1. Circuit ground is internally isolated from chassis ground.
2. T<sub>FAULT</sub> is an open collector/drain output, which is pulled up with a 4.7 kΩ to 10 kΩ resistor on the host board, but is grounded inside the SFP+ cable plug.

3. Laser output disabled on  $T_{DIS} > 2.0$  V or open, enabled on  $T_{DIS} < 0.8$  V.
4. Should be pulled up with 4.7 k $\Omega$  to 10 k $\Omega$  on host board to a voltage between 2.0 V and 3.6 V. MOD\_ABS pulls line low to indicate module is plugged in.
5. LOS is open collector output. Should be pulled up with 4.7 k $\Omega$  to 10 k $\Omega$  on host board to a voltage between 2.0 V and 3.6 V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.

## Specifications

### Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Maximum Supply Voltage	V <sub>CC</sub>	-0.5		3.6	V	
Storage Temperature	T <sub>S</sub>	-40		85	°C	1
Case Operating Temperature	T <sub>OP</sub>	0		70	°C	
Relative Humidity	RH	0		85	%	2

#### Notes:

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

### Electrical Characteristics (TOP = 0 to 70°C, VCC = 3.3 $\pm$ 5% Volts)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Supply Voltage	V <sub>CC</sub>	3.15	3.45		V	
Supply Current	I <sub>CC</sub>		300		mA	
<b>Transmitter</b>						
Input differential impedance	R <sub>in</sub>		100		$\Omega$	1
Differential data input swing	V <sub>in,pp</sub>	200	1000		mV	
Transmit Disable Voltage	V <sub>D</sub>	2	V <sub>CC</sub>		V	
Transmit Enable Voltage	V <sub>EN</sub>	V <sub>EE</sub>	V <sub>EE</sub> +0.8		V	
<b>Receiver</b>						
Differential data output swing	V <sub>out,pp</sub>	200	100		mV	2
LOS Fault	V <sub>LOS_fault</sub>	2	V <sub>CC</sub> HOST		V	3
LOS Normal	V <sub>LOS_norm</sub>	V <sub>EE</sub>	V <sub>EE</sub> +0.8		V	3
Power Supply Noise Tolerance	V <sub>CC1</sub> /V <sub>CC2</sub>	Per SFF-8431 Rev 4.1			mVpp	4

#### Notes:

1. Connected directly to TX data input pins.AC coupling from pins into laser driver IC.
2. Into 100  $\Omega$  differential termination.
3. 20 % to 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<sup>9</sup> is an acceptable alternative. SFF-8431 Rev 4.1
4. LOS is an open collector output. Should be pulled up with 4.7 k $\Omega$  to 10 k $\Omega$  on the host board. Normal operation is logic 0; loss of signal is logic 1. Maximum pull-up voltage is 5.5 V.
5. Testing methodology per SFF-8431. Rev 4.1

## Ordering Information

Product Name	Product Description
SFP28-25-AOC-001	25G SFP28 Active Optical Cable 1 m
SFP28-25-AOC-003	25G SFP28 Active Optical Cable 3 m
SFP28-25-AOC-005	25G SFP28 Active Optical Cable 5 m
SFP28-25-AOC-008	25G SFP28 Active Optical Cable 8 m
SFP28-25-AOC-010	25G SFP28 Active Optical Cable 10 m
SFP28-25-AOC-015	25G SFP28 Active Optical Cable 15 m
SFP28-25-AOC-030	25G SFP28 Active Optical Cable 30 m

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