10G SFP+ AOC

Overview



The Wave2Wave 10G SFP+ Active Optical Cable (AOC) series delivers reliable, high-speed connectivity for data centers, cloud networks, and HPC environments. Designed as a lightweight, low-power alternative to copper DACs, these AOCs improve cable flexibility, thermal efficiency, and reach in dense network deployments.

Compliant with IEEE 802.3ae, SFF-8431, and SFF-8472 standards, each cable integrates 850nm VCSEL technology to support full-duplex 10.3125Gbps performance. Digital diagnostics (DDM) via I^2C enable real-time monitoring of temperature, voltage, and optical power for proactive system reliability.

Hot-pluggable and optimized for transmission distances up to 300m, Wave2Wave SFP+ AOCs are ideal for switch-to-server and rack-to-rack interconnects where bandwidth, efficiency, and clean cable management are essential.

Features and Benefits

- Supports up to 11.1Gbps per channel.
- Up to 300 meters transmission over multimode fiber.
- High-reliability 850nm VCSEL technology.
- Electrical interface compliant with SFF-8431.
- Hot-pluggable SFP+ form factor.
- Single +3.3V power supply.
- Operating case temperature: 0°C to 70°C.
- RoHS compliant.
- Power consumption <1W per cable end.

Applications

- 10G Ethernet links.
- InfiniBand QDR networks.
- Fiber Channel systems.
- Data processing and computing (DPC) interconnects.
- High-density server & switch connectivity.

NOTES:

XX=different cable lengths on Multimode Fiber (MMF)

Ordering Information								
Part Number	Transmitter	Bit Rate	Receiver	BER	Reach	Temp	DDM	RoHS
78-S010-xxM	850nm VCSEL	10.3125Gb/s	PIN	10^{-12}	xxm	0~ 70 ºC	Available	Compliant
78C-S010-xxM	850nm VCSEL	10.3125Gb/s	PIN	10^{-12}	xxm	0~ 70 ºC	Available	Compliant
78A-S010-xxM	850nm VCSEL	10.3125Gb/s	PIN	10^{-12}	xxm	0~ 70 ºC	Available	Compliant
78J-S010-xxM	850nm VCSEL	10.3125Gb/s	PIN	10^{-12}	xxm	0~ 70 ºC	Available	Compliant

NOTES:

1. 77-S010-SR compatible with Generic.
2. 77C-S010-SR compatible with Cisco.
3. 77A-S010-SR compatible with Arista.
4. 77D-S010-SR compatible with Dell.

Absolute Maximum Ratings					
Parameter	Symbol	Min	Max	Unit	Notes
Storage Temperature	Ts	-40	85	ºC	-
Relative Humidity	Rh	5	85	%	-
Supply Voltage	Vcc	-0.5	4.0	V	-

Recommended Operating Conditions					
Parameter	Symbol	Min	Typ	Max	Unit
Operating Case Temperature	Tc	0	25	70	ºC
Power Supply Voltage	Vcc	3.135	3.3	3.465	V
Power Supply Current	Icc	-	-	300	mA
Data Rate	-	-	10.3125	-	Gb/s

Electrical Characteristics						
Parameter	**Symbol**	**Min**	**Typical**	**Max**	**Unit**	**Notes**
Supply Voltage	Vcc	3.135	3.3	3.465	V	-
Supply Current	Icc	-	-	300	mA	-
Transmitter						
Differential Input Impedance	Zin	-	100	-	Ω	1
Differential Input Swing	$V_{IN,P-P}$	180	-	1000	mV	-
Transmit Disable Voltage	V_D	Vcc-1.3	-	Vcc	V	-
Transmit Enable Voltage	V_{EN}	Vee	-	Vee+0.8	V	2
Receiver						
Differential data output swing	$V_{OUT,P-P}$	300	-	850	mV	3
Data output rise time	Tr	30	-	-	ps	4
Data output fall time	Tf	30	-	-	ps	4
LOS Fault	V_{LOS} fault	Vcc-1.3	-	V_{CCHOST}	V	5
LOS Normal	V_{LOS} norm	Vee	-	Vee+0.8	V	5

NOTES:

1. Connected directly to TX data input pins AC coupled thereafter.
2. Or open circuit.
3. Into 100 ohms differential termination.
4. These are unfiltered 20-80% values.
5. Loss Of Signal is LVTTL. Logic 0 indicates normal operation; logic 1 indicates no signal detected.

Pin Description			
Pin	**Name**	**Description**	**Notes**
1	VeeT	Transmitter Ground	1
2	TX Fault	Transmitter Fault (LVTTL-O) - High indicates a fault condition	-
3	TX Disable	Transmitter Disable (LVTTL-I) – High or open disables the transmitter	2
4	SDA	Two wire serial interface Data Line (LVCMOS-I/O) (MOD-DEF2)	3
5	SCL	Two wire serial interface Clock Line (LVCMOS-I/O) (MOD-DEF1)	3
6	MOD_ABS	Module Absent (Output), connected to VeeT or VeeR in the module	3
7	RS0	Rate Select 0 – Not used, Presents high input impedance	-
8	RX_LOS	Receiver Loss of Signal (LVTTL-O)	4
9	RS1	Rate Select 1 – Not used, Presents high input impedance	-
10	VeeR	Receiver Ground	1
11	VeeR	Receiver Ground	1
12	RD-	Inverse Received Data out (CML-O)	-
13	RD+	Received Data out (CML-O)	-
14	VeeR	Receiver Ground	1
15	VccR	Receiver Power - +3.3V	-
16	VccT	Transmitter Power - +3.3 V	-
17	VeeT	Transmitter Ground	1
18	TD+	Transmitter Data In (CML-I)	-
19	TD-	Inverse Transmitter Data In (CML-I)	-
20	VeeT	Transmitter Ground	1

NOTES:

1. The module signal grounds are isolated from the module case.
2. Laser output disabled on TDIS >2.0V or open, enabled on TDIS <0.8V.
3. Should be pulled up with 4.7kΩ- 10kΩ host board to a voltage between 2.0V and 3.6V. MOD_ABS pulls line low to indicate is plugged in.
4. LOS is open collector output. It should be pulled up with 4.7kΩ – 10kΩ on host board to a voltage between 2.0V and 3.6V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.

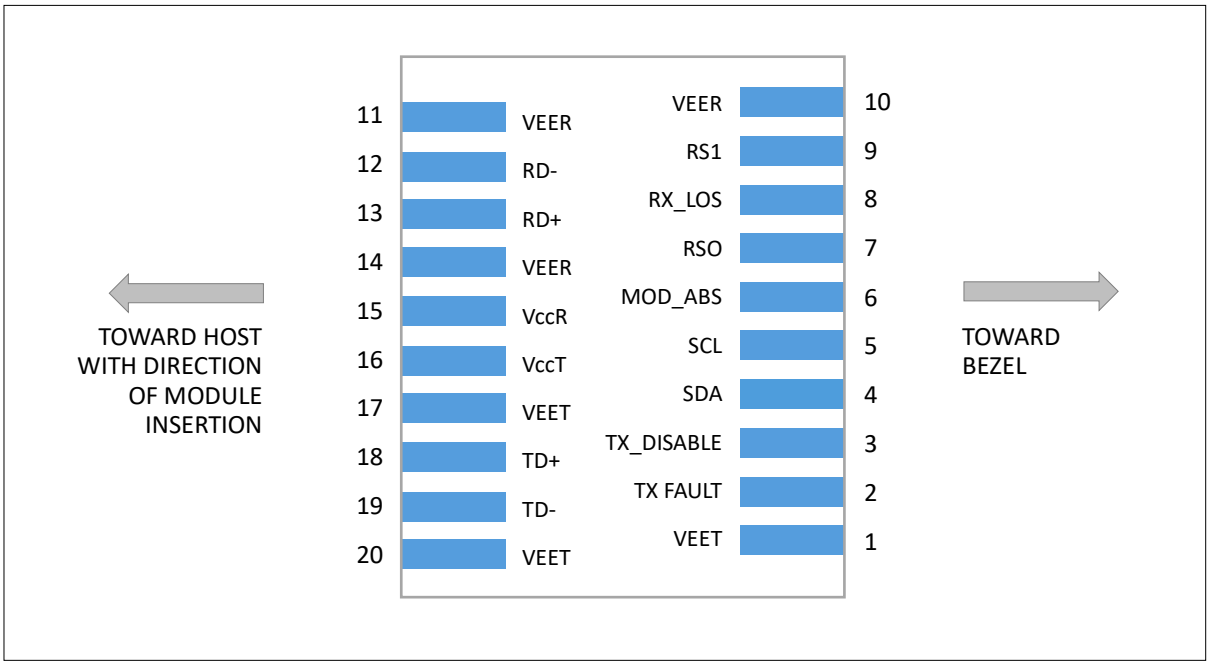


Figure 1. Host PCB SFP+ pad assignment top view