



## 10G SFP+ Active Optical Cables

Optronics® SFP+ 10G Active Optical Cables are direct-attach fibre assemblies with SFP+ connectors. They are suitable for very short distances and offer a cost-effective way to connect within racks and across adjacent racks. The module is a Single-Channel, Pluggable, Fibre-Optic SFP+ for 10 Gigabit Ethernet and Infiniband EDR Applications. These modules are designed to operate over multimode fibre systems using a nominal wavelength of 850nm. The electrical interface uses a 20 contact edge type connector. It has low power scattering and has a rigid force tab for enhanced high-density installations. It is fully tested for compatibility with intended equipment.

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## Features

- Electrical interface compliant to SFF-8431
- 850nm VCSEL laser and PIN photo-detector
- Maximum link length of 82m on OM2 MMF and 300m on OM3 MMF
- Hot Pluggable
- Built-in digital diagnostic functions
- Low Power Dissipation <0.8W per end
- Case operation temperature range: Standard: temperature 0°C to 70°C; Industrial temperature: -40°C to 85°C
- RoHS compliant

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## Applications

- 10GBASE SR Ethernet
- Data Centres
- InfiniBand transmission

## Specifications

### Absolute Maximum Ratings

These values represent the damage threshold of the module. Stress in excess of any of the individual Absolute Maximum Ratings can cause immediate catastrophic damage to the module even if all other parameters are within Recommended Operating Conditions.

Parameters	Symbol	Min.	Max.	Unit
Power Supply Voltage	VCC	-0.5	+3.6	V
Storage Temperature	Tc	-40	+85	°C
Relative Humidity	RH	0	85	%

### Recommended Operating Conditions

Parameter	Symbol	Min	Typical	Max	Unit
Supply Voltage	VCC	3.15	3.3	3.45	V
Operating Case Temperature (Standard)	Tca	0	-	70	°C
Operating Case Temperature (Industrial)	Tca	-40	-	85	°C
Data Rate	DR	-	10.3125	-	Gbps
Fibre Bend Radius	Rb	3	-	-	cm

Notes:

1. Supply current is shared between VCCTX and VCCR<sub>X</sub>.
2. In-rush is defined as current level above steady state current requirements.

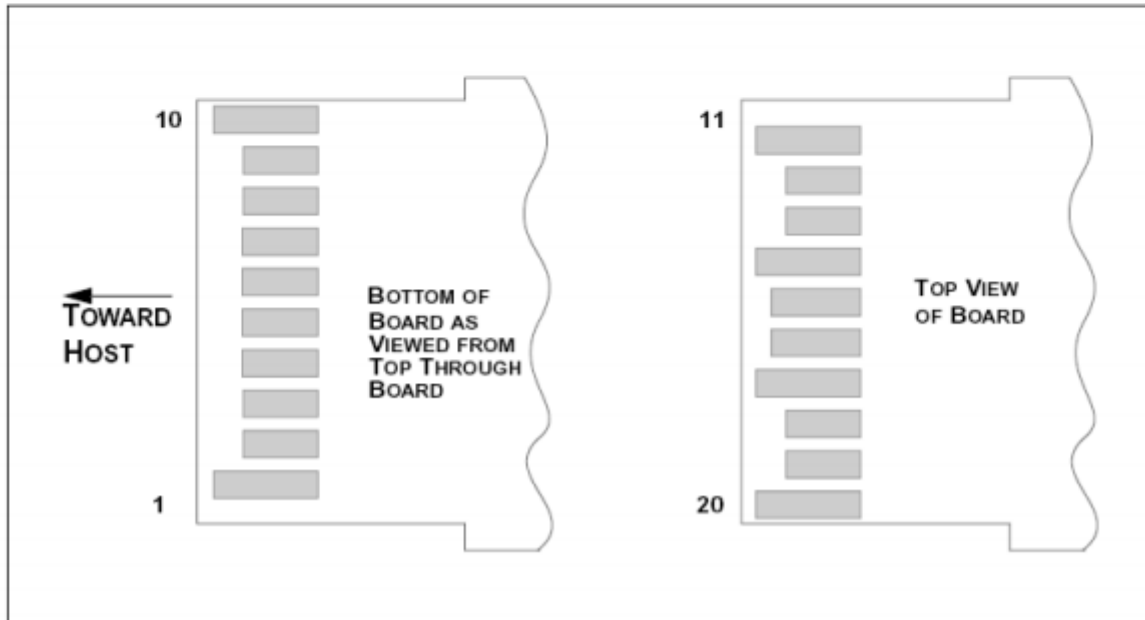
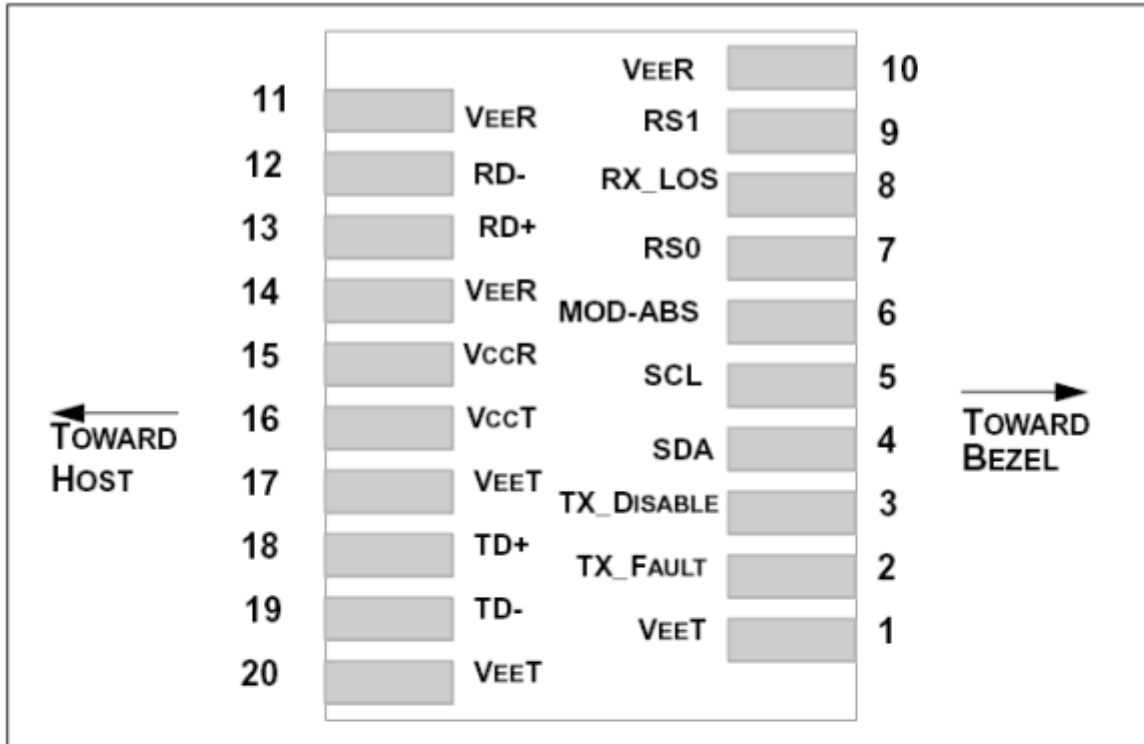
### Transmitter Specifications

Parameter	Symbol	Min	Typical	Max	Unit
Input differential impedance	R <sub>in</sub>	-	100	-	Ω
Differential Data Input Swing	V <sub>in</sub>	150	-	1200	mV
Transmit Disable Voltage	VD	2.0	-	VCC+0.3	V
Transmit Enable Voltage	V <sub>en</sub>	V <sub>ee</sub>	-	V <sub>ee</sub> +0.8	V

### Receiver Specifications

Parameter	Symbol	Min	Typical	Max	Unit
Differential Data Output Swing	V <sub>out</sub>	300	-	700	mV
Bit Error Rate	BER	-	-	10-12	
Output Differential Impedance	R <sub>out</sub>	-	100	-	Ω
Loss of Signal –Asserted	-	2.0	-	VCC+0.3	V
Loss of Signal –Negated	-	V <sub>ee</sub>	-	V <sub>ee</sub> +0.8	V

SFP+ Transceiver Electrical Pad Layout



## Pin definition

Pin	Symbol	Name/Description
1	VEET [1]	Transmitter Ground
2	Tx_FAULT [2]	Transmitter Fault
3	Tx_DIS [3]	Transmitter Disable. Laser output disabled on high or open
4	SDA [2]	2-wire Serial Interface Data Line
5	SCL [2]	2-wire Serial Interface Clock Line
6	MOD_ABS [4]	Module Absent. Grounded within the module
7	RS0 [5]	Rate Select 0
8	RX_LOS [2]	Loss of Signal indication. Logic 0 indicates normal operation
9	RS1 [5]	Rate Select 1
10	VEER [1]	Receiver Ground
11	VEER [1]	Receiver Ground
12	RD-	Receiver Inverted DATA out. AC Coupled
13	RD+	Receiver DATA out. AC Coupled
14	VEER [1]	Receiver Ground
15	VCCR	Receiver Power Supply
16	VCCT	Transmitter Power Supply
17	VEET [1]	Transmitter Ground
18	TD+	Transmitter DATA in. AC Coupled
19	TD-	Transmitter Inverted DATA in. AC Coupled
20	VEET [1]	Transmitter Ground

### Notes:

[1] Module circuit ground is isolated from module chassis ground within the module.

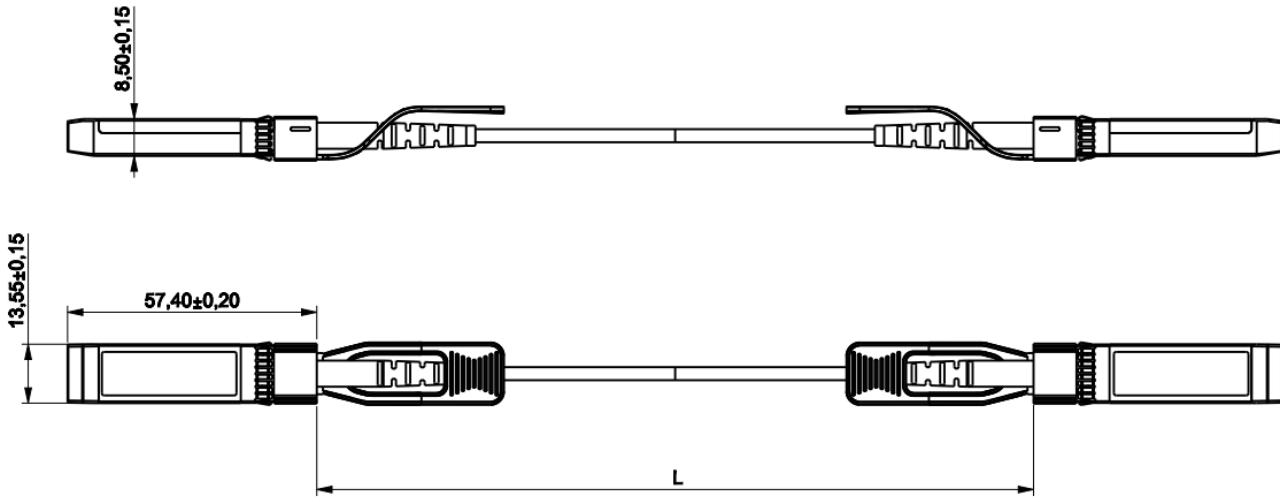
[2] Should be pulled up with 4.7k – 10k ohms on host board to a voltage between 3.15V and 3.45V.

[3] Tx\_Disable is an input contact with a 4.7 kΩ to 10 kΩ pullup to VccT inside the module.

[4] Mod\_ABS is connected to VeeT or VeeR in the SFP+ module. The host may pull this contact up to VCC\_Host with a resistor in the range 4.7 kΩ to 10 kΩ. Mod\_ABS is asserted "High" when the SFP+ module is physically absent from a host slot.

[5] RS0 and RS1 are module inputs and are pulled low to VeeT with > 30 kΩ resistors in the module.

## Mechanical



Unit : mm

AOC product bagging circle size:

L	Disc fiber diameter (mm)	number of circle
0.5m	Based on actual circling	1.5
1m		2.5
1.5m		3.5
2m	110 ≤ Inner diameter, outer diameter ≤ 130	4.5
2.5m	120 ≤ Inner diameter, outer diameter ≤ 140	5.5
3m		6.5
3m < L ≤ 5m	110 ≤ Inner diameter, outer diameter ≤ 160	Not required
5m < L ≤ 7m	110 ≤ Inner diameter, outer diameter ≤ 170	
7m < L ≤ 30m	110 ≤ Inner diameter, outer diameter ≤ 180	
30m < L ≤ 50m	110 ≤ Inner diameter, outer diameter ≤ 210	
50m < L ≤ 100m	110 ≤ Inner diameter, outer diameter ≤ 250	

Length tolerance table:

L	Tolerance (mm)
L ≤ 1 M	+70/-0
1 M < L < 7 M	+100/-0
L ≥ 7 M	+2%L/-0

## Ordering Information

DESCRIPTION	PART NUMBER
Optronics 10G SFP+ Active Optical Cables 0°C ~ +70°C	OSFP-AOC-1010-XXXC
Optronics 10G SFP+ Active Optical Cables -40°C ~ +85°C	OSFP-AOC-1010-XXXT

\*Where XXX is 001~082, 1~82 Length in meters on OM2 MMF  
 XXX is 001~300, 1~300 Length in meters on OM3 MMF