



## 02311PQS-SKY

Huawei® 02311PQS Compatible 10GBase-AOC SFP+ Active Optical Cable (850nm, MMF, 5m)

### Product Description

This is an Huawei® compatible 10GBase-AOC SFP+ to SFP+ active optical cable that operates over active fiber with a maximum reach of 5m. At a wavelength of 850nm, it has been programmed, uniquely serialized, and data-traffic and application tested to ensure it is 100% compliant and functional. This active optical cable is built to comply with MSA (Multi-Source Agreement) standards. We stand behind the quality of our products and proudly offer a limited lifetime warranty.

Skylane's transceivers are RoHS compliant and lead-free.

### Features:

- High Speed/ High Density: Supports up to 10Gbps bi-directional operation
- Reliable VCSEL and PIN photonic devices
- Compliant to SFP MSA Standards
- Excellent High Speed Signal Interface
- Operating Temperature: 0 to 70 Celsius
- I2C Standard Management Interface
- RoHS Compliant and Lead-Free



### Applications:

- 10G Ethernet
- High Performance Computing, Server, and Data Storage

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*For your product safety, please read the following information carefully before any manipulation of the transceiver:*



#### **ESD**

This transceiver is specified as ESD threshold 1kV for SFI pins and 2kV for all others electrical input pins, tested per MIL-STD-883G, Method 3015.4 /JESD22-A114-A (HBM). However, normal ESD precautions are still required during the handling of this module.



#### **LASER SAFETY**

This is a Class1 Laser Product according to IEC 60825-1:2007. This product complies with 21 CFR 1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated (June 24, 2007).

*The optical ports of the module need to be terminated with an optical connector or with a dust plug in order to avoid contamination.*

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### Absolute Maximum Ratings

| Parameter              | Symbol | Min. | Typ. | Max. | Unit | Notes |
|------------------------|--------|------|------|------|------|-------|
| Storage Temperature    | Tstg   | -40  |      | 85   | °C   |       |
| Operating Temperature  | Tc     | 0    | 25   | 70   | °C   |       |
| Relative Humidity      | RH     | 5    |      | 85   | %    |       |
| Maximum Supply Voltage | Vcc    | 0    |      | 3.6  | V    |       |
| Data Rate              |        |      | 10.3 |      | Gbps |       |

### Electrical Characteristics

| Parameter                        | Symbol | Min.  | Typ. | Max.  | Unit | Notes |
|----------------------------------|--------|-------|------|-------|------|-------|
| Supply Voltage                   | Vcc    | 3.135 | 3.3  | 3.465 | V    |       |
| +3.3V Supply Current             | Icc    |       |      | 290   | mA   |       |
| Transmitter Fault (Tx_Fault)     | VOH    | 2.0   |      | Vcc   | V    | 1     |
| Loss of Signal (LOS)             | VOL    | 0     |      | 0.8   | V    | 1     |
| Transmitter Disable (Tx_Disable) | VIH    | 2.0   |      | Vcc   | V    | 2     |
| MOD_DEF1, MOD_DEF2               | VIL    | 0     |      | 0.8   | V    | 2     |
| Clock Rate-I2C                   |        |       |      |       |      | 3     |

#### Notes:

1. For all control input pins: Tx\_Disable.
2. For all status output pins: Rx\_LOS, Tx\_Fault.
3. For the management interface.

## Optical Characteristics

| Parameter                                     | Symbol | Min. | Typ. | Max. | Unit     | Notes |
|-----------------------------------------------|--------|------|------|------|----------|-------|
| <b>Transmitter</b>                            |        |      |      |      |          |       |
| Reference Differential Input Impedance        | ZD     |      | 100  |      | $\Omega$ | 1     |
| Signal Speed                                  |        |      | 10.3 |      | Gbps     | 2     |
| Differential Data Input Swing                 | VIN,pp | 180  |      | 700  | mV       |       |
| <b>Receiver</b>                               |        |      |      |      |          |       |
| Reference Differential Input Impedance        | ZD     |      | 100  |      | $\Omega$ | 1     |
| Signal Speed                                  |        |      | 10.3 |      | Gbps     | 2     |
| Differential Data Output Swing                |        | 150  |      | 850  | mV       |       |
| Differential Data Output Swing When Squelched |        |      |      | 50   | mV       |       |
| Rise/Fall Time (20-80%)                       |        | 24   |      |      | ps       |       |

### Notes:

1. AC coupled inside the AOC module.
2. Tested with PRBS  $2^{31}-1$  and BER: $10^{-12}$ .

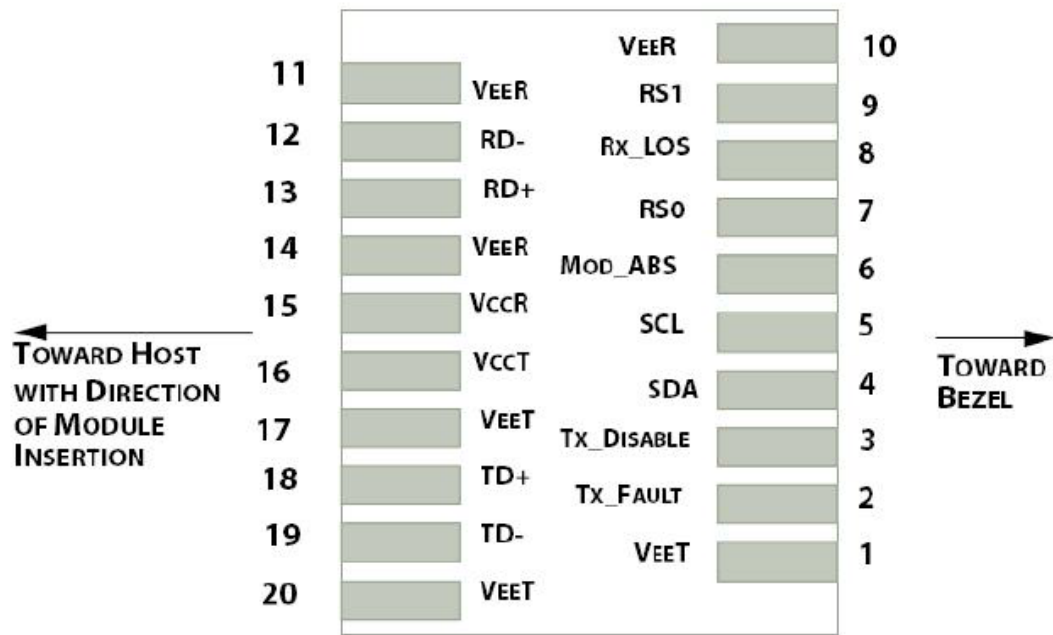
## Pin Descriptions

| Pin | Symbol     | Name/Description                                                          | Notes |
|-----|------------|---------------------------------------------------------------------------|-------|
| 1   | VeeT       | Transmitter Ground.                                                       | 1     |
| 2   | Tx_Fault   | Transmitter Fault (LVTTL-O). "High" indicates a fault condition.          | 2     |
| 3   | Tx_Disable | Transmitter Disable (LVTTL-I). "High" or "open" disables the transmitter. | 3     |
| 4   | SDA        | 2-Wire Serial Interface Data Line. LVCMOS-I/O. MOD_DEF2.                  | 4     |
| 5   | SCL        | 2-Wire Serial Interface Clock Line. LVCMOS-I/O. MOD_DEF1.                 | 4     |
| 6   | MOD_ABS    | Module Absent (Output). Connected to the VeeT or VeeR in the module.      | 5     |
| 7   | RS0        | Rate Select 0. Not Used. Presents high input impedance.                   |       |
| 8   | Rx_LOS     | Receiver Loss of Signal. LVTTL-O.                                         | 2     |
| 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.                                                          |       |
| 15  | VccR       | +3.3V Receiver Power.                                                     |       |
| 16  | VccT       | +3.3V Transmitter Power.                                                  |       |
| 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     |

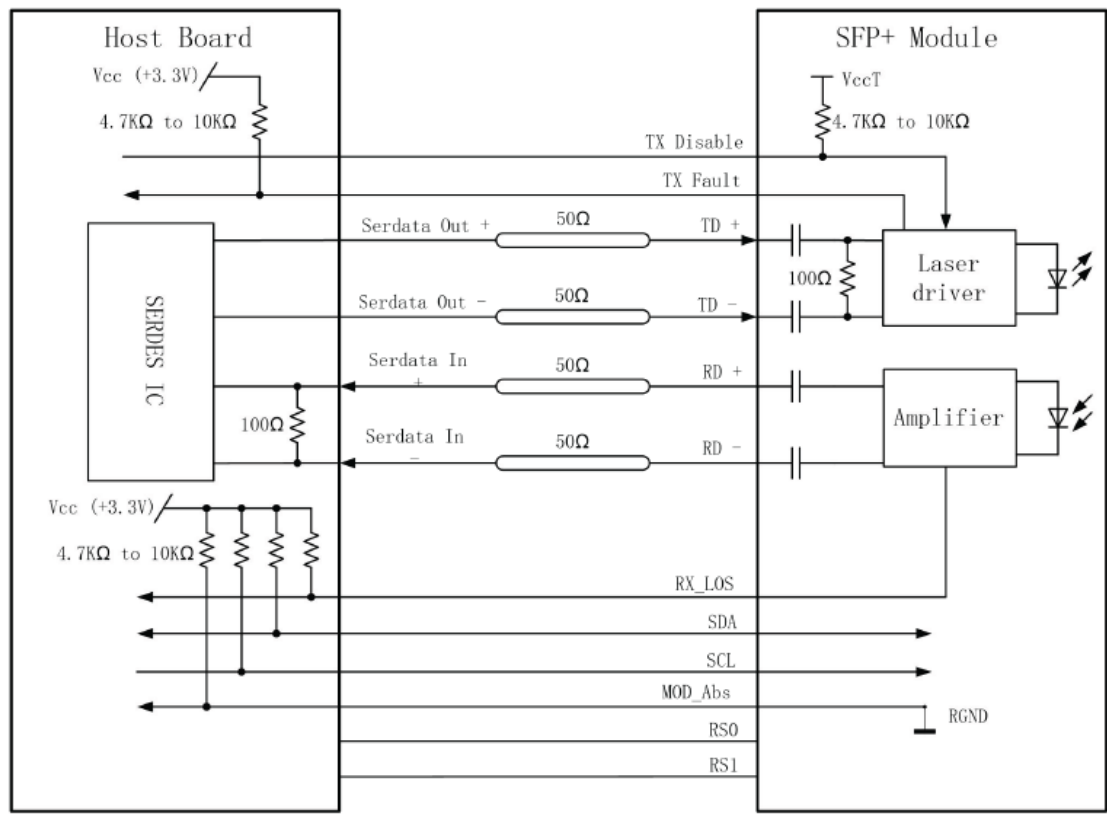
### Notes:

1. The module signal grounds are isolated from the module case.
2. This is an open collector/drain output that, on the host board, requires a 4.7k $\Omega$  to 10k $\Omega$  pull-up resistor to the Host\_Vcc.
3. This input is internally biased "high" with a 4.7k $\Omega$  to 10k $\Omega$  pull-up resistor to the VccT.
4. 2-Wire Serial Interface Clock and Data Lines require an external pull-up resistor dependent on the capacitance load.
5. This is a ground return that, on the host board, requires a 4.7k $\Omega$  to 10k $\Omega$  pull-up resistor to the Host\_Vcc.

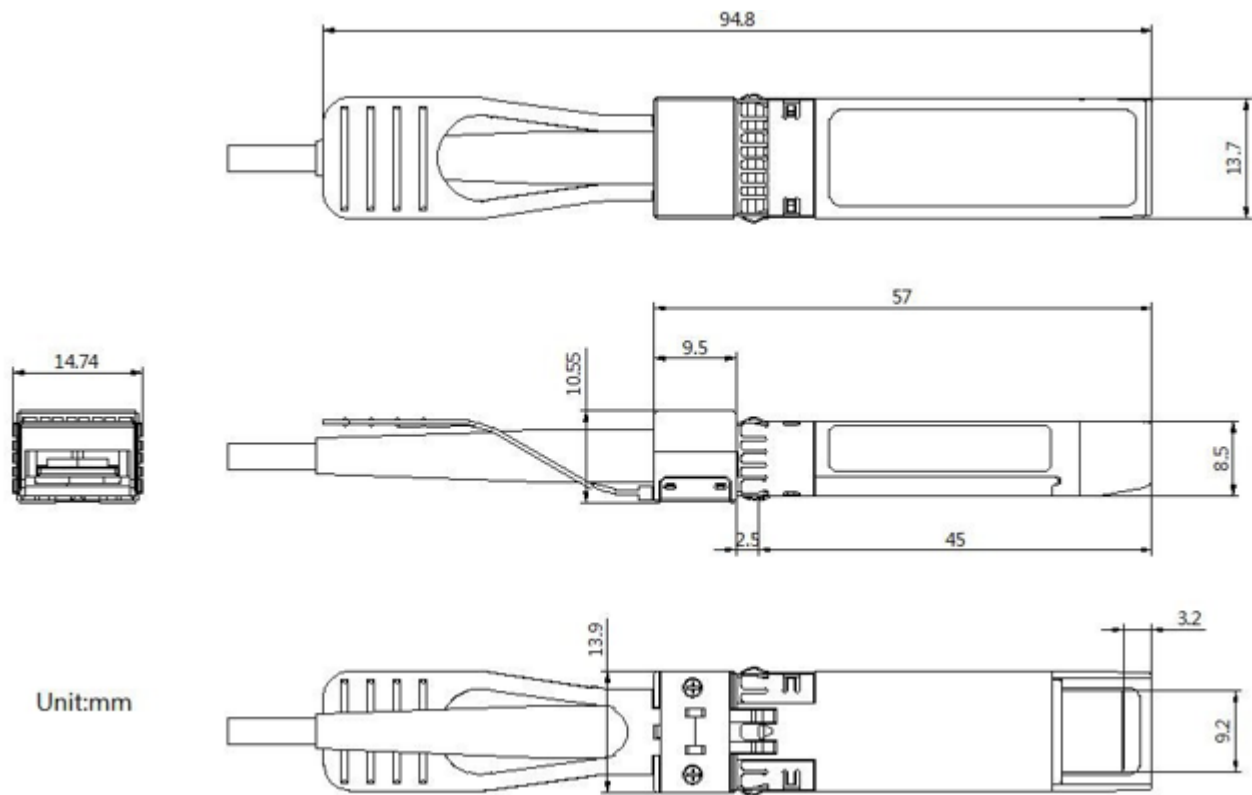
Pin-Out Connectors



Application Interface Circuit



Mechanical Specifications



| Parameter                               | Symbol | Min. | Typ. | Max. | Unit   | Notes |
|-----------------------------------------|--------|------|------|------|--------|-------|
| Module Retention                        |        | 90   |      | 170  | N      |       |
| Module Insertion                        |        | 0    |      | 18   | N      |       |
| Module Extraction                       |        | 0    |      | 25   | N      |       |
| Cable Pull Strength – Apply Load at 0°  |        | 25   |      |      | N      |       |
| Cable Pull Strength – Apply Load at 90° |        | 20   |      |      | N      |       |
| Cable Bending Radius                    |        | 50   |      |      | mm     |       |
| Insertion/Removal Cycles                |        | 50   |      |      | Cycles |       |

# About Skylane Optics

Skylane is a leading provider of transceivers for optical communication.

We offer an extensive portfolio for the enterprise, access, datacenter and metropolitan fiber optical market as well as for smart home applications and home networks.

We cover the European, South American and North American market with a strong partner network and have offices in Belgium, Brazil, Sweden and USA.

Our offerings are characterized by high quality and performance. In combination with our strong technical support, we enable our customers to build cost optimized network solutions.

We offer an extensive range of high-quality products including transceivers (Optical and copper), Active Optical Cable (AOC), Direct Attach Cable (DAC), Mux/Demux, Coding Box.

