



## QDD4-400GB-SR4-BD-AR-SKY

Arista Networks® Compatible 400GBase-BX SR4.2 PAM4 QSFP-DD Transceiver (MMF, 850nm to 902nm, 100m, MPO-12, DOM, CMIS 4.0)

### Product Description

This Arista Networks® compatible QSFP-DD transceiver provides 400GBase-BX SR4.2 throughput up to 100m over multi-mode fiber (MMF) PAM4 using a wavelength of 850nm to 902nm via an MPO-12 connector. This bidirectional unit must be used with another transceiver or network appliance of complementing wavelengths. It can operate at temperatures between 0 and 70C. Our transceiver is built to meet or exceed OEM specifications and is guaranteed to be 100% compatible with Arista Networks®. It has been programmed, uniquely serialized, and tested for data-traffic and application to ensure that it will initialize and perform identically. All of our transceivers comply with Multi-Source Agreement (MSA) standards to provide seamless network integration. Additional product features include Digital Optical Monitoring (DOM) support which allows access to real-time operating parameters. 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:

- 8x50 Gbps MMF optical interface
- 850nm/908nm VCSEL 850nm/908nm PD Array Technology
- Supports 4x100G breakout function
- Multi-mode fiber
- CMIS V4.0 compliance
- MPO-12 connector
- Hot Pluggable
- Commercial Temperature 0 to 70 Celsius
- RoHS Compliant and lead-free
- Excellent ESD Protection



### Applications:

- 400GBase Ethernet
- Access and Enterprise

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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 |
|-----------------------------|--------|------|-------|------|------|-------|
| Maximum Supply Voltage      | Vcc    | -0.5 |       | 3.6  | V    | 1     |
| Storage Temperature         | Tstg   | -40  |       | 85   | °C   | 1     |
| Storage Relative Humidity   | RH     | 0    |       | 95   | %    | 1, 2  |
| Operating Case Temperature  | Tc     | 0    | 25    | 70   | °C   |       |
| Operating Relative Humidity | RH     | 0    |       | 85   | %    | 1, 2  |
| Signaling Speed Per Channel | S      |      | 26.56 |      | GB   |       |

#### Notes:

1. Exceeding the Absolute Maximum Ratings may cause irreversible damage to the device. The device is not intended to be operated under the condition of simultaneous Absolute Maximum Ratings, a condition which may cause irreversible damage to the device.
2. Non-condensing condition.

### Electrical Characteristics

| Parameter                             | Symbol           | Min. | Typ. | Max. | Unit | Notes |
|---------------------------------------|------------------|------|------|------|------|-------|
| Module Supply Voltage                 | Vcc              | 3.14 | 3.3  | 3.46 | V    |       |
| Power Consumption                     | P                |      |      | 12   | W    |       |
| Module Supply Current                 | I <sub>N</sub>   |      | 3500 |      | mA   |       |
| Transmitter                           |                  |      |      |      |      |       |
| Tx_Data Differential Input Voltage    | V <sub>IN</sub>  |      |      | 900  | mV   |       |
| Tx_Data Differential Input Impedance  | Z <sub>IN</sub>  |      | 100  |      | Ω    |       |
| Receiver                              |                  |      |      |      |      |       |
| Rx_Data Differential Output Voltage   | V <sub>OUT</sub> |      |      | 900  | mV   |       |
| Rx_Data Differential Output Impedance | Z <sub>OUT</sub> |      | 100  |      | Ω    |       |

## Optical Characteristics

| Parameter                                               | Symbol          | Min.  | Typ.  | Max.                  | Unit | Notes |
|---------------------------------------------------------|-----------------|-------|-------|-----------------------|------|-------|
| <b>Transmitter</b>                                      |                 |       |       |                       |      |       |
| Signaling Rate Per Lane                                 | SR              |       | 26.56 |                       | GBd  |       |
| Signaling Speed Accuracy                                | SSA             | -100  |       | 100                   | ppm  |       |
| Modulation Format                                       |                 | PAM4  |       |                       |      |       |
| Average Launch Power Per Lane                           | POUT            | -6.5  |       | 4                     | dBm  | 1     |
| Outer Optical Modulation Amplitude Per Lane             | OMOuter         | -4.5  |       | 3                     | dBm  |       |
| Optical Output with Tx Off                              | POFF            |       |       | -30                   | dBm  |       |
| Extinction Ratio                                        | ER              | 3     |       |                       | dB   |       |
| $\lambda 1$ Center Wavelength (Range)                   | $\lambda$       | 840   |       | 868                   | nm   | 2     |
| $\lambda 2$ Center Wavelength (Range)                   | $\lambda$       | 900   |       | 918                   | nm   | 3     |
| RMS Spectral Width ( $\lambda 1$ )                      | $\Delta\lambda$ |       |       | 0.65                  | nm   |       |
| RMS Spectral Width ( $\lambda 2$ )                      | $\Delta\lambda$ |       |       | 0.65                  | nm   |       |
| Transmitter and Dispersion Eye Closure (TDECQ) Per Lane | TDECQ           |       |       | 4.5                   | dB   |       |
| Launch Power in OMOuter Minus TDECQ Per Lane (Minimum)  |                 | -5.9  |       |                       | dB   |       |
| Optical Return Loss Tolerance (Maximum)                 | ORLT            |       |       | 12                    | dB   |       |
| <b>Receiver</b>                                         |                 |       |       |                       |      |       |
| Signaling Rate Per Lane                                 | SR              |       | 26.56 |                       | GBd  |       |
| Signaling Speed Accuracy                                |                 | -100  |       | 100                   | ppm  |       |
| Modulation Format                                       |                 | PAM4  |       |                       |      |       |
| Average Power at Receive Input Per Lane                 | PIN             | -8.5  |       | 4                     | dBm  |       |
| Receive Power (OMOuter) Per Lane (Maximum)              |                 |       |       | 3                     | dBm  |       |
| Receiver Sensitivity (OMOuter) Per Lane                 | S               |       |       | Max. (-6.6, SECQ - 8) | dBm  | 4     |
| $\lambda 1$ Center Wavelength (Range)                   | $\lambda$       | 840   |       | 868                   | nm   | 2     |
| $\lambda 2$ Center Wavelength (Range)                   | $\lambda$       | 900   |       | 918                   | nm   | 3     |
| Rx_LOS - Assert                                         | LOSA            | -24.6 |       |                       | dBm  |       |
| Rx_LOS - De-Assert                                      | LOSD            |       |       | -8.6                  | dBm  |       |
| Rx_LOS - Hysteresis                                     | LOSH            | 0.5   |       |                       | dB   |       |

### Notes:

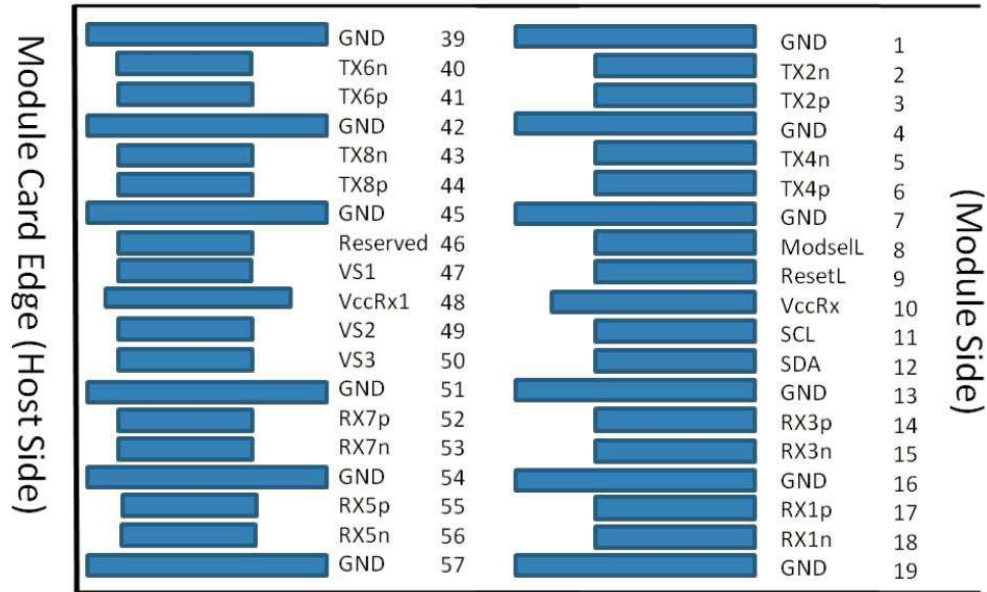
1. Average Optical Output.
2. TxRx pair type TR.
3. TxRx pair type RT.
4. Sensitivity where the BER=2.4E<sup>-4</sup> measured with a PRBS 31Q test pattern @26.56GBaud.

## Pin Descriptions

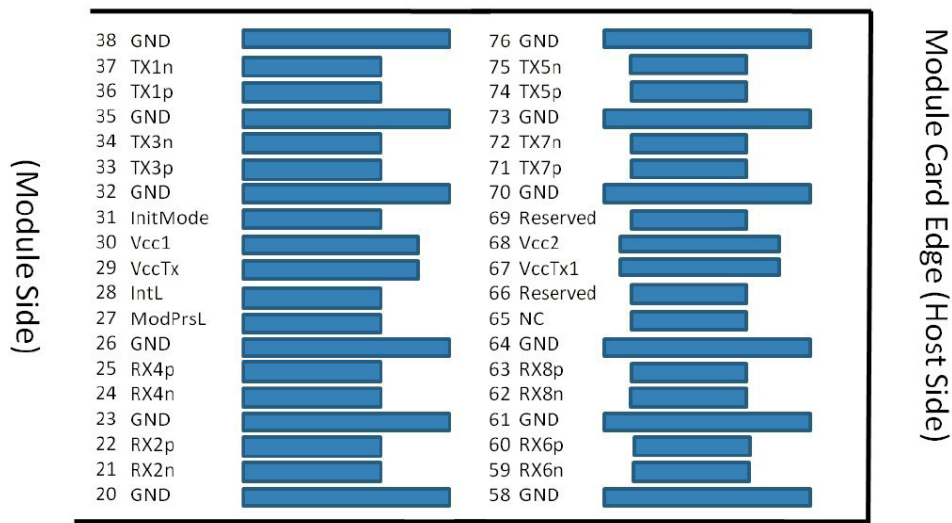
| Pin | Logic       | Symbol   | Name/Descriptions                    |
|-----|-------------|----------|--------------------------------------|
| 1   |             | GND      | Module Ground.                       |
| 2   | CML-I       | Tx2-     | Transmitter Inverted Data Input.     |
| 3   | CML-I       | Tx2+     | Transmitter Non-Inverted Data Input. |
| 4   |             | GND      | Module Ground.                       |
| 5   | CML-I       | Tx4-     | Transmitter Inverted Data Input.     |
| 6   | CML-I       | Tx4+     | Transmitter Non-Inverted Data Input. |
| 7   |             | GND      | Module Ground.                       |
| 8   | LVTTL-I     | ModSelL  | Module Select.                       |
| 9   | LVTTL-I     | ResetL   | Module Reset.                        |
| 10  |             | VccRx    | +3.3V Power Supply Receiver.         |
| 11  | LVC MOS-I/O | SCL      | 2-Wire Serial Interface Clock.       |
| 12  | LVC MOS-I/O | SDA      | 2-Wire Serial Interface Data.        |
| 13  |             | GND      | Module Ground.                       |
| 14  | CML-O       | Rx3+     | Receiver Non-Inverted Data Output.   |
| 15  | CML-O       | Rx3-     | Receiver Inverted Data Output.       |
| 16  |             | GND      | Module Ground.                       |
| 17  | CML-O       | Rx1+     | Receiver Non-Inverted Data Output.   |
| 18  | CML-O       | Rx1-     | Receiver Inverted Data Output.       |
| 19  |             | GND      | Module Ground.                       |
| 20  |             | GND      | Module Ground.                       |
| 21  | CML-O       | Rx2-     | Receiver Inverted Data Output.       |
| 22  | CML-O       | Rx2+     | Receiver Non-Inverted Data Output.   |
| 23  |             | GND      | Module Ground.                       |
| 24  | CML-O       | Rx4-     | Receiver Inverted Data Output.       |
| 25  | CML-O       | Rx4+     | Receiver Non-Inverted Data Output.   |
| 26  |             | GND      | Module Ground.                       |
| 27  | LVTTL-O     | ModPrsL  | Module Present.                      |
| 28  | LVTTL-O     | IntL     | Interrupt.                           |
| 29  |             | VccTx    | +3.3V Power Supply Transmitter.      |
| 30  |             | Vcc1     | +3.3V Power Supply.                  |
| 31  | LVTTL-I     | InitMode | Initialization Mode.                 |
| 32  |             | GND      | Module Ground.                       |
| 33  | CML-I       | Tx3+     | Transmitter Non-Inverted Data Input. |
| 34  | CML-I       | Tx3-     | Transmitter Inverted Data Input.     |
| 35  |             | GND      | Module Ground.                       |
| 36  | CML-I       | Tx1+     | Transmitter Non-Inverted Data Input. |
| 37  | CML-I       | Tx1-     | Transmitter Inverted Data Input.     |
| 38  |             | GND      | Module Ground.                       |
| 39  |             | GND      | Module Ground.                       |

|    |       |          |                                      |
|----|-------|----------|--------------------------------------|
| 40 | CML-I | Tx6-     | Transmitter Inverted Data Input.     |
| 41 | CML-I | Tx6+     | Transmitter Non-Inverted Data Input. |
| 42 |       | GND      | Module Ground.                       |
| 43 | CML-I | Tx8-     | Transmitter Inverted Data Input.     |
| 44 | CML-I | Tx8+     | Transmitter Non-Inverted Data Input. |
| 45 |       | GND      | Module Ground.                       |
| 46 |       | Reserved |                                      |
| 47 |       | VS1      | Module Vendor-Specific 1.            |
| 48 |       | VccRx1   | +3.3V Power Supply.                  |
| 49 |       | VS2      | Module Vendor-Specific 2.            |
| 50 |       | VS3      | Module Vendor-Specific 3.            |
| 51 |       | GND      | Module Ground.                       |
| 52 | CML-O | Rx7+     | Receiver Non-Inverted Data Output.   |
| 53 | CML-O | Rx7-     | Receiver Inverted Data Output.       |
| 54 |       | GND      | Module Ground.                       |
| 55 | CML-O | Rx5+     | Receiver Non-Inverted Data Output.   |
| 56 | CML-O | Rx5-     | Receiver Inverted Data Output.       |
| 57 |       | GND      | Module Ground.                       |
| 58 |       | GND      | Module Ground.                       |
| 59 | CML-O | Rx6-     | Receiver Inverted Data Output.       |
| 60 | CML-O | Rx6+     | Receiver Non-Inverted Data Output.   |
| 61 |       | GND      | Module Ground.                       |
| 62 | CML-O | Rx8-     | Receiver Inverted Data Output.       |
| 63 | CML-O | Rx8+     | Receiver Non-Inverted Data Output.   |
| 64 |       | GND      | Module Ground.                       |
| 65 |       | NC       | Not Connected.                       |
| 66 |       | Reserved |                                      |
| 67 |       | VccTx1   | +3.3V Power Supply.                  |
| 68 |       | Vcc2     | +3.3V Power Supply.                  |
| 69 |       | Reserved |                                      |
| 70 |       | GND      | Module Ground.                       |
| 71 | CML-I | Tx7+     | Transmitter Non-Inverted Data Input. |
| 72 | CML-I | Tx7-     | Transmitter Inverted Data Input.     |
| 73 |       | GND      | Module Ground.                       |
| 74 | CML-I | Tx5+     | Transmitter Non-Inverted Data Input. |
| 75 | CML-I | Tx5-     | Transmitter Inverted Data Input.     |
| 76 |       | GND      | Module Ground.                       |

Electrical Pin-Out Details

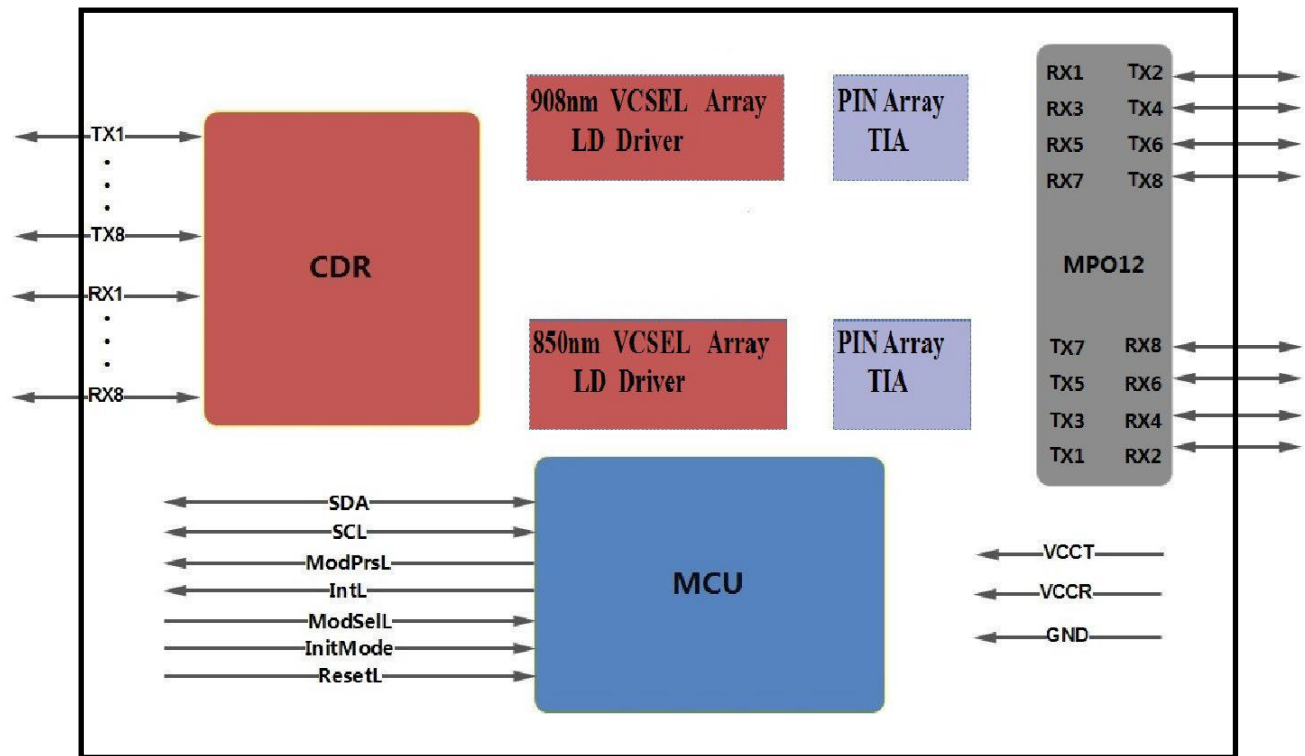


Bottom side viewed from bottom

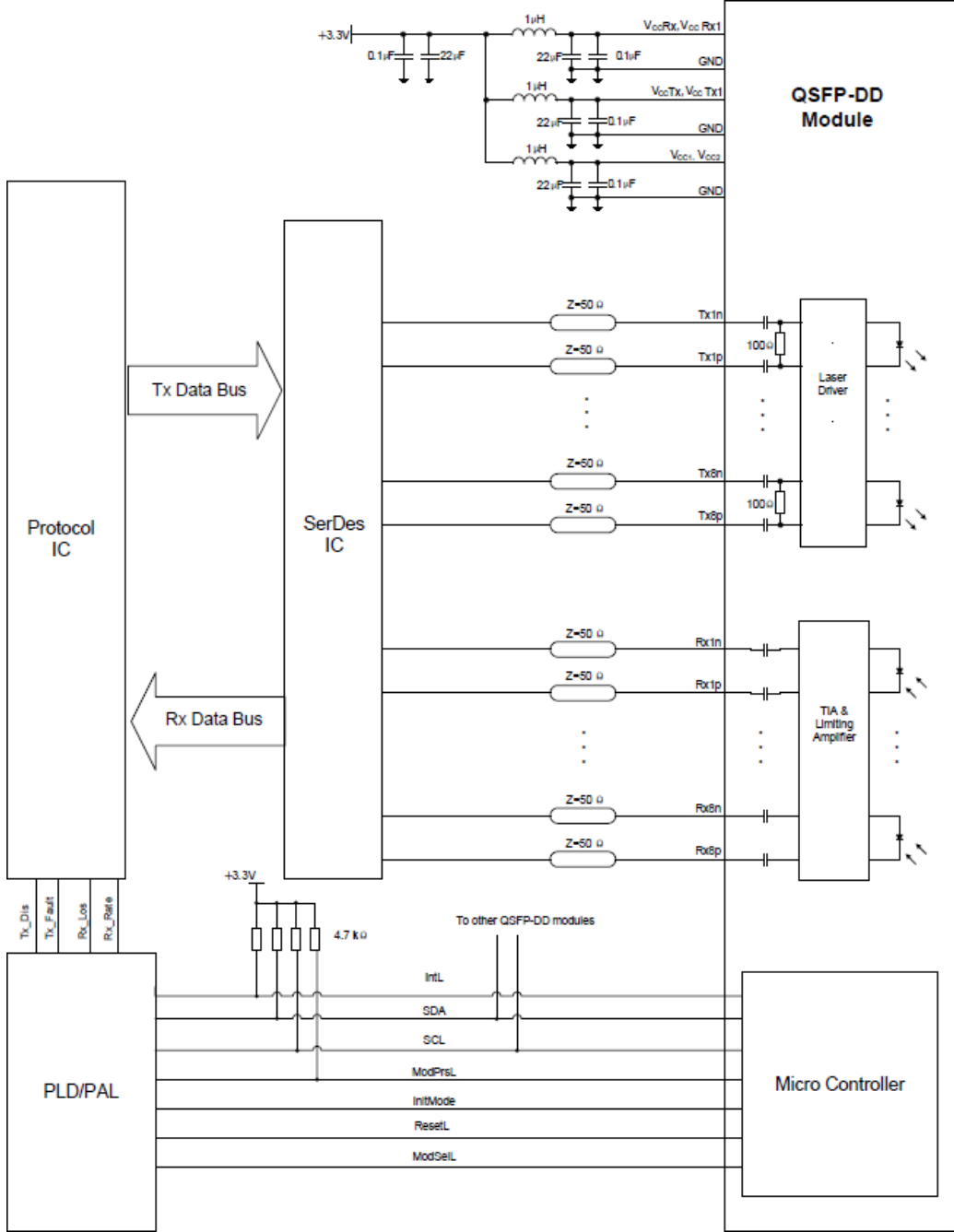


Top side viewed from top

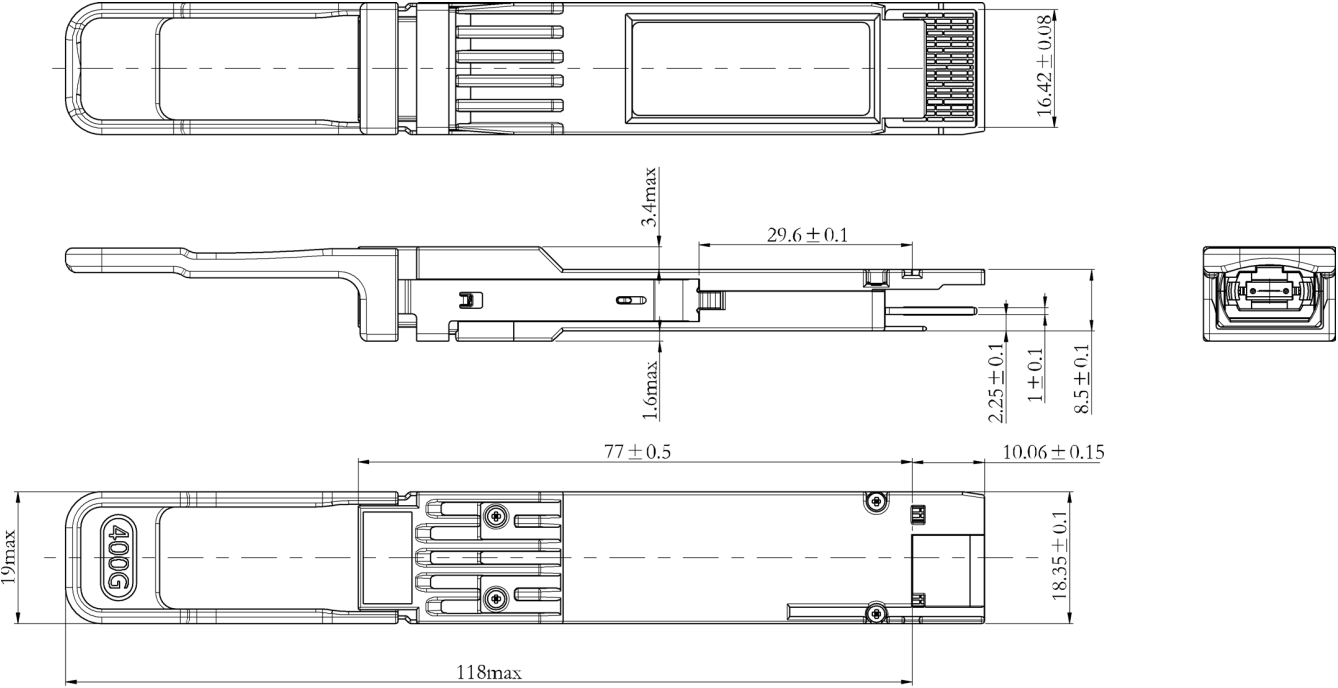
Transceiver Block Diagram



Electrical Interface



**Mechanical Specifications**



NOTES:  
1.TOLERANCE: +/-0.1MM.  
2.OTHERS ACCORDING WITH QSFP-DD MSA OR CUSTOMER SPEC.  
3.LIGHT PORT ACCORDING WITH FIBER CONNECTOR SPEC.

# 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.

