



## QSFP-40GBASE-ESR4-SKY

MSA Compliant 40GBase-SR4 QSFP+ Transceiver (MMF, 850nm, 300m, MPO, DOM)

### Product Description

This MSA compliant QSFP+ transceiver provides 40GBase-SR4 throughput up to 300m over multi-mode fiber (MMF) using a wavelength of 850nm via an MPO connector. All of our transceivers are built to comply with Multi-Source Agreement (MSA) standards and are uniquely serialized and tested for data-traffic and application to ensure 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:

- SFF-8436 Compliance
- MPO Connector
- Commercial Temperature 0 to 70 Celsius
- Multi-mode Fiber
- Hot Pluggable
- Excellent ESD Protection
- Metal with Lower EMI
- RoHS Compliant and Lead Free



### Applications:

- 40GBase Ethernet
- Access and Enterprise
- 4x10G Breakout Option

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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 |
|----------------------------|-----------------|------|---------|------|------|
| Maximum Supply Voltage     | V <sub>CC</sub> | -0.5 |         | 4.0  | V    |
| Storage Temperature        | T <sub>S</sub>  | -40  |         | 85   | °C   |
| Case Operating Temperature | T <sub>C</sub>  | 0    | 25      | 70   | °C   |
| Humidity (non-condensing)  | RH              | 5    |         | 95   | %    |
| Data Rate per Channel      |                 |      | 10.3125 |      | Gbps |

## Electrical Characteristics (TOP=25°C, V<sub>CC</sub>=3.3Volts)

| Parameter                      | Symbol               | Min.  | Typ. | Max.  | Unit | Notes |
|--------------------------------|----------------------|-------|------|-------|------|-------|
| Power Supply Voltage           | V <sub>CC</sub>      | 3.135 | 3.30 | 3.465 | V    |       |
| Power Supply Current           | I <sub>CC</sub>      |       |      | 430   | mA   |       |
| Power Consumption              | P <sub>DISS</sub>    |       |      | 1.5   | W    |       |
| Transmitter                    |                      |       |      |       |      |       |
| Differential data input swing  | V <sub>in,pp</sub>   | 180   |      | 900   | mV   |       |
| Input differential impedance   | Z <sub>in</sub>      |       | 100  |       | Ω    |       |
| Receiver                       |                      |       |      |       |      |       |
| Differential data output swing | V <sub>out, pp</sub> | 300   |      | 850   | mV   |       |
| Output differential impedance  | Z <sub>in</sub>      |       | 100  |       | Ω    |       |

## Optical Characteristics

| Parameter                          | Symbol           | Min. | Typ. | Max. | Unit | Notes |
|------------------------------------|------------------|------|------|------|------|-------|
| Transmitter                        |                  |      |      |      |      |       |
| Optical Power (average)            | P <sub>AVE</sub> | -7.6 |      | +2.4 | dBm  | 1     |
| Optical Wavelength                 | Tλ               | 830  | 850  | 860  | nm   |       |
| Optical Extinction Ratio           | ER               | 3    |      |      | dB   | 2     |
| Spectral Width (RMS)               | Δλ               |      |      | 0.4  | nm   |       |
| Optical Return Loss Tolerance      | ORLT             |      |      | 12   | dB   |       |
| Transmitter and Dispersion Penalty | TDP              |      |      | 3.2  | dB   |       |
| Receiver                           |                  |      |      |      |      |       |
| Receiver Sensitivity (average)     | R <sub>AVE</sub> |      |      | -9.5 | dBm  | 3     |
| Damage Threshold                   | P <sub>ol</sub>  | 2.5  |      |      | dBm  | 3     |
| Receiver wavelength                | Rλ               | 830  | 850  | 860  | nm   |       |

### Notes:

1. The optical power is launched into OM3 MMF.
2. Measured with a PRBS 2<sup>31</sup>-1 test pattern @10.3125Gbps.
3. Measured with PRBS 2<sup>31</sup>-1 test pattern, 10.3125Gb/s, BER<10<sup>-12</sup>.

## Pin Descriptions

| Pin | Logic       | Symbol            | Name/Descriptions                                   | Ref. |
|-----|-------------|-------------------|-----------------------------------------------------|------|
| 1   |             | GND               | Module Ground                                       | 1    |
| 2   | CML-I       | Tx2-              | Transmitter inverted data input                     |      |
| 3   | CML-I       | Tx2+              | Transmitter non-inverted data input                 |      |
| 4   |             | GND               | Module Ground                                       | 1    |
| 5   | CML-I       | Tx4-              | Transmitter inverted data input                     |      |
| 6   | CML-I       | Tx4+              | Transmitter non-inverted data input                 |      |
| 7   |             | GND               | Module Ground                                       | 1    |
| 8   | LVTTL-I     | MODSEIL           | Module Select                                       | 2    |
| 9   | LVTTL-I     | ResetL            | Module Reset                                        | 2    |
| 10  |             | VCCR <sub>x</sub> | +3.3v Receiver Power Supply                         |      |
| 11  | LVC MOS-I   | SCL               | 2-wire Serial interface clock                       | 2    |
| 12  | LVC MOS-I/O | SDA               | 2-wire Serial interface data                        | 2    |
| 13  |             | GND               | Module Ground                                       | 1    |
| 14  | CML-O       | RX3+              | Receiver non-inverted data output                   |      |
| 15  | CML-O       | RX3-              | Receiver inverted data output                       |      |
| 16  |             | GND               | Module Ground                                       | 1    |
| 17  | CML-O       | RX1+              | Receiver non-inverted data output                   |      |
| 18  | CML-O       | RX1-              | Receiver inverted data output                       |      |
| 19  |             | GND               | Module Ground                                       | 1    |
| 20  |             | GND               | Module Ground                                       | 1    |
| 21  | CML-O       | RX2-              | Receiver inverted data output                       |      |
| 22  | CML-O       | RX2+              | Receiver non-inverted data output                   |      |
| 23  |             | GND               | Module Ground                                       | 1    |
| 24  | CML-O       | RX4-              | Receiver inverted data output                       |      |
| 25  | CML-O       | RX4+              | Receiver non-inverted data output                   |      |
| 26  |             | GND               | Module Ground                                       | 1    |
| 27  | LVTTL-O     | ModPrsL           | Module Present, internal pulled down to GND         |      |
| 28  | LVTTL-O     | IntL              | Interrupt output, should be pulled up on host board | 2    |
| 29  |             | VCCT <sub>x</sub> | +3.3v Transmitter Power Supply                      |      |
| 30  |             | VCC1              | +3.3v Power Supply                                  |      |
| 31  | LVTTL-I     | LPMode            | Low Power Mode                                      | 2    |
| 32  |             | GND               | Module Ground                                       | 1    |
| 33  | CML-I       | Tx3+              | Transmitter non-inverted data input                 |      |

|    |       |      |                                     |   |
|----|-------|------|-------------------------------------|---|
| 34 | CML-I | Tx3- | Transmitter inverted data input     |   |
| 35 |       | GND  | Module Ground                       | 1 |
| 36 | CML-I | Tx1+ | Transmitter non-inverted data input |   |
| 37 | CML-I | Tx1- | Transmitter inverted data input     |   |
| 38 |       | GND  | Module Ground                       | 1 |

#### Notes:

1. Module circuit ground is isolated from module chassis ground with in the module.
2. Open collector; should be pulled up with 4.7k-10k ohms on host board to a voltage between 3.15V and 3.6V.

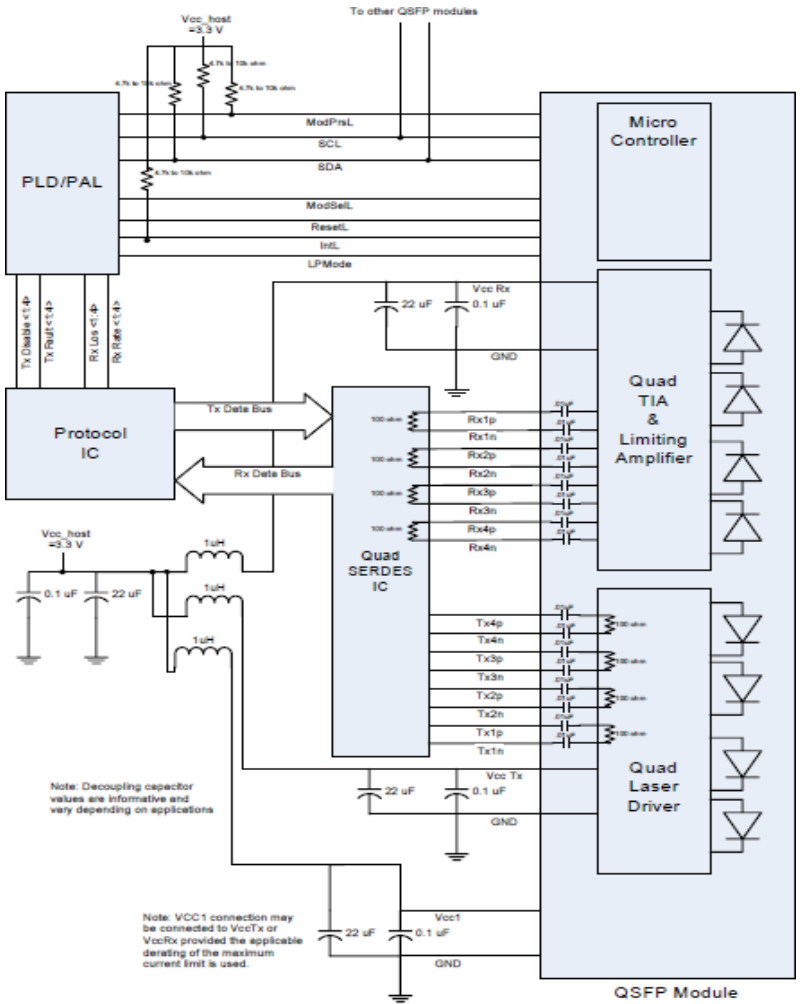
#### Electrical Pin-out Details



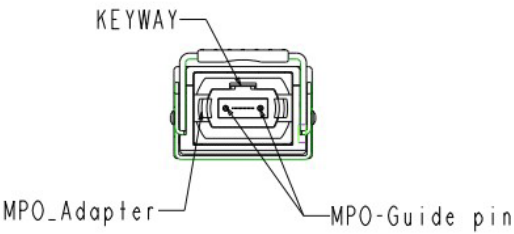
Recommended Host Board Power Supply Filter Network



Recommended Application Interface Block Diagram



Mechanical Specifications



# 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.

