

## TRA-QSFP-40G-LR4

1310nm / 10km / 40 Gigabit Ethernet / LR-4

### Features

- Hot pluggable QSFP+ footprint
- Serial ID functionality supported according to [SFF-8438]
- Dual LC connector
- 4x CWDM DFB transmitters (1271/1291/1311/1331nm)
- 10km point-to-point transmission on single mode fibre
- Operating temperature range 0°C to 70°C
- Up to 11.2Gbps per Lane
- Low power dissipation (<3.5W)
- Digital Diagnostics Monitoring (DDM)



### Applications

- 40GBASE-LR4
- Rack to Rack
- Client-side 40G Telecom Connections

### Description

**TRansceiver.ASIA** is a high performance QSFP+ transceiver module for 40 Gigabit Ethernet data links over two single mode fibres. The maximum reach<sup>1</sup> is 10km, with 7.5dB end of life (EOL) power budget. The transmitters (4×) are CWDM DFB (Distributed Feedback) lasers, the receivers (4×) are PIN photodiodes. This transceiver module is compliant with the QSFP28 Multisource Agreement (MSA) and hot pluggable. Always contact **TRansceiver.ASIA** commercial agents for compatibility with different equipment platforms

### Optical Interfaces

| P/N             | Nominal Wavelength [nm] | Optical Output Power, per Lane <sup>2</sup> [dBm] | Optical Receiver Sensitivity, per Lane [dBm] | Optical Path Penalty <sup>3</sup> , per Lane [dB] | Optical Receiver Overload <sup>4</sup> , per Lane [dBm] | Power Budget <sup>2</sup> , per Lane [dB] |
|-----------------|-------------------------|---|--|---|---|---|
| TRA-SFP-40G-LR4 | 1271/1291/1311/1331nm   | -4 to 3.5   | ≤ -11.5                                      | ≤ 2.3   | 23  | ≥ 7.5                                     |

## Recommended Operating Conditions

| Parameter                  | Min  | Typ | Max  | Unit | Notes          |
|----------------------------|------|-----|------|------|----------------|
| Storage temperature        | -40  |     | 85   | °C   |                |
| Operating Case Temperature | 0    |     | 70   | °C   |                |
| Relative Humidity          | 5    |     | 85   | %    | Non-Condensing |
| Power Supply Voltage       | 3.15 | 3.3 | 3.45 | V    |                |
| Power Supply Current       |      |     | 1000 | W    |                |
| Power Dissipation          |      |     | 3.5  | W    |                |

## Transmitter Optical Specifications

| Parameter   | Min    | Typ  | Max    | Unit | Notes  |
|---|--------|------|--------|------|--------|
| Total Average Output Power                          |        |      | 8.3    |      | 5      |
| Average Output Power, each Lane                     | -7     |      | 2.3    | dBm  |        |
| Optical Modulation Amplitude (OMA), each Lane       | -4     |      | 3.5    |      |        |
| Difference in OMA between any two Lanes             |        |      | 6.5    | dB   |        |
| Centre Wavelength                                   | 1264.5 | 1271 | 1277.5 | nm   | L0     |
|   | 1284.5 | 1291 | 1297.5 |      | L1     |
|   | 1304.5 | 1311 | 1317.5 |      | L2     |
|   | 1324.5 | 1331 | 1337.5 |      | L3     |
| Transmitter and Dispersion Penalty (TDP), each Lane |        |      | 2.3    | dB   |        |
| OMA with TDP subtracted, each Lane                  | -4.8   |      |        | dBm  |        |
| Optical Extinction Ratio ER                         | 3.5    |      |        | dB   |        |
| Spectral Width                                      |        |      | 1      | nm   | -20 dB |

## Receiver Optical Specification

| Parameter                                    | Min | Typ | Max   | Unit | Notes |
|--|-----|-----|-------|------|-------|
| Receiver Overload, each Lane                 |     |     | 2.3   | dBm  |       |
| Receiver Sensitivity OMA, each Lane          |     |     | -11.5 | dBm  |       |
| Stressed Receiver Sensitivity OMA, each Lane |     |     | -9.9  | dBm  |       |

## Pin Function Definition

| Pin | Symbol  | Description                         | Pin | Symbol  | Description                         |
|-----|---------|-------------------------------------|-----|---------|-------------------------------------|
| 1   | GND     | Ground                              | 20  | GND     | Ground                              |
| 2   | TX2n    | Transmitter Inverted Data Input     | 21  | RX2n    | Receiver Inverted Data Output       |
| 3   | TX2p    | Transmitter Non-Inverted Data Input | 22  | RX2p    | Receiver Non-Inverted Data Output   |
| 4   | GND     | Ground                              | 23  | GND     | Ground                              |
| 5   | TX4n    | Transmitter Inverted Data Input     | 24  | RX4n    | Receiver Inverted Data Output       |
| 6   | TX4p    | Transmitter Non-Inverted Data Input | 25  | RX4p    | Receiver Non-Inverted Data Output   |
| 7   | GND     | Ground                              | 26  | GND     | Ground                              |
| 8   | ModSelL | Module Select                       | 27  | ModPrsL | Module Present                      |
| 9   | ResetL  | Module Reset                        | 28  | IntL    | Interrupt                           |
| 10  | VccRx   | +3.3V Power Supply Receiver         | 29  | VccTx   | +3.3V Power supply transmitter      |
| 11  | SCL     | 2-wire serial interface clock       | 30  | Vcc1    | +3.3V Power supply                  |
| 12  | SDA     | 2-wire serial interface data        | 31  | LPMode  | Low Power Mode                      |
| 13  | GND     | Ground                              | 32  | GND     | Ground                              |
| 14  | RX3p    | Receiver Non-Inverted Data Output   | 33  | TX3p    | Transmitter Non-Inverted Data Input |
| 15  | RX3n    | Receiver Inverted Data Output       | 34  | TX3n    | Transmitter Inverted Data Input     |
| 16  | GND     | Ground                              | 35  | GND     | Ground                              |
| 17  | RX1p    | Receiver Non-Inverted Data Output   | 36  | TX1p    | Transmitter Non-Inverted Data Input |
| 18  | RX1n    | Receiver Inverted Data Output       | 37  | TX1n    | Transmitter Inverted Data Input     |
| 19  | GND     | Ground                              | 38  | GND     | Ground                              |

## Ordering information

| Part Number     | Description   |
|-----------------|---|
| TRA-SFP-40G-LR4 | QSFP+ LR-4 40G 1310nm window, Tx DFB , Rx PIN, maximum distance 10km, power budget 5dB, 40x Gigabit Ethernet & Infiniband QDR, LC connector, 0°C to 70°C, DDM |

## Warnings

### Process plug

The transceiver optics is supplied with a dust cover. This plug protects the transceiver optics during standard manufacturing processes by preventing contamination from air borne particles. It is recommended that the dust cover remain in the transceiver whenever an optical fiber connector is not inserted.

### Handling Precautions

The transceiver optics is susceptible to damage as a result of electrostatic discharge (ESD). A static free environment is highly recommended. Follow guidelines according to proper ESD procedures.

### Laser Safety

The transceiver optics is a Class 1 laser product per international standard IEC 60825-1. Radiation emitted by laser