# QSFP+ 40G, 850nm, 100M, MULTIMODE
# SNQ-40G-02

## Overview:

This **SCIENTIFIC SNQ-40G-02** are designed for use in Gigabit per second links over multimode fiber. They a compliant with the QSFP+ MSA and IEEE 802.3b 40GBASE-SR4.Module-level digital diagnostic functions are available via an $I^2C$ interface, as specified by the QSFP+ MSA. The optical transceiver is compliant per the RoHS Directive 2011/65/EU.


## Features:

- Multirate capability: 1.06Gb/s to 10.5Gb/s per channel
- Reliable VCSEL array technology
- Maximum link length of 300m on OM3 Multimode Fiber (MMF) and 400m ON OM4 MMF
- Hot-pluggable QSFP+ footprint
- Single 1x12 MPO receptacle
- Maximum power dissipation<1W
- Four-channel full-duplex transceiver module
- RoHS-6 compliant and lead-free
- Support Digital Diagnostic Monitor interface
- Unretired XLPPI electrical interface
- Case operating temperature Commercial: 0°C to +70°C

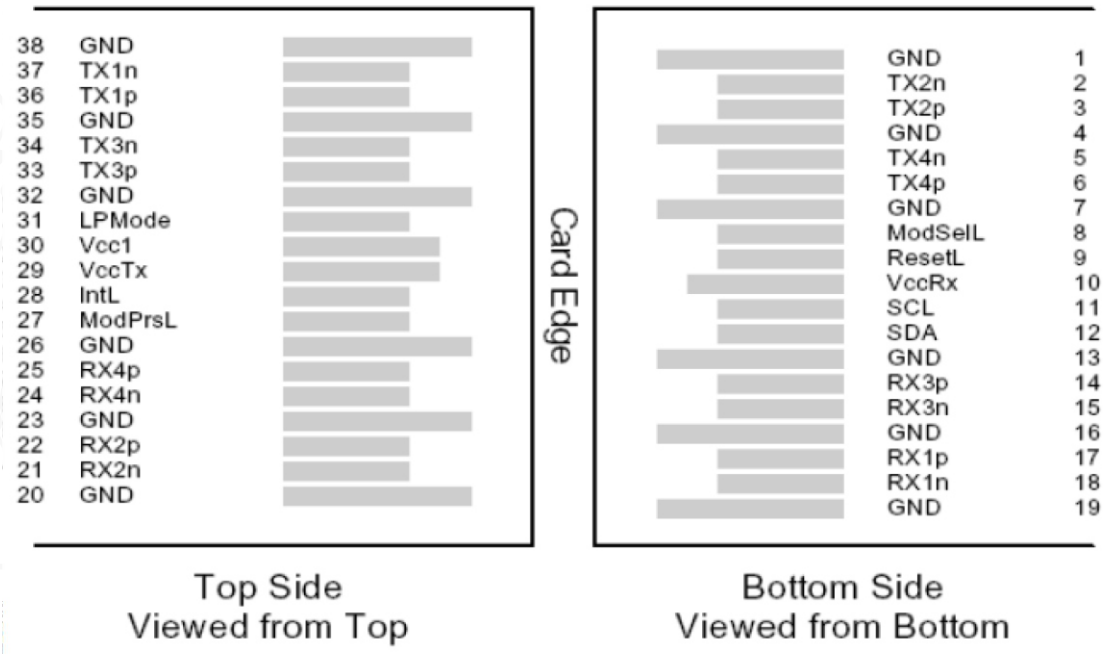
## Application

- 40GBASE-SR4 40G Ethernet
- Breakout to10GBASE-SR Ethernet
- Proprietary interconnections

## Compliance

- QSFP+ MSA
- IEEE802.3ba
- SFF-8436

## Pin definition




QSFP+ MSA-compliant 38-pin connector

## Pin Description

| Pin | Symbol | Name/Description | Ref. |
|---|---|---|---|
| 1 | GND | Ground | 1 |
| 2 | Tx2n | Transmitter Inverted Data Input | |
| 3 | Tx2p | Transmitter Non-Inverted Data Input | |
| 4 | GND | Ground | 1 |
| 5 | Tx4n | Transmitter Inverted Data Input | |
| 6 | Tx4p | Transmitter Non-Inverted Data Input | |
| 7 | GND | Ground | 1 |
| 8 | ModSe1L | Module Select | |
| 9 | ResetL | Module Reset | |
| **Pin** | **Symbol** | **Name/Description** | **Ref.** |
| 10 | Vcc Rx | +3.3V Power supply receiver | |
| 11 | SCL | 2-wire serial interface clock | |
| 12 | SDA | 2-wire serial interface data | |
| 13 | GND | Ground | 1 |
| 14 | Rx3p | Receiver Non-Inverted Data Output | |
| 15 | Rx3n | Receiver Inverted Data Output | |
| 16 | GND | Ground | 1 |
| 17 | Rx1p | Receiver Non-Inverted Data Output | |

| | | | |
|---|---|---|---|
| 18 | Rx1n | Receiver Inverted Data Output | |
| 19 | GND | Ground | 1 |
| 20 | GND | Ground | 1 |
| 21 | Rx2n | Receiver Inverted Data Output | |
| 22 | Rx2p | Receiver Non-Inverted Data Output | |
| 23 | GND | Ground | 1 |
| 24 | Rx4n | Receiver Inverted Data Output | |
| 25 | Rx4p | Receiver Non-Inverted Data Output | |
| 26 | GND | Ground | 1 |
| 27 | ModPrSL | Module Present | |
| 28 | IntL | Interrupt | |
| 29 | VccTx | +3.3V Power supply transmitter | |
| 30 | Vcc1 | +3.3V Power Supply | |
| 31 | LPMode | Low Power Mode | |
| 32 | GND | Ground | 1 |
| 33 | Tx3p | Transmitter Non-Inverted Data Input | |
| 34 | Tx3n | Transmitter Inverted Data Input | |
| 35 | GND | Ground | 1 |
| 36 | Tx1p | Transmitter Non-Inverted Data Input | |
| 37 | Tx1n | Transmitter Inverted Data Input | |
| 38 | GND | Ground | 1 |

**Note:**

1. Circuit ground is internally isolated from chassis ground.

## Absolute Maximum Ratings

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Ref. |
|---|---|---|---|---|---|---|
| Storage Temperature | $T_S$ | -40 | | 85 | °C | |
| Storage Ambient Humidity | $H_A$ | 5 | | 95 | % | |
| Maximum Supply Voltage | $V_{CC}1$, $V_{CC}T_X$, $V_{CC}R_X$ | -0.5 | | 3.6 | V | |
| Signal Input Voltage | | Vcc-0.3 | | Vcc+0.3 | V | |
| Receiver Damage Threshold | | +3.4 | | | dBm | |
| Lead Soldering Temperature/Time | TSOLD | | | 260/10 | °C/sec | 1 |
| Lead Soldering Temperature/Time | TSOLD | | | 360/10 | °C/sec | 2 |

**Note:**

1. Suitable for wave soldering.
2. Only for soldering by iron.

NOVA CABLE COMPANY
Complete FTTH Solutions

# Data Sheet

SNQ-40G-02

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## General Product Characteristics

| Parameter | Value | Unit | Ref. |
|---|---|---|---|
| Module Form Factor | QSFP+ | | |
| Number of Lanes | 4 Tx and 4 Rx | | |
| Maximum Aggregate Data Rate | 42.0 | Gb/s | |
| Maximum Data Rate per Lane | 10.5 | Gb/s | Higher bit rates may be supported. Please contact Inphilight |
| Protocols Supported | Typical applications include 40G Ethernet, InfiniBand, Fiber Channel, SATA/SAS3 | | |
| Management Interface | Serial, I2c-based,400kHz maximum frequency | | As defined by the QSFP+ MSA |

| Data Rate Specifications | Symbol | Min. | Typ. | Max. | Unit | Ref. |
|---|---|---|---|---|---|---|
| Bit Rate per Lane | BR | 1062 | | 10500 | Mb/s | 1 |
| Bit Error Ratio | BER | | | $10^{-12}$ | | 2 |
| Link distance on OM3 MMF | D | | | 300 | meters | 3 |
| Link distance on OM4 MMF | D | | | 400 | meters | 3 |

**Notes:**

1. Compliant with 40G Ethernet. Compatible with 1/10 Gigabit Ethernet and 1/2/4/8/10G Fiber Channel.
2. Tested with a PRBS $2^{31}$-1 test pattern.
3. Per 40GBASE-SR4, IEEE 802.3ba

## Optical Characteristics

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Ref. |
|---|---|---|---|---|---|---|
| **Transmitter (per Lane)** | | | | | | |
| Average Output Power | POUT | -7.6 | | 2.4 | dBm | |
| Transmit OMA per Lane | TxOMA | -5.6 | | 3.0 | dBm | 1 |
| Extinction Ratio | ER | 3.0 | | | dB | |
| Center Wavelength | λC | 840 | 850 | 860 | nm | |
| RMS Spectral Width | σ | | | 0.65 | nm | |
| Transmitter and Dispersion Penalty | TDP | | | 3.5 | dB | |
| Transmitter OFF Output Power | POff | | | -30 | dBm | |
| Relative Intensity Noise | RIN | | | -128 | dB/Hz | |
| Transmitter eye mask definition {X1, X2, X3, Y1, Y2, Y3} | | 0.23,0.34,0.43,0.27,0.35,0.4 | | | | |

| Receiver (per Lane) | | | | | | |
|---|---|---|---|---|---|---|
| Input Optical Wavelength | λIN | 840 | 850 | 860 | nm | |
| Rx Sensitivity per lane | RSENS | | | -9.5 | dBm | |
| Input Saturation Power (Overload) | PSAT | +2.4 | | | dBm | |
| Receiver Reflectance | Rfl | | | -12 | dBm | |
| Loss of Signal Assert | PA | -30 | | | dBm | |
| Loss of Signal De-assert | PD | | | -12 | dBm | |
| LOS Hysteresis | PD - PA | 0.5 | | 6 | dB | |

**Note:** Even if TDP is <0.9dB, the OMA min must exceed this value.

## Memory Map and Control Registers

Compatible with SFF-8436Rev.4.8(QSFP+).

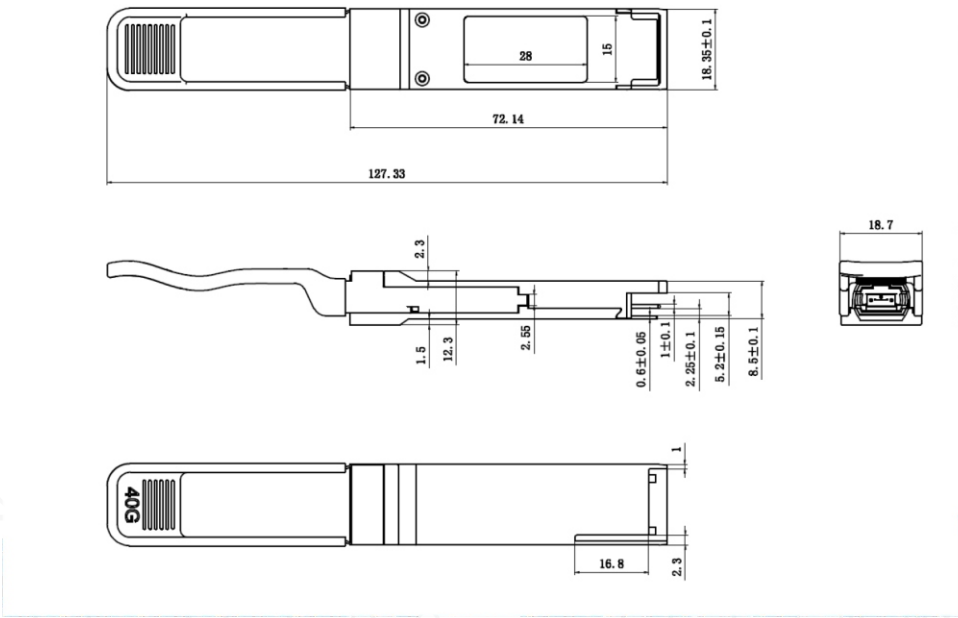
## Electrical Interface Characteristics

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Ref. |
|---|---|---|---|---|---|---|
| Supply Voltage | VCC1, VCCTX, VCCRX | 3.15 | | 3.45 | V | |
| Supply Current | ICC | | | 300 | mA | |
| **Transmitter (per Lane)** | | | | | | |
| Input different impedance | Rin | 90 | 100 | 110 | Ω | 1 |
| Single ended input voltage tolerance | VinT | -0.3 | | 4.0 | V | |
| Single ended data input swing | Vin, pp | 180 | | 1200 | mV | 2 |
| **Receiver (per Lane)** | | | | | | |
| Output different impedance | Rout | 90 | 100 | 110 | Ω | 1 |
| Single ended data output swing | Vout, pp | 0 | | 800 | mV | 3 |
| Single-ended output voltage | | -0.3 | | 4.0 | V | |
| Power Supply Rejection | PSR | 50 | | | mVpp | |

**Note:**

1. Connected directly to TX data input pins. AC coupled thereafter.
2. After internal AC coupling. Self-biasing 100Ω differential input
3. Into 100Ωdifferential termination.

## Mechanical Specifications (Unit: mm)




**QSFP-40G-SR4**

## Regulatory Compliance

QSFP-40G-SR4 transeciver are RoHS-6 Compliant.

QSFP-40G-SR4 transceiver modules are Class 1 laser eye safety compliant per IEC 60825-1, which means that they are eye safe under normal "unaided" viewing conditions. Laser radiation may be hazardous if viewed with magnifying optics.

## Ordering Information:

| Package | Product part NO. | Data Rate (Gbps) | Media | Wavelength(nm) | Transmission Distance(m) | Temperature Range（℃） | |
|---|---|---|---|---|---|---|---|
| QSFP+ | QSFP-40G-SR4 | 42.0 | multi-mode fiber | 850 | 100~400 | 0~70 | QSFP+ |

| Model | Description |
|---|---|
| SNQ - 100G-SR-02 | QSFP28-100G-850nm, 150M, Multi Mode |

SFP-ZR