


# Specification of 100Gbps QSFP28 Extension Copper Cable with the Adapter (connector to cage) for Liquid Immersion Cooling System



**T C P - Q 1 4 1 B - N N E x x**

↑ Length

### Ordering Information

| Model Name     | TCP-Q141B-NNExx  |                 | Note                                   |
|----------------|--|-----------------|--|
|                | TCP-Q141B-NNE22  | TCP-Q141B-NNE36 |  |
| Feature        | Adapter (convert connector type to cage type) with extended cable                            |                 |  |
| Connector type | QSFP28 (SFF-8665)  |                 |  |
| Cage type      | QSFP28 cage  |                 |  |
| Temperature    | 0°C ~+70°C   |                 |  |
| Length         | 22cm   | 36cm            | The length excludes connector and cage |
| Latch Color    | Sky Blue  |                 |  |

## ■ General Description

Immersion Cooling completes the immersion of electronic components in a dielectric liquid. All the heat generated by the IT is captured in the liquid. Suitable dielectric liquids can absorb approximately 1500 times more heat energy than air with the same volumes and temperatures. Formerica's QSFP28 extender with QSFP28 plug vs. QSFP28 cage is designed to be applied for immersion solution. It extends the 100G interfaces to surface, aiming to realize the interconnection of 100G transceivers and AOC.

## ■ Features

- Low EMI radiation
- Insertion Loss < 7.0dB @12.89GHZ/channel within 50cm
- Oil-resistance, dust-proof and anti-corrosion
- 100 ohm differential impedance system
- Low Near-End Crosstalk (NEXT)
- RoHS compliant

## ■ Applications

- Extend the 100Gb/s high speed interconnection for liquid immersion solution
- Extend the link of 100G AOC
- Extend the link of 100G transceiver

## ■ Applicable Documents

The following documents form a part of this specification to the extent specified herein. Unless otherwise specified, the latest edition of the document applies. In the event of conflict between the requirements of this specification and the product drawing, the product drawing shall take precedence. In the event of conflict between the requirements of this specification and the referenced documents, this specification shall take precedence.

- Compliant with QSFP-MSA / SFF-8436 / SFF-8665, IEEE 802.3bj, and Infiniband EDR.
- SFF-8417, EIA-364 Electrical Connector / Socket Test Procedures, including Environmental Classifications.

## ■ Absolute Maximum Rating

| Parameter           | Symbol | Min | Typ. | Max | Unit |
|---------------------|--------|-----|------|-----|------|
| Storage Temperature | Ts     | -20 |      | 80  | °C   |

## ■ Recommended Operating Conditions

| Parameter                  | Symbol | Min | Typ.     | Max | Unit |
|----------------------------|--------|-----|----------|-----|------|
| Operating Case Temperature | Top    | 0   | 25       | 70  | °C   |
| Data Rate per lane         |        |     | 25.78125 |     | Gbps |

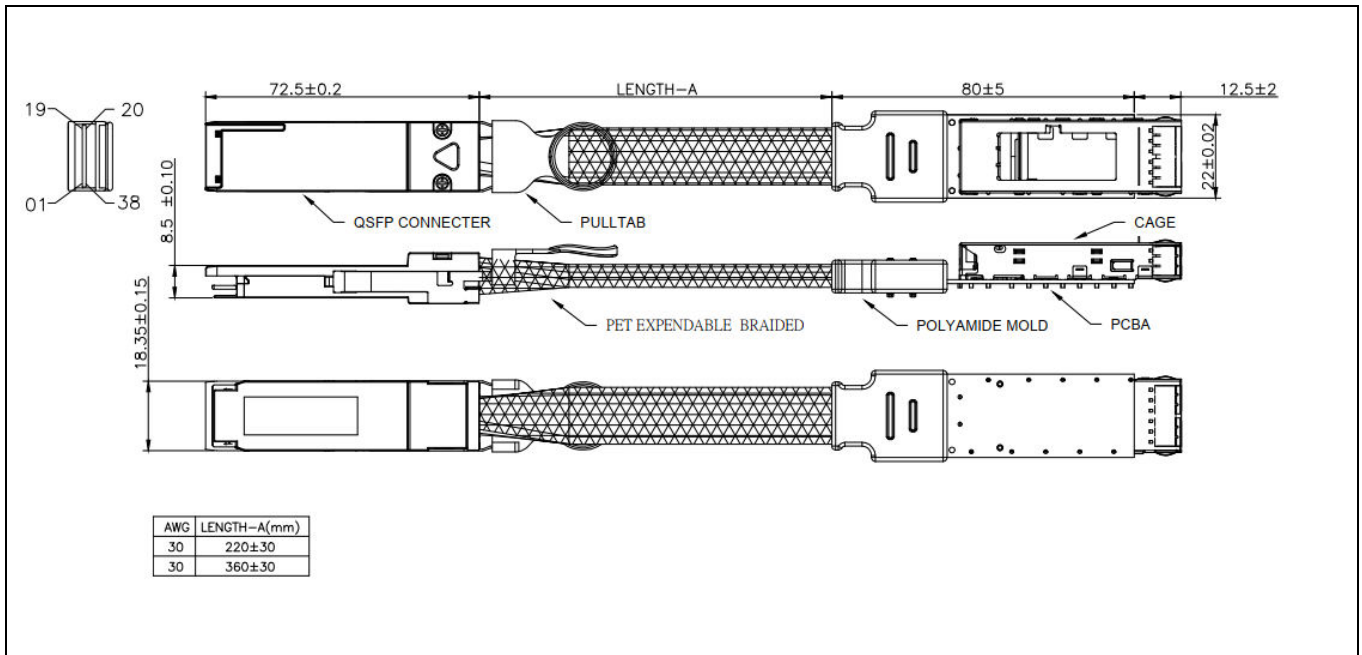
■ PIN Assignment

WIRING DIAGRAM

| HIGH SPEED SIGNAL                                   |         |  |   |         |
|---|---------|--|---|---------|
| P1(QSFP28 PLUG)                                     |         |  | P2(QSFP28 RECEPTACLE)                               |         |
| PAD   | SIGNAL  |  | PAD   | SIGNAL  |
| 02  | TX2n    |  | 02  | TX2n    |
| 03  | TX2p    |  | 03  | TX2p    |
| 05  | TX4n    |  | 05  | TX4n    |
| 06  | TX4p    |  | 06  | TX4p    |
| 14  | RX3p    |  | 14  | RX3p    |
| 15  | RX3n    |  | 15  | RX3n    |
| 17  | RX1p    |  | 17  | RX1p    |
| 18  | RX1n    |  | 18  | RX1n    |
| 21  | RX2n    |  | 21  | RX2n    |
| 22  | RX2p    |  | 22  | RX2p    |
| 24  | RX4n    |  | 24  | RX4n    |
| 25  | RX4p    |  | 25  | RX4p    |
| 33  | TX3p    |  | 33  | TX3p    |
| 34  | TX3n    |  | 34  | TX3n    |
| 36  | TX1p    |  | 36  | TX1p    |
| 37  | TX1n    |  | 37  | TX1n    |
| 08  | ModSelL |  | 08  | ModSelL |
| 09  | ResetL  |  | 09  | ResetL  |
| 10  | VccRx   |  | 10  | VccRx   |
| 11  | SCL     |  | 11  | SCL     |
| 12  | SDA     |  | 12  | SDA     |
| 27  | ModPrsL |  | 27  | ModPrsL |
| 28  | IntL    |  | 28  | IntL    |
| 29  | VccTx   |  | 29  | VccTx   |
| 30  | Vcc1    |  | 30  | Vcc1    |
| 31  | LPMoDe  |  | 31  | LPMoDe  |
| GND GROUP   | GND     |  | GND GROUP   | GND     |
| GND GROUP<br>01,04,07,13,16,19<br>20,23,26,32,35,38 |         |  | GND GROUP<br>01,04,07,13,16,19<br>20,23,26,32,35,38 |         |
| CONNECTOR SHELL                                     |         |  | CONNECTOR SHELL                                     |         |

\*DC BLOCKING CAPS ON P1,P2 RX END.

■ **Module Outline**



**Note:**

1. Standard length as LENGTH-A in drawing with tolerance. Option of LENGTH-A: 22cm and 36cm
2. Unit: mm
3. Compliant with IEEE802.3bj
4. LED function: Once pluggable QSFP28 connector end of the extender plugged into an equipment that support Vcc power 3.3v, the LED will be ON.

**■ Contact Information**

|   |   |
|---|---|
| <b>Formerica OptoElectronics Inc.</b><br>5F-11, No.38, Taiyuan St., Zhubei City,<br>Hsinchu County 30265, Taiwan<br>Tel: +886-3-5600286 Fax: +886-3-5600239 | <b>San Diego, CA</b><br>Tel: 1-949-466-8069 |
| <a href="mailto:inquiry@formericaoe.com">inquiry@formericaoe.com</a><br><a href="http://www.formericaoe.com">www.formericaoe.com</a>                        |   |

**■ Revision History**

| Date      | Version     | Description                                  |
|-----------|-------------|--|
| 1/5/2021  | Preliminary | Initial release                              |
| 3/18/2021 | V1.0        | Update the product photo and outline drawing |

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