

## QSFP28 to 1XSFP28 DAC cable

GQS-P28101-XXC

### Features

- ◆ Up to 25.78125 Gbps data rate
- ◆ Up to 5 meter transmission
- ◆ Hot-pluggable SFP28 and QSFP28
- ◆ Compatible to SFF-8402 and SFF-8432
- ◆ Compatible to SFF-8665
- ◆ Compatible to IEEE 802.3bj
- ◆ I2C based two-wire serial interface for EEPROM signature which can be customized
- ◆ Power consumption <0.1 W
- ◆ Temperature Range: 0~ 70 °C
- ◆ RoHS Compatible



### Applications

- ◆ 25GE Ethernet
- ◆ Data storage and communication industry
- ◆ Switch / router / HBA
- ◆ Enterprise network
- ◆ SAN
- ◆ Data Center Network

### Product Description

Gigalight's GQS-P28101-XXC cable assembly is a customized passive copper cable. The cable connects data signals from each of the 1 pair on the single QSFP end to the SFP28 end, the pair operates at data rates of up to 25Gb/s, each end can be addressed by EEPROM to provide product information, which can be read or write by I2C interface.

## Recommended Operating Conditions

| Parameter                   | Symbol           | Min  | Typical | Max   | Unit |
|-----------------------------|------------------|------|---------|-------|------|
| Storage Ambient Temperature |                  | -40  |         | +85   | °C   |
| Operating Case Temperature  | Tc               | 0    |         | +70   | °C   |
| Power Supply Voltage        | V <sub>CC3</sub> | 3.14 | 3.3     | 3.47  | V    |
| Power consumption           |                  |      |         | 0.1   | W    |
| Data Rate Per Lane          |                  | 1    |         | 25.78 | Gb/s |

## High Speed Characteristics

| Parameter                                     | Symbol   | Min | Typical | Max   | Unit | Note                 |
|-----------------------------------------------|----------|-----|---------|-------|------|----------------------|
| Differential Impedance(bulk cable)            | Rin1,P-P | 95  | 100     | 110   | Ω    |                      |
| Differential Impedance (Mated connector)      | Rin2,P-P | 90  | 100     | 110   | Ω    |                      |
| Differential Impedance(cable termination)     | Rin3,P-P | 85  | 100     | 110   | Ω    |                      |
| Insertion loss                                | SDD21    |     |         | 22.48 | dB   | At 12.8906 GHz       |
| Differential Return Loss                      | SDD11    |     |         | See 1 | dB   | At 0.05 to 4.1 GHz   |
|                                               | SDD22    |     |         | See 2 | dB   | At 4.1 to 19 GHz     |
| Common-mode to common-mode output return loss | SCC11    | 2   |         |       | dB   | At 0.2 to 19 GHz     |
|                                               | SCC22    |     |         |       |      |                      |
| Differential to common-mode return loss       | SCD11    |     |         | See 3 | dB   | At 0.01 to 12.89 GHz |
|                                               | SCD22    |     |         | See 4 |      | At 12.89 to 19 GHz   |
| Differential to common Mode Conversion Loss   | SCD21    |     |         | 10    | dB   | At 0.01 to 12.89 GHz |
|                                               |          |     |         | See 5 |      | At 12.89 to 15.7 GHz |
|                                               |          |     |         | 6.3   |      | At 15.7 to 19 GHz    |
| Channel Operating Margin                      | COM      | 3   |         |       | dB   |                      |

Notes:

1. Reflection Coefficient given by equation  $SDD11(dB) < 16.5 - 2 \times \sqrt{f}$ , with f in GHz
2. Reflection Coefficient given by equation  $SDD11(dB) < 10.66 - 14 \times \log_{10}(f/5.5)$ , with f in GHz
3. Reflection Coefficient given by equation  $SCD11(dB) < 22 - (20/25.78) \times f$ , with f in GHz
4. Reflection Coefficient given by equation  $SCD11(dB) < 15 - (6/25.78) \times f$ , with f in GHz
5. Reflection Coefficient given by equation  $SCD21(dB) < 27 - (29/22) \times f$ , with f in GHz

## SFP28 end Pin Descriptions

| Pin | Logic      | Symbol   | Name/Description                | Notes |
|-----|------------|----------|---------------------------------|-------|
| 1   |            | VeeT     | Transmitter Ground              |       |
| 2   | LV-TTL-O   | TX_Fault | N/A                             | 1     |
| 3   | LV-TTL-I   | TX_DIS   | Transmitter Disable             | 2     |
| 4   | LV-TTL-I/O | SDA      | Tow Wire Serial Data            |       |
| 5   | LV-TTL-I   | SCL      | Tow Wire Serial Clock           |       |
| 6   |            | MOD_DEF0 | Module present, connect to VeeT |       |
| 7   | LV-TTL-I   | RS0      | N/A                             | 1     |
| 8   | LV-TTL-O   | LOS      | LOS of Signal                   | 2     |
| 9   | LV-TTL-I   | RS1      | N/A                             | 1     |
| 10  |            | VeeR     | Reciever Ground                 |       |
| 11  |            | VeeR     | Reciever Ground                 |       |
| 12  | CML-O      | RD-      | Reciever Data Inverted          |       |
| 13  | CML-O      | RD+      | Reciever Data Non-Inverted      |       |
| 14  |            | VeeR     | Reciever Ground                 |       |
| 15  |            | VccR     | Reciever Supply 3.3V            |       |
| 16  |            | VccT     | Transmitter Supply 3.3V         |       |
| 17  |            | VeeT     | Transmitter Ground              |       |
| 18  | CML-I      | TD+      | Transmitter Data Non-Inverted   |       |
| 19  | CML_I      | TD-      | Transmitter Data Inverted       |       |
| 20  |            | VeeT     | Transmitter Ground              |       |

Note:

1. Signals not supported in SFP+ Copper pulled-down to VeeT with 30K ohms resistor
2. Passive cable assemblies do not support LOS and TX\_DIS

## QSFP28 end Pin Descriptions

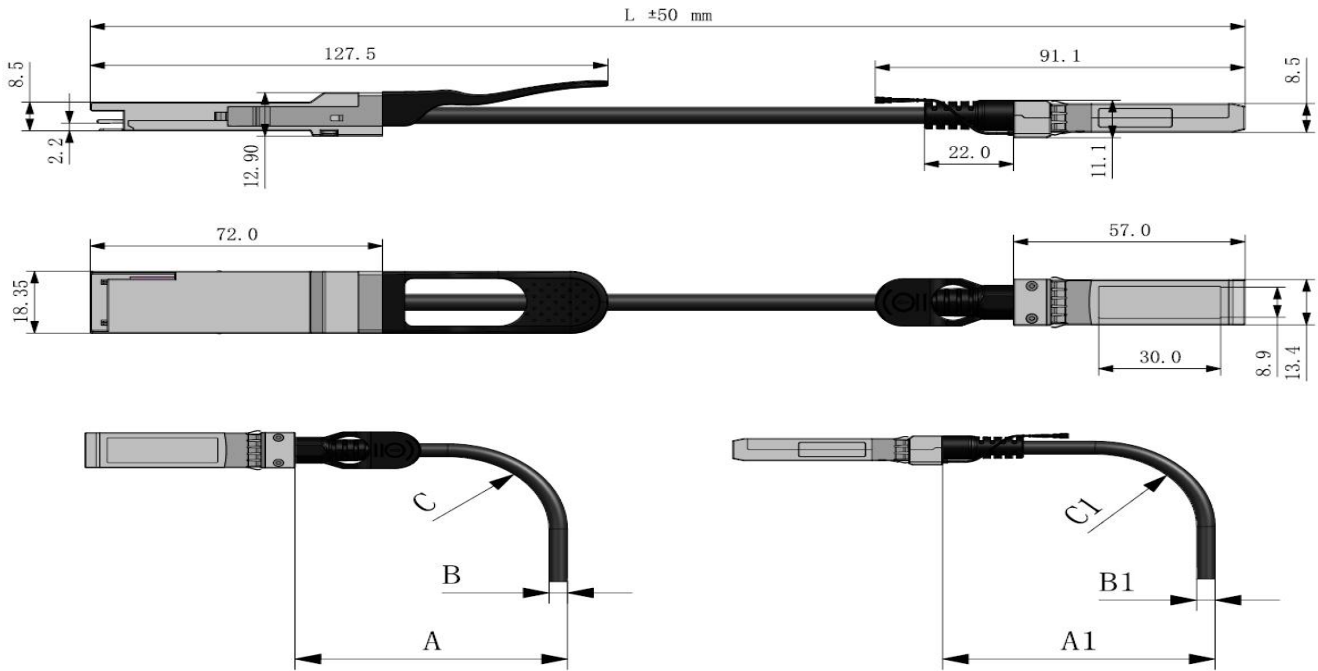
| Pin | Logic   | Symbol  | Name/Description                    | Notes |
|-----|---------|---------|-------------------------------------|-------|
| 1   |         | GND     | Ground                              | 1     |
| 2   | CML-I   | Tx2n    | Transmitter Inverted Data Input     |       |
| 3   | CML-I   | Tx2p    | Transmitter Non-Inverted Data Input |       |
| 4   |         | GND     | Ground                              | 1     |
| 5   | CML-I   | Tx4n    | Transmitter Inverted Data Input     |       |
| 6   | CML-I   | Tx4p    | Transmitter Non-Inverted Data Input |       |
| 7   |         | GND     | Ground                              | 1     |
| 8   | LVTTL-I | ModSelL | Module Select                       |       |
| 9   | LVTTL-I | ResetL  | Module Reset                        |       |
| 10  |         | Vcc Rx  | +3.3V Power Supply Receiver         | 2     |

|    |            |         |                                     |   |
|----|------------|---------|-------------------------------------|---|
| 11 | LVC MOSI/O | SCL     | 2-wire serial interface clock       |   |
| 12 | LVC MOSI/O | SDA     | 2-wire serial interface data        |   |
| 13 |            | GND     | Ground                              | 1 |
| 14 | CML-O      | Rx3p    | Receiver Non-Inverted Data Output   |   |
| 15 | CML-O      | Rx3n    | Receiver Inverted Data Output       |   |
| 16 |            | GND     | Ground                              | 1 |
| 17 | CML-O      | Rx1p    | Receiver Non-Inverted Data Output   |   |
| 18 | CML-O      | Rx1n    | Receiver Inverted Data Output       |   |
| 19 |            | GND     | Ground                              | 1 |
| 20 |            | GND     | Ground                              | 1 |
| 21 | CML-O      | Rx2n    | Receiver Inverted Data Output       |   |
| 22 | CML-O      | Rx2p    | Receiver Non-Inverted Data Output   |   |
| 23 |            | GND     | Ground                              | 1 |
| 24 | CML-O      | Rx4n    | Receiver Inverted Data Output       |   |
| 25 | CML-O      | Rx4p    | Receiver Non-Inverted Data Output   |   |
| 26 |            | GND     | Ground                              | 1 |
| 27 | LVTTL-O    | ModPrsL | Module Present                      |   |
| 28 | LVTTL-O    | IntL    | Interrupt                           |   |
| 29 |            | Vcc Tx  | +3.3V Power supply transmitter      | 2 |
| 30 |            | Vcc1    | +3.3V Power supply                  | 2 |
| 31 | LVTTL-I    | LPMode  | Low Power Mode                      |   |
| 32 |            | GND     | Ground                              | 1 |
| 33 | CML-I      | Tx3p    | Transmitter Non-Inverted Data Input |   |
| 34 | CML-I      | Tx3n    | Transmitter Inverted Data Input     |   |
| 35 |            | GND     | Ground                              | 1 |
| 36 | CML-I      | Tx1p    | Transmitter Non-Inverted Data Input |   |
| 37 | CML-I      | Tx1n    | Transmitter Inverted Data Input     |   |
| 38 |            | GND     | Ground                              | 1 |

Note:

1. GND is the symbol for signal and supply (power) common for the QSFP+ module. All are common within the QSFP+ module and all module voltages are referenced to this potential unless otherwise noted. Connect these directly to the host board signal-common ground plane.
2. Vcc Rx, Vcc1 and Vcc Tx are the receiver and transmitter power supplies and shall be applied concurrently. Requirements defined for the host side of the Host Edge Card Connector are listed in Table 6. Recommended host board power supply filtering is shown in Figure 4. Vcc Rx Vcc1 and Vcc Tx may be internally connected within the QSFP+ Module module in any combination. The connector pins are each rated for a maximum current of 500 mA.

## Mechanical Dimensions

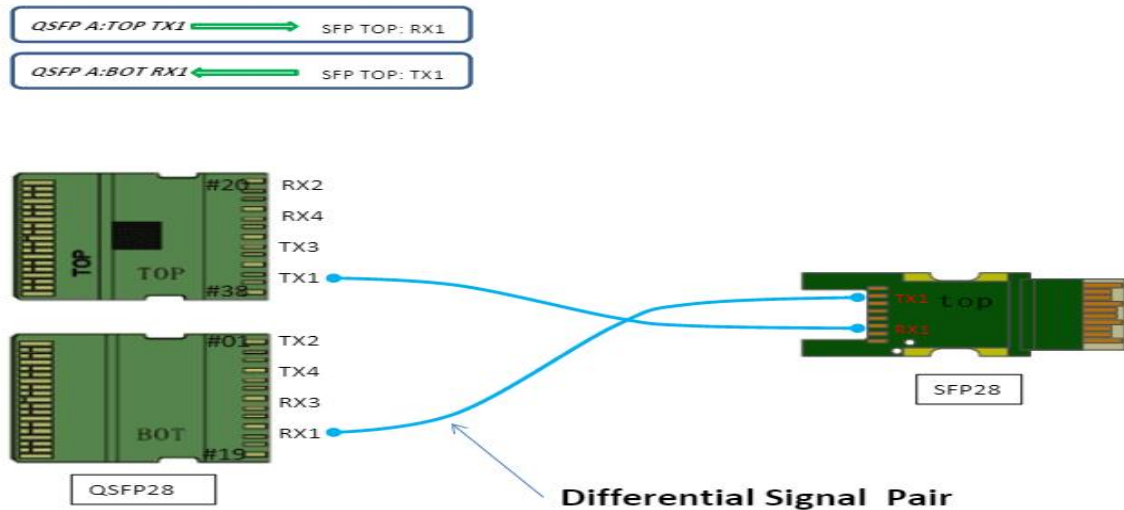


| SFP Horizontal Direction |               |                      |                      |
|--------------------------|---------------|----------------------|----------------------|
| CABLE GAUGE              | DIAMETER "B"  | MIN BEND RADIUS "C"  | MIN BEND RADIUS "A"  |
| 30AWG                    | 4.5MM         | 22.5MM               | 49MM                 |
| 26AWG                    | 5.2MM         | 25MM                 | 52.2MM               |
| SFP Vertical Direction   |               |                      |                      |
| CABLE GAUGE              | DIAMETER "B1" | MIN BEND RADIUS "C1" | MIN BEND RADIUS "A1" |
| 30AWG                    | 4.5MM         | 22.5MM               | 49MM                 |
| 26AWG                    | 5.2MM         | 25MM                 | 52.2MM               |



| QSFP Horizontal Direction |              |                     |                     |
|---------------------------|--------------|---------------------|---------------------|
| CABLE GAUGE               | DIAMETER"B"  | MIN BEND RADIUS"C"  | MIN BEND RADIUS"A"  |
| 30AWG 2P                  | 4.5MM        | 22.5MM              | 39MM                |
| 26AWG 2P                  | 5.2MM        | 25MM                | 42.2MM              |
| QSFP Vertical Direction   |              |                     |                     |
| CABLE GAUGE               | DIAMETER"B1" | MIN BEND RADIUS"C1" | MIN BEND RADIUS"A1" |
| 30AWG 2P                  | 4.5MM        | 22.5MM              | 39MM                |
| 26AWG 2P                  | 5.2MM        | 25MM                | 42.2MM              |

## Wiring connection diagram



## Ordering information

Note: You can be customized diameter and distance.

| Part Number      | GQS-P28101-XXC |    |       |    |    |
|------------------|----------------|----|-------|----|----|
| Length (meter)   | 1              | 2  | 3     | 4  | 5  |
| Wire gauge (AWG) | 30             | 30 | 30/26 | 26 | 26 |

## Important Notice

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#### Revision History

| Revision | Date             | Description      |
|----------|------------------|------------------|
| V0       | July. 15th, 2025 | Advance Release. |