



## Q2885P10C1PFK8Y

HP® 882251-B21 Compatible 100GbE/OTU-4/128G FC Multi-Rate SR4 QSFP28 Transceiver (MMF, 850nm, 100m, MPO, DOM)

### Product Description

This HP® 882251-B21 compatible QSFP28 transceiver provides 100GBase-SR4 throughput up to 100m over OM4 multi-mode fiber (MMF) using a wavelength of 850nm via an MPO connector. It is guaranteed to be 100% compatible with the equivalent HP® transceiver. This easy to install, hot swappable transceiver has been programmed, uniquely serialized and data-traffic and application tested to ensure that it will initialize and perform identically. Digital optical monitoring (DOM) support is also present to allow 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:

- Supports 103.1Gbps and 112.2Gbps Aggregate Bit Rates
- Up to 70m Transmission on MMF OM3, and 100m Transmission on MMF OM4
- Single 3.3V Power Supply and Power Dissipation < 3.5W
- Class 1 FDA and IEC60825-1 Laser Safety Compliant
- I2C Interface with Integrated Digital Diagnostic Monitoring
- Hot-Pluggable QSFP28 Footprint
- RoHS6 Compliant
- Operating Temperature: 0C to 70C



### Applications:

- 100GBase Ethernet
- Access and Enterprise

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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 |
|-----------------------------|-----------------|------|------|------|------|
| Supply Voltage              | V <sub>cc</sub> | -0.5 |      | 3.6  | V    |
| Storage Temperature         | T <sub>s</sub>  | -40  |      | +85  | °C   |
| Case Operating Temperature  | T <sub>c</sub>  | 0    |      | 70   | °C   |
| Operating Relative Humidity | RH              | 5    |      | 85   | %    |

### Notes:

1. Exceeding any one of these values may destroy the device immediately.

### Electrical Characteristics

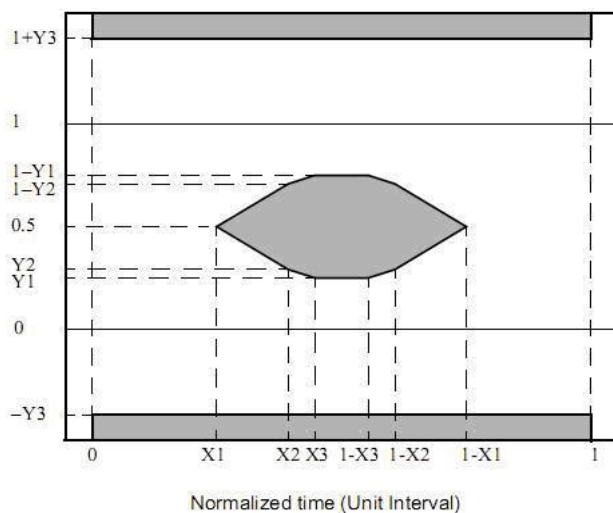
| Parameter                       | Symbol                         | Min.  | Typ. | Max.  | Unit             | Notes                            |
|---------------------------------|--------------------------------|-------|------|-------|------------------|----------------------------------|
| Power Supply Voltage            | V <sub>cc</sub>                | 3.135 | 3.3  | 3.465 | V                |                                  |
| Power Consumption               | P                              |       |      | 3.5   | W                |                                  |
| Transmitter                     |                                |       |      |       |                  |                                  |
| Input Amplitude (Differential)  | V <sub>in</sub>                | 150   |      | 1050  | mV <sub>pp</sub> | AC coupled inputs                |
| Input Impedance (Differential)  | Z <sub>in</sub>                | 85    | 100  | 115   | ohms             | R <sub>in</sub> > 100 kohms @ DC |
| Receiver                        |                                |       |      |       |                  |                                  |
| Output Amplitude (Differential) | V <sub>out</sub>               | 200   |      | 1100  | mV <sub>pp</sub> | AC coupled outputs               |
| Output Impedance (Differential) | Z <sub>out</sub>               | 85    | 100  | 115   | ohms             |                                  |
| Output Rise/Fall Time           | t <sub>r</sub> /t <sub>f</sub> |       | 12   |       | ps               | 20%~80%                          |

## Optical Characteristics 100GBASE-SR4 Ethernet Operation

| Parameter                                                | Symbol      | Min.                      | Typ.  | Max.  | Unit | Notes |   |
|----------------------------------------------------------|-------------|---------------------------|-------|-------|------|-------|---|
| Transmitter                                              |             |                           |       |       |      |       |   |
| Signaling Speed per Lane                                 | BRAVE       |                           | 25.78 |       | Gbps |       |   |
| Center Wavelength                                        | $\lambda_C$ | 840                       | 850   | 860   | nm   |       |   |
| Average Launch Power, Each Lane                          | Pout/lane   | -8.4                      |       | 2.4   | dBm  | 1     |   |
| Optical modulation amplitude                             | Poma        |                           |       | 3     | dBm  |       |   |
| Extinction Ratio                                         | ER          | 3                         |       |       | dB   |       |   |
| Transmitter eye mask definition {X1, X2, X3, Y1, Y2, Y3} |             | IEEE 802.3bm 100Gbase-SR4 |       |       |      |       | 2 |
| Receiver                                                 |             |                           |       |       |      |       |   |
| Signaling Speed per Lane                                 | BRAVE       | 25.78                     |       | 28.05 | Gbps |       |   |
| Center Wavelength                                        | $\lambda_C$ | 840                       | 850   | 860   | nm   |       |   |
| Average Receive Power per Lane                           | Rpow        | -10.3                     |       | 2.4   | dBm  |       |   |
| Stressed Receive Sensitivity in OMA per Lane             | Pmin        |                           |       | -5.2  | dBm  | 3     |   |
| Receive Sensitivity in OMA per Lane                      | Pmin        |                           |       | -8    | dBm  | 3     |   |
| LOS Assert                                               | LOSA        | -20                       |       |       | dBm  |       |   |
| LOS De-Assert                                            | LOSD        |                           |       | -12   | dBm  |       |   |
| LOS Hysteresis                                           |             | 0.5                       |       |       | dB   |       |   |

### Notes:

1. Output is coupled into a 50/125 $\mu$ m multi-mode fiber.
2. Filtered, measured with a PRBS  $2^{31}-1$  test pattern @25.78Gbps.
3. Receive sensitivity measured at BER less than  $5E-5$ , with a  $2^{31}-1$  PRBS @25.78Gbps.



## Optical Characteristics OTU4 and 128G Fiber Channel Operation

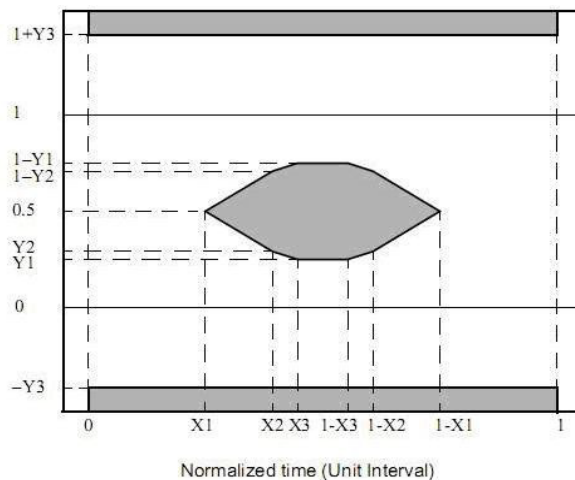
| Parameter                                                | Symbol      | Min.    | Typ. | Max.  | Unit | Notes |   |
|----------------------------------------------------------|-------------|---------|------|-------|------|-------|---|
| Transmitter                                              |             |         |      |       |      |       |   |
| Signaling Speed per Lane                                 | BRAVE       | 27.95   |      | 28.05 | Gbps | 1     |   |
| Center Wavelength                                        | $\lambda_C$ | 840     | 850  | 860   | nm   |       |   |
| Average Launch Power, Each Lane                          | Pout/lane   | -2.5    |      | 2.4   | dBm  | 2     |   |
| Optical modulation amplitude                             | Poma        |         |      | 3     | dBm  |       |   |
| Extinction Ratio                                         | ER          | 3       |      |       | dB   |       |   |
| Transmitter eye mask definition {X1, X2, X3, Y1, Y2, Y3} |             | FC-PI-6 |      |       |      |       | 3 |
| Receiver                                                 |             |         |      |       |      |       |   |
| Signaling Speed per Lane                                 | BRAVE       | 27.95   |      | 28.05 | Gbps |       |   |
| Center Wavelength                                        | $\lambda_C$ | 840     | 850  | 860   | nm   |       |   |
| Average Receive Power per Lane                           | Rpow        | -10.2   |      | 2.4   | dBm  |       |   |
| Receive Sensitivity in OMA per Lane                      | Pmin        |         |      | -6    | dBm  | 4     |   |
| LOS Assert                                               | LOSA        | -20     |      |       | dBm  |       |   |
| LOS De-Assert                                            | LOSD        |         |      | -12   | dBm  |       |   |
| LOS Hysteresis                                           |             | 0.5     |      |       | dB   |       |   |

### Notes:

1. This module will work at 103.1Gbps (25.78Gbpsx4) in default. To work at 112.2Gbps (28.05Gbpsx4), Page 00 bytes 87-88 (Rx and Tx Rate Select) need to be written with 0xFF to enable rate select (refer to SFF-8636), which will lose to default when powered off.

| Page 00 Byte 87 | Page 00 Byte 88 | Data Rate           |
|-----------------|-----------------|---------------------|
| 0xAA            | 0xAA            | 103.1Gbps (Default) |
| 0xFF            | 0xFF            | 112.2Gbps           |

2. Output is coupled into a 50/125 $\mu$ m multi-mode fiber.
3. Filtered, measured with a PRBS  $2^{31}-1$  test pattern @28.05Gbps.
4. Receive sensitivity measured at BER less than  $1E-6$ , with a  $2^{31}-1$  PRBS @28.05Gbps.



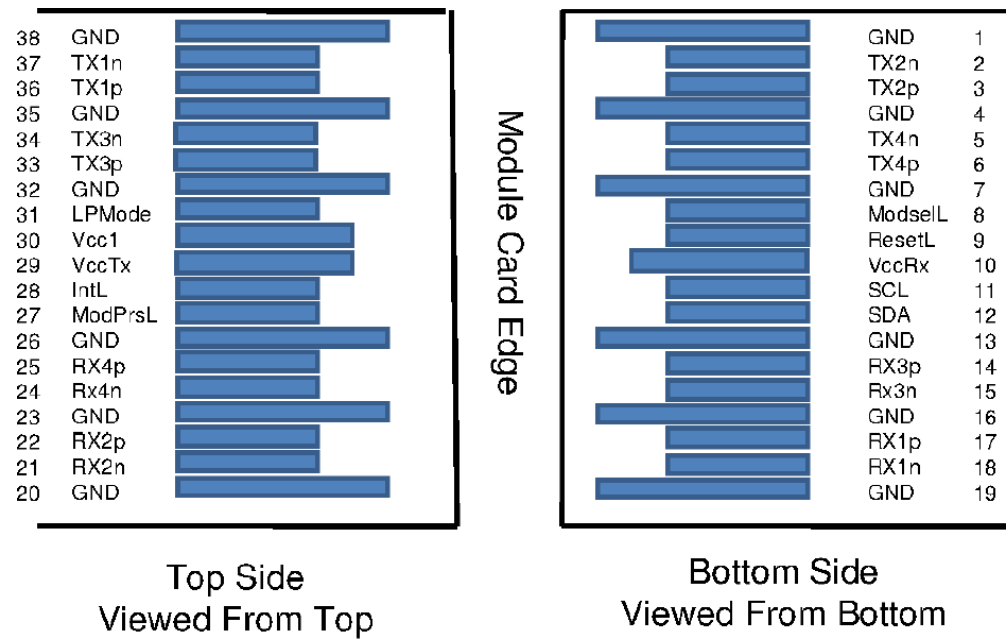
## Pin Descriptions

| Pin | Logic        | Symbol  | Name/Descriptions                   | Ref. |
|-----|--------------|---------|-------------------------------------|------|
| 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  |              | VccRx   | +3.3V Power Supply Receiver         | 2    |
| 11  | LVC MOS- I/O | SCL     | 2-wire serial interface clock       |      |
| 12  | LVC MOS- I/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  |              | VccTx   | +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    |

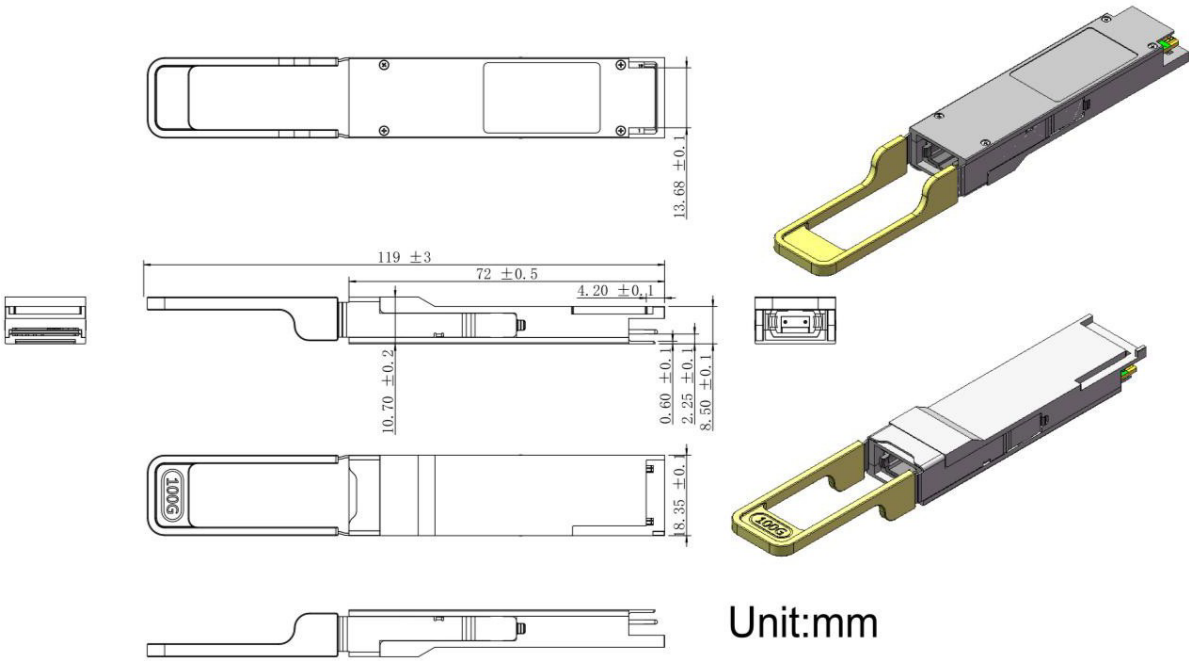
**Notes:**

- 1. GND is the symbol for signal and supply (power) common for the QSFP28 module. All are common within the QSFP28 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. Vcc Rx, Vcc1 and Vcc Tx may be internally connected within the QSFP28 Module in any combination. The connector pins are each rated for a maximum current of 500mA.

**Electrical Pin-out Details**



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.

