

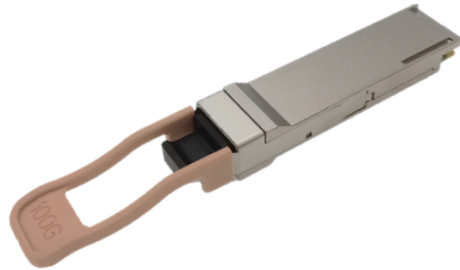
## LPBQMM85-S10C

QSFP28 100Gb/s SR4 100m DDM

### PRODUCT FEATURES

- Supports 103.1Gb/s aggregate bit rate
- 4x25Gb/s electrical interface
- Maximum link length of 100m on OM4 Multimode Fiber (MMF)
- Hot-pluggable QSFP28 footprint
- Single MPO 12 receptacle
- Low power Consumption
- RoHS-6 compliant and lead-free
- +3.3V single power supply
- Support Digital Diagnostic Monitor interface
- Case operating temperature

Commercial: 0°C to +70°C



### APPLICATIONS

- 100GBASE-SR4 100G Ethernet

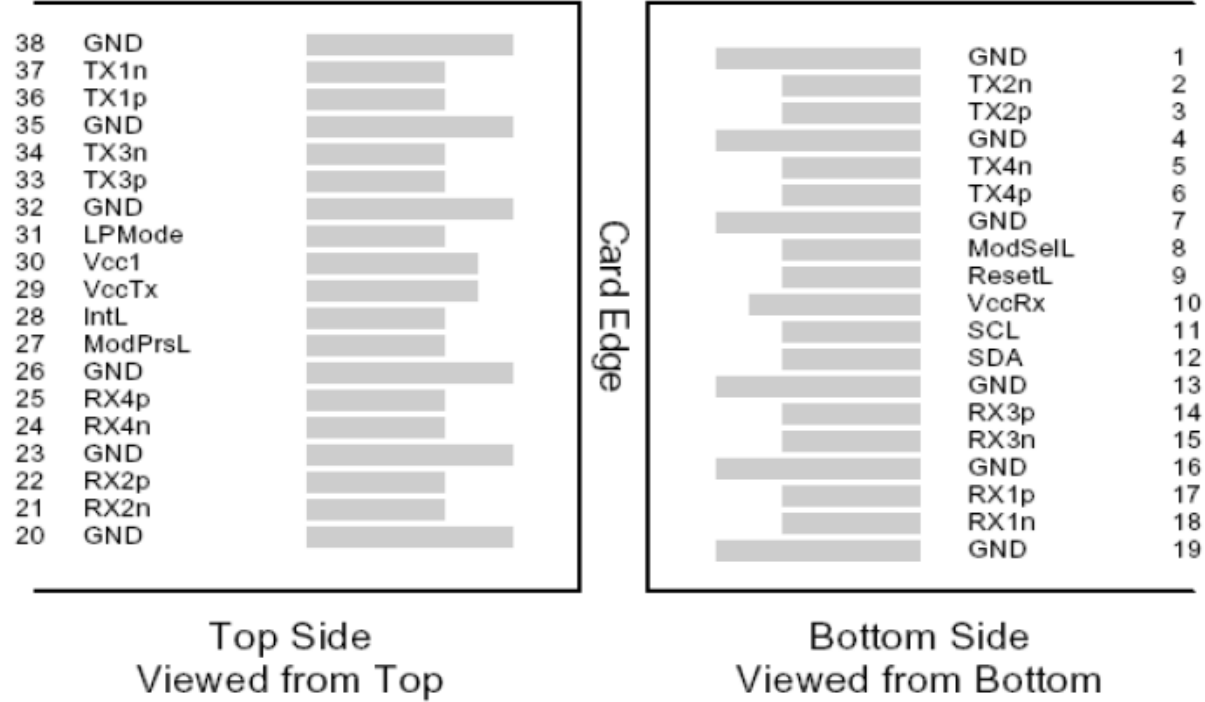
### Compliance

- QSFP28 MSA.
- IEEE802.3bm
- SFF-8636
- RoHS

Ordering information

| Part NO.    | Bit Rate (Gbps) | Laser (nm) | Distance( m) | Media            | DDMI | Connector | Temp (℃) |
|-------------|-----------------|------------|--------------|------------------|------|-----------|----------|
| LPBQMM-S10C | 100             | 850        | 100 (OM4)    | multi-mode fiber | YES  | MPO 1X12  | 0~70     |

I. Pin Diagram



QSFP28-compliant 38-pin connector (per SFF-8679)

II. Pin Descriptions

| 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                        |   |
| 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 | Vcc Tx  | +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.

## III. Absolute Maximum Ratings

| Parameter                       | Symbol            | Min. | Typ. | Max.   | Unit   | Ref. |
|---------------------------------|-------------------|------|------|--------|--------|------|
| Storage Temperature             | T <sub>S</sub>    | -40  |      | 85     | °C     |      |
| Storage Ambient Humidity        | H <sub>A</sub>    | 0    |      | 85     | %      |      |
| Maximum Supply Voltage          | V <sub>CC</sub>   | -0.5 |      | 3.6    | V      |      |
| Receiver Damage Threshold       |                   | +3.4 |      |        | dBm    |      |
| Lead Soldering Temperature/Time | T <sub>SOLD</sub> |      |      | 260/10 | °C/sec | 1    |
| Lead Soldering Temperature/Time | T <sub>SOLD</sub> |      |      | 360/10 | °C/sec | 2    |

Note:

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

## IV. General Product Characteristics

| Data Rate Specifications          | Symbol | Min. | Typ. | Max.             | Unit   | Ref. |
|-----------------------------------|--------|------|------|------------------|--------|------|
| Bit Rate(all wavelength combined) | BR     |      |      | 103.1            | Gb/s   | 1    |
| Bit Error Ratio(pre-FEC)          | BER    |      |      | 10 <sup>-5</sup> |        | 2    |
| Maximum Supported Distances       |        |      |      |                  |        |      |
| Fiber Type                        |        |      |      |                  |        |      |
| Link distance on OM3 MMF          | d      |      |      | 70               | meters | 3    |
| Link distance on OM4 MMF          | d      |      |      | 100              | meters | 3    |

Notes:

1. Supports 100GBASE-SR4 per IEEE 802.3bm.
2. Tested with a PRBS 2<sup>31</sup>-1 test pattern.
3. Requires FEC on the host to support maximum distance, per 100GBASE-SR4.

## V. Optical Characteristics

| Parameter                       | Symbol           | Min.                          | Typ. | Max. | Unit | Ref. |
|---------------------------------|------------------|-------------------------------|------|------|------|------|
| <b>Transmitter(per lane)</b>    |                  |                               |      |      |      |      |
| Average Output Power per lane   | P <sub>OUT</sub> | -6                            |      | 2.4  | dBm  |      |
| Extinction Ratio                | ER               | 2                             |      |      | dB   |      |
| Center Wavelength               | λ <sub>C</sub>   | 840                           |      | 860  | nm   |      |
| RMS Spectral Width              | σ                |                               |      | 0.6  | nm   |      |
| Transmitter OFF Output Power    | P <sub>Off</sub> |                               |      | -30  | dBm  |      |
| Transmitter eye mask definition |                  | {0.3,0.38,0.45,0.35,0.41,0.5} |      |      |      | 1    |

|                                        |                |      |  |       |     |   |
|----------------------------------------|----------------|------|--|-------|-----|---|
| {X1,X2,X3,Y1,Y2,Y3}                    |                |      |  |       |     |   |
| <b>Receiver(per lane)</b>              |                |      |  |       |     |   |
| Input Optical Wavelength               | $\lambda_{IN}$ | 840  |  | 860   | nm  |   |
| Rx Sensitivity(OMA) per lane @BER=5E-5 | $R_{SENS}$     |      |  | -10.3 | dBm | 2 |
| Input Saturation Power (Overload)      | $P_{SAT}$      | +2.4 |  |       | dBm |   |
| Receiver Reflectance                   | $R_{fl}$       |      |  | -12   | dBm |   |
| Loss of Signal Assert                  | $P_A$          | -30  |  |       | dBm |   |
| Loss of Signal De-assert               | $P_D$          |      |  | -12   | dBm |   |
| LOS Hysteresis                         | $P_D - P_A$    | 0.5  |  |       | dB  |   |

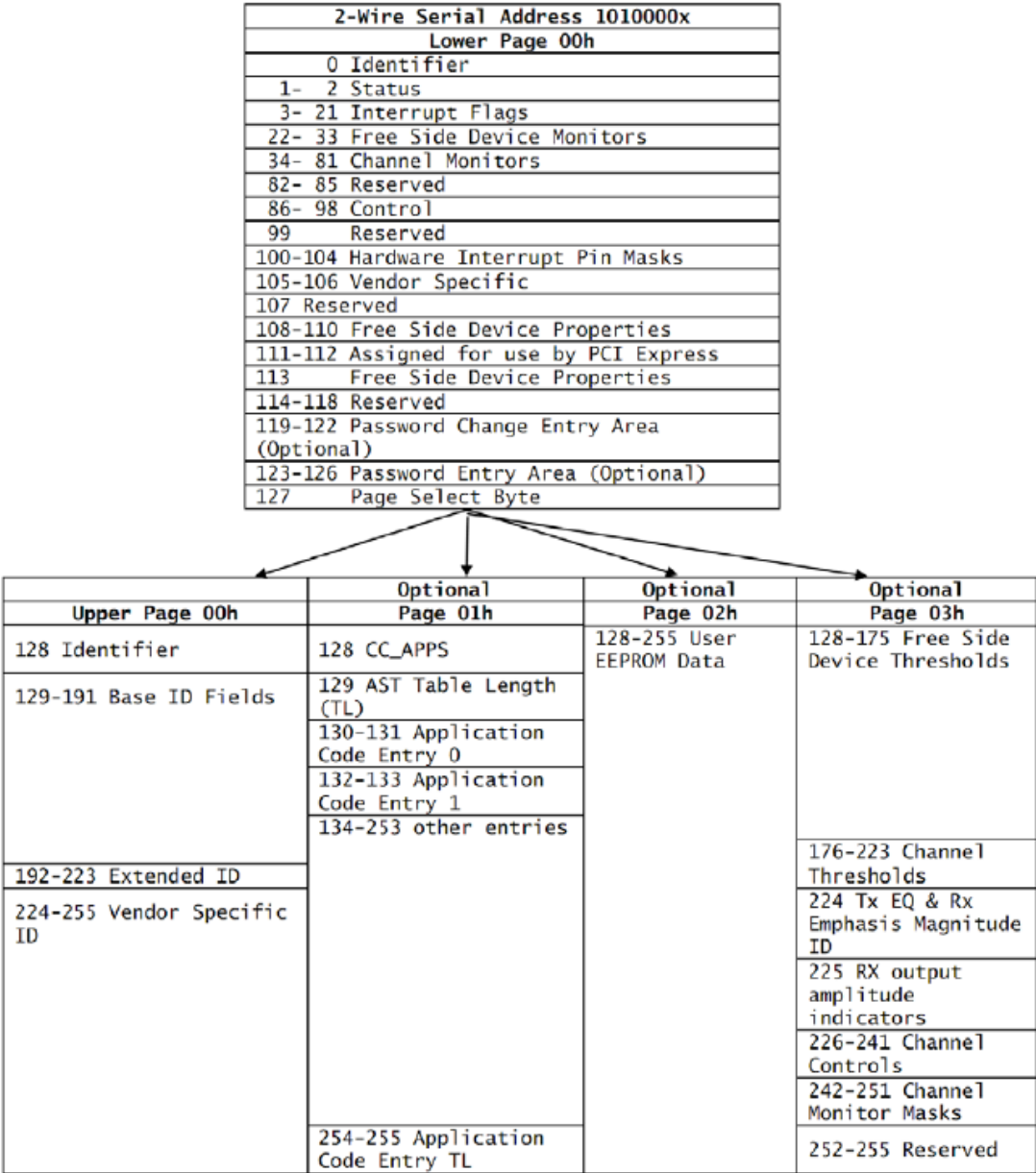
Note:

1. Hit Ratio  $1.5 \times 10^{-3}$  hit/sample.
2. Measured with PRBS  $2^{31}-1$  test pattern 25.78125Gbps.

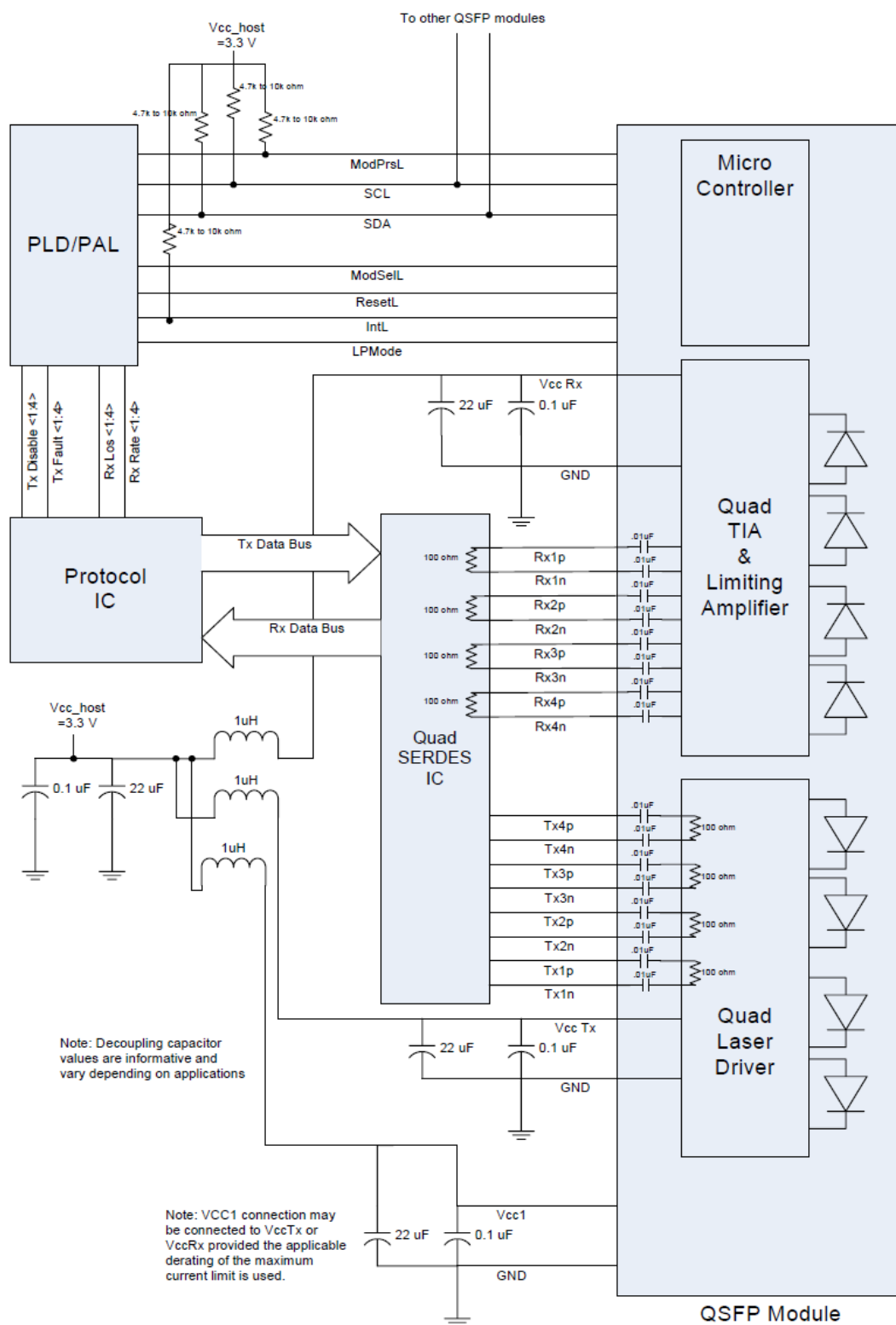
## VI. Electrical Interface Characteristics

| Parameter                            | Symbol                                  | Min. | Typ. | Max. | Unit     | Ref. |
|--------------------------------------|-----------------------------------------|------|------|------|----------|------|
| Supply Voltage                       | $V_{CC1},$<br>$V_{CCTx},$<br>$V_{CCRx}$ | 3.15 |      | 3.45 | V        |      |
| Supply Current                       | $I_{CC}$                                |      |      | 750  | mA       |      |
| <b>Transmitter(per Lane)</b>         |                                         |      |      |      |          |      |
| Input different impedance            | $R_{in}$                                | 90   | 100  | 110  | $\Omega$ |      |
| Single ended input voltage tolerance | $V_{inT}$                               | -0.3 |      | 4.0  | V        |      |
| Differential data input swing        | $V_{in,pp}$                             | 200  |      | 1000 | mV       |      |
| <b>Receiver (per Lane)</b>           |                                         |      |      |      |          |      |
| Output different impedance           | $R_{out}$                               | 90   | 100  | 110  | $\Omega$ |      |
| Differential data output swing       | $V_{out,pp}$                            | 200  |      | 1000 | mV       |      |
| Single-ended output voltage          | $V_{outR}$                              | -0.3 |      | 4.0  | V        |      |

VII. Digital Diagnostic Functions



## VIII.Recommended Interface Circuit



IX. Mechanical Specifications (Unit: mm)

