

# SV-QSFP-100G-LR4

100GBase aggregating 4 x 25Gbps duplex LWDM SM DML (LC) with DDM, distance up to 10km, supporting 100GE.



## Features

- Supports 103Gbps
- Single 3.3V Power Supply and Power dissipation< 3.5W
- Up to 10km over SMF
- RoHS-6 compliant (lead-free)
- Commercial case temperature range of 0°C to 70°C
- 4\*25Gbps DFB-based LAN-WDM transmitter
- PIN and TIA array on the receiver side
- 4x25G electrical interface
- Duplex LC receptacles

## Applications

- 100GBASE-LR4 100G Ethernet

| Part number             | Description                                                                                                                                                                                                                         |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>SV-QSFP-100G-LR4</b> | Starview QSFP28 100Gbps module 100GBase aggregating 4 x 25Gbps duplex LWDM (1295.6 nm, 1300.1 nm, 1304.6 nm, and 1309.1nm) wavelengths SM DML (LC) with Digital Diagnostic Monitoring (DDM), distance up to 10km, supporting 100GE. |

## Absolute Maximum Ratings

| Parameter                           | Symbol | Min. | Max. | Unit |
|-------------------------------------|--------|------|------|------|
| Storage Temperature                 | Ts     | -40  | +85  | °C   |
| Supply Voltage                      | Vcc    | -0.5 | 3.6  | V    |
| Operating Relative Humidity         | RH     | 5    | 85   | %    |
| Receiver Damage Threshold, per Lane | Rxdmg  | 5.5  |      | dBm  |

## Recommended Operating Conditions

| Parameter                  | Symbol | Min.  | Typical | Max.  | Unit |
|----------------------------|--------|-------|---------|-------|------|
| Operating Case Temperature | Tc     | 0     | 25      | 70    | °C   |
| Power Supply Voltage       | Vcc    | 3.135 | 3.3     | 3.465 | V    |
| Power Dissipation          | PD     |       |         | 3.5   | W    |

## Electrical Characteristics

| Parameter                              | Symbol | Min.                     | Typ. | Max  | Unit  | Notes   |
|----------------------------------------|--------|--------------------------|------|------|-------|---------|
| Transmitter                            |        |                          |      |      |       |         |
| Differential data input swing per lane |        |                          |      | 900  | mvp-p |         |
| Input Impedance (Differential)         | Zin    |                          |      | 10   | %     |         |
| Stressed input parameters              |        |                          |      |      |       |         |
| Eye width                              |        | 0.46                     |      |      | UI    |         |
| Applied pk-pk sinusoidal jitter        |        | IEEE 802.3bm Table 88-13 |      |      |       |         |
| Eye height                             |        | 95                       |      |      | mv    |         |
| DC common mode voltage                 |        | -350                     |      | 2850 | mv    |         |
| Receiver                               |        |                          |      |      |       |         |
| Differential output amplitude          |        | 200                      |      | 900  | mvp-p |         |
| Output Impedance (Differential)        | Zout   |                          |      | 10   | %     |         |
| Output Rise/Fall Time                  | tr/tf  | 12                       |      |      | ps    | 20%~80% |
| Eye width                              |        | 0.57                     |      |      | UI    |         |
| Eye height differential                |        | 228                      |      |      | mv    |         |
| Vertical eye closure                   |        |                          |      | 5.5  | db    |         |

## Optical Characteristics

| Parameter                                                        | Symbol         | Min.                               | Typical | Max.    | Unit  |
|------------------------------------------------------------------|----------------|------------------------------------|---------|---------|-------|
| Transmitter                                                      |                |                                    |         |         |       |
| Signaling Speed per Lane                                         | BRAVE          |                                    | 25.78   |         | Gbps  |
| Data Rate Variation                                              |                | -100                               |         | +100    | ppm   |
| Lane_0 Center Wavelength                                         | $\lambda_{C0}$ | 1294.53                            | 1295.56 | 1296.59 | nm    |
| Lane_1 Center Wavelength                                         | $\lambda_{C1}$ | 1299.02                            | 1300.05 | 1301.09 | nm    |
| Lane_2 Center Wavelength                                         | $\lambda_{C2}$ | 1303.54                            | 1304.58 | 1305.63 | nm    |
| Lane_3 Center Wavelength                                         | $\lambda_{C3}$ | 1308.09                            | 1309.14 | 1310.19 | nm    |
| Total Average Output Power                                       | Po             |                                    |         | 10.5    | dBm   |
| Average Launch Power each Lane*(Note3)                           | Peach          | -4.3                               |         | 4.5     | dBm   |
| Optical Modulation Amplitude (OMA) each Lane                     | TxOMA          | -1.3                               |         | 4.5     | dBm   |
| Difference in launch power between any two lanes (OMA)           |                |                                    |         | 5       | dB    |
| Launch power in OMA minus TDP, each lane                         |                | -2.3                               |         |         | dBm   |
| Transmitter and dispersion penalty (TDP), each lane              |                |                                    |         | 2.2     | dB    |
| Extinction Ratio                                                 | ER             | 4                                  |         |         | dB    |
| Side-mode Suppression ratio                                      | SMSRmin        | 30                                 |         |         | dB    |
| Average launch power of OFF transmitter per lane                 |                |                                    |         | -30     | dBm   |
| Relative Intensity Noise                                         | RIN            |                                    |         | -130    | dB/hz |
| Transmitter Reflectance                                          |                |                                    |         | -12     | dB    |
| Optical Return Loss Tolerance                                    |                |                                    |         | 20      | dB    |
| Transmitter eye mask definition {X1, X2, X3, Y1, Y2, Y3}*(Note4) |                | {0.25, 0.4, 0.45, 0.25, 0.28, 0.4} |         |         |       |
| Receiver                                                         |                |                                    |         |         |       |
| Signaling Speed per Lane                                         | BRAVE          |                                    | 25.78   |         | Gbps  |
| Data Rate Variation                                              |                | -100                               |         | +100    | ppm   |
| Damage threshold per lane                                        | Rxdmg          | 5.5                                |         |         | dBm   |
| Lane_0 Center Wavelength                                         | $\lambda_{C0}$ | 1294.53                            | 1295.56 | 1296.59 | nm    |
| Lane_1 Center Wavelength                                         | $\lambda_{C1}$ | 1299.02                            | 1300.05 | 1301.09 | nm    |
| Lane_2 Center Wavelength                                         | $\lambda_{C2}$ | 1303.54                            | 1304.58 | 1305.63 | nm    |
| Lane_3 Center Wavelength                                         | $\lambda_{C3}$ | 1308.09                            | 1309.14 | 1310.19 | nm    |
| Average Receive Power per Lane*(Note5)                           | Rxpow          | -10.6                              |         | 4.5     | dBm   |
| Receive Power (OMA) per Lane                                     | RxOMA          |                                    |         | 4.5     | dBm   |

|                                                                     |        |      |     |
|---------------------------------------------------------------------|--------|------|-----|
| Receive Sensitivity in OMA<br>per Lane                              | Rxsens | -8.6 | dBm |
| Receiver 3 dB electrical upper<br>cutoff frequency, per lane        |        | 31   | GHz |
| Stressed Receiver Sensitivity<br>(OMA) per Lane <sup>*(Note6)</sup> | RXSRS  | -6.8 | dBm |
| Optical Return Loss                                                 | ORL    | -26  | dB  |
| LOS Assert                                                          | LOSA   | -25  | dBm |
| LOS De-Assert                                                       | LOSD   | -12  | dBm |
| LOS Hysteresis                                                      |        | 0.5  | dB  |
| Conditions of stressed receiver sensitivity test                    |        |      |     |
| Vertical eye closure<br>penalty <sup>*(Note7)</sup>                 | VECP   | 1.8  | dB  |
| Stressed eye J2 Jitter <sup>*(Note7)</sup>                          | J2     | 0.3  | UI  |
| Stressed eye J9 Jitter <sup>*(Note7)</sup>                          | J9     | 0.47 | UI  |

Note3: Average launch power, each lane (min) is informative and not the principal indicator of signal strength. A transmitter with launch power below this value cannot be compliant; however, a value above this does not ensure compliance.

Note4: Hit ratio  $5 \times 10^{-5}$ .

Note5: Average receive power, each lane (min) is informative and not the principal indicator of signal strength. A received power below this value cannot be compliant; however, a value above this does not ensure compliance. Note6: Measured with conformance test signal at TP3 for BER =  $10^{-12}$ .

Note7: Vertical eye closure penalty, stressed eye J2 Jitter, and stressed eye J9 Jitter are test conditions for measuring stressed receiver sensitivity. They are not characteristics of the receiver.