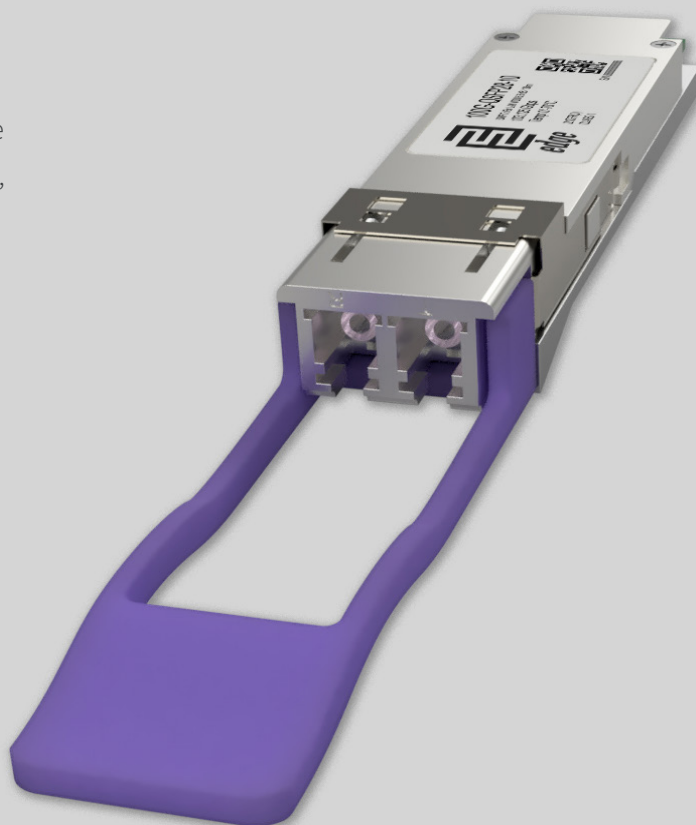# edge
## OPTICAL SOLUTIONS

# *Product Data Sheet*

## Key Highlights:

- **Type**: 100GBASE-LR4 QSFP28
- **Compatibility:** Multi-Vendor MSA Compatible
- **Tx/Rx Wavelength:** 1295.56, 1300.05, 1304.58, 1309.14 nm
- **Laser:** EML LAN WDM TOSA
- **Fiber Type:** Single-Mode Fiber (SMF)
- **Connectors:** Double LC
- **Optical Budget:** 6.6 dB
- **Max. Distance:** 10km
- **Data Rate:** 103.125 Gbps
- **FEC Forward Error Correction:** Supported
- **DDM/DOM:** Supported
- **Power Consumption:** ≤ 3.5W
- **Temperature:** Standard 0°-70°C

# Optical Transceiver : 100G-QSFP28-10

## Product Description:

100G-QSFP28-10 is Multi-Vendor MSA Compatible 100GBASE-LR4 QSFP28 (Quad Small Form-Factor Pluggable 28) Transceiver, operating over pair of single-mode optical fiber with four independent optical communication lanes, separated from each other using LAN WDM technology. Module has minimum guaranteed optical budget of 6.6 dB, which in most cases is enough to reach 10 km distance using single-mode cable. However, distance is just indicative parameter calculated for comfort of identification. Eventually we calculate distance taking in account minimal optical budget and average attenuation of optical cabling in industry. 100G-QSFP28-10 uses cooled 4x25Gb/s LAN WDM TOSA (1295.56, 1300.05, 1304.58, 1309.14nm) laser transmitters and 4x25Gb/s PIN ROSA receivers. Module support DDM/DOM optical diagnostics, which provide diagnostic information about the present operating conditions. Additionally module supports FEC (Forward Error Correction) function which will help receiving side detect and correct bit errors and improve the overall quality of the link. 100G-QSFP28-10 operates in Standard 0°-70°C temperature range and has double LC connectors.

# Product Data Sheet

100GBASE-LR4 QSFP28 support up to 103.125 Gbps data rate and such applications as 100G Ethernet (103.125 Gbps). 100G-QSFP28-10 optical transceiver is multi-purpose module used in number of different places in today's networking environment. Most popular applications are Internet Service Provider (ISP) Fiber to the Home Aggregation and Backbone, Mobile Operator Core Networks and Mobile Backhaul and Data Center networking site interconnections.

Transceiver is CE/RoHS certified and it is Compliant with product safety standards. 100G-QSFP28-10 Transceiver is fully compliant to QSFP28 Multi Source Agreement (MSA), IEEE 802.3ba 100GBASE-LR4 and IEEE 802.3bm standard. Consequently compliance to above standards guarantees that module is compatible and works with majority of networking equipment, where is not implemented special algorithm for protection against third party modules. However – our technical team has accumulated deep expertise in custom-encoded firmware's for 100GBASE-LR4 QSFP28 transceiver in order to make it work in almost any brand equipment. We will be glad to know your requirements.

## Product Specification:

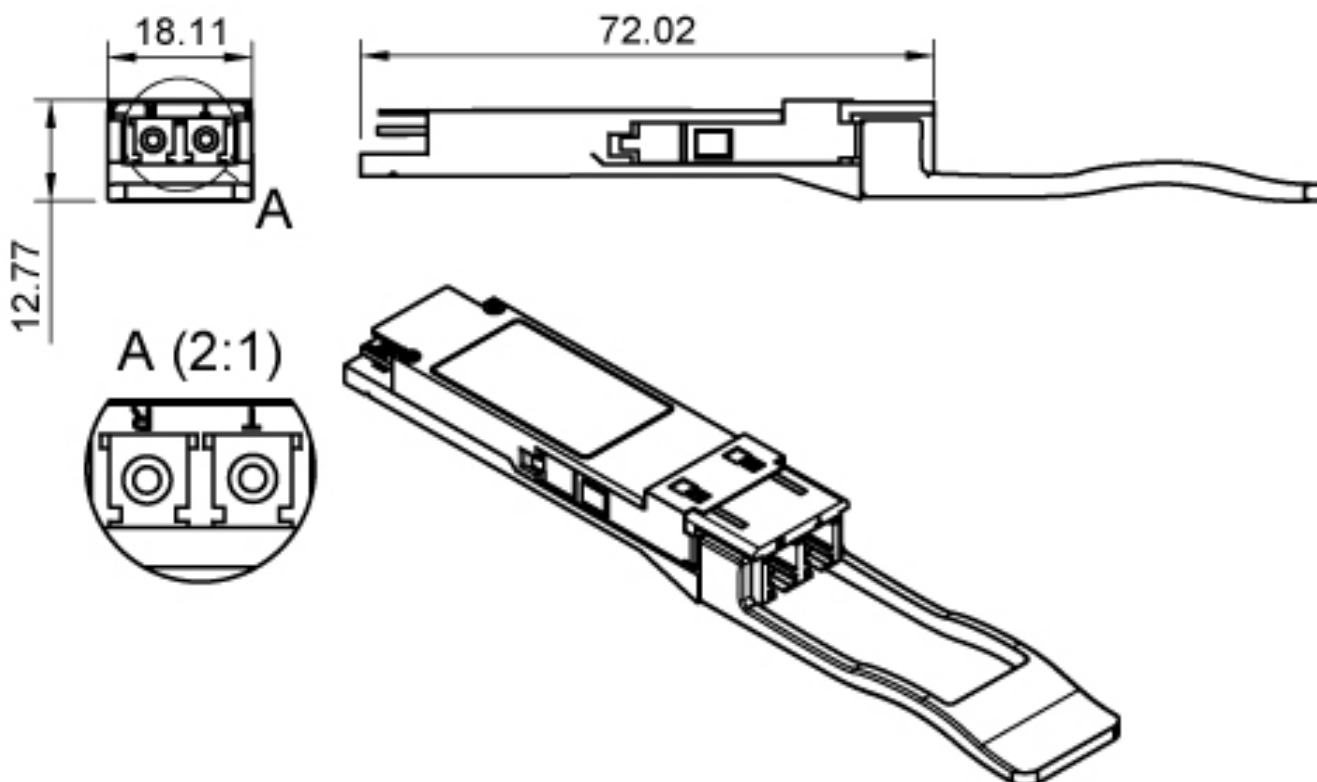| General parameter | Value |
|---|---|
| Media Type: | Single-Mode Fiber (SMF) |
| Connectors: | Double LC |
| TX Wavelength: | 1295.56, 1300.05, 1304.58, 1309.14 nm |
| RX Wavelength: | 1295.56, 1300.05, 1304.58, 1309.14 nm |
| Minimum Optical Budget: | 6.6 dB |
| Maximum Distance: | 10 km |
| Supported Data Rate: | 103.125 Gbps |
| Data Rate, each Lane up to: | 25.78125Gbps |
| Supported Applications: | 100G Ethernet (103.125Gbps) |
| Digital Diagnostic Monitoring (DDM): | Supported |
| Optical Clock And Data Recovery (CDR): | Supported |
| Forward Error Correction (FEC): | Supported |
| Operating Temperature Range: | Standard 0° - 70°C |
| Storage Temperature Range: | - 40° to 85°C |
| Relative Humidity (Non-Condensation): | 0 to 85% |
| Power Consumption: | ≤ 3.5W |

# edge
## OPTICAL SOLUTIONS

# *Product Data Sheet*

| General parameter | Value |
|---|---|
| Power Supply Voltage Typical: | + 3.3V |
| Power Supply Voltage Range: | - 3.135 to 3.465V |
| Chipset: | Macom, Sumitomo, Samtech, Oclaro, Avago, II-IV |
| Compliance: | QSFP28 MSA, IEEE 802.3ba 100GBASE-LR4, IEEE 802.3bm, SFF-8636, SFF-8665, CE, RoHS-6, Class 1 FDA, IEC60825-1 Laser Safety Compliant |

| Transmitter Parameters: | Value |
|---|---|
| Transmitter Type: | EML LAN WDM TOSA |
| Tx Wavelength Bandwidth: | 4 LAN WDM Seperated 1310 nm Lanes (15.66 nm 1294.53 – 1310.19nm) (L0 Tx center 1295.56nm, L1 Tx center 1300.05nm, L2 Tx center 1304.58nm, L3 Tx center 1309.14nm) |
| Total Average Launch Power (Min) | - 4 dBm |
| Total Average Launch Power (Max) | 8.3 dBm |
| Average Launch Power (Min) Each Lane: | - 4 dBm |
| Average Launch Power (Max) EachLane: | 4.5 dBm |
| Optical Modulation Amplitude OMA (Min) Each Lane: | - 4 dBm |
| Optical Modulation Amplitude OMA (Max) Each Lane: | 4.5 dBm |
| Difference in Launch Power between any Two Lanes OMA (Max): | 6.5 dBm |
| Launch Power in OMA minus TDEC (Min) Each Lane: | 4.8 dBm |
| TDP Each Lane: | 2.2 dB |
| Extinction Ratio (Min): | 4 dB |
| Optical Return Loss Tolerance (Max): | 20 dB |
| Relative Intensity Noise: | - 128 dB/HZ |
| Side-mode Suppression Ratio: | 30 dB |
| Average Launch Power OFF Transmitter (Max) Each Lane: | - 30 dBm |

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# Product Data Sheet

| Receiver Parameters: | Value |
|---|---|
| Receiver Type: | PIN ROSA |
| Rx Wavelength Bandwidth: | 4 LAN WDM Seperated 1310 nm Lanes (15.66 nm 1294.53 – 1310.19nm) (L0 Tx center 1295.56nm, L1 Tx center 1300.05nm, L2 Tx center 1304.58nm, L3 Tx center 1309.14nm) |
| Average Receiver Sensitivity (Min) Each Lane: | - 10.6 dBm |
| Average Receiver Sensitivity (Max) Each Lane: | 0 dBm |
| Receiver Overload: | 3.3 dBm |
| Receiver Reflectance (Max) Each Lane: | - 26 dB |
| Receive Power OMA (Max) Each Lane: | 3.5 dBm |
| LOS Assert (Min): | - 25 dBm |
| LOS De-assert (Max): | - 15 dBm |
| LOS Hysteresis (Min): | 0.5 dB |

## Mechanical Dimensions:

# Product Data Sheet

## Compatibility:

EDGE Optical transceivers can be provided with custom-encoded firmware, in order to provide compatibility with more then 100 vendor brands in data and telecom communications industry:

| | | | |
|---|---|---|---|
| **MS** - General MSA | **ER** - Ericsson | **IN** - Intel | **RD** - RAD |
| **AD** - ADVA | **EX** - Extreme Networks | **JU** - Juniper Networks | **RU** - Ruijie Networks |
| **AL** - Alcatel-Lucent | **F5** - F5 Networks | **LI** - Linksys | **SM** - Supermicro |
| **AR** - Arista | **FO** - Fortinet | **ML** - Mellanox | **SY** - Synology |
| **AV** - Avaya | **FU** - Fujitsu | **ME** - Meraki (Cisco) | **TC** - Telco Systems |
| **BR** - Brocade | **H3** - H3C | **MT** - MikroTik | **TP** - TP-LINK |
| **CN** - Ciena | **HI** - Hirschmann | **MO** - Moxa | **TN** - Trendnet |
| **CI** - Cisco | **HP*** - HP Networking | **MR** - MRV | **WG** - WatchGuard |
| **DL** - Dell & Force10 | **HS*** - HP Storage | **NG** - Netgear | **ZT** - ZTE |
| **DK** - D-Link | **HU** - Huawei | **NS** - NSN | **XX** - Other |
| **EM** - EMC2 | **IB** - IBM | **PA** - Palo Alto Network | |
| **ET** - Enterasys | **IF** - Infinera | **QL** - Qlogic | |

## Warranty:

EDGE Optic's provides a limited warranty for **sixty (60)** months from Purchaser's receipt of the Equipment represented in this data sheet against defective design or workmanship.

**EDGE Technologies Ltd.**
Plienciema Street 33, Marupe
Latvia, LV-2167
sales@edgeoptic.com
www.edgeoptic.com