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OPTICAL SOLUTIONS

Product Data Sheet

Key Highlights:

- **Type**: 100G 4WDM & CLR4 QSFP28
- **Compatibility:** Multi-Vendor MSA Compatible
- **Tx/Rx Wavelength:** 1271, 1291, 1311, 1331 nm
- **Laser:** DML LAN WDM TOSA
- **Fiber Type:** Single-Mode Fiber (SMF)
- **Connectors:** Double LC
- **Optical Budget:** 7 dB
- **Max. Distance:** 500m / 2km / 10km
- **Data Rate:** 103.125-112.2 Gbps
- **DDM/DOM:** Supported
- **FEC Forward Error Correction:** Supported
- **Power Consumption:** ≤3.5W
- **Temperature:** Standard 0°-70°C

Optical Transceiver : 100G-QSFP28-11

Product Description:

100G-QSFP28-11 is Multi-Vendor MSA Compatible 100G 4WDM/CLR4 QSFP28 (Quad Small Form-Factor Pluggable 28) Transceiver, operating over pair of single-mode optical fiber. Module adopts CWDM MUX/DEMUX technology with central wavelength of the lanes at: 1271, 1291, 1311, 1331 nm. On the transmission side module converts 4 electrical input channels (each up to 28.05Gbps) into 4 lanes with optical signal and multiplexes them into a single channel of 100 Gbps optical transmission, reversely on the receiver side, module optically de-multiplexes 100 Gbps input into 4 lanes signals and converts them to 4 lanes of electrical data (each up to 28.05Gbps). Module has minimum guaranteed optical budget of 7 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-QSFP28-11 uses cooled 4x28Gb/s LAN WDM TOSA (1271, 1291, 1311, 1331 nm) laser transmitters and 4x28Gb/s PIN ROSA receivers.

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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-QSFP28-11 operates in Standard 0°-70°C temperature range and has double LC connector. 100G 4WDM/CLR4 QSFP28 support up to 103.125-112.2 Gbps data rate and such applications as 100G Ethernet (103.125Gbps), Optical Transport Network OTU4 4l1-9D1F (112 Gbps) and 128G Fiber Channel (112.2 Gbps). 100G-QSFP28-11 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), Mobile Operator and Data Center Core Networks. Transceiver is CE/RoHS certified and is compliant with product safety standards.

100G-QSFP28-11 Transceiver is fully compliant to QSFP28 Multi Source Agreement (MSA), 100G 4WDM MSA and 100G CLR4 Alliance, Optical Transport Network OTU4 4l1-9D1F and 128G Generation 6 Fiber Channel standards. 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 100G 4WDM/CLR4 QSFP28 transceiver in order to make it work in almost any brand equipment. We will be glad to know your requirements.

Product Specification:

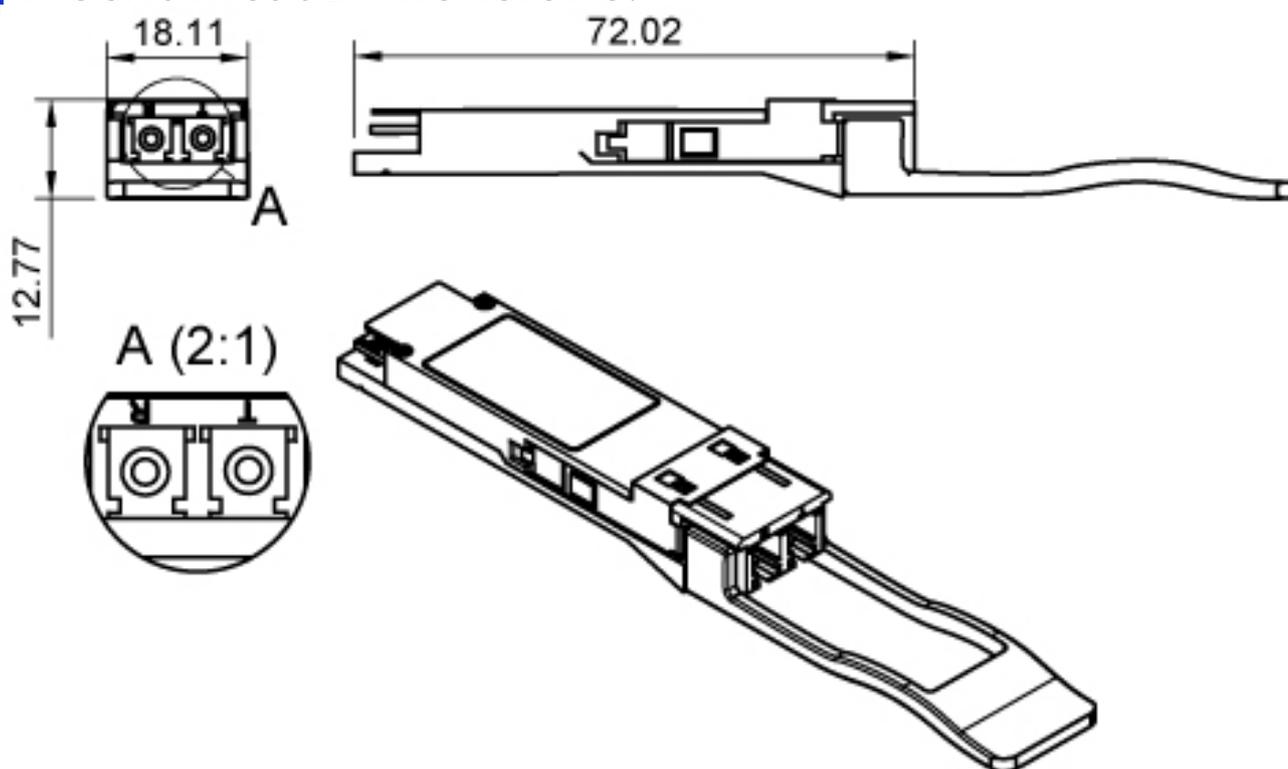| General parameter	Value
Media Type:	Single-Mode Fiber (SMF)
Connectors:	Double LC
TX Wavelength:	1271, 1291, 1311, 1331 nm
RX Wavelength:	1271, 1291, 1311, 1331 nm
Minimum Optical Budget:	7 dB
Maximum Distance:	500m / 2km / 10km
Supported Data Rate:	103.125 - 112.2 Gbps
Data Rate, each Lane up to:	28.05 Gbps
Supported Applications:	100G Ethernet (103.125Gbps), OTU4 4l1-9D1F (112 Gbps), 128GFC (112.2 Gbps)
Digital Diagnostic Monitoring (DDM):	Supported
Forward Error Correction (FEC):	Supported
Optical Clock And Data Recovery (CDR):	Supported
Operating Temperature Range:	Standard 0° - 70°C
Storage Temperature Range:	- 40° to 85°C

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

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General parameter	Value
Relative Humidity (Non-Condensation):	0 to 85%
Power Consumption:	≤ 3.5W
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-ER4 Lite, OTN OTU4 4l1-9D1F, 128GFC Gen 6, SFF-8636, SFF-8665, CE, RoHS-6, Class 1 FDA, IEC60825-1 Laser Safety Compliant

Transmitter Parameters:	Value
Transmitter Type:	DML 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)	- 6 dBm
Total Average Launch Power (Max)	10.5 dBm
Average Launch Power (Min) Each Lane:	- 6 dBm
Average Launch Power (Max) Each Lane:	2.5 dBm
Difference in Launch Power between any Two Lanes OMA (Max):	3.5 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

EDGE Technologies Ltd.
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Receiver Parameters:	Value
Receiver Type:	PIN ROSA
Rx Wavelength Bandwidth:	4 CWDM Lanes (73 nm 1264.50 – 1337.50nm) (L0 Tx center 1271nm, L1 Tx center 1291nm, L2 Tx center 1311nm, L3 Tx center 1331nm)
Average Receive Power (Min):	- 13 dBm
Average Receive Power (Max):	0 dBm
Receiver Overload:	3.3 dBm
Receiver Reflectance (Max) Each Lane:	- 26 dB
RSSI Accuracy (Min):	- 2 dB
RSSI Accuracy (Max):	2 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:

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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.