

Key Highlights:

- **Type:** 400GBASE-FR4 QSFP-DD
- **Compatibility:** Multi-Vendor MSA Compatible
- **Tx/Rx Wavelength:** 1271, 1291, 1311, 1331 nm
- **Laser:** EML
- **Modulation:** PAM4
- **Fiber Type:** Single-Mode Fiber (SMF)
- **Connectors:** Double LC
- **Optical Budget:** 6.3dB
- **Max. Distance:** 10km
- **Data Rate:** 425 Gbps
- **DDM/DOM:** Supported
- **Power Consumption:** ≤ 12W
- **Temperature:** Standard 0° - 70°C



Optical Transceiver : 400G-QSFP-DD-11

Product Description:

400G-QSFP-DD-11 is a 400GBASE-LR4 Multi-Vendor MSA Compatible QSFP-DD (Quad Small Form-Factor Pluggable - Double Density) Transceiver designed for operation over Double Fiber Single-Mode Fiber (SMF) optical cable. On the transmission side module converts 8x 50G 400GAUI-8 PAM4 (Pulse-Amplitude Modulation) electrical input channels (each 53.125Gbps) into 4 Single Lambda 100G PAM4 CWDM optical signals. Reversely the opposite is done on the receiving side, module converts 4 Single Lambda 100G PAM4 CWDM optical signals into 8x 50G 400GAUI-8 electrical inputs. Module has minimum guaranteed optical budget of 6.3 dB, which in most cases is enough to reach 10 km distance over OS2 single-mode fiber. However, distance is just indicative parameter for comfort of identification that is calculated by taking into account minimal optical budget and average attenuation of optical cabling in industry. 400G-QSFP-DD-11 uses top quality Quad channel EML driver and EML lasers together with an optical multiplexer (CWDM lines:1271, 1291, 1311, 1331) transmitter and 400Gb/s PIN photodiode array receiver. 400G-QSFP-DD-11 400GBASE-LR4 supports DDM/DOM optical diagnostics that provide real-time diagnostic information about the present operating conditions. 400G-QSFP-DD-11 op-



erates in Standard 0°-70°C temperature range and has Double LC interface. 400G-QSFP-DD-11 400GBASE-LR4 QSFP-DD support up to 425 Gbps data rate and is designed for 400G Ethernet application. 400G-QSFP-DD-11 QSFP-DD Double Fiber optical transceiver is multi-purpose module used in number of different places of today's networking. Consequently, most popular use cases are in Internet Service Provider (ISP), Mobile Operator and Data Center Core Networks.

400G-QSFP-DD-11 400GBASE-LR4 QSFP-DD transceiver is CE/RoHS certified and is compliant with product safety standards. 400G-QSFP-DD-11 is fully compliant to QSFP-DD MSA, 100G Lambda MSA 400G-LR4, CMIS 4.0, IEEE 802.3bs 400 Gbps specification. 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 firmwares for 400GBASE-LR4 QSFP-DD 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:	6.3dB
Maximum Distance:	10 km
Supported Data Rate:	425 Gbps
Data Rate, each Lane up to:	106.25 Gbps
Modulation:	PAM4
Supported Applications:	Ethernet (425 Gbps), Infinband
Digital Diagnostic Monitoring (DDM):	Supported
Optical Clock And Data Recovery (CDR):	Supported
Operating Temperature Range:	Standard 0° - 70°C
Storage Temperature Range:	- 40° to 85°C
Relative Humidity (Non-Condensation):	0 to 85%
Power Consumption:	≤ 12W
Power Supply Voltage Typical:	+ 3.3V
Power Supply Voltage Range:	-3.135 to 3.465V



General parameter	Value
Chipset:	INPHI
Compliance:	QSFP-DD MSA, IEEE 802.3bs 100GBASE-LR4, CE, RoHS-6, Class 1 Laser Product, IEC60825-1, 21 CFR 1040.10 - 1040.11

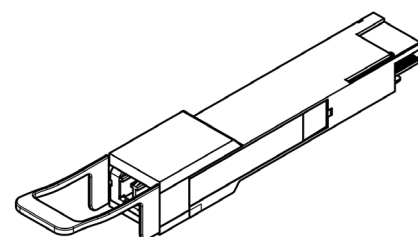
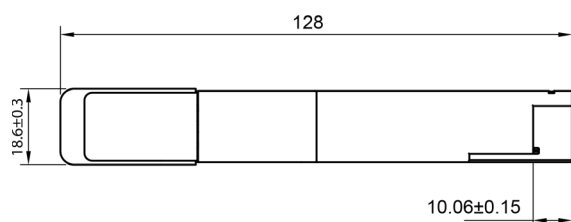
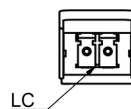
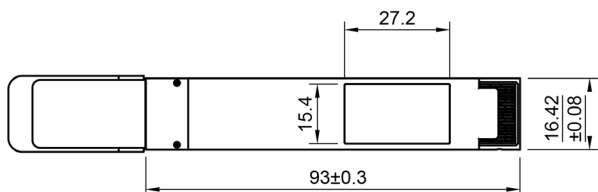
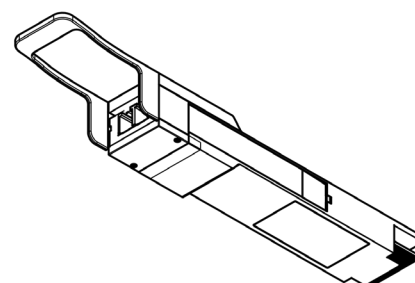
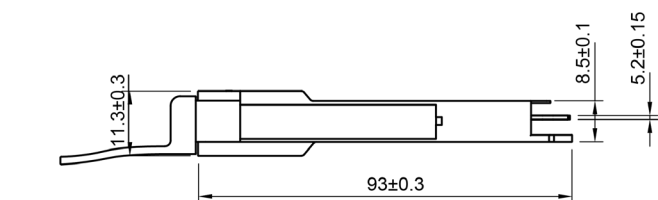
Transmitter Parameters:	Value
Transmitter Type:	EML Laser
Tx Wavelength Bandwidth:	4 Single Lambda CWDM Lanes (L0 Tx center 1271nm, L1 Tx center 1291nm, L2 Tx center 1311nm, L3 Tx center 1331nm)
Total Average Launch Power (Max):	10 dBm
Side-mode Suppression Ratio (Min):	30 dB
Outer Optical Modulation Amplitude OMA (Min) Each Lane:	- 0.2 dBm
Outer Optical Modulation Amplitude OMA (Max) Each Lane:	4.4 dBm
Difference in Launch Power between any Two Lanes OMA (Max):	4 dBm
Launch Power in OMA minus TDECQ (Min) Each Lane:	- 1.2 dBm
Extinction Ratio (Min):	3.5 dB
Relative Intensity Noise (Max):	- 136 dB/Hz
Transmitter reflectance (Max):	- 26 dB
Average Launch Power OFF Transmitter (Max) Each Lane:	- 30 dB

Receiver Parameters:	Value
Receiver Type:	PIN Photodiode Array
Rx Wavelength Bandwidth:	4 Single Lambda CWDM Lanes (L0 Tx center 1271nm, L1 Tx center 1291nm, L2 Tx center 1311nm, L3 Tx center 1331nm)



Receiver Parameters:	Value
Average Receive Power Each Lane (Min):	-9.1 dBm
Average Receive Power Each Lane (Max):	5.6 dBm
Damage Threshold Each Lane:	5.5 dBm
Difference in receiver power between any two lanes (OMA):	4.6 dB
Receiver Sensitivity (OMA) Each Lane:	-6.8 dB
Receiver Reflectance (Max):	-26 dB
LOS Assert (Min):	-20 dBm
LOS De-assert (Max):	-12.1 dBm
LOS Hysteresis (Min):	0.5 dB

Mechanical Dimensions:



Compatibility:

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

MS - General MSA

AD - ADVA

AE - Advantech

AL - Alcatel (Nokia)

AT - Allied Telesis

AR - Arista

AS - Arris

AV - Avaya

BC - Barracuda

BR - Broadcom

QL - Cavium (Qlogic)

CR - Ceragon

CP - Checkpoint

CH - Chelsio

CN - Ciena

CI - Cisco

LI - Cisco (Linksys)

CE - Comnet

CO - Coriant

DH - Dahua

DC - DCN

DL - Dell & Force10

DK - D-Link

DZ - DZS(Dasan-Zhone)

EI - ECI

EC - EdgeCore

EW - EdgeWare

EL - Eltex

EM - EMC2

EN - Enterasys

ER - Ericsson

EF - EXFO

EX - Extreme Networks

F5 - F5 Networks

FI - Finisar

FO - Fortinet

FU - Fujitsu

H3 - H3C

HI - Hirschmann

HU - Huawei

IB - IBM

IF - Infinera

IN - Intel

IX - Ixia

JU - Juniper Networks

KM - KeyMile

KY - KyLand

LN - Lenovo

ML - Mellanox

ME - Meraki (Cisco)

MT - MikroTik

MO - Moxa

MR - MRV

NC - NEC

NG - Netgear

NK - Nokia

NT - Nortel

NS - NSN

OR - Oracle

PA - Palo Alto Network

PL - Planet

QC - QCT(Quanta)

QN - QNAP

RD - RAD

RW - RadWare

RC - Raisecom

RK - Ruckus

RU - Ruijie Networks

SG - Samsung

SV - Sandvine

SC - Silicom

SF - SolarFlare

SW - Sonicwall

SM - Supermicro

SY - Synology

TC - Telco Systems

TP - TP-LINK

TN - Trendnet

UN - Ubiquiti Networks

VX - VeEx

WG - WatchGuard

WS - Waystream

WT - Westermo

ZT - ZTE

ZX - Zyxel

HP - HP

AG - Avago

OC - Oclaro

EU - Emulex

TM - Transmode

AU - HP Aruba

XX - Other

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. Warranty does not cover damage caused by improper deployment, misuse and accidents.

