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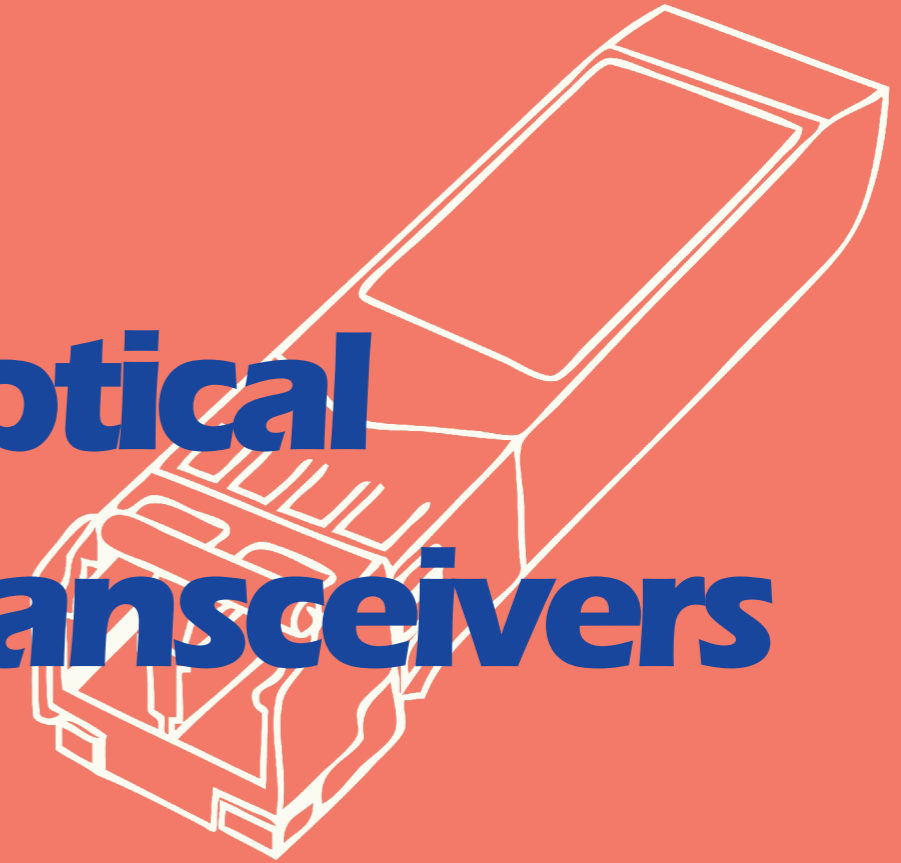
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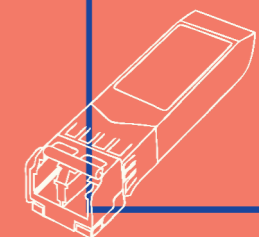
100G/200G/400G QSFP-DD  
QSFP28/SFP28/SFP+



# Optical Transceivers



Data Center & Cloud Computing  
SAN(Fiber Channel)  
Deep Packet Inspection  
Metro & Broadcast  
Wireless & 5G



# Company Profile

## Milestones

### 2006-2009

Gigalight was committed to R&D and production of optical devices under 10Gbps, building the global channel market of optical transceiver modules;

### 2010-2011

Gigalight sold 10G optical transceivers in quantity and launched 10G/40G/120G Active Optical Cables;

### 2012-2013

Gigalight invested into Optical Passive Components product line and HD Video Optical Transceiver industry Invested on Optical Passive Components product line and video HD optical modules;

### 2014

Gigalight accomplished the commercialized process of 10G/40G Active Optical Cables in Data Center; meanwhile launched GIGAC high-density MTP/MPO cloud cabling products;

### 2015

Gigalight launched 40G optical transceivers and Consumer USB3.0/HDMI1.4 Active Optical Cables;

### 2016

Gigalight launched 100G VCSEL optical transceivers and Active Optical Cables, and finished the development of the product ecosystem: Cloud Programmer and E-Commerce platform - www.infiberone.com, etc;

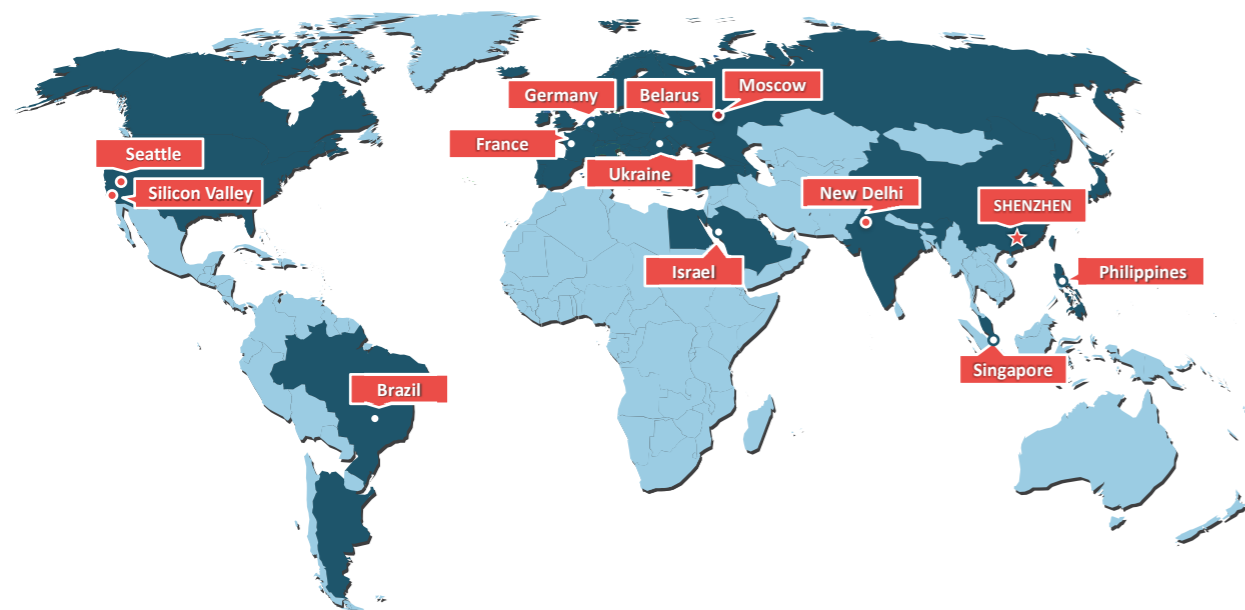
### 2017

Gigalight launched 200G VCSEL optical transceivers, 100G MAN optical transceivers and 100G optical transceivers for long-distance transmission in Data Center;

### 2018

Gigalight will deploy and launch 400G optical interconnect products in Data Center and related DCI optical communication products.

## Global Distribution



★ **Headquarters:** in Shenzhen, China, includes R&D, production, sales and technical support center.

● **Branch :** in Silicon Valley, USA, and business office in Russia.

○ **Global agents and distributors:** in North America, Brazil, Russia, India, Israel, Europe and Southeast Asia.

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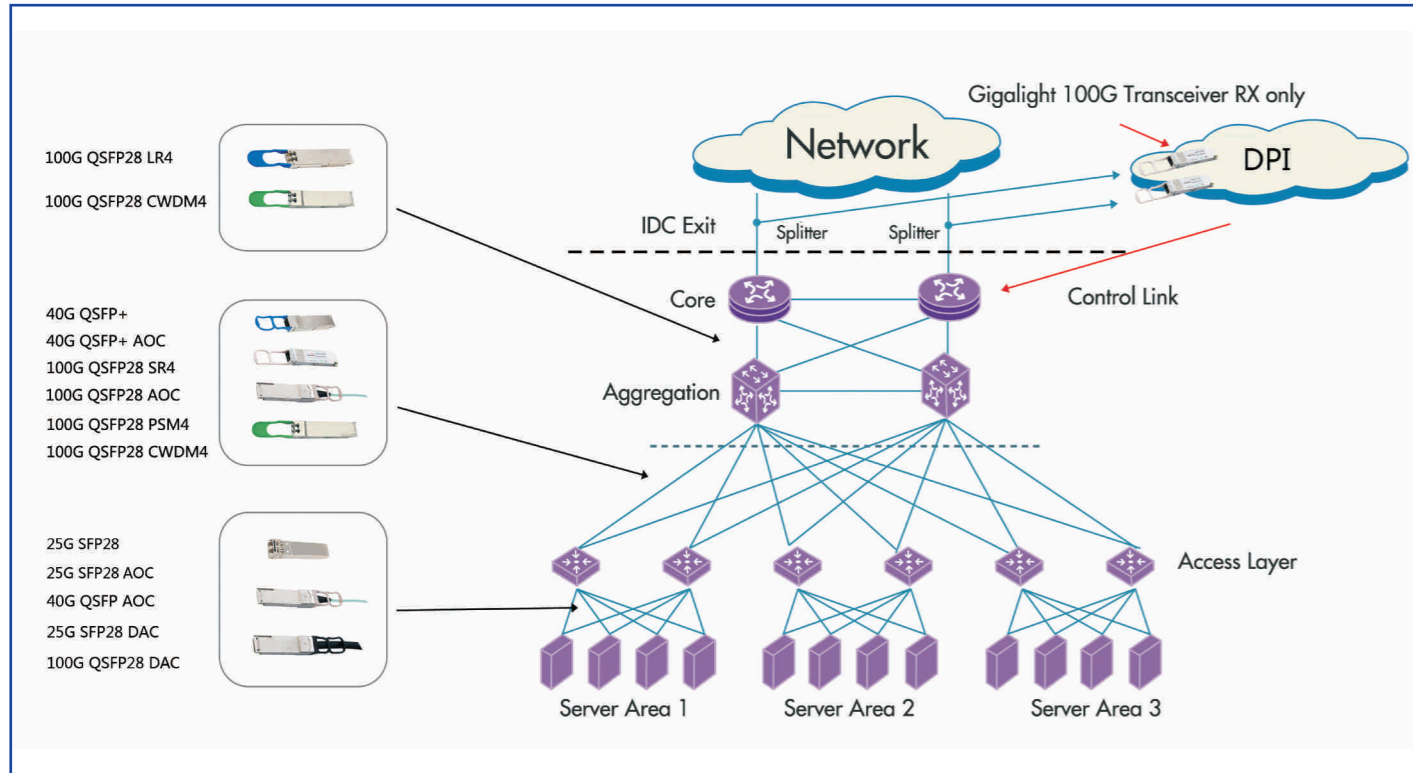
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# Data Center Solution



## 200G QSFP-DD SR8

### Features

- 8 channels full-duplex transceiver modules
- Transmission data rate up to 26Gbps per channel
- 8 channels 850nm VCSEL array
- 8 channels PIN photo detector array
- Internal CDR circuits on both receiver and transmitter channels
- Support CDR bypass
- Low power consumption <3.5W
- Hot Pluggable QSFP-DD form factor
- Maximum link length of 70m on OM3 Multimode Fiber (MMF) & 100m on OM4 MMF
- MPO24 connector receptacle
- Built-in digital diagnostic functions
- Operating case temperature 0°C to +70°C
- 3.3V power supply voltage
- RoHS 6 compliant(lead free)



### Applications

- IEEE 802.3bm 100GBASE SR4

## 400G QSFP-DD SR8 preliminary

### Features

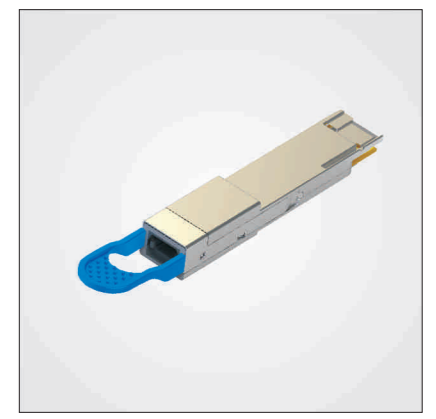
- QSFP-DD module form factor
- Standard interfaces defined by IEEE802.3cd 200GBASE-SR4
- 8x56G parallel optics architecture
- 8x56G retimed electrical I/O(CAUI-4)
- 100m reach on Om4 MMF and 70m on Om3,(RS-FEC on the host)
- Maximum power dissipation <7W
- Operating case temperature range 0°C to 70°C
- I2C management interface (same as QSFP+)
- Support QSFP-DD MSA
- 2x200GBASE-SR4 Application
- PAM4 CDR ICs can be enabled or disabled on a per-channel
- VCSEL and PIN arrays to ensure high quality optics
- Maximum link length of 70m on OM3 Multimode Fiber (MMF) and 100m on OM4 MMF
- MPO24 connector receptacle



## 200G QSFP-DD PSM8 preliminary

### Features

- 8 channels full-duplex transceiver modules
- Transmission data rate up to 26Gbps per channel
- 8 channels DFB-based PSM4 uncooled transmitter
- 8 channels PIN ROSA
- Internal CDR circuits on both receiver and transmitter channels
- Low power consumption <7.0W
- Hot Pluggable QSFP-DD form factor
- Up to 10km reach for G.652 SMF with FEC
- Single MPO24 connector receptacle
- Built-in digital diagnostic functions
- Operating case temperature 0°C to +70°C
- 3.3V power supply voltage
- RoHS 6 compliant(lead free)



### Applications

- High density 200G Ethernet links
- 100G PSM4 applications
- Datacenter and Enterprise networking
- HPC

## 100G QSFP28 SR4

### Features

- 4 channels full-duplex transceiver modules
- Transmission data rate up to 25Gbps per channel
- Support 40GE and 56G FDR data rate
- 4 channels 850nm VCSEL array
- 4 channels PIN photo detector array
- Internal CDR circuits on both receiver and transmitter channels
- Support CDR bypass
- Low power consumption <2.5W
- Hot Pluggable QSFP form factor
- Maximum link length of 70m on OM3 Multimode Fiber (MMF) and 100m on OM4 MMF
- Single MPO connector receptacle
- Built-in digital diagnostic functions
- Operating case temperature 0°C to +70°C
- 3.3V power supply voltage
- RoHS 6 compliant(lead free)

### Applications

- IEEE 802.3bm 100GBASE SR4 and 40GBASE Sr4
- Infiniband FDR/EDR



## 100G QSFP28 PSM4/Pigatail 10KM

### Features

- 4 channels full-duplex transceiver modules
- Transmission data rate up to 26Gbps per channel
- 4 x 26Gb/s DFB-based 1310nm Uncooled transmitter
- 4 channels PIN ROSA
- Internal CDR circuits on both receiver and transmitter channels
- Compliant to 100G PSM4 MSA
- Low power consumption <3.5W
- Hot Pluggable QSFP form factor
- Up to reach 10km for G.652 SMF[with KR4 FEC]
- MPO/MTP receptacles
- Built-in digital diagnostic functions
- Operating case temperature 0°C to +70°C
- 3.3V power supply voltage
- RoHS 6 compliant(lead free)

### Applications

- 100G PSM4 applications
- Infiniband EDR interconnects



## 100G QSFP28 CWDM4

### Features

- 4 channels full-duplex transceiver modules
- Transmission data rate up to 26Gbps per channel
- 4 x 26Gb/s DFB-based CWDM Uncooled transmitter : 1271, 1291, 1311 and 1331 nm
- 4 channels PIN ROSA
- Internal CDR circuits on both receiver and transmitter channels
- Low power consumption <3.5W
- Hot Pluggable QSFP form factor
- Up to reach 2km for G.652 SMF[with KR4 FEC]
- Duplex LC receptacles
- Built-in digital diagnostic functions
- Operating case temperature 0°C to +70°C
- 3.3V power supply voltage
- RoHS 6 compliant(lead free)

### Applications

- 100G CWDM4 applications
- Infiniband EDR interconnects



## 100G QSFP28 4WDM 20&40KM

### Features

- QSFP28 module form factor, per SFF-8665
- Standard interfaces defined by IEEE 802.3bm & 4WDM MSA
- 4x25G optical architecture on LAN-WDM Cooling & APD-based receiver
- Same LAN-WDM grid as 100GBASE-LR4
- 4x25G retimed electrical I/O (IEEE CAUI-4)
- 30km reach on SMF(2 fibers without FEC)
- 40km reach on SMF(2 fibers with FEC)
- Maximum power dissipation <3.5W
- Operating case temperature range 0°C to 70°C
- I2C management interface
- Internal CDR on both receiver and transmitter channels

### Applications

- Data Center Interconnect
- 100G GE



## 100G QSFP28 CLR4/4WDM 10KM

### Features

- Compliant to CWDM4 MSA and CLR4 Alliance
- Support both host with fec and without fec
- Transmission data rate up to 26Gbps per channel
- 4 channels DFB-based cwm uncooled transmitter
- 4 channels PIN ROSA
- 25.78125 Gbit/s x 4 channel Electrical Interface (CAUI4)
- Low power consumption <3.5W
- Hot Pluggable QSFP28 form factor
- Up to 10km reach for G.652 SMF
- Duplex LC receptacles
- Built-in digital diagnostic functions
- Two-wire common management interface (SFF-8636)
- Operating case temperature 0°C to +70°C
- 3.3V power supply voltage
- RoHS 6 compliant(lead free)



### Applications

- High density 100G Ethernet links
- 100G CWDM4&CLR4 applications
- Datacenter and Enterprise networking
- High Performance Computing Interconnect

## 100G QSFP28 LR4/OTU4

### Features

- 4 channels full-duplex transceiver modules
- Transmission data rate up to 26Gbps per channel
- 4 x 26Gb/s DFB-based LAN-WDM Cooling transmitter
- 4 channels PIN ROSA
- Internal CDR circuits on both receiver and transmitter channels
- Low power consumption <3.5W
- Hot Pluggable QSFP form factor
- Up to reach 10km for G.652 SMF
- Duplex LC receptacles
- Built-in digital diagnostic functions
- Operating case temperature 0°C to +70°C
- 3.3V power supply voltage
- RoHS 6 compliant(lead free)



### Applications

- IEEE 802.3ba 100GBASE LR4/OTU4
- 100G QSFP28 LR4 Ethernet

## 100G QSFP28 ER4 Lite

### Features

- 4 channels full-duplex transceiver modules
- Supports data rate up to 111.8Gb/s
- Supports QSFP28 4WDM 40km MSA /100GBASE-ER4 Lite/OTU4
- 4 x 28Gb/s DFB-based LAN-WDM Cooling transmitter
- 4 channels APD ROSA
- Internal CDR circuits on both receiver and transmitter channels
- Low power consumption <4.2W
- Hot Pluggable QSFP form factor
- Up to 30km reach for G.652 SMF without FEC
- Up to 40km reach for G.652 SMF with FEC
- Duplex LC receptacles
- Built-in digital diagnostic functions
- Operating case temperature 0°C to +70°C
- 3.3V power supply voltage
- RoHS 6 compliant(lead free)



### Applications

- IEEE 802.3ba 100GBASE ER4 Links
- Client-side 100G interconnections
- OTN OTU4

## 40G QSFP+ SR4

### Features

- 4 channels full-duplex transceiver modules
- Transmission data rate up to 10.5Gbps per channel
- 4 channels 850nm VCSEL array
- 4 channels PIN photo detector array
- Low power consumption <1.5W
- Hot Pluggable QSFP form factor
- Maximum link length of 100m on OM3 Multimode Fiber (MMF) and 150m on OM4 MMF
- Single MPO connector receptacle
- Built-in digital diagnostic functions
- Operating case temperature 0°C to +70°C
- 3.3V power supply voltage
- RoHS 6 compliant (lead free)

### Applications

- 40G Ethernet and OTU3
- Datacom/Telecom switch & router connections
- Data Aggregation and Backplane Applications
- Proprietary Protocol and Density Applications
- Infiniband transmission at 4ch SDR, DDR and QDR



## 40G QSFP+ LR4

### Features

- Transmission data rate up to 11.2Gbps per channel
- QSFP+ MSA compliant
- Compliant to IEEE 802.3ba specification for 40GBASE-LR4 links
- 4 CWDM un-cooled DFB lasers, using ITU G.694.2 wavelength grid at 1271, 1291, 1311 and 1331nm
- High Sensitivity PIN-TIA with optical DEMUX
- Up to 10km reach over standard single mode fiber
- Compliant with QDR/DDR Infiniband data rates
- Hot pluggable electrical interface
- Lower power consumption
- Operating case temperature 0°C to +70°C
- 3.3V power supply
- RoHS 6 compliant (lead free)

### Applications

- 40G Ethernet
- Infiniband QDR and DDR interconnects
- Client-side 40G Telecom connections



## 40G QSFP+ PSM4/Pigatail

### Features

- Single Mode 8 fibers MPO(APC) connector receptacle
- Maximum power consumption **2.5W**
- Housing isolated from connector ground
- Operating case temperature 0°C to +70°C
- Maximum link length of 10km on G652 single mode fiber (SMF)
- 3.3V power supply voltage
- RoHS 6 compliant

### Applications

- Infiniband Connectivity SDR/DDR/QDR
- 10GBASE-LR/W 10G Ethernet
- 2/4/8 Gbps Fiber Channel
- Data Centers and Storage Arrays



## 25G SFP28 SR

### Features

- Hot-pluggable SFP28 form factor
- Supports 28Gbps data rate
- Maximum link length of 70m on OM3 MMF & 100m on OM4 MMF
- 850nm VCSEL laser and PIN photo-detector
- Internal CDR on both Transceiver and Receiver channel
- Duplex LC receptacle
- Single 3.3V power supply
- Power dissipation **< 1W**
- Digital diagnostics functions are available via the I2C interface
- RoHS-6 compliant
- Commercial case temperature range: 0°C to 70°C

### Applications

- 25GBASE-SR Ethernet



## 10G SFP+ SR

### Features

- Optical interface compliant to IEEE 802.3ae
- Supports 10Gbps data rate
- Electrical interface compliant to SFF-8431
- Hot Pluggable
- 850nm VCSEL transmitter, PIN photo-detector
- Maximum link length of 100m on 2000MHz/km MMF
- Low power consumption
- All-metal housing for superior EMI performance
- Advanced firmware allow customer system encryption information to be stored in transceiver
- Cost effective SFP+ solution, enables higher port densities and greater bandwidth
- Operating case temperature: Standard : 0°C~70°C
- RoHS6 compliant(lead free)

### Applications

- Tri Rate 2.125/4.25/8.5Gbps Fiber Channel or 4.25/8.5/14.025Gbps Fiber Channel



# SAN(Fiber channel)

Data Rate	Form Factor	Distance							
		100m	300m	2km	10km	20km	40km	80km	120km
128G FC	QSFP28	★							
64G FC	QSFP+	★							
32G FC	SFP28	★		★	★				
16G FC	SFP+	★							
8G FC	SFP+		★	★	★	★	★	★	
4G FC	SFP		★		★		★	★	
2G FC	SFP		★	★		★	★	★	★

## 128GFC QSFP28 SR4

### Features

- 4 channels full-duplex transceiver modules
- Transmission 103.1Gbps and 112.2Gbps data rates
- 4 channels 850nm VCSEL array
- 4 channels PIN photo detector array
- Internal CDR circuits on both receiver & transmitter channels
- Support CDR bypass
- Low power consumption <2.5W
- Hot Pluggable QSFP form factor
- Maximum link length of 70m on OM3 Multimode Fiber (MMF) and 100m on OM4 MMF
- Single MPO connector receptacle
- Built-in digital diagnostic functions
- Operating case temperature 0°C to +70°C
- 3.3V power supply voltage
- RoHS 6 compliant(lead free)



## 64GFC QSFP+

### Features

- Hot-pluggable QSFP+ form factor
- 4 channels full-duplex transceiver modules
- Supports 56Gb/s data rate
- 4 channels 850nm VCSEL array
- 4 channels PIN photo detector array
- Internal CDR circuits on both receiver and transmitter channels
- Power dissipation <1.5W
- Maximum link length of 100m on OM4 MMF
- Built-in digital diagnostic functions
- Operating case temperature 0°C to +70°C
- 3.3V power supply voltage



## 32GFC SFP28 SR

### Features

- Hot-pluggable SFP28 form factor
- Supports 28Gbps data rate
- Maximum link length of 70m on OM3 MMF & 100m on OM4 MMF
- 850nm VCSEL laser and PIN photo-detector
- Internal CDR on both Transmitter and Receiver channel
- Duplex LC receptacle
- Single 3.3V power supply
- Power dissipation <1W
- Digital diagnostics functions are available via the I2C interface
- RoHS-6 compliant
- Commercial case temperature range: 0°C to 70°C



## 8GFC/16GFC SFP+

### Features

- Compliant with SFF-8431 and IEE802.3ae
- Data rate up to 8.5Gb/s or 14.025Gb/s
- Link length up to 80km
- Low Power Dissipation 1.5W Typical (Maximum:2W)
- 5°C to 70°C Operating Case Temperature
- Single 3.3V power supply
- Diagnostic Performance Monitoring of module temperature, supply Voltages, laser bias current, transmit optical power, receive optical power
- RoHS compliant and lead free



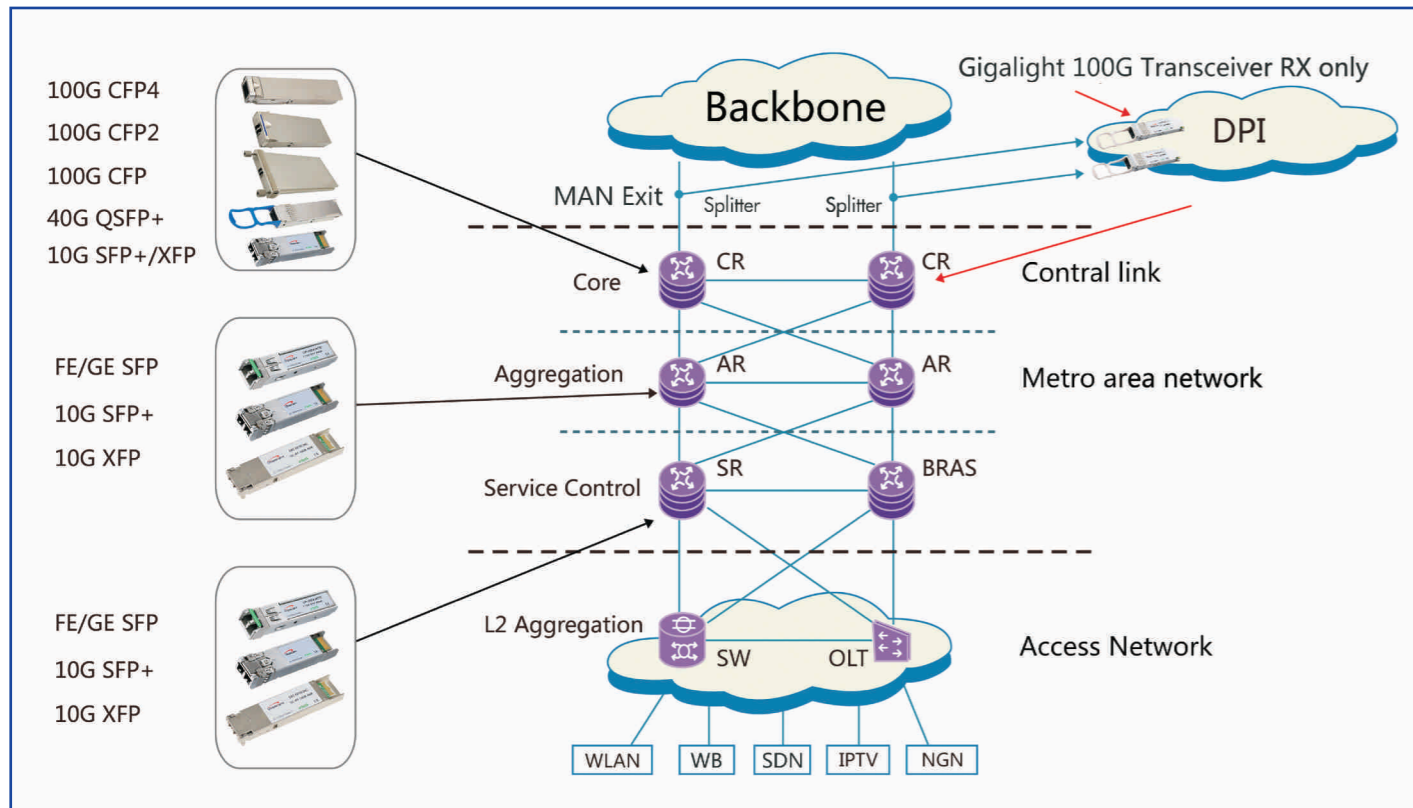
## 2GFC/4GFC SFP

### Features

- Compliant with SFF-8431 and IEE802.3ae
- Data rate up to 2.125Gb/s or 4.25Gb/s
- Link length up to 80km
- Low Power Dissipation 1.5W Typical (Maximum:2W)
- 5°C to 70°C Operating Case Temperature
- Single 3.3V power supply
- Diagnostic Performance Monitoring of module temperature, supply Voltages, laser bias current, transmit optical power, receive optical power
- RoHS compliant and lead free



# Deep Packet Inspection Solution



## 100G QSFP28 ER4 RX Only

### Features

- Supports data rate up to 111.8Gb/s
- Supports QSFP28 4WDM 40km MSA/ 100GBASE-ER4 Lite/OTU4 for Receiver
- 4 channels APD ROSA
- Internal CDR circuits on both receiver channel
- Low power consumption <1.5W
- Hot Pluggable QSFP form factor
- Up to 30km reach for G.652 SMF without FEC
- Up to 40km reach for G.652 SMF with FEC
- Duplex LC receptacles
- Built-in digital diagnostic functions
- Operating case temperature 0°C to +70°C
- 3.3V power supply voltage
- RoHS 6 compliant(lead free)



### Applications

- IEEE 802.3ba 100GBASE ER4 Links
- Client-side 100G interconnections
- OTN OTU4

## 100G QSFP28 LR4 RX Only

(100G Ethernet & OTU4, Deep Packet Inspection Market)

### Features

- PIN arrays only (without TOSA)
- QSFP28 form factor, compliant QSFP28 MSA
- 4 channels PIN ROSA ,LC receptacles
- Receive wavelength: 1295.56/1300.05/1304.58/1309.14nm
- Data rate up to 28Gbps per channel
- Up to reach 10km for G.652 SMF
- Low power consumption <1.5W
- Built-in digital diagnostic functions
- Hot Pluggable
- Operating case temperature 0°C to +70°C
- RoHS 6 compliant(lead free)



## 100G CFP LR4 RX Only

### Features

- CFP form factor, compliant CFP MSA
- 4 channels PIN ROSA ,LC receptacles
- Receive wavelength: 1295.56/1300.05/1304.58/1309.14nm
- Data rate up to 28Gbps per channel
- Up to reach 10km for G.652 SMF
- Low power consumption <5W
- MDIO real-time digital diagnostic functions
- Hot Pluggable
- Operating case temperature 0°C to +70°C
- RoHS 6 compliant(lead free)





## 100G CFP ER4 RX Only

### Features

- CFP form factor, compliant CFP MSA
- 4 channels SOA+PIN ROSA ,LC receptacles
- Receive wavelength: 1295.56/1300.05/1304.58/1309.14nm(LAN-WDM)
- Data rate up to 28Gbps per channel
- Up to reach 40km for G.652 SMF
- Low power consumption <6W
- MDIO real-time digital diagnostic functions
- Hot Pluggable
- Operating case temperature 0°C to +70°C
- RoHS 6 compliant(lead free)



## 100G CFP2 LR4 RX Only

### Features

- CFP2 form factor, compliant CFP2 MSA
- 4 channels PIN ROSA ,LC receptacles
- Receive wavelength: 1295.56/1300.05/1304.58/1309.14nm
- Data rate up to 28Gbps per channel
- Up to reach 10km for G.652 SMF
- Low power consumption <3W
- MDIO real-time digital diagnostic functions
- Hot Pluggable
- Operating case temperature 0°C to +70°C
- RoHS 6 compliant(lead free)



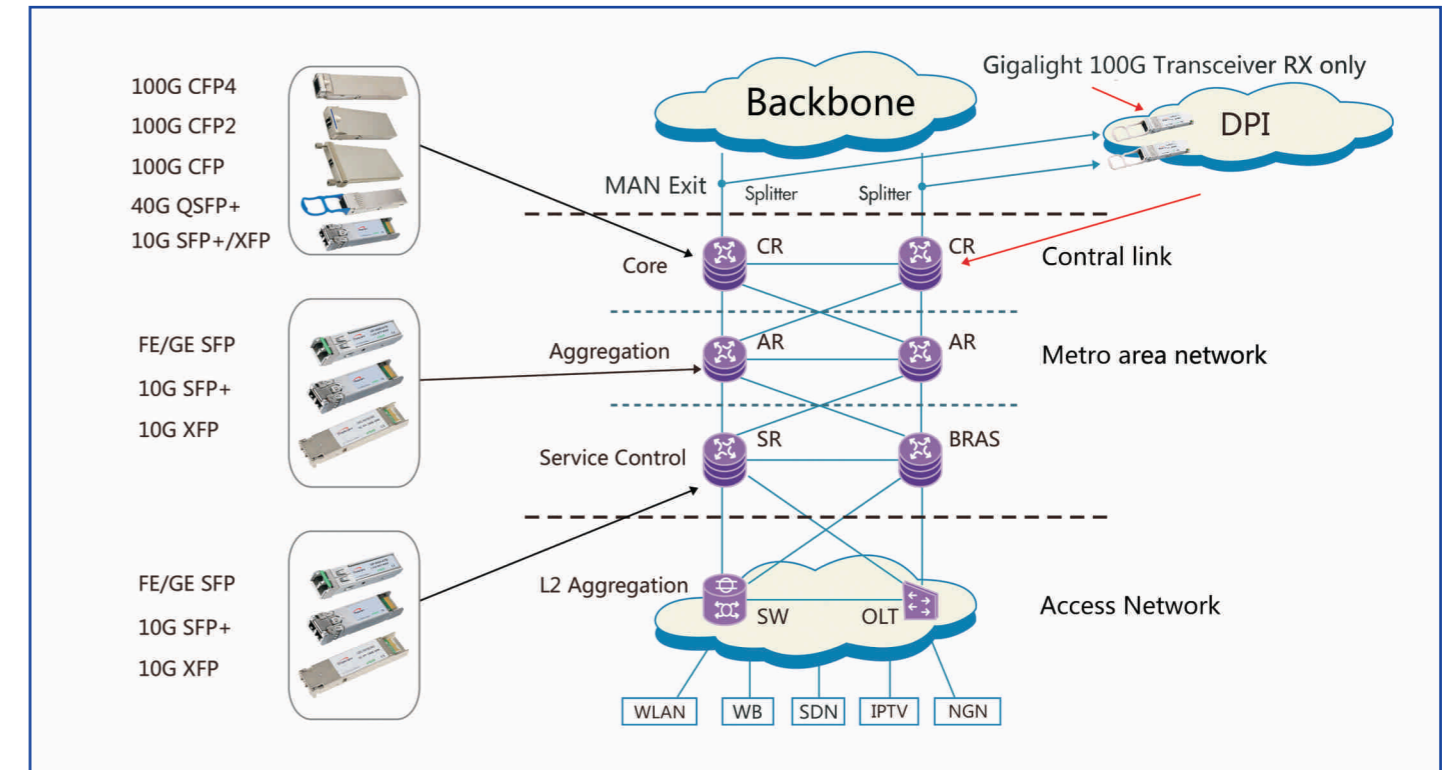
## 100G CFP2 ER4 RX Only

### Features

- CFP2 form factor, compliant CFP2 MSA
- 4 channels SOA+PIN ROSA ,LC receptacles
- Receive wavelength: 1295.56/1300.05/1304.58/1309.14nm(LAN-WDM)
- Data rate up to 28Gbps per channel
- Up to reach 40km for G.652 SMF
- Low power consumption <4W
- MDIO real-time digital diagnostic functions
- Hot Pluggable
- Operating case temperature 0°C to +70°C
- RoHS 6 compliant(lead free)



## Metro Area Network Solution



## 100G CFP SR10

### Features

- Compliant to the CFP Hardware Specification Version 1.4
- Compliant to the CFP MSA Management Interface Specification Version 2.2
- Compliant to the IEEE 802.3ba(100GBASE-SR10)
- Transmission data rate up to 11.18 Gbit/s per channel
- Up to 300m on OM3 and 400m on OM4 MMF
- Power class 1 (<8W max)
- OTU4 compatible
- 10 channels 850nm VCSEL array transmitter
- 10 channels PIN photo detector array receiver
- MDIO digital diagnostic interface and control capabilities
- TX input and RX output CDR retiming
- Hot pluggable electrical interface
- Operating case temperature: 0°C~ +70°C
- Single 3.3V power supply
- RoHS 6 compliant(lead free)
- Utilizes a standard 24/20 lane optical fiber with MPO connector

### Applications

- 100GBE interconnects
- High-speed core router connections & Datacom/Telecom switch
- Data aggregation and backplane applications
- Proprietary protocol and density application



## 100G CFP LR4

### Features

- Operating optical data rate up to 112Gbps
- Transmission distance up to **10km**
- CFP MSA compliant
- Compliant to 100GbE IEEE 802.3ba specification for 100GBASE-LR4 links
- OTU4 compatible
- 1310 nm window cooled EA-DFB LD and PIN ROSA
- Built in digital diagnostic function
- 10 parallel electrical serial interface and AC coupling of CML signals
- Hot pluggable electrical interface
- Low power dissipation **<9W**
- Operating case temperature 0°C to +70°C
- Single 3.3V power supply
- RoHS 6 compliant(lead free)



### Applications

- 100GbE IEEE 802.3ba 100GBASE-LR4
- OTN-OTU4
- Switch to switch interface or Switch to router interface

## 100G CFP ER4

preliminary

### Features

- Operating optical data rate up to 112Gbps
- Transmission distance up to **40km**
- CFP MSA compliant
- Compliant to 100GbE IEEE 802.3ba specification for 100GBASE-ER4 links
- OTU4 compatible
- 1310 nm window cooled SOA+ PIN ROSA
- Built in digital diagnostic function
- 10 parallel electrical serial interface and AC coupling of CML signals
- Hot pluggable electrical interface
- Low power dissipation **<11W**
- Operating temperature range: 0 to 70°C
- Single 3.3V power supply
- RoHS 6 compliant (lead free)



### Applications

- 100GbE IEEE 802.3ba 100GBASE-ER4
- OTN-OTU4
- Switch to switch interface or Switch to router interface

## 100G CFP2 SR10

### Features

- Compliant to the CFP2 Hardware Specification Version 1.0
- Compliant to the CFP2 MSA Management Interface Specification Version 2.2
- Compliant to the IEEE 802.3ba (100GBASE-SR10) and OTU4
- Transmission data rate up to 11.18 Gbit/s per channel
- Up to **300m on OM3** and **400m on OM4 MMF**
- Power class 1 (**<7W max**)
- 10 channels 850nm VCSEL array transmitter
- 10 channels PIN photo detector array receiver
- MDIO digital diagnostic interface and control capabilities.
- TX input and RX output CDR retiming
- Hot pluggable electrical interface
- Operating case temperature: 0°C ~ +70°C
- Single 3.3V power supply
- RoHS 6 compliant(lead free)
- Utilizes a standard 24/20 lane optical fiber with MPO connector



## 100G CFP2 LR4

(DML & EML)

### Features

- CFP2 MSA module form factor
- **10 km** reach on single-mode fiber
- Standard interfaces per IEEE 802.3ba
- Dual rate, support 100GE and OTU4
- 4x 25/28G LAN WDM optical architecture ( IEEE 802.3ba | ITU-T G.959.1)
- 4x 25/28G retimed electrical I/O (CAUI-4 IEEE 802.3bm | OIF CEI-28G-VSR)
- 28G DFB-based integrated TOSA
- 28G PIN-based Integrated ROSA
- 28G CDR Ics
- Power dissipation: **<9W (EML Version)**  
**<6W (DML Version)**
- Operating case temperature range of 0°C to +75°C
- Duplex LC receptacles



### Applications

- 100GbE IEEE 802.3ba 100GBASE-LR4
- OTN-OTU4
- Switch to switch interface or Switch to
- Router interface

## 100G CFP2 ER4 (SOA)

### Features

- CFP2 MSA module form factor
- **40 km** reach on single-mode fiber
- Standard interfaces per IEEE 802.3ba
- Dual rate, support 100GE and OTU4
- 4x 25/28G LAN WDM optical architecture (IEEE 802.3ba | ITU-T G.959.1)
- 4x 25/28G retimed electrical I/O (CAUI-4 IEEE 802.3bm | OIF CEI-28G-VSR)
- 28G DFB-based integrated TOSA
- 28G PIN-based Integrated ROSA with SOA
- 28G CDR Ics
- Power dissipation: **<9W (EML Version)**
- Operating case temperature range of 0°C to +75°C
- Duplex LC receptacles



### Applications

- 100GBASE-ER4
- OTN-OTU4
- Switch to switch interface or Switch to
- Router interface

## 100G CFP4 SR4

### Features

- Hot pluggable CFP4 MSA form factor
- Supports 103.1Gb/s to 112.2Gb/s aggregate bit rates
- Compliant to IEEE 802.3bm 100GBASE-SR4
- Power class 2 (**<2.5W**)
- Up to **70m on OM3** and **100m OM4 MMF** transmission
- Up to 28Gb/s data rate per channel
- Operating case temperature: 0°C~70°C
- 4x28G Electrical Serial Interface (CEI-28G-VSR)
- MDIO management interface with digital diagnostic monitoring
- Maximum power consumption 2.5W
- Utilizes a standard 12/8 lane optical fiber with MPO connector
- RoHS 6 compliant(lead free)
- 4 × 28Gb/s 850nm VCSEL-based transmitter



### Applications

- 100GBASE-SR4 Ethernet
- OTN OTU4
- 128G Fiber Channel

## 100G CFP2 to QSFP28 Adapter

- ✓ Transmission data rate up to 28Gbps per channel
- ✓ 1 port QSFP28 TX&RX, supports 100G QSFP28 LR4/ER4



## 100G CFP2 to QSFP28 Adapter

### Features

- Compliant to CFP2 Hardware Specification Version 1.0
- Compliant to CFP MSA Management Interface Specification Version 2.4
- 4 channels full-duplex transceiver
- Internal CDR circuits on both receiver and transmitter channels
- Transmission data rate up to 28Gbps per channel
- OTU4 compatible
- Without FEC (Forward Error Correction)
- 1 port QSFP28TX&RX,supports 100G QSFP28LR4/ER4
- MDIO digital diagnostic interface and control capabilities
- Power class 3(Adapter<2W max)
- Hot pluggable electrical interface
- Operating case temperature:0°C~+70°C
- Single 3.3V power supply
- RoHS 6 compliant(lead free)



### Applications

- 100GBE interconnects, IEEE 802.3ba 100GBASE-LR4(Adapter+QSFP28\_LR4)
- High-speed core router connections& Datacom/Telecom switch
- Data aggregation and backplane applications
- Proprietary protocol and density application

## 100G CFP to QSFP28 Adapter

### Features

- Compliant to CFP Hardware Specification Version 1.4
- Compliant to CFP MSA Management Interface Specification Version 2.2
- Converts 10 bidirectional 10G lanes to 4 bidirectional 25G lanes
- 1 port QSFP28 TX&RX
- Support 100G IEEE 802.3bj NRZ FEC
- Transmission data rate up to 28Gbps per channel
- OTU4 compatible
- MDIO digital diagnostic interface and control capabilities
- Power class 1 (<4W max)
- Hot pluggable electrical interface
- Single 3.3V power supply
- Operating case temperature: 0°C ~ +70°C
- RoHS 6 compliant (lead free)



### Applications

- 100G Ethernet interconnects, IEEE 802.3ba 100GBASE-LR4(Adapter+QSFP28\_LR4), IEEE 802.3bm 100GBASE-SR4(Adapter+QSFP28\_SR4)
- High-speed core router connections & Datacom/Telecom switch
- Data aggregation and backplane applications
- Proprietary protocol and density application

## 25G SFP28 SR OTU4

### Features

- Hot-pluggable SFP28 form factor
- Supports 28Gbps data rate
- Maximum link length of 70m on OM3 MMF & 100m on OM4 MMF
- 850nm VCSEL laser and PIN photo-detector
- Internal CDR on both Transceiver and Receiver channel
- Duplex LC receptacle
- Single 3.3V power supply
- Power dissipation <1W
- Digital diagnostics functions are available via the I2C interface
- RoHS-6 compliant
- Commercial case temperature range: 0°C to 70°C



### Applications

- 25GBASE-SR Ethernet

## 25G SFP28 LR OTU4

### Features

- Hot-pluggable SFP28 form factor
- Support up to 28.05Gb/s
- Maximum link length of 10km on SMF
- 1310nm DFB laser and PIN photo-detector
- Internal CDR on both Transmitter and Receiver channel
- Duplex LC receptacle
- Power dissipation <1.5W
- Single 3.3V power supply
- Digital diagnostics functions are available via the I2C interface
- RoHS-6 compliant
- Commercial case temperature range: 0°C to 70°C



### Applications

- Tri-Rate 8.5/14.025/28.05 Gb/s Fiber Channel
- 25G Ethernet
- 32G Fiber Channel

## Ethernet

Data Rate	Form Factor	Distance								
		200m	500m	2km	10km	20km	40km	50km	80km	120km
10G	SFP+		★	★	★	★	★		★	
	SFP+ BIDI				★	★	★	★		
	SFP+ DWDM						★		★	
	SFP+ CWDM				★		★		★	
	SFP+ Tunable				★		★		★	
	XFP						★		★	
	XFP BIDI				★	★	★	★		
	XFP DWDM						★		★	★
	XFP CWDM		★				★		★	
	XFP Tunable								★	
1.25G	SFP		★	★		★	★		★	★
	BIDI SFP					★	★		★	★
	CWDM SFP						★		★	★
	DWDM SFP								★	★
	SGMII SFP			★	★					
	Copper SFP	★								
	Compact BIDI SFP					★				

## 10G-BASE-T Copper SFP+

preliminary

### Features

- Supports Links up to 30m using Cat 6a/7 Cable
- SFF-8431 and SFF-8432 MSA Compliant
- IEEE 802.3az Compliant
- Hot-pluggable SFP+ footprint
- TX Disable and RX Losfunction
- Fully metallic enclosure for Low EMI Emissions
- +3.3V single power supply
- Low Power Consumption (2.5W MAX @ 30m)
- Compact RJ-45 connector assembly
- Access to physical layer IC via 2-wire serial bus
- XFI/5GBASE-R/2500BASE-X/SGMII, SGMII Auto-NegotiationOn
- Auto-negotiates with other 10GBase-T PHYs
- Supports 100/1000Base-T using Cat 5e cable or better
- MDI/MDIX Crossover
- Multiple Loopback Modes for Testing and Troubleshooting
- Built-in Cable Monitoring and Link Diagnostic
- Unshielded and Shielded cable support
- Operating case temperature range of 0°C to +70°C



### Applications

- 10 Gigabit Ethernet over Cat 6A cable

## 10G SFP++ (with CDR)

### Features

- Compliant with SFF-8431, SFF-8432 & IEEE 802.3ae/OC192/STM-64
- Cooled EML transmitter and APD receiver
- Dual CDR with 9.95-11.095Gb/s
- Link length up to 80km
- Low Power Dissipation 1.5W Typical (Maximum: 3W)
- -5°C to 70°C Operating Case Temperature
- Single 3.3V power supply
- Diagnostic Performance Monitoring of module temperature, supply Voltages, laser bias current, transmit optical power, receive optical power
- RoHS6 compliant and lead free



## 10G XFP

### Features

- Support 9.95Gb/s to 11.3 Gb/s bit rates
- XFP MSA Compliant
- 3.3V Operating voltage
- Distance 300m/10km/40km/80km/120km
- VCSEL/DFB/EML/CWDM/DWDM optional
- Bi-directional XFP Transceiver available
- Wide Operating Temperature range 0°C–70°C and –40°C–85°C optional
- Diagnostic Optics Monitoring
- RoHS 6 Compliant

### Applications

- SONET OC-192/SDH STM 64
- 10G BASE LR/LW, ER/EW, ZR/ZW etc.
- 10G Fiber Channel
- CWDM/DWDM Networks



## 10G SFP+

### Features

- Support 9.95Gb/s to 11.3 Gb/s bit rates
- SFP+ MSA Compliant
- 3.3V operating voltage
- Distance from short links up to 80km
- VCSEL/DFB/EML/CWDM/DWDM optional
- Bi-directional SFP+ Transceiver available
- Wide operating Temperature range 0–70°C and –40–85°C optional
- Digital Diagnostic Monitoring
- 10G SFP+SONET (CDR) available
- RoHS 6 Compliant

### Applications

- SONET OC-192/SDH STM 64
- 10G BASE LR/LW, ER/EW, ZR/ZW etc.
- 8G/10G Fiber Channel
- CWDM/DWDM Networks



## 10G Tunable XFP

### Features

- XFP MSA Rev 4.5 Compliant
- Support 9.95Gb/s to 11.1Gb/s
- Tunability over full C-band 50GHz ITU-T wavelengths (SFF-8477 Control)
- 80km 50GHZ tunable laser
- Adaptive Receiver Decision Threshold Control for improved OSNR range
- High performance APD photodiode receiver
- Duplex LC fiber connector
- Compliant with XFP Electrical and Mechanical MSA INF-8077
- Digital diagnostics and alarm reporting
- -5°C to 70°C Operating Case Temperature
- Power Dissipation **3.5W** Maximum
- ROHS6 Compliant(lead free)

### Applications

- 10G Fiber Channel & 10G Ethernet
- SONET OC-192 & SDH STM64
- Ethernet Switch or IP Router Interconnect
- DWDM Networks



## 10G Tunable SFP+

### Features

- Hot-pluggable SFP+ footprint
- 50GHz DWDM ITU-T Full C-band Tunability
- Support 9.95Gb/s to 11.3Gb/s bit rates
- **80km** 50GHz DWDM laser
- 80km APD photodiode receiver
- Single 3.3V power supply
- Power dissipation **<1.7W**
- -5°C to +70°C
- Duplex LC fiber connectors
- 10GBASE-ZR/ZW
- SDH STM-64 ITU-T G.959.1 P1L1-2D2
- Full Digital Optical Monitoring
- Metal enclosure for lower EMI
- Complies with RoHS directive (2002/95/EC)
- Compliant with SFP+ Electrical MSA SFF-8431
- Compliant with SFP+ Mechanical MSA SFF-8432
- Laser Class 1 IEC/CDRH compliant

## 2.5G CSFP

### Features

- Support data rates from 100Mb/s to 2.5Gb/s
- 1310/1490/1550nm DFB laser and PIN photodetector
- 2-channel bi-directional optics in single SFP package
- Compliant with CSFP MSA Option 2 and SFF-8472
- Dual LC receptacles
- Support Digital Diagnostic Monitoring (DDM)
- Compatible with RoHS
- +3.3V single power supply
- Operating case temperature: 0 to 70°C or -40 to 85°C

### Applications

- SONET/SDH
- Gigabit Ethernet
- Fibre Channel
- Fast Ethernet
- Other optical links



## 2.5G CWDM SFP

### Features

- Data-rate of 2.67Gbps operation
- 8 CWDM DFB wavelengths laser and APD photodetector for **80km** transmission
- Compliant with SFP MSA and SFF-8472 with duplex LC receptacle
- Digital Diagnostic Monitoring:
  - Internal Calibration or External Calibration
- Compatible with RoHS
- +3.3V single power supply
- Operating case temperature:
  - Standard : 0 to +70°C

### Applications

- Tri Rate 1.0625 / 2.125 / 4.25Gbps Fiber Channel
- 1.25 Gb/s 1000 BASE Ethernet



## 2.5G DWDM SFP

### Features

- Wavelength selectable to C-band ITU-T grid wavelengths
- Suitable for use in 100GHz channel spacing DWDM systems
- DWDM SFP MSA Compliant
- Up to 2.67Gb/s data rate
- OC48 Long Reach **120km**
- Cold Start up Wavelength Compliance
- Low Power Dissipation **<1.3W** Maximum
- -5°C to 70°C Operating Case Temperature
- Diagnostic Performance Monitoring of module temperature, supply Voltages, laser bias current, transmit optical power, receive optical power, laser temperature and TEC current
- Extended link budget with APD receiver technology
- RoHS compliant and lead free

### Applications

- SFP Transceivers for DWDM SONET/ SDH
- Ethernet IEEE 802.3ae
- Fiber Channel



## 155M-1.25G SFP

### Features

- Data rates up to 155M/622M/1.25G/2.5G
- Compliant with SFP MSA & SFF-8472 with duplex LC receptacle
- **300m/500m/2km/20km/40km/80km/120km** reach
- +3.3V Single power supply
- Internal or external calibration
- Commercial case temperature range: 0°C to 70°C & 40°C to 85°C optional
- RoHS compliant

### Applications

- Ethernet IEEE802.3ae
- Fiber Channel
- SONET/SDH



## 3G SDI SFP Video Optical Transceiver

### Features

- HD-SDI SFP Transceiver available
- SD-SDI SFP Transceiver available
- 3G-SDI SFP Transceiver available
- SMPTE 297-2006 Compatible
- Metal enclosure for Lower EMI
- 1550nm DFB laser and PIN photodetector
- Supports video pathological patterns for SD-SDI, HD-SDI and 3G-SDI
- Compliant with SFP MSA and SFF-8472 with duplex LC receptacle
- Digital Diagnostic functions available through the I2C interface
- Compatible with RoHS
- +3.3V single power supply
- Operating case temperature: Standard: 0 to +70°C Industrial : -40 to +85°C

### Applications

- SMPTE 297-2006 Compatible Electrical-to-Optical Interfaces
- HDTV/SDTV Service Interfaces



## 6G SDI SFP Video Optical Transceiver

### Features

- SD/HD/3G/6G SFP Transceiver available
- SMPTE ST-297-2006, ST2081 Compatible
- Metal enclosure for Lower EMI
- 1310nm DFB laser
- Supports video pathological patterns for SD-SDI, HD-SDI, 3G-SDI, 6G-SDI
- Compliant with SFP MSA and SFF-8472 with duplex LC receptacle
- Digital Diagnostic functions available through the I2C interface
- Compatible with RoHS
- +3.3V single power supply
- Operating case temperature: Standard: 0°C to 70°C
- SMPTE ST-297-2006, ST2081 Compatible Electrical-to-Optical Interfaces
- UHDTV/HDTV/SDTV Service Interfaces

### Applications

- SMPTE ST-297-2006, ST2081 and ST-2082 Compatible Electrical-to-Optical Interfaces
- UHDTV/HDTV/SDTV Service Interfaces



## 12G SDI Video SFP Optical Transceiver

### Features

- SD/HD/3G/6G/12G-SDI SFP Transceiver available
- SMPTE ST-297-2006, ST2081 and ST-2082 Compatible
- Metal enclosure for Lower EMI
- 1310nm DFB laser
- Supports video pathological patterns for SD-SDI, HD-SDI, 3G-SDI, 6G-SDI and 12G SDI
- Compliant with SFP MSA and SFF-8472 with duplex LC receptacle
- Digital Diagnostic functions available through the I2C interface
- Compatible with RoHS
- +3.3V single power supply
- Operating case temperature: Standard: 0°C to 70°C

### Applications

- SMPTE ST-297-2006, ST2081 and ST-2082 Compatible Electrical-to-Optical Interfaces
- UHDTV/HDTV/SDTV Service Interfaces

preliminary



## Mini HDMI Optical Transceiver

### Features

- Compliant with HDMI 1.4 Version, 4K/3D/1080p HD signal transfer without compression
- 10Gb/s Data rate
- Support HDCP/EDID/DDC/Audio
- Plug and play
- HDMI A-type interface, CEC(consumer electronics control)not supported
- Power/Working condition indicated by LED light
- Transmission distance up to 300m on SMF or MMF, with HDCP requirement
- 850nm VCSEL transmitter, PIN photo-detector
- Duplex LC connector
- Lower power consumption
- Compact size 67\*23\*10.3mm

### Applications

- Transport HDMI signal over optical fiber, the HDMI source can be Blue-ray DVD, HDMI Encoder and so on. The Receiver can be HDTV/SDTV/4K.



## 4x 3G-SDI Optical Extenders

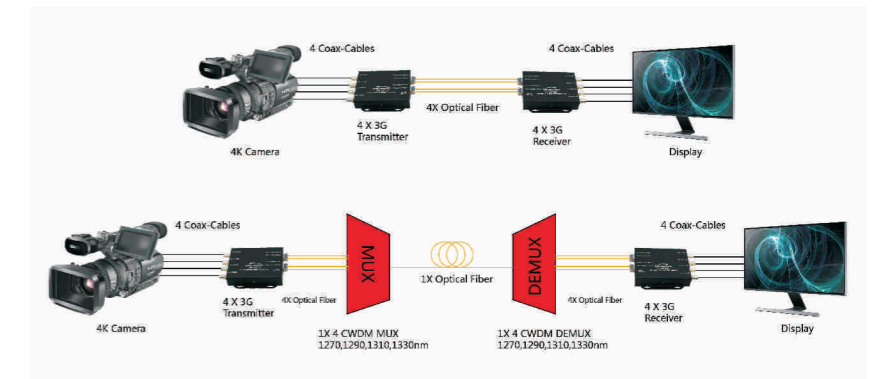
### Features

- Extend SDI signal up to 2km~80km over fiber optics
- Data rate per lane up to 3G, total 12G for 4K
- Compliant with SMPTE-424M/292M/295M/297M/305M/310M and DVB-ASI
- Plug and play, no software to be installed
- Longer, thinner cable without EMI/RFI emissions
- Operating case temperature: 0°C to 60°C
- All-metal housing for superior EMI performance
- RoHS compliant (lead free)



### Applications

- Live Broadcast
- 4K Screen
- 4K Camera
- Video Meeting
- Security Monitoring



## 12G-SDI Video Optical Transceiver Extenders

### Features

- SD, HD, 3G, 6G, 12G input datarate detected Automatically, 125M/270M/1.48G/3G/6G/12G datarate selected both automatically and manually
- Reachable distance: 80km(@3G SDI SFP transceiver), 20km(@12G SDI SFP transceiver), 700m(@6G SDI SFP transceiver)
- Supported format : SMPTE ST 2082-1 (11.88Gbps/s), SMPTE ST 2081-1 (5.94Gbps/s), SMPTE ST 424 (2.97Gbps/s), SMPTE ST 292 (1.485Gbps/s), SMPTE ST 259(360Mb/s), DVB-ASI(270Mb/s), MADI (125Mb/s)
- Co-axis cable equalizer embedded in the transmitter:
  - 70m at 11.88Gb/s: <0.2UI output jitter
  - 90m at 5.94Gb/s: <0.15UI output jitter
  - 180m at 2.97Gb/s: <0.1UI output jitter
  - 240m at 1.485Gb/s: <0.1UI output jitter
  - 300m at 270Mb/s: <0.1UI output jitter
- CDR embedded in the receiver
- SDI signal connecting status indicated by LED
- 5~12V DC power supply
- Friendly simple GUI



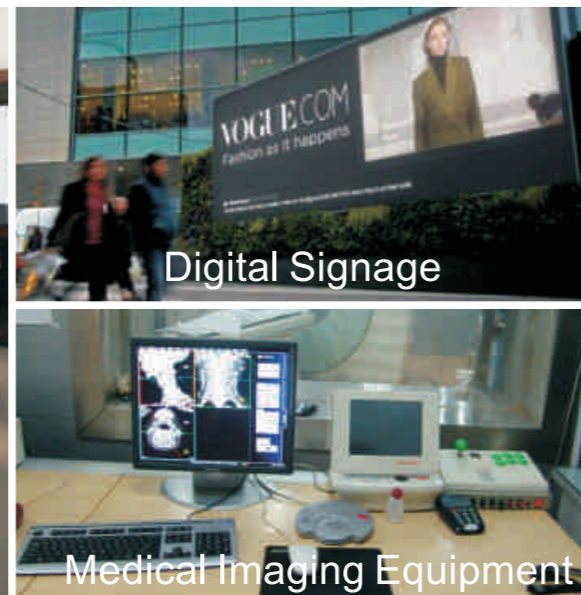
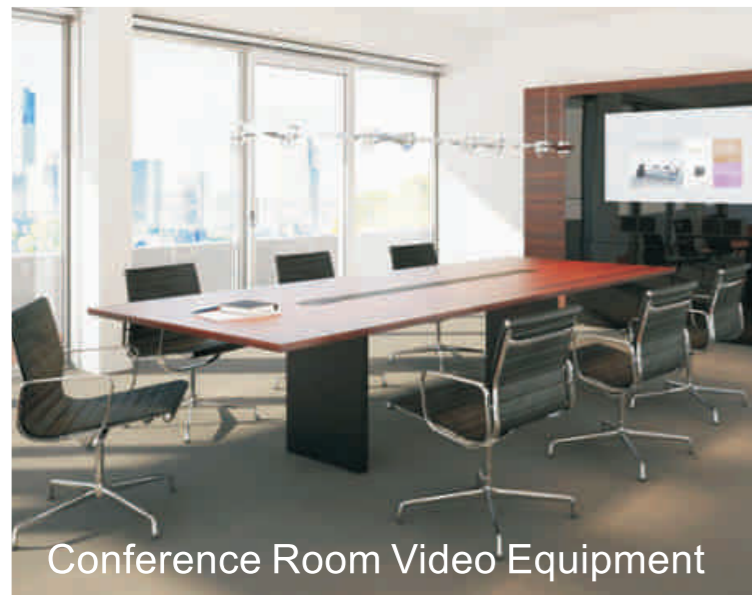
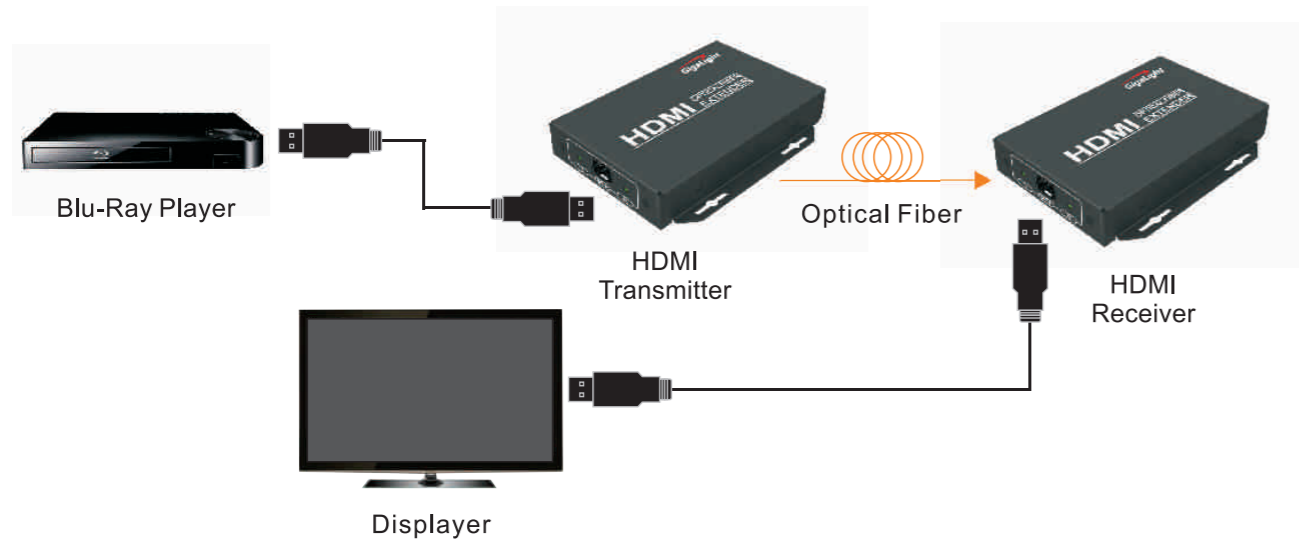


# HDMI 1.4 Mini Optical Extenders

## Features

- Compliant with HDMI 1.4 Version, 4K/3D/1080p HD signal transfer without compression
- No compression; 10Gb/s Data rate
- Support HDCP/EDID/DDC/Audio
- Plug and play; Dispense with software
- HDMI A-type interface, CEC (consumer electronics control) not supported
- Power/Working condition indicated by LED light
- Transmission distance up to **300m on SMF or MMF**, with HDCP requirement
- Transmission distance up to **40KM on SMF** (Single fiber or Dual fiber, with HDCP shunt/decoding box)

## Applications



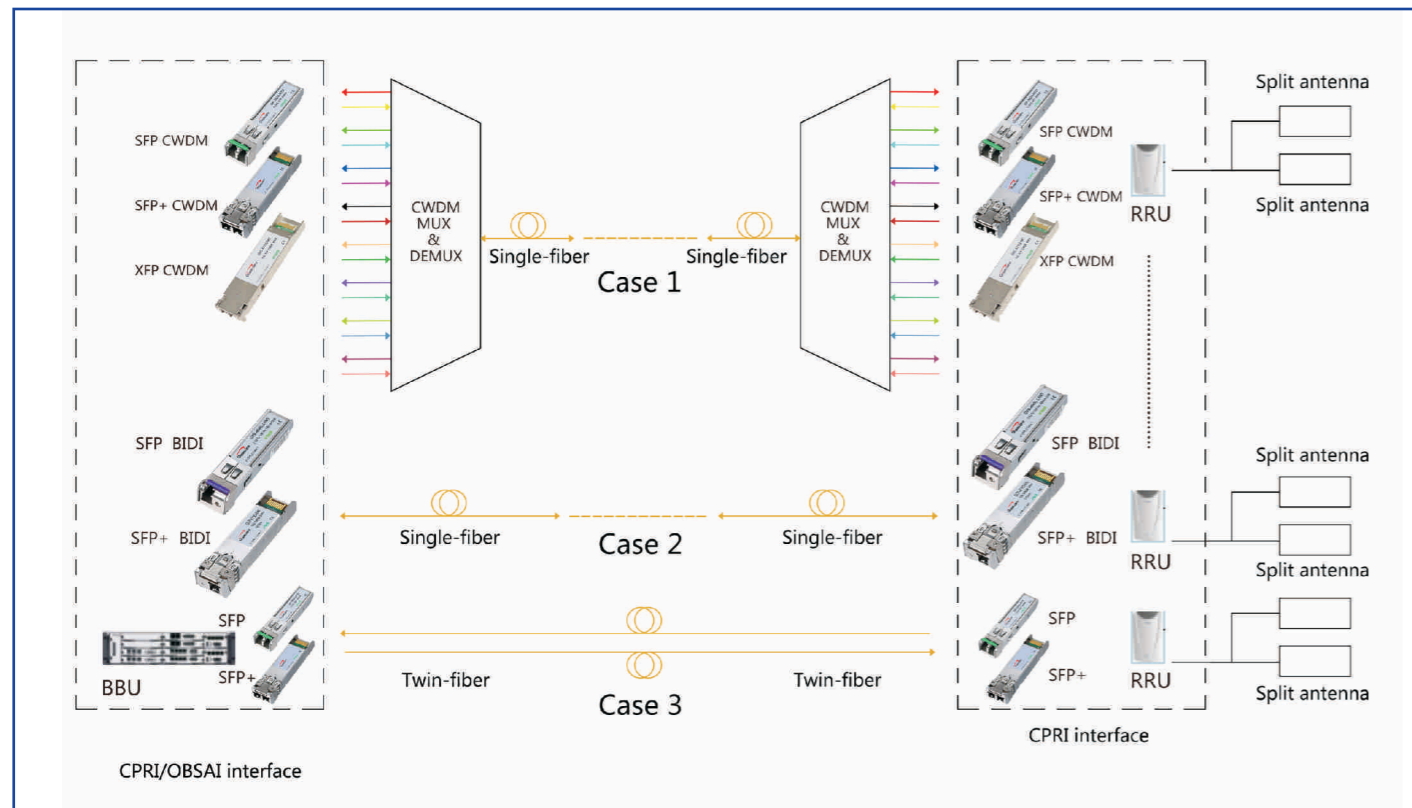
# XG VSFP

Product Series	Part Number	Data rate (Gb/s)	Wavelength (nm)	Connector	Reach	Case Temperature (°C)	
3G-SDI Video SFP TX and RX	GHP-313G-02CD	3Gbps	1310	LC	2km	0~70	
	GHP-313G-L2CD	3Gbps	1310	LC	20km	0~70	
	GHP-313G-L4CD	3Gbps	1310	LC	40km	0~70	
	GHP-553G-L4CD	3Gbps	1550	LC	40km	0~70	
	GHPC-XX3G-L4CD	3Gbps	CWDM	LC	40km	0~70	
	GHP-313G-L8CD	3Gbps	1310	LC	80km	0~70	
3G-SDI Video SFP TX	GHT-313G-02CD	3Gbps	1310	LC	2km	0~70	
	GHT-313G-L2CD	3Gbps	1310	LC	20km	0~70	
	GHT-313G-L4CD	3Gbps	1310	LC	40km	0~70	
	GHT-553G-L4CD	3Gbps	1550	LC	40km	0~70	
	GHTC-XX3G-L4CD	3Gbps	CWDM	LC	40km	0~70	
	GTT-313G-02CD	3Gbps	1310	LC	2km	0~70	
3G-SDI Video SFP Dual TX	GTT-313G-L2CD	3Gbps	1310	LC	20km	0~70	
	GTT-313G-L4CD	3Gbps	1310	LC	40km	0~70	
	GTT-553G-L4CD	3Gbps	1550	LC	40km	0~70	
	GTTC-XXX3G-L4CD	3Gbps	CWDM	LC	40km	0~70	
	3G-SDI Video SFP RX	GHR-XX3G-XXXD	3Gbps	N/A	LC	2km/20km/40km	0~70
	3G-SDI Video SFP Dual RX	GRR-XX3G-XXXD	3Gbps	N/A	LC	2km/20km/40km	0~70
3G-SDI Video SFP Bidi	GHB-353G-L2CD	3Gbps	1310/1550	LC	20km	0~70	
	GHB-533G-L2CD	3Gbps	1550/1310	LC	20km	0~70	
	GHB-353G-L2CD	3Gbps	1310/1550	LC	20km	0~70	
6G-SDI Video SFP TX and RX	GHP-316G-02CD	6Gbps	1310	LC	2KM	0~70	
	GHP-316G-L2CD	6Gbps	1310	LC	20KM	0~70	
	GHP-316G-L4CD	6Gbps	1310	LC	40KM	0~70	
6G-SDI Video SFP Dual TX	GTT-316G-02CD	6Gbps	1310	LC	2KM	0~70	
	GTT-316G-L2CD	6Gbps	1310	LC	20KM	0~70	
	GTT-316G-L4CD	6Gbps	1310	LC	40KM	0~70	
6G-SDI Video SFP Dual RX	GRR-XX6G-XXCD	6Gbps	N/A	LC	2KM/20KM/40KM	0~70	
	12G-SDI Video SFP TX and RX	GHP-3112G-02CD	12Gbps	1310	LC	2KM	0~70
	12G-SDI Video SFP TX and RX	GHP-3112G-L2CD	12Gbps	1310	LC	20KM	0~70
12G-SDI Video SFP Dual TX	GTT-3112G-02CD	12Gbps	1310	LC	2KM	0~70	
	GTT-3112G-L2CD	12Gbps	1310	LC	20KM	0~70	
	12G-SDI Video SFP Dual RX	GRR-XX12G-XXCD	12Gbps	N/A	LC	2KM/20KM	0~70
MINI HDMI 1.4	N/A	10Gbps	850	LC	200M	0~70	

# XG SDI/HDMI Extender

Product Series	Part Number	Data rate (Gb/s)	Wavelength (nm)	Connector	Reach	Case Temperature (°C)
4x 3G-SDI Optical Extender	G-SDI-E-4*3G-Tx/Rx	3Gbps	TBD	SFP slot	TBD	0~70
12G-SDI Optical Extender (2channel T&R)	G-SDI-E-1*12G-TR	12Gbps	TBD	SFP slot	TBD	0~70
HDMI1.4 Optical Fiber Extender (For pair)	G-HDMI-E-Tx/Rx	10Gbps	TBD	SFP slot	TBD	0~70
mini HDMI1.4 Optical Fiber Extender (For pair)	TBD	10Gbps	TBD	LC	300m	0~70

# Wireless & 5G Solutions



## 10G CPRI SFP+

### Features

- Operating data rate up to 10.3Gb/s data rates
- Simplex LC Connector Bi-Directional SFP+ Optical Transceiver
- Single 3.3V Supply
- Up to 60km on 9/125um SMF
- A:1270nm DFB Laser transmitter,1330nm APD receiver
- B:1330nm DFB Laser transmitter,1270nm APD receiver
- Compliant with IEEE 802.3ae 10GBASE-E6R and 10GBASE-E6W
- SFP+ MSA SFF-8431 Compliant
- Digital Diagnostic SFF-8472 Compliant
- RoHS compliant and Lead Free
- Operating case temperature:
- Commercial: 0°C ~70 °C



## 6G/10G CPRI BiDi SFP+ 60km (Industrial)

### Features

- Operating data rate up to 10.3125Gb/s
- Simplex LC connector
- Single 3.3V supply
- SFP+ MSA SFF-8431 compliant
- Digital diagnostic SFF-8472 compliant
- RoHS compliant and lead free
- Operating temperature range: -40 to 85°C



### Applications

- 10GBASE-LR at 10.3125Gbps
- 10GBASE-LW at 9.953Gbps
- 8G Fibre Channel
- 6.1440/9.8304/10.1376Gbps CPRI data rate

## 3G/5G CPRI BiDi SFP (Industrial)

### Features

- Supports 2.4576/3.0720/4.9152Gbps data rates
- Simplex LC connector
- Single 3.3V supply
- Gigabit Ethernet compatible
- SFP MSA SFF-8074i compliant
- Digital diagnostic SFF-8472 compliant
- RoHS compliant and lead free
- Operating temperature range: -40 to 85°C



## 25G SFP28 LR/Lite

### Features

- Hot-pluggable SFP28 form factor
- Support 25Gbps data rate
- Maximum link length of 10km on SMF
- 1310nm DFB laser and PIN photo-detector
- Internal CDR on both Transmitter and Receiver channel
- Duplex LC receptacle
- Power dissipation <1.5W
- Single 3.3V power supply
- Digital diagnostics functions are available via the I2C interface
- RoHS-6 compliant
- Commercial case temperature range: 0°C to 70°C



### Applications

- 25GBASE-LR Ethernet

### Applications

- Multi-rate 2.4576/3.0720/4.9142Gbps