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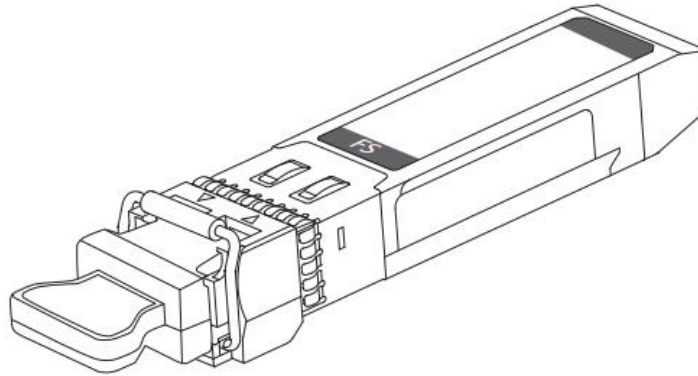
# 10G SFP+ Cable and Transceiver Modules Data Sheet

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## Product overview

The FS® 10GBASE Quad Small Form-Factor Pluggable (SFP+) portfolio offers customers a wide variety of high-density and low-power 10 Gigabit Ethernet connectivity options for data center, high-performance computing networks, enterprise core and distribution layers, and service provider applications. The SFP+-10G modules are our latest generation of 10G transceiver modules solution based on a SFP+ form factor. (See Figure 1).



- SFP-10GSR-85
- SFP-10GLR-31
- SFP-10GLRM-31
- SFP-10GER-55

**Figure 1.**  
SFP+ 10G Optical modules

## Features and benefits

- Industry's smallest 10G form factor for greatest density per chassis
- Hot-swappable input/output device that plugs into an Ethernet SFP+ port
- Digital optical monitoring capability for strong diagnostic capabilities
- Certified and tested on Cisco, Arista, Juniper, Brocade SFP+ 10G ports for superior performance, quality, and reliability. For more details, refer to the [FS Assured Program for Transceivers](#)

Table 1 describes the SFP+ 10G portfolio.

Table 1. SFP+ 10G portfolio

Product	Description	Connector type
SFP-10G-T-30	10GBASE -T SFP+ Transceiver, RJ-45, 30m over Copper Cable	RJ-45
SFP-10G-T-80	10GBASE -T SFP+ Transceiver, RJ-45, 80m over Copper Cable	RJ-45
SFP-10G-T-100	10GBASE -T SFP+ Transceiver, RJ-45, 100m over Copper Cable	RJ-45
SFP-10G-T-30I	10GBASE -T SFP+ Transceiver, RJ-45, 30m over Copper Cable, I-Temp	RJ-45

Product	Description	Connector type
SFP-10GSR-85	10GBASE SR SFP+ Transceiver, LC, 300m over OM3 MMF	Duplex LC
SFP-10GSR-85-I	10GBASE SR SFP+ Transceiver, LC, 300m over OM3 MMF, I-Temp	Duplex LC
SFP-10GLRM-31	10GBASE LRM SFP+ Transceiver, LC, 220m over OM3 MMF	Duplex LC
SFP-10GLRM-31-I	10GBASE LRM SFP+ Transceiver, LC, 220m over OM3 MMF, I-Temp	Duplex LC
SFP-10GLRL-31	10GBASE LRM SFP+ Transceiver, LC, 2km over OS2 SMF	Duplex LC
SFP-10GLRL-31-I	10GBASE LRL SFP+ Transceiver, LC, 2km over OS2 SMF, I-Temp	Duplex LC
SFP-10GMLR-31	10GBASE LR SFP+ Transceiver, LC, 10km over OS2 SMF, Dual rate	Duplex LC
SFP-10GLR-31	10GBASE LR SFP+ Transceiver, LC, 10km over OS2 SMF	Duplex LC
SFP-10GLR-31-I	10GBASE LR SFP+ Transceiver, LC, 10km over OS2 SMF, I-Temp	Duplex LC
SFP-10GER-31	10GBASE ER SFP+ Transceiver, LC, 40km over OS2 SMF	Duplex LC
SFP-10GER-31-I	10GBASE ER SFP+ Transceiver, LC, 40km over OS2 SMF, I-Temp	Duplex LC
SFP-10GER-55	10GBASE ER SFP+ Transceiver, LC, 40km over OS2 SMF	Duplex LC
SFP-10GER-55-I	10GBASE ER SFP+ Transceiver, LC, 40km over OS2 SMF, I-Temp	Duplex LC
SFP-10GZR-55	10GBASE ZR SFP+ Transceiver, LC, 80km over OS2 SMF	Duplex LC
SFP-10GZR-55-I	10GBASE ZR SFP+ Transceiver, LC, 80km over OS2 SMF, I-Temp	Duplex LC
SFP-10GZR100-55	10GBASE ZRC SFP+ Transceiver, LC, 100km over OS2 SMF	Duplex LC
SFP-10GZR100-55-I	10GBASE ZRC SFP+ Transceiver, LC, 100km over OS2 SMF, I-Temp	Duplex LC
SFP-10GZR120-55	10GBASE ZRC SFP+ Transceiver, LC, 120km over OS2 SMF	Duplex LC
SFP-10G-BX	10GBASE BX SFP+ Transceiver, LC, 10km over OS2 SMF, 1270nm/1330nm	Simplex LC
SFP-10G-BX-I	10GBASE BX SFP+ Transceiver, LC, 10km over OS2 SMF, 1270nm/1330nm, I-Temp	Simplex LC
SFP-10G-BX	10GBASE BX20 SFP+ Transceiver, LC, 20km over OS2 SMF, 1270nm/1330nm	Simplex LC
SFP-10G-BX-I	10GBASE BX20 SFP+ Transceiver, LC, 20km over OS2 SMF, 1270nm/1330nm, I-Temp	Simplex LC

Product	Description	Connector type
SFP-10G-BX40	10GBASE BX40 SFP+ Transceiver, LC, 40km over OS2 SMF, 1270nm/1330nm	Simplex LC
SFP-10G-BX40-I	10GBASE BX40 SFP+ Transceiver, LC, 40km over OS2 SMF, 1270nm/1330nm, I-Temp	Simplex LC
SFP-10G-BX60	10GBASE BX60 SFP+ Transceiver, LC, 60km over OS2 SMF, 1270nm/1330nm	Simplex LC
SFP-10G-BX60-I	10GBASE BX60 SFP+ Transceiver, LC, 60km over OS2 SMF, 1270nm/1330nm, I-Temp	Simplex LC
SFP-10G-BX80	10GBASE BX80 SFP+ Transceiver, LC, 80km over OS2 SMF, 1490nm/1550nm	Simplex LC
SFP-10G-BX80-I	10GBASE BX80 SFP+ Transceiver, LC, 80km over OS2 SMF, 1490nm/1550nm, I-Temp	Simplex LC
SFP-10G-BX100	10GBASE BX100 SFP+ Transceiver, LC, 100km over OS2 SMF, 1490nm/1550nm	Simplex LC
CWDM-SFP10G-10SP	10GBASE CWDM SFP+ Transceiver, LC, 10km over OS2 SMF, 1270nm-1330nm	Duplex LC
CWDM-SFP10G-10M	10GBASE CWDM SFP+ Transceiver, LC, 10km over OS2 SMF, 1350nm-1610nm	Duplex LC
CWxx-10GSFP-10-I	10GBASE CWDM SFP+ Transceiver, LC, 10km over OS2 SMF, 1270nm-1610nm, I-Temp	Duplex LC
CWDM-SFP10G-20SP	10GBASE CWDM SFP+ Transceiver, LC, 20km over OS2 SMF, 1270nm-1330nm	Duplex LC
CWDM-SFP10G-20S	10GBASE CWDM SFP+ Transceiver, LC, 20km over OS2 SMF, 1350nm-1450nm	Duplex LC
CWDM-SFP10G-20L	10GBASE CWDM SFP+ Transceiver, LC, 20km over OS2 SMF, 1470nm-1610nm	Duplex LC
CWDM-SFP10G-40S	10GBASE CWDM SFP+ Transceiver, LC, 40km over OS2 SMF, 1270nm-1450nm	Duplex LC
CWDM-SFP10G-40L	10GBASE CWDM SFP+ Transceiver, LC, 40km over OS2 SMF, 1470nm-1610nm	Duplex LC
CWDM-SFP10G-40-I	10GBASE CWDM SFP+ Transceiver, LC, 40km over OS2 SMF, 1270nm-1610nm, I-Temp	Duplex LC
CWDM-SFP10G-80L	10GBASE CWDM SFP+ Transceiver, LC, 80km over OS2 SMF, 1470nm-1610nm	Duplex LC
CWDM-SFP10G-80-I	10GBASE CWDM SFP+ Transceiver, LC, 80km over OS2 SMF, 1470nm-1610nm, I-Temp	Duplex LC
DWDM-SFP10G-40	10GBASE DWDM SFP+ Transceiver, LC, 40km over OS2 SMF, C17-C61	Duplex LC
DWDM-SFP10G-40-I	10GBASE DWDM SFP+ Transceiver, LC, 40km over OS2 SMF, C17-C61, I-Temp	Duplex LC
DWDM-SFP10G-80	10GBASE DWDM SFP+ Transceiver, LC, 80km over OS2 SMF, C17-C61	Duplex LC
DWDM-SFP10G-80-I	10GBASE DWDM SFP+ Transceiver, LC, 80km over OS2 SMF, C17-C61, I-Temp	Duplex LC
DWxx-10GSFP-100	10GBASE DWDM SFP+ Transceiver, LC, 80km over OS2 SMF, C17-C61	Duplex LC
DWDM-SFP10G-C	10GBASE DWDM SFP+ Transceiver, LC, 80km over OS2 SMF, Tunable	Duplex LC

Product	Description	Connector type
SFP-10G-PCxxx (0.5M, 1M, 1.5M, 2M, 2.5M, 3M, 4M, 5M, 6M, 7M)	10GBASE SFP+ Passive Copper Cable	-
SFP-10G-ACxxx (1M, 3M, 5M, 7M, 10M)	10GBASE SFP+ Active Copper Cable	-
SFP-10G-AOxxx (1M, 2M, 3M, 5M, 7M, 10M, 15M, 20M, 25M, 30M)	100GBASE QSFP28 to 4xSFP25G Passive Copper Splitter Cables	-

### SFP-10G-T-30

The SFP-10G-T-30 transceiver provides 10GBase-T throughput up to 30m over cat6a/cat7 copper cable via RJ-45 connector. This transceiver is compliant with IEEE 802.3an, IEEE 802.3az, SFF-8431 and SFP+ MSA. Each SFP+ transceiver module is individually tested to be used on a series of switches, routers, servers, network interface card (NICs) etc.

### SFP-10G-T-80

The SFP-10G-T-80 transceiver provides 10GBase throughput up to 80m over cat6a/cat7 copper cable via RJ-45 connector. This transceiver is compliant with IEEE 802.3an, IEEE 802.3az, SFF-8431 and SFP+ MSA. Each SFP+ transceiver module is individually tested to be used on a series of switches, routers, servers, network interface card (NICs) etc.

### SFP-10G-T-100

The SFP-10G-T-100 transceiver provides 10GBase-T throughput up to 100m over cat6a/cat7 copper cable. This transceiver is compliant with IEEE 802.3az, SFF-8431, SFF-8432 and SFP+ MSA. Each SFP+ transceiver module is individually tested to be used on a series of switches, routers, servers, network interface card (NICs) etc.

### SFP-10G-T-30I

The SFP-10G-T-30I transceiver provides 10GBase-T throughput up to 30m over cat6a/cat7 copper cable via RJ-45 connector. This transceiver is compliant with IEEE 802.3an, IEEE 802.3az, SFF-8431 and SFP+ MSA. Each SFP+ transceiver module is individually tested to be used on a series of switches, routers, servers, network interface card (NICs) etc. Featuring an operating temperature range of -40° C to 85° C, this industrial transceiver can work in harsh industrial environments, such as telecommunication, data processing & management, the application of industrial and factory automation, outdoor applications, rail and intelligent transportation systems (ITSs), marine, oil and gas, mining etc.

### SFP-10GSR-85

The SFP-10GSR-85 transceiver supports up to 400m link lengths over OM4 MMF (300m over OM3 MMF) via an LC duplex connector. This transceiver is compliant with SFF-8431, SFF-8432 and IEEE 802.3ae standards. Digital diagnostics monitoring is available via a 2-wire serial interface, as specified in SFF-8472. etc.

### **SFP-10GSR-85-I**

The SFP-10GSR-85-I transceiver supports up to 400m link lengths over OM4 MMF (300m over OM3 MMF) via an LC duplex connector. This transceiver is compliant with SFF-8431, SFF-8432 and IEEE 802.3ae standards. Digital diagnostics monitoring is available via a 2-wire serial interface, as specified in SFF-8472. Featuring an operating temperature range of -40° C to 85° C, this industrial fiber optic transceiver can work in harsh industrial environments.

### **SFP-10GLRM-31-I**

The SFP-10GLRM-31-I transceiver supports up to 220m over OM3 multimode fiber (MMF). This transceiver is compliant with IEEE802.3. Digital diagnostics monitoring is available via a 2-wire serial interface, as specified in SFF-8472. Featuring an operating temperature range of -40° C to 85° C, this industrial fiber optic transceiver can work in harsh industrial environments.

### **SFP-10GLRM-31**

The SFP-10GLRM-31 transceiver supports up to 220m over OM3 multimode fiber (MMF). This transceiver is compliant with SFF-8431, SFF-8432 and IEEE 802.3aq 10GBASE-LRM. Digital diagnostics monitoring is available via a 2-wire serial interface, as specified in SFF-8472. Featuring low power consumption, high speed, this 10G SFP+ transceiver is ideal for data center, 10G Ethernet and Legacy FDDI multimode links etc.

### **SFP-10GLRL-31**

The SFP-10GLRL-31 transceiver supports up to 2km over OS2 SMF via an LC duplex connector. This transceiver is compliant with SFF-8431, SFF-8432 and IEEE 802.3ae 10GBASE-LR. Digital diagnostics monitoring is available via a 2-wire serial interface, as specified in SFF-8472. Featuring low power consumption, high speed, this 10G SFP+ transceiver is ideal for data center, 10G Fiber Channel, SONET and SDH etc.

### **SFP-10GLRL-31-I**

The SFP-10GLRL-31-I transceiver supports up to 2km link lengths over duplex LC OS2 singlemode fiber (SMF). This transceiver is compliant with SFP+ MSA, SFF-8431 and SFF-8472 standards. The built-in digital diagnostics monitoring (DDM) allows access to real-time operating parameters via the I2C interface. It is suitable for 10GBASE Ethernet application and can work in harsh industrial environments, such as telecommunications, outdoor applications and marine, oil and gas, mining.

### **SFP-10GMLR-31**

The SFP-10GMLR-31 transceiver supports up to 10km over OS2 SMF via an LC duplex connector. This transceiver is compliant with SFF-8431, SFF-8432 and IEEE 802.3ae 10GBASE-LR/LW, and 10G Fibre Channel 1200-SM-LL-L. Digital diagnostics monitoring is available via a 2-wire serial interface, as specified in SFF-8472. Featuring low power consumption, high speed, this 10G SFP+ transceiver is ideal for data center, 10G Ethernet and Fibre Channel etc.

### **SFP-10GLR-31**

The SFP-10GLR-31 transceiver supports up to 10km link lengths over LC duplex SMF fiber. This transceiver is compliant with SFF-8431, SFF-8432 and IEEE 802.3ae standards. Digital diagnostics monitoring is available via a 2-wire serial interface, as specified in SFF-8472. This 10G SFP+ transceiver is ideal for data center, enterprise wiring closet, service provider transport application, Radio & Baseband Unit, etc.

### **SFP-10GLR-31-I**

The SFP-10GLR-31-I transceiver supports up to 10km link lengths over LC duplex SMF fiber. This transceiver is compliant with SFF-8431, SFF-8432 and IEEE 802.3ae standards. Digital diagnostics monitoring is available via a 2-wire serial interface, as specified in SFF-8472. Featuring an operating temperature range of -40° C to 85° C, this industrial fiber optic transceiver can work in harsh industrial environments.

### **SFP-10GER-31**

The SFP-10GER-31 transceiver supports up to 40km over OS2 SMF via an LC duplex connector. This transceiver is compliant with SFF-8431 and SFF-8432. Digital diagnostics monitoring is available via a 2-wire serial interface, as specified in SFF-8472. Featuring low power consumption, high speed, this 10G SFP+ transceiver is ideal for data center, 10G Ethernet and Fibre Channel etc.

### **SFP-10GER-31-I**

The SFP-10GER-31-I transceiver supports up to 40km link lengths over OS2 SMF via an LC duplex connector. Digital diagnostics monitoring is available via a 2-wire serial interface, as specified in SFF-8472. Each SFP+ transceiver module is individually tested to be used on a series of Cisco switches, routers, servers, network interface card (NICs) etc. Featuring an operating temperature range of -40° C to 85° C, this industrial fiber optic transceiver can work in harsh industrial environments.

### **SFP-10GER-55**

The SFP-10GER-55 transceiver supports up to 40km over OS2 SMF via an LC duplex connector. This transceiver is compliant with SFF-8431 and SFF-8432. Digital diagnostics monitoring is available via a 2-wire serial interface, as specified in SFF-8472. Featuring low power consumption, high speed, this 10G SFP+ transceiver is ideal for data center, 10G Ethernet and Fibre Channel etc.

### **SFP-10GER-55-I**

The SFP-10GER-55-I transceiver supports up to 40km link lengths over SMF fiber. This transceiver is compliant with SFF-8431, SFF-8432, 10GFC Rev 4.0 and 10GBASE-ER standards. Digital diagnostics monitoring is available via a 2-wire serial interface, as specified in SFF-8472. Featuring an operating temperature range of -40° C to 85° C, this industrial fiber optic transceiver can work in harsh industrial environments.



## **SFP-10GZR-55**

The SFP-10GZR-55 transceiver supports up to 80km over OS2 SMF via an LC duplex connector. This transceiver is compliant with per the RoHS Directive 2011/65/EU. Digital diagnostics monitoring is available via a 2-wire serial interface, as specified in SFF-8472. Featuring low power consumption, high speed, this 10G SFP+ transceiver is ideal for data center, 10G Ethernet and Fiber Channel etc.

## **SFP-10GZR-55-I**

The SFP-10GZR-55-I transceiver supports up to 80km link lengths over SMF via an LC duplex connector. This transceiver is compliant with IEEE Std 802.3by, SFF-8431, SFF-8432, SFF-8402, SFF-8472, SFF-8024. Digital diagnostics monitoring is available via a 2-wire serial interface, as specified in SFF-8472. The SFP-10GZR-55-I is for industrial operating temperature range and can work in harsh industrial environments.

## **SFP-10GZR100-55**

The SFP-10GZR100-55 transceiver supports up to 100km over OS2 SMF via an LC duplex connector. This transceiver is compliant with per the RoHS Directive 2011/65/EU. Digital diagnostics monitoring is available via a 2-wire serial interface, as specified in SFF-8472. Featuring low power consumption, high speed, this 10G SFP+ transceiver is ideal for data center, 10G Ethernet and Fiber Channel etc.

## **SFP-10GZR100-55-I**

The SFP-10GZR100-55-I transceiver supports up to 100km link lengths over SMF fiber. This transceiver is compliant with SFP+ MSA and IEEE802.3ae standards. Digital diagnostics monitoring is available via a 2-wire serial interface, as specified in SFF-8472. Featuring an operating temperature range of -40° C to 85° C, this industrial fiber optic transceiver can work in harsh industrial environments.

## **SFP-10GZR120-55**

The SFP-10GZR120-55 transceiver supports up to 120km over OS2 SMF via an LC duplex connector. This transceiver is compliant with SFF-8431. Digital diagnostics monitoring is available via a 2-wire serial interface, as specified in SFF-8472. Featuring low power consumption, high speed, this 10G SFP+ transceiver is ideal for data center, 10G Ethernet and Fibre Channel etc.

**SFP-10G-BX (10km)**

The SFP-10G-BX transceiver supports up to 10km link lengths over OS2 SMF via an LC simplex connector. Digital diagnostics can also be used through the I2C interface designated by SFF-8472 to allow access to real-time operating parameters. Each BIDI SFP+ transceiver module is individually tested to be used on a series of Cisco switches, routers, servers, network interface cards (NICs) etc. Featuring low power consumption and high speed, this 10G BIDI SFP+ transceiver is ideal for enterprise wiring closets, service provider transport applications, Radio & Baseband Units, etc.

**SFP-10G-BX-I (10km)**

The SFP-10G-BX-I transceiver supports up to 10km link lengths over OS2 SMF via an LC simplex connector. Digital diagnostics can also be used through the I2C interface designated by SFF-8472 to allow access to real-time operating parameters. Each BIDI SFP+ transceiver module is individually tested to be used on a series of Cisco switches, routers, servers, network interface cards (NICs) etc. Featuring an operating temperature range of -40° C to 85° C, this industrial fiber optic transceiver can work in harsh industrial environments.

**SFP-10G-BX (20km)**

The SFP-10G-BX transceiver supports up to 20km over OS2 SMF via an LC simplex connector. This transceiver is compliant with SFF-8431 and IEEE 802.3ae standard. Digital diagnostics monitoring is available via a 2-wire serial interface, as specified in SFF-8472. Featuring low power consumption, high speed, this 10G SFP+ transceiver is ideal for data center, 10G Ethernet etc.

**SFP-10G-BX-I (20km)**

The SFP-10G-BX-I transceiver supports up to 20km over OS2 SMF via an LC simplex connector. This transceiver is compliant with SFF-8431 and IEEE 802.3ae standard. Digital diagnostics monitoring is available via a 2-wire serial interface, as specified in SFF-8472. Featuring an operating temperature range of -40° C to 85° C, this industrial fiber optic transceiver can work in harsh industrial environments.

**SFP-10G-BX40**

The SFP-10G-BX40 transceiver supports up to 40km over OS2 SMF via an LC simplex connector. This transceiver is compliant with SFF-8431 and IEEE 802.3ae standard. Digital diagnostics monitoring is available via a 2-wire serial interface, as specified in SFF-8472. Featuring low power consumption, high speed, this 10G SFP+ transceiver is ideal for data center, 10G Ethernet etc.

**SFP-10G-BX40-I**

The SFP-10G-BX40-I transceiver supports up to 40km link lengths over OS2 SMF via an LC simplex connector. This transceiver is compliant with IEEE 802.3ae, SFP+ MSA, SFF-8472, SFF-8431 and SFF-8432 standards. The built-in digital diagnostics monitoring (DDM) allows access to real-time operating parameters. The SFP-10G-BX40-I is for industrial operating temperature range and can work in harsh industrial environments. It is suitable for 10G Ethernet, OBSAI, CPRI and Data Center applications.

## **SFP-10G-BX60**

The SFP-10G-BX60 transceiver supports up to 60km over OS2 SMF via an LC simplex connector. This transceiver is compliant with SFF-8431 and IEEE 802.3ae standard. Digital diagnostics monitoring is available via a 2-wire serial interface, as specified in SFF-8472. Featuring low power consumption, high speed, this 10G SFP+ transceiver is ideal for data center, 10G Ethernet etc.

## **SFP-10G-BX60-I**

The SFP-10G-BX60-I transceiver supports up to 60km link lengths over SMF via a simplex LC connector. This transceiver is compliant with SFF-8432, SFF-8431, SFF-8472, IEEE 802.3ae, 10GBASE-LR standards. The built-in digital diagnostics monitoring (DDM) allows access to real-time operating parameters. The SFP-10G-BX60-I is for industrial operating temperature range and can work in harsh industrial environments, such as telecommunication, data processing and management, the application of industrial and factory automation, outdoor applications, rail and intelligent transportation systems (ITSs), marine, oil and gas, mining etc.

## **SFP-10G-BX80**

The SFP-10G-BX80 transceiver supports up to 80km over OS2 SMF via an LC simplex connector. This transceiver is compliant with SFF-8431, SFF-8432 and IEEE 802.3ae standard. Digital diagnostics monitoring is available via a 2-wire serial interface, as specified in SFF-8472. Featuring low power consumption, high speed, this 10G SFP+ transceiver is ideal for data center, 10G Ethernet, SONET OC-192/SDH and Fiber Channel etc.

## **SFP-10G-BX80-I**

The SFP-10G-BX80-I transceiver supports up to 80km over OS2 SMF via an LC simplex connector. This transceiver is compliant with SFF-8431, SFF-8432 and IEEE 802.3ae standard. Digital diagnostics monitoring is available via a 2-wire serial interface, as specified in SFF-8472. Featuring an operating temperature range of -40° C to 85° C, this industrial fiber optic transceiver can work in harsh industrial environments, such as telecommunication, data processing & management, the application of industrial and factory automation, outdoor applications, rail and intelligent transportation systems (ITSs), marine, oil and gas, mining etc.

## **SFP-10G-BX100**

The SFP-10G-BX100 transceiver supports up to 100km over OS2 SMF via an LC simplex connector. This transceiver is compliant with SFF-8431 and IEEE 802.3ae standard. Digital diagnostics monitoring is available via a 2-wire serial interface, as specified in SFF-8472. Featuring low power consumption, high speed, this 10G SFP+ transceiver is ideal for optical data communications such as 10G Ethernet etc.

## **CWDM-SFP10G-10SP & CWDM-SFP10G-10M**

The CWDM-SFP10G-10SP&CWDM-SFP10G-10M transceiver supports up to 10km link lengths over single-mode fiber (SMF) via an LC duplex connector. This transceiver is compliant with SFF-8431, SFF-8432 and IEEE 802.3ae standards. Digital diagnostics functions are available via a 2-wire serial interface, as specified in SFF-8472, to allow access to real-time operating parameters. Featuring low power consumption, high speed, this 10G SFP+ transceiver is ideal for data center and 10G Ethernet etc.

## **CWxx-10GSFP-10-I**

The CWxx-10GSFP-10-I transceiver supports up to 10km link lengths over single-mode fiber (SMF). This transceiver is compliant with SFF-8431 and SFF-8432 MSA standards. Digital diagnostics functions are available via a 2-wire serial interface, as specified in SFF-8472, to allow access to real-time operating parameters. With these features, this easy to install, hot swappable transceiver is suitable for fiber communications application up to 10G.

## **CWDM-SFP10G-40-I**

The CWDM-SFP10G-40-I transceiver supports up to 40km link lengths over single-mode fiber (SMF) via an LC duplex connector. This transceiver is compliant with SFF-8431 and SFF-8472 MSA standards. Digital diagnostics functions are available via a 2-wire serial interface, as specified in SFF-8472, to allow access to real-time operating parameters. With these features, this easy to install, hot swappable transceiver is suitable for 10G Ethernet and 10G SONET/SDH applications.

## **CWDM-SFP10G-80L**

The CWDM-SFP10G-80L transceiver supports up to 80km link lengths over single-mode fiber (SMF) via an LC duplex connector. This transceiver is compliant with SFF-8431 and SFF-8432 MSA standards. Digital diagnostics functions are available via a 2-wire serial interface, as specified in SFF-8472, to allow access to real-time operating parameters. With these features, this easy to install, hot swappable transceiver is suitable for fiber communications application up to 10G.

## **CWDM-SFP10G-80-I**

The CWDM-SFP10G-80-I transceiver supports up to 80km link lengths over single-mode fiber (SMF) and is suitable for 10G Ethernet and Data Center applications. It is compliant with IEEE 802.3ae, SFP+ MSA, SFF-8472 and SFF-8431 standards. The built-in digital diagnostics monitoring (DDM) allows access to real-time operating parameters. The CWDM-SFP10G-80-I is for industrial operating temperature range and can work in harsh industrial environments, such as telecommunication, data processing & management, the application of industrial and factory automation, outdoor applications, rail and intelligent transportation systems (ITSs), marine, oil and gas, mining etc.

## **DWDM-SFP10G-40**

The DWDM-SFP10G-40 transceiver supports up to 40km link lengths over single-mode fiber (SMF) via an LC duplex connector. This transceiver is compliant with SFF-8431 and SFF-8432 MSA standards. Digital diagnostics functions are available via a 2-wire serial interface, as specified in SFF-8472, to allow access to real-time operating parameters. With these features, this easy to install, hot swappable transceiver is suitable to be deployed in the DWDM networking equipment in metropolitan access and core networks.

## **DWDM-SFP10G-40-I**

The DWDM-SFP10G-40-I transceiver supports up to 40km link lengths over single-mode fiber (SMF) via an LC duplex connector. This transceiver is compliant with SFF-8431 and SFF-8432 MSA standards. Digital diagnostics functions are available via a 2-wire serial interface, as specified in SFF-8472, to allow access to real-time operating parameters. The DWDM-SFP10G-40-I is for industrial operating temperature range and can work in harsh industrial environments, such as telecommunication, data processing & management, the application of industrial and factory automation, outdoor applications, rail and intelligent transportation systems (ITSs), marine, oil and gas, mining etc.

## **DWDM-SFP10G-80**

The DWDM-SFP10G-80 transceiver supports up to 80km link lengths over single-mode fiber (SMF) via an LC duplex connector. This transceiver is compliant with SFF-8431 and SFF-8432 MSA standards. Digital diagnostics functions are available via a 2-wire serial interface, as specified in SFF-8472, to allow access to real-time operating parameters. With these features, this easy to install, hot swappable transceiver is suitable to be deployed in the DWDM networking equipment in metropolitan access and core networks.

## **DWDM-SFP10G-80-I**

The DWDM-SFP10G-80-I transceiver supports up to 80km link lengths over single-mode fiber (SMF) via an LC duplex connector. This transceiver is compliant with SFF-8431 and SFF-8432 MSA standards. Digital diagnostics functions are available via a 2-wire serial interface, as specified in SFF-8472, to allow access to real-time operating parameters. The DWDM-SFP10G-80-I is for industrial operating temperature range and can work in harsh industrial environments, such as telecommunication, data processing & management, the application of industrial and factory automation, outdoor applications, rail and intelligent transportation systems (ITSs), marine, oil and gas, mining etc.

## **DWxxx-10GSFP-100**

The DWxxx-10GSFP-100 transceiver supports up to 100km link lengths over single-mode fiber (SMF) via an LC duplex connector. This transceiver is compliant with SFF-8472 MSA standards. The built-in digital diagnostics monitoring (DDM) allows access to real-time operating parameters. It is suitable to be deployed in the DWDM networking equipment in metropolitan access and core networks.

## **DWDM-SFP10G-C**

The DWDM-SFP10G-C transceiver supports up to 80km link lengths over single-mode fiber (SMF) via an LC duplex connector. This transceiver is compliant with SFF-8431, SFF-8432, SFF-8690 and ITU-T G.698.1 standards. Digital diagnostics functions are available via a 2-wire serial interface, as specified in SFF-8472, to allow access to real-time operating parameters. With these features, this easy to install, hot swappable transceiver is suitable to be deployed in the DWDM networking equipment in metropolitan access and core networks.

## SFP-10G-PCxxx & SFP-10G-ACxxx

FS SFP+ Copper Twinax (Figure 2) direct-attach cables are suitable for very short distances and offer a cost-effective way to connect within racks and across adjacent racks. FS offers passive Twinax cables in lengths of 0.5, 1, 1.5, 2, 2.5, 3, 4, 5, 6 and 7 meters, and active Twinax cables in lengths of 1, 3, 5, 7 and 10 meters or can be customized for longer meters.



Figure 2.  
SFP-10G-PCxxx & SFP-10G-ACxxx cables

## SFP-10G-AOxxx

FS SFP+ Active Optical Cables (Figure 3) are direct-attach fiber assemblies with SFP+ connectors. They are suitable for very short distances and offer a cost-effective way to connect within racks and across adjacent racks. FS offers Active Twinax Cables in lengths of 1, 2, 3, 5, 7, 10, 15, 20, 25 and 30 meters or can be customized for longer meters.



Figure 3.  
SFP-10G-AOxxx cables

## Product Specifications

Table 2 shows the key electrical characteristics for the 10G SFP+ modules.

Table 2. Electrical specifications

Product	Description	Nominal data rate (Gbps)	Link meter
SFP-10G-T-30	10GBASE -T SFP+ Transceiver, RJ-45, 30m over Copper Cable	10.3125Gbps	30m
SFP-10G-T-30I	10GBASE -T SFP+ Transceiver, RJ-45, 30m over Copper Cable, I-Temp	10.3125Gbps	30m
SFP-10G-T-80	10GBASE -T SFP+ Transceiver, RJ-45, 80m over Copper Cable	10.3125Gbps	80m
SFP-10G-T-100	10GBASE -T SFP+ Transceiver, RJ-45, 100m over Copper Cable	10.3125Gbps	100m
SFP-10GLRM-31	10GBASE LRM SFP+ Transceiver, LC, 220m over OM3 MMF	10.3125Gbps	220m
SFP-10GLRM-31-I	10GBASE LRM SFP+ Transceiver, LC, 220m over OM3 MMF, I-Temp	10.3125Gbps	220m
SFP-10GSR-85	10GBASE SR SFP+ Transceiver, LC, 300m over OM3 MMF	10.3125Gbps	300m
SFP-10GSR-85-I	10GBASE SR SFP+ Transceiver, LC, 300m over OM3 MMF, I-Temp	10.3125Gbps	300m
SFP-10GLRL-31	10GBASE LRM SFP+ Transceiver, LC, 2km over OS2 SMF	10.3125Gbps	2km
SFP-10GLRL-31-I	10GBASE LRL SFP+ Transceiver, LC, 2km over OS2 SMF, I-Temp	10.3125Gbps	2km
SFP-10GMLR-31	10GBASE LR SFP+ Transceiver, LC, 10km over OS2 SMF, Dual rate	Dual rate 10.3125Gbps and 1Gbps	10km
SFP-10GLR-31	10GBASE LR SFP+ Transceiver, LC, 10km over OS2 SMF	10.3125Gbps	10km
SFP-10GLR-31-I	10GBASE LR SFP+ Transceiver, LC, 10km over OS2 SMF, I-Temp	10.3125Gbps	10km
SFP-10GER-31	10GBASE ER SFP+ Transceiver, LC, 40km over OS2 SMF	10.3125Gbps	40km
SFP-10GER-31-I	10GBASE ER SFP+ Transceiver, LC, 40km over OS2 SMF, I-Temp	10.3125Gbps	40km

Product	Description	Nominal data rate (Gbps)	Link meter
SFP-10GER-55	10GBASE ER SFP+ Transceiver, LC, 40km over OS2 SMF	10.3125Gbps	40km
SFP-10GER-55-I	10GBASE ER SFP+ Transceiver, LC, 40km over OS2 SMF, I-Temp	10.3125Gbps	40km
SFP-10GZR-55	10GBASE ZR SFP+ Transceiver, LC, 80km over OS2 SMF	10.3125Gbps	80km
SFP-10GZR-55-I	10GBASE ZR SFP+ Transceiver, LC, 80km over OS2 SMF, I-Temp	10.3125Gbps	80km
SFP-10GZR100-55	10GBASE ZRC SFP+ Transceiver, LC, 100km over OS2 SMF	10.3125Gbps	100km
SFP-10GZR100-55-I	10GBASE ZRC SFP+ Transceiver, LC, 100km over OS2 SMF, I-Temp	10.3125Gbps	100km
SFP-10GZR120-55	10GBASE ZRC SFP+ Transceiver, LC, 120km over OS2 SMF	10.3125Gbps	120km
SFP-10G-BX	10GBASE BX SFP+ Transceiver, LC, 10km over OS2 SMF, 1270nm/1330nm	10.3125Gbps	10km
SFP-10G-BX	10GBASE BX SFP+ Transceiver, LC, 10km over OS2 SMF, 1330nm/1270nm	10.3125Gbps	10km
SFP-10G-BX-I	10GBASE BX SFP+ Transceiver, LC, 10km over OS2 SMF, 1270nm/1330nm, I-Temp	10.3125Gbps	10km
SFP-10G-BX-I	10GBASE BX SFP+ Transceiver, LC, 10km over OS2 SMF, 1330nm/1270nm, I-Temp	10.3125Gbps	10km
SFP-10G-BX	10GBASE BX20 SFP+ Transceiver, LC, 20km over OS2 SMF, 1270nm/1330nm	10.3125Gbps	20km
SFP-10G-BX	10GBASE BX20 SFP+ Transceiver, LC, 20km over OS2 SMF, 1330nm/1270nm	10.3125Gbps	20km
SFP-10G-BX-I	10GBASE BX20 SFP+ Transceiver, LC, 20km over OS2 SMF, 1270nm/1330nm, I-Temp	10.3125Gbps	20km
SFP-10G-BX-I	10GBASE BX20 SFP+ Transceiver, LC, 20km over OS2 SMF, 1330nm/1270nm, I-Temp	10.3125Gbps	20km
SFP-10G-BX40	10GBASE BX40 SFP+ Transceiver, LC, 40km over OS2 SMF, 1270nm/1330nm	10.3125Gbps	40km
SFP-10G-BX40	10GBASE BX40 SFP+ Transceiver, LC, 40km over OS2 SMF, 1330nm/1270nm	10.3125Gbps	40km



Product	Description	Nominal data rate (Gbps)	Link meter
SFP-10G-BX40-I	10GBASE BX40 SFP+ Transceiver, LC, 40km over OS2 SMF, 1270nm/1330nm, I-Temp	10.3125Gbps	40km
SFP-10G-BX40-I	10GBASE BX40 SFP+ Transceiver, LC, 40km over OS2 SMF, 1330nm/1270nm, I-Temp	10.3125Gbps	40km
SFP-10G-BX60	10GBASE BX60 SFP+ Transceiver, LC, 60km over OS2 SMF, 1270nm/1330nm	10.3125Gbps	60km
SFP-10G-BX60	10GBASE BX60 SFP+ Transceiver, LC, 60km over OS2 SMF, 1330nm/1270nm	10.3125Gbps	60km
SFP-10G-BX60-I	10GBASE BX60 SFP+ Transceiver, LC, 60km over OS2 SMF, 1270nm/1330nm, I-Temp	10.3125Gbps	60km
SFP-10G-BX60-I	10GBASE BX60 SFP+ Transceiver, LC, 60km over OS2 SMF, 1330nm/1270nm, I-Temp	10.3125Gbps	60km
SFP-10G-BX80	10GBASE BX80 SFP+ Transceiver, LC, 80km over OS2 SMF, 1490nm/1550nm	10.3125Gbps	80km
SFP-10G-BX80	10GBASE BX80 SFP+ Transceiver, LC, 80km over OS2 SMF, 1550nm/1490nm	10.3125Gbps	80km
SFP-10G-BX80-I	10GBASE BX80 SFP+ Transceiver, LC, 80km over OS2 SMF, 1490nm/1550nm, I-Temp	10.3125Gbps	80km
SFP-10G-BX80-I	10GBASE BX80 SFP+ Transceiver, LC, 80km over OS2 SMF, 1550nm/1490nm, I-Temp	10.3125Gbps	80km
SFP-10G-BX100	10GBASE BX100 SFP+ Transceiver, LC, 100km over OS2 SMF, 1490nm/1550nm	10.3125Gbps	100km
SFP-10G-BX100	10GBASE BX100 SFP+ Transceiver, LC, 100km over OS2 SMF, 1550nm/1490nm	10.3125Gbps	100km

Product	Description	Nominal data rate (Gbs)	Link meter
CWDM-SFP10G-10SP	10GBASE CWDM SFP+ Transceiver, LC, 10km over OS2 SMF, 1270nm-1330nm	10.3125Gbps	10km
CWDM-SFP10G-10M	10GBASE CWDM SFP+ Transceiver, LC, 10km over OS2 SMF, 1350nm-1610nm	10.3125Gbps	10km
CWxx-10GSFP-10-I	10GBASE CWDM SFP+ Transceiver, LC, 10km over OS2 SMF, 1270nm-1610nm, I-Temp	10.3125Gbps	10km
CWDM-SFP10G-20SP	10GBASE CWDM SFP+ Transceiver, LC, 20km over OS2 SMF, 1270nm-1330nm	10.3125Gbps	20km
CWDM-SFP10G-20S	10GBASE CWDM SFP+ Transceiver, LC, 20km over OS2 SMF, 1350nm-1450nm	10.3125Gbps	20km
CWDM-SFP10G-20L	10GBASE CWDM SFP+ Transceiver, LC, 20km over OS2 SMF, 1470nm-1610nm	10.3125Gbps	20km
CWDM-SFP10G-40S	10GBASE CWDM SFP+ Transceiver, LC, 40km over OS2 SMF, 1270nm-1450nm	10.3125Gbps	40km
CWDM-SFP10G-40L	10GBASE CWDM SFP+ Transceiver, LC, 40km over OS2 SMF, 1470nm-1610nm	10.3125Gbps	40km
CWDM-SFP10G-40-I	10GBASE CWDM SFP+ Transceiver, LC, 40km over OS2 SMF, 1270nm-1610nm, I-Temp	10.3125Gbps	40km
CWDM-SFP10G-80L	10GBASE CWDM SFP+ Transceiver, LC, 80km over OS2 SMF, 1470nm-1610nm	10.3125Gbps	80km
CWDM-SFP10G-80-I	10GBASE CWDM SFP+ Transceiver, LC, 80km over OS2 SMF, 1470nm-1610nm, I-Temp	10.3125Gbps	80km
DWDM-SFP10G-40	10GBASE DWDM SFP+ Transceiver, LC, 40km over OS2 SMF, C17-C61	10.3125Gbps	40km
DWDM-SFP10G-40-I	10GBASE DWDM SFP+ Transceiver, LC, 40km over OS2 SMF, C17-C61, I-Temp	10.3125Gbps	40km
DWDM-SFP10G-80	10GBASE DWDM SFP+ Transceiver, LC, 80km over OS2 SMF, C17-C61	10.3125Gbps	80km
DWDM-SFP10G-80-I	10GBASE DWDM SFP+ Transceiver, LC, 80km over OS2 SMF, C17-C61, I-Temp	10.3125Gbps	80km
DWxxx-10GSFP-100	10GBASE DWDM SFP+ Transceiver, LC, 100km over OS2 SMF, C17-C61	10.3125Gbps	100km
DWDM-SFP10G-C	10GBASE DWDM SFP+ Transceiver, LC, 80km over OS2 SMF, Tunable	10.3125Gbps	80km

Product	Description	Nominal data rate (Gbps)	Link meter
SFP-10G-PCxxx (0.5M, 1M, 1.5M, 2M, 2.5M, 3M, 4M, 5M, 6M, 7M)	10GBASE SFP+ Passive Copper Cable	10.3125Gbps	0.5, 1, 1.5, 2, 2.5, 3, 4, 5, 6, 7
SFP-10G-ACxxx (1M, 3M, 5M, 7M, 10M)	10GBASE SFP+ Active Copper Cable	10.3125Gbps	1, 3, 5, 7, 10
SFP-10G-AOxxx (1M, 2M, 3M, 5M, 7M, 10M, 15M, 20M, 25M, 30M)	10GBASE SFP+ Active Optical Cable	10.3125Gbps	1, 2, 3, 5, 7, 10, 15, 20, 25, 30

Table 3 shows the key optical characteristics for the 10G SFP+ modules.

Table 3. Optical specifications

Product	Description	Transmit Power (dBm)		Receive Power (dBm)		Transmit and Receive Wavelength (nm)
		Minimum	Maximum	Minimum	Maximum	
SFP-10G-T-30	10GBASE -T SFP+ Transceiver, RJ-45, 30m over Copper Cable	-	-	-	-	-
SFP-10G-T-30I	10GBASE -T SFP+ Transceiver, RJ-45, 30m over Copper Cable, I-Temp	-	-	-	-	-
SFP-10G-T-80	10GBASE -T SFP+ Transceiver, RJ-45, 80m over Copper Cable	-	-	-	-	-
SFP-10G-T-100	10GBASE -T SFP+ Transceiver, RJ-45, 100m over Copper Cable	-	-	-	-	-
SFP-10GLRM-31	10GBASE LRM SFP+ Transceiver, LC, 220m over OM3 MMF	-6.5	0.5	-8.4	1.5	1310
SFP-10GLRM-31-I	10GBASE LRM SFP+ Transceiver, LC, 220m over OM3 MMF, I-Temp	-8.2	0.5	-14.4	0.5	1310
SFP-10GSR-85	10GBASE SR SFP+ Transceiver, LC, 300m over OM3 MMF	-7.3	-1	-11.1	0.5	850
SFP-10GSR-85-I	10GBASE SR SFP+ Transceiver, LC, 300m over OM3 MMF, I-Temp	-8	1	-11.1	0.5	850

Product	Description	Transmit Power (dBm) per lane		Receive Power (dBm) per lane		Transmit and Receive Wavelength (nm)
		Minimum	Maximum	Minimum	Maximum	
SFP-10GLRL-31	10GBASE LRM SFP+ Transceiver, LC, 2km over OS2 SMF	-8.2	0.5	-12.6	0	1310
SFP-10GLRL-31-I	10GBASE LRL SFP+ Transceiver, LC, 2km over OS2 SMF, I-Temp	-8.2	0.5	-14.4	0.5	1310
SFP-10GMLR-31	10GBASE LR SFP+ Transceiver, LC, 10km over OS2 SMF, Dual rate	-8.2	0.5	-14.4	0.5	1310
SFP-10GLR-31	10GBASE LR SFP+ Transceiver, LC, 10km over OS2 SMF	-8.2	0.5	-14.4	0.5	1310
SFP-10GLR-31-I	10GBASE LR SFP+ Transceiver, LC, 10km over OS2 SMF, I-Temp	-8.2	0.5	-12.6	0.5	1310
SFP-10GER-31	10GBASE ER SFP+ Transceiver, LC, 40km over OS2 SMF	0	5	-15	1	1310
SFP-10GER-31-I	10GBASE ER SFP+ Transceiver, LC, 40km over OS2 SMF, I-Temp	0	5	-15	1	1310
SFP-10GER-55	10GBASE ER SFP+ Transceiver, LC, 40km over OS2 SMF	-1	4	-16	-1	1550
SFP-10GER-55-I	10GBASE ER SFP+ Transceiver, LC, 40km over OS2 SMF, I-Temp	-2	4	-16	0	1550
SFP-10GZR-55	10GBASE ZR SFP+ Transceiver, LC, 80km over OS2 SMF	0	5	-23	-7	1550
SFP-10GZR-55-I	10GBASE ZR SFP+ Transceiver, LC, 80km over OS2 SMF, I-Temp	0	5	-23	-8	1550
SFP-10GZR100-55	10GBASE ZRC SFP+ Transceiver, LC, 100km over OS2 SMF	0	5	-25	-7	1550
SFP-10GZR100-55-I	10GBASE ZRC SFP+ Transceiver, LC, 100km over OS2 SMF, I-Temp	1	5	-25	-8	1550

Product	Description	Transmit Power (dBm) per lane		Receive Power (dBm) per lane		Transmit and Receive Wavelength (nm)
		Minimum	Maximum	Minimum	Maximum	
SFP-10GZR120-55	10GBASE ZRC SFP+ Transceiver, LC, 120km over OS2 SMF	1	3	6	-8	1550
SFP-10G-BX	10GBASE BX SFP+ Transceiver, LC, 10km over OS2 SMF, 1270nm/1330nm	-8.2	0.5	-14.4	0.5	1270 (Tx) 1330 (Rx)
SFP-10G-BX	10GBASE BX SFP+ Transceiver, LC, 10km over OS2 SMF, 1330nm/1270nm	-8.2	0.5	-14.4	0.5	1330 (Tx) 1270 (Rx)
SFP-10G-BX-I	10GBASE BX SFP+ Transceiver, LC, 10km over OS2 SMF, 1270nm/1330nm, I-Temp	-8.2	0.5	-14.4	0.5	1270 (Tx) 1330 (Rx)
SFP-10G-BX-I	10GBASE BX SFP+ Transceiver, LC, 10km over OS2 SMF, 1330nm/1270nm, I-Temp	-8.2	0.5	-14.4	0.5	1330 (Tx) 1270 (Rx)
SFP-10G-BX	10GBASE BX20 SFP+ Transceiver, LC, 20km over OS2 SMF, 1270nm/1330nm	-6	3	-14.4	0.5	1270 (Tx) 1330 (Rx)
SFP-10G-BX	10GBASE BX20 SFP+ Transceiver, LC, 20km over OS2 SMF, 1270nm/1330nm	-6	3	-14.4	0.5	1330 (Tx) 1270 (Rx)
SFP-10G-BX-I	10GBASE BX20 SFP+ Transceiver, LC, 20km over OS2 SMF, 1270nm/1330nm, I-Temp	-6	3	-14.4	0.5	1270 (Tx) 1330 (Rx)
SFP-10G-BX-I	10GBASE BX20 SFP+ Transceiver, LC, 20km over OS2 SMF, 1330nm/1270nm, I-Temp	-6	3	-14.4	0.5	1330 (Tx) 1270 (Rx)
SFP-10G-BX40	10GBASE BX40 SFP+ Transceiver, LC, 40km over OS2 SMF, 1270nm/1330nm	1	5	-15	0.5	1270 (Tx/Rx) 1330 (Rx/Tx)
SFP-10G-BX40	10GBASE BX40 SFP+ Transceiver, LC, 40km over OS2 SMF, 1330nm/1270nm	1	5	-15	0.5	1330 (Tx) 1270 (Rx)

Product	Description	Transmit Power (dBm) per lane		Receive Power (dBm) per lane		Transmit and Receive Wavelength (nm)
		Minimum	Maximum	Minimum	Maximum	
SFP-10G-BX40-I	10GBASE BX40 SFP+ Transceiver, LC, 40km over OS2 SMF, 1270nm/1330nm, I-Temp	1	5	-15	0.5	1270 (Tx) 1330 (Rx)
SFP-10G-BX40-I	10GBASE BX40 SFP+ Transceiver, LC, 40km over OS2 SMF, 1330nm/1270nm, I-Temp	1	5	-15	0.5	1330 (Tx) 1270 (Rx)
SFP-10G-BX60	10GBASE BX60 SFP+ Transceiver, LC, 60km over OS2 SMF, 1270nm/1330nm	1	6	-20	0.5	1270 (Tx/Rx) 1330 (Rx/Tx)
SFP-10G-BX60	10GBASE BX60 SFP+ Transceiver, LC, 60km over OS2 SMF, 1330nm/1270nm	1	6	-20	0.5	1330 (Tx) 1270 (Rx)
SFP-10G-BX60-I	10GBASE BX60 SFP+ Transceiver, LC, 60km over OS2 SMF, 1270nm/1330nm, I-Temp	1	6	-20	0.5	1270 (Tx) 1330 (Rx)
SFP-10G-BX60-I	10GBASE BX60 SFP+ Transceiver, LC, 60km over OS2 SMF, 1330nm/1270nm, I-Temp	1	6	-20	0.5	1330 (Tx) 1270 (Rx)
SFP-10G-BX80	10GBASE BX80 SFP+ Transceiver, LC, 80km over OS2 SMF, 1490nm/1550nm	0	5	-22	-7	1490 (Tx) 1550 (Rx)
SFP-10G-BX80	10GBASE BX80 SFP+ Transceiver, LC, 80km over OS2 SMF, 1550nm/1490nm	0	5	-22	-7	1550 (Tx) 1490 (Rx)
SFP-10G-BX80-I	10GBASE BX80 SFP+ Transceiver, LC, 80km over OS2 SMF, 1490nm/1550nm, I-Temp	0	5	-23	-7	1490 (Tx) 1550 (Rx)
SFP-10G-BX80-I	10GBASE BX80 SFP+ Transceiver, LC, 80km over OS2 SMF, 1550nm/1490nm, I-Temp	0	5	-23	-7	1550 (Tx) 1490 (Rx)
SFP-10G-BX100	10GBASE BX100 SFP+ Transceiver, LC, 100km over OS2 SMF, 1490nm/1550nm	1	5	-22	-7	1490 (Tx) 1550 (Rx)

Product	Description	Transmit Power (dBm) per lane		Receive Power (dBm) per lane		Transmit and Receive Wavelength (nm)
		Minimum	Maximum	Minimum	Maximum	
SFP-10G-BX100	10GBASE BX100 SFP+ Transceiver, LC, 100km over OS2 SMF, 1550nm/1490nm	1	5	-22	-7	1550 (Tx) 1490 (Rx)
CWDM-SFP10G-10SP	10GBASE CWDM SFP+ Transceiver, LC, 10km over OS2 SMF, 1270nm-1330nm	-8.2	0.5	-14.4	0.5	1270 to 1330
CWDM-SFP10G-10M	10GBASE CWDM SFP+ Transceiver, LC, 10km over OS2 SMF, 1350nm-1610nm	-8.2	0.5	-14.4	0.5	1350 to 1610
CWxx-10GSFP-10-I	10GBASE CWDM SFP+ Transceiver, LC, 10km over OS2 SMF, 1270nm-1610nm, I-Temp	-2	5	-16	0	1270 to 1610
CWDM-SFP10G-20SP	10GBASE CWDM SFP+ Transceiver, LC, 20km over OS2 SMF, 1270nm-1330nm	-6	2	-14.4	0.5	1270 to 1330
CWDM-SFP10G-20S	10GBASE CWDM SFP+ Transceiver, LC, 20km over OS2 SMF, 1350nm-1450nm	-6	2	-14.4	0.5	1350 to 1450
CWDM-SFP10G-20L	10GBASE CWDM SFP+ Transceiver, LC, 20km over OS2 SMF, 1470nm-1610nm	-1	4	-14.4	0.5	1470 to 1610
CWDM-SFP10G-40S	10GBASE CWDM SFP+ Transceiver, LC, 40km over OS2 SMF, 1270nm-1450nm	0	5	-16	-0.5	1270 to 1450
CWDM-SFP10G-40L	10GBASE CWDM SFP+ Transceiver, LC, 40km over OS2 SMF, 1470nm-1610nm	-1	4	-16	-8	1470 to 1610
CWDM-SFP10G-40-I	10GBASE CWDM SFP+ Transceiver, LC, 40km over OS2 SMF, 1270nm-1610nm, I-Temp	-1	4	-16	0	1270 to 1610
CWDM-SFP10G-80L	10GBASE CWDM SFP+ Transceiver, LC, 80km over OS2 SMF, 1470nm-1610nm	0	4	-23	-8	1470 to 1610
CWDM-SFP10G-80-I	10GBASE CWDM SFP+ Transceiver, LC, 80km over OS2 SMF, 1470nm-1610nm, I-Temp	0	5	-23	-6	1470 to 1610

Product	Description	Transmit Power (dBm) per lane		Receive Power (dBm) per lane		Transmit and Receive Wavelength (nm)
		Minimum	Maximum	Minimum	Maximum	
DWDM-SFP10G-40	10GBASE DWDM SFP+ Transceiver, LC, 40km over OS2 SMF, C17-C61	-1	4	-16	0	1563.86 to 1528.77
DWDM-SFP10G-40-I	10GBASE DWDM SFP+ Transceiver, LC, 40km over OS2 SMF, C17-C61, I-Temp	-1	4	-16	0	1563.86 to 1528.77
DWDM-SFP10G-80	10GBASE DWDM SFP+ Transceiver, LC, 80km over OS2 SMF, C17-C61	0	4	-23	-7	1563.86 to 1528.77
DWDM-SFP10G-80-I	10GBASE DWDM SFP+ Transceiver, LC, 80km over OS2 SMF, C17-C61, I-Temp	0	5	-23	-6	1563.86 to 1528.77
DWxxx-10GSFP-100	10GBASE DWDM SFP+ Transceiver, LC, 100km over OS2 SMF, C17-C61	1	7	-25	-8	1563.86 to 1528.77
DWDM-SFP10G-C	10GBASE DWDM SFP+ Transceiver, LC, 80km over OS2 SMF, Tunable	0	5	-23	-8	1563.86 to 1528.77

Table 4 shows the mechanical characteristics for the 10G SFP+ modules.

Table 4. Mechanical specifications

Parameter	Product	Weight
Module dimension with pull tab	(H x W x D) 8.5 x 13.4 x 56.5 mm	
Module weight (Max)	Optical modules	
	SFP-10G-PC005	105 g
	SFP-10G-PC01	115 g
	SFP-10G-PC015	130 g
	SFP-10G-PC02	145 g
	SFP-10G-PC025	160 g
	SFP-10G-PC03	170 g



Parameter	Product	Weight
Module weight (Max)	SFP-10G-PC04	295 g
	SFP-10G-PC05	350 g
	SFP-10G-PC06	395 g
	SFP-10G-PC07	435 g
	SFP-10G-AC01	120 g
	SFP-10G-AC03	160 g
	SFP-10G-AC05	280 g
	SFP-10G-AC07	360 g
	SFP-10G-AC10	600 g
	SFP-10G-AO01	200 g
	SFP-10G-AO02	220 g
	SFP-10G-AO03	230 g
	SFP-10G-AO05	230 g
	SFP-10G-AO07	280 g
	SFP-10G-AO10	480 g
	SFP-10G-AO15	720 g
	SFP-10G-AO20	960 g
	SFP-10G-AO25	1040 g
	SFP-10G-AO30	1200 g

## Warranty

- Standard warranty: 5 years
- For more information for FS Returns & Refunds policy, visit [Products Warranty](#) or [Returns & Refunds](#)

## Ordering information

Table 5 provides the ordering information for SFP+ 10G modules and related cables.

Table 5. Ordering information

Part number	Description
<b>SFP+ Optics Modules</b>	
<a href="#">SFP-10G-T-30</a>	10GBASE -T SFP+ Transceiver, RJ-45, 30m over Copper Cable
<a href="#">SFP-10G-T-30I</a>	10GBASE -T SFP+ Transceiver, RJ-45, 30m over Copper Cable, I-Temp
<a href="#">SFP-10G-T-80</a>	10GBASE -T SFP+ Transceiver, RJ-45, 80m over Copper Cable
<a href="#">SFP-10G-T-100</a>	10GBASE -T SFP+ Transceiver, RJ-45, 100m over Copper Cable
<a href="#">SFP-10GLRM-31</a>	10GBASE LRM SFP+ Transceiver, LC, 220m over OM3 MMF
<a href="#">SFP-10GLRM-31-I</a>	10GBASE LRM SFP+ Transceiver, LC, 220m over OM3 MMF, I-Temp
<a href="#">SFP-10GSR-85</a>	10GBASE SR SFP+ Transceiver, LC, 300m over OM3 MMF
<a href="#">SFP-10GSR-85-I</a>	10GBASE SR SFP+ Transceiver, LC, 300m over OM3 MMF, I-Temp
<a href="#">SFP-10GLRL-31</a>	10GBASE LRM SFP+ Transceiver, LC, 2km over OS2 SMF
<a href="#">SFP-10GLRL-31-I</a>	10GBASE LRL SFP+ Transceiver, LC, 2km over OS2 SMF, I-Temp
<a href="#">SFP-10GMLR-31</a>	10GBASE LR SFP+ Transceiver, LC, 10km over OS2 SMF, Dual rate
<a href="#">SFP-10GLR-31</a>	10GBASE LR SFP+ Transceiver, LC, 10km over OS2 SMF
<a href="#">SFP-10GLR-31-I</a>	10GBASE LR SFP+ Transceiver, LC, 10km over OS2 SMF, I-Temp
<a href="#">SFP-10GER-31</a>	10GBASE ER SFP+ Transceiver, LC, 40km over OS2 SMF
<a href="#">SFP-10GER-31-I</a>	10GBASE ER SFP+ Transceiver, LC, 40km over OS2 SMF, I-Temp

Part number	Description
<b>SFP+ Optics Modules</b>	
<a href="#">SFP-10GER-55</a>	10GBASE ER SFP+ Transceiver, LC, 40km over OS2 SMF
<a href="#">SFP-10GER-55-I</a>	10GBASE ER SFP+ Transceiver, LC, 40km over OS2 SMF, I-Temp
<a href="#">SFP-10GZR-55</a>	10GBASE ZR SFP+ Transceiver, LC, 80km over OS2 SMF
<a href="#">SFP-10GZR-55-I</a>	10GBASE ZR SFP+ Transceiver, LC, 80km over OS2 SMF, I-Temp
<a href="#">SFP-10GZR100-55</a>	10GBASE ZRC SFP+ Transceiver, LC, 100km over OS2 SMF
<a href="#">SFP-10GZR100-55-I</a>	10GBASE ZRC SFP+ Transceiver, LC, 100km over OS2 SMF, I-Temp
<a href="#">SFP-10GZR120-55</a>	10GBASE ZRC SFP+ Transceiver, LC, 120km over OS2 SMF
<a href="#">SFP-10G-BX</a>	10GBASE BX SFP+ Transceiver, LC, 10km over OS2 SMF, 1270nm/1330nm
<a href="#">SFP-10G-BX</a>	10GBASE BX SFP+ Transceiver, LC, 10km over OS2 SMF, 1330nm/1270nm
<a href="#">SFP-10G-BX-I</a>	10GBASE BX SFP+ Transceiver, LC, 10km over OS2 SMF, 1270nm/1330nm, I-Temp
<a href="#">SFP-10G-BX-I</a>	10GBASE BX SFP+ Transceiver, LC, 10km over OS2 SMF, 1330nm/1270nm, I-Temp
<a href="#">SFP-10G-BX</a>	10GBASE BX20 SFP+ Transceiver, LC, 20km over OS2 SMF, 1270nm/1330nm
<a href="#">SFP-10G-BX</a>	10GBASE BX20 SFP+ Transceiver, LC, 20km over OS2 SMF, 1330nm/1270nm
<a href="#">SFP-10G-BX-I</a>	10GBASE BX20 SFP+ Transceiver, LC, 20km over OS2 SMF, 1270nm/1330nm, I-Temp
<a href="#">SFP-10G-BX-I</a>	10GBASE BX20 SFP+ Transceiver, LC, 20km over OS2 SMF, 1330nm/1270nm, I-Temp
<a href="#">SFP-10G-BX40</a>	10GBASE BX40 SFP+ Transceiver, LC, 40km over OS2 SMF, 1270nm/1330nm
<a href="#">SFP-10G-BX40</a>	10GBASE BX40 SFP+ Transceiver, LC, 40km over OS2 SMF, 1330nm/1270nm
<a href="#">SFP-10G-BX40-I</a>	10GBASE BX40 SFP+ Transceiver, LC, 40km over OS2 SMF, 1270nm/1330nm, I-Temp
<a href="#">SFP-10G-BX40-I</a>	10GBASE BX40 SFP+ Transceiver, LC, 40km over OS2 SMF, 1330nm/1270nm, I-Temp
<a href="#">SFP-10G-BX60</a>	10GBASE BX60 SFP+ Transceiver, LC, 60km over OS2 SMF, 1270nm/1330nm
<a href="#">SFP-10G-BX60</a>	10GBASE BX60 SFP+ Transceiver, LC, 60km over OS2 SMF, 1330nm/1270nm
<a href="#">SFP-10G-BX60-I</a>	10GBASE BX60 SFP+ Transceiver, LC, 60km over OS2 SMF, 1270nm/1330nm, I-Temp
<a href="#">SFP-10G-BX60-I</a>	10GBASE BX60 SFP+ Transceiver, LC, 60km over OS2 SMF, 1330nm/1270nm, I-Temp

Part number	Description
<b>SFP+ Optics Modules</b>	
<a href="#">SFP-10G-BX80</a>	10GBASE BX80 SFP+ Transceiver, LC, 80km over OS2 SMF, 1490nm/1550nm
<a href="#">SFP-10G-BX80</a>	10GBASE BX80 SFP+ Transceiver, LC, 80km over OS2 SMF, 1550nm/1490nm
<a href="#">SFP-10G-BX80-I</a>	10GBASE BX80 SFP+ Transceiver, LC, 80km over OS2 SMF, 1490nm/1550nm, I-Temp
<a href="#">SFP-10G-BX80-L</a>	10GBASE BX80 SFP+ Transceiver, LC, 80km over OS2 SMF, 1550nm/1490nm, I-Temp
<a href="#">SFP-10G-BX100</a>	10GBASE BX100 SFP+ Transceiver, LC, 100km over OS2 SMF, 1490nm/1550nm
<a href="#">SFP-10G-BX100</a>	10GBASE BX100 SFP+ Transceiver, LC, 100km over OS2 SMF, 1550nm/1490nm
<a href="#">CWDM-SFP10G-10SP</a>	10GBASE CWDM SFP+ Transceiver, LC, 10km over OS2 SMF, 1270nm-1330nm
<a href="#">CWDM-SFP10G-10M</a>	10GBASE CWDM SFP+ Transceiver, LC, 10km over OS2 SMF, 1350nm-1610nm
<a href="#">CWxx-10GSFP-10-I</a>	10GBASE CWDM SFP+ Transceiver, LC, 10km over OS2 SMF, 1270nm-1610nm, I-Temp
<a href="#">CWDM-SFP10G-20SP</a>	10GBASE CWDM SFP+ Transceiver, LC, 20km over OS2 SMF, 1270nm-1330nm
<a href="#">CWDM-SFP10G-20S</a>	10GBASE CWDM SFP+ Transceiver, LC, 20km over OS2 SMF, 1350nm-1450nm
<a href="#">CWDM-SFP10G-20L</a>	10GBASE CWDM SFP+ Transceiver, LC, 20km over OS2 SMF, 1470nm-1610nm
<a href="#">CWDM-SFP10G-40S</a>	10GBASE CWDM SFP+ Transceiver, LC, 40km over OS2 SMF, 1270nm-1450nm
<a href="#">CWDM-SFP10G-40L</a>	10GBASE CWDM SFP+ Transceiver, LC, 40km over OS2 SMF, 1470nm-1610nm
<a href="#">CWDM-SFP10G-40-I</a>	10GBASE CWDM SFP+ Transceiver, LC, 40km over OS2 SMF, 1270nm-1610nm, I-Temp
<a href="#">CWDM-SFP10G-80L</a>	10GBASE CWDM SFP+ Transceiver, LC, 80km over OS2 SMF, 1470nm-1610nm
<a href="#">CWDM-SFP10G-80-I</a>	10GBASE CWDM SFP+ Transceiver, LC, 80km over OS2 SMF, 1470nm-1610nm, I-Temp
<a href="#">DWDM-SFP10G-40</a>	10GBASE DWDM SFP+ Transceiver, LC, 40km over OS2 SMF, C17-C61
<a href="#">DWDM-SFP10G-40-I</a>	10GBASE DWDM SFP+ Transceiver, LC, 40km over OS2 SMF, C17-C61, I-Temp
<a href="#">DWDM-SFP10G-80</a>	10GBASE DWDM SFP+ Transceiver, LC, 80km over OS2 SMF, C17-C61
<a href="#">DWDM-SFP10G-80-I</a>	10GBASE DWDM SFP+ Transceiver, LC, 80km over OS2 SMF, C17-C61, I-Temp
<a href="#">DWxxx-10GSFP-100</a>	10GBASE DWDM SFP+ Transceiver, LC, 100km over OS2 SMF, C17-C61
<a href="#">DWDM-SFP10G-C</a>	10GBASE DWDM SFP+ Transceiver, LC, 80km over OS2 SMF, Tunable

Part number	Description
<b>SFP+ Copper Cables</b>	
<a href="#">SFP-10G-PC005</a>	10GBASE SFP+ Passive Copper Cable, 0.5-meter
<a href="#">SFP-10G-PC01</a>	10GBASE SFP+ Passive Copper Cable, 1-meter
<a href="#">SFP-10G-PC015</a>	10GBASE SFP+ Passive Copper Cable, 1.5-meter
<a href="#">SFP-10G-PC02</a>	10GBASE SFP+ Passive Copper Cable, 2-meter
<a href="#">SFP-10G-PC025</a>	10GBASE SFP+ Passive Copper Cable, 2.5-meter
<a href="#">SFP-10G-PC03</a>	10GBASE SFP+ Passive Copper Cable, 3-meter
<a href="#">SFP-10G-PC04</a>	10GBASE SFP+ Passive Copper Cable, 4-meter
<a href="#">SFP-10G-PC05</a>	10GBASE SFP+ Passive Copper Cable, 5-meter
<a href="#">SFP-10G-PC06</a>	10GBASE SFP+ Passive Copper Cable, 6-meter
<a href="#">SFP-10G-PC07</a>	10GBASE SFP+ Passive Copper Cable, 7-meter
<a href="#">SFP-10G-AC01</a>	10GBASE SFP+ Active Copper Cable, 1-meter
<a href="#">SFP-10G-AC03</a>	10GBASE SFP+ Active Copper Cable, 3-meter
<a href="#">SFP-10G-AC05</a>	10GBASE SFP+ Active Copper Cable, 5-meter
<a href="#">SFP-10G-AC07</a>	10GBASE SFP+ Active Copper Cable, 7-meter
<a href="#">SFP-10G-AC10</a>	10GBASE SFP+ Active Copper Cable, 10-meter
<b>SFP+ Optics Cables</b>	
<a href="#">SFP-10G-AO01</a>	10GBASE SFP+ Active Optical Cable, 1-meter
<a href="#">SFP-10G-AO02</a>	10GBASE SFP+ Active Optical Cable, 2-meter
<a href="#">SFP-10G-AO03</a>	10GBASE SFP+ Active Optical Cable, 3-meter
<a href="#">SFP-10G-AO05</a>	10GBASE SFP+ Active Optical Cable, 5-meter
<a href="#">SFP-10G-AO07</a>	10GBASE SFP+ Active Optical Cable, 7-meter
<a href="#">SFP-10G-AO10</a>	10GBASE SFP+ Active Optical Cable, 10-meter
<a href="#">SFP-10G-AO15</a>	10GBASE SFP+ Active Optical Cable, 15-meter

Part number	Description
<b>SFP+ Optics Cables</b>	
<a href="#">SFP-10G-AO20</a>	10GBASE SFP+ Active Optical Cable, 20-meter
<a href="#">SFP-10G-AO25</a>	10GBASE SFP+ Active Optical Cable, 25-meter
<a href="#">SFP-10G-AO30</a>	10GBASE SFP+ Active Optical Cable, 30-meter

## **I** Regulatory and standards compliance

### Standards

- GR-20-CORE: Generic Requirements for Optical Fiber and Optical Fiber Cable
- GR-326-CORE: Generic Requirements for Single-Mode Optical Connectors and Jumper Assemblies
- GR-1435-CORE: Generic Requirements for Multifiber Optical Connectors
- IEEE 802.3: 10-Gigabit Ethernet
- ITU-T G.709: Interfaces for the Optical Transport Network
- ITU-T G.975: GFEC
- ITU-T G.975.1: EFEC
- SFP+ MSA SFF-8431 (Optical Modules, Active Optical Cables, and Passive Twinax cables)
- SFP+ MSA SFF-8461 (Active Twinax cables)

### Safety

- Laser Class 1 21CFR-1040 LN#50 7/2001
- Laser Class 1 IEC60825-1
- Cable jacket of SFP+ copper modules is UL #E116441 Compliant
- All length SFP+ copper cables are ELV and RoHS Compliant

Table 6. Laser class for the SFP+ 10G optical modules

Product	Laser class
SFP-10GSR-85	1
SFP-10GSR-85-I	1
SFP-10GLRM-31	1
SFP-10GLRM-31-I	1
SFP-10GLRM-31	1
SFP-10GLRL-31-I	1
SFP-10GLR-31	1
SFP-10GLR-31(Dual rate)	1
SFP-10GLR-31-I	1
SFP-10GER-31	1
SFP-10GER-31-I	1
SFP-10GER-55	1
SFP-10GER-55-I	1
SFP-10GZR-55	1
SFP-10GZR-55-I	1
SFP-10GZR100-55	1
SFP-10GZR100-55-I	1
SFP-10GZR120-55	1
SFP-10G-BX	1
SFP-10G-BX-I	1
SFP-10G-BX40	1
SFP-10G-BX40-I	1

Product	Laser class
SFP-10G-BX60	1
SFP-10G-BX60-I	1
SFP-10G-BX80	1
SFP-10G-BX80-I	1
SFP-10G-BX100	1
CWDM-SFP10G-10SP	1
CWDM-SFP10G-10M	1
CWxx-10GSFP-10-I	1
CWDM-SFP10G-20SP	1
CWDM-SFP10G-20S	1
CWDM-SFP10G-20L	1
CWDM-SFP10G-40S	1
CWDM-SFP10G-40L	1
CWDM-SFP10G-40-I	1
CWDM-SFP10G-80L	1
CWDM-SFP10G-80L-I	1
DWDM-SFP10G-40	1
DWDM-SFP10G-40-I	1
DWDM-SFP10G-80	1
DWDM-SFP10G-80-I	1
DWxxx-10GSFP-100	1
DWDM-SFP10G-C	1
SFP-10G-AOxxx	1




## Additional information

For more information about 10GBASE SFP+ optics and copper modules, contact your account manager or visit [10G Modules](#)

## Document history

New or revised topic	Described in	Date
10GBASE SFP+ Modules Data Sheet	Add CWxx-10GSFP-10-I module	19/12/2022
10GBASE SFP+ Modules Data Sheet	Add document	13/12/2022



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