

# SFP OPTICAL MODULES



## DESCRIPTION

**High  
Reliability**

**Industry  
Grade**

**Lower TCO**

**Digital  
Diagnostic**

**Extended  
Temperature**

**CXR SFP Modules** are industry standard Small Form Pluggable optical modules that serve networking services in the range of low speed to 10-Gigabit application requirements:

- 10 Gigabit Ethernet, Carrier Ethernet and MPLS-TP
- 2.5 Gigabit Ethernet, STM-16 and OC-48
- Gigabit Ethernet
- STM-4 and OC-12
- STM-1 and OC-3
- Fast Ethernet
- Low speed synchronous and TDM solutions



**CXR SFP modules** are based on industrial grade components to deliver higher reliability and to enable extended operating temperature range in any host equipment and integration conditions.

SFP modules provide LC connectors. Fiber cables are offered on option to connect to distribution frames and convert to other types of connector.

The DDMI—Digital Diagnostic Monitoring Interface, reports the SFP status to the host equipment : SFP model number, operating temperature, TX and RX power.

SFP modules comply with the MSA Multi-Source Agreement standard. They are Class 1 laser and comply with the international standards - 21 CFR 1040.10/11.



## APPLICATIONS

CXR SFP modules are ideal optical interfaces to the following networking solutions:

- Ethernet switches : Fast, Gigabit, 2.5 Gigabit and 10-Gigabit Ethernet
- MPLS-TP and Carrier Ethernet : Gigabit and 10-Gigabit interfaces
- Ethernet Media Converters, FTTH devices, CWDM multiplexers
- SDH and PDH Multi-Service Access Platform : STM-1, STM-4, STM-16
- Pseudowire, TDM over IP gateway : Gigabit Ethernet
- TDM optical extenders for synchronous TDM, E1/T1 and SONET/SDH networks
- Hybrid copper and fiber devices : CopperWay and FiberWay

## 100FX STM-1/OC-3

### 100FX and STM-1 / OC-3 SFP Modules

**100FX** works at 125 Mbps over the optical interface and **STM-1 / OC-3** operates at 155 Mbps.

SFP modules come with LC connectors. Fiber patch cables are available to connect to distribution frames and convert to different connectors. Typical power consumption is 1 W.

SFP Reference	Fiber	Distance	Wavelength	TX Power	RX Sens	DDM	Application	T °C	MTBF
SFP-STM1-MM-850	MM	2 km	850 nm	-4 ~ -10	< -24	No	FX	-20 +85 °C	3 418 000H
SFP-STM1-MM	MM	2 km	1310 nm	-14 ~ -20	< -31	No	FX, STM1	-40 +85 °C	3 040 000H
SFP-STM1-SM30	SM	30 km	1310 nm	-8 ~ -15	< -34	No	FX, STM1	-40 +85 °C	2 782 000H
SFP-STM1-SM60	SM	60 km	1310 nm	0 ~ -5	< -35	No	FX, STM1	-40 +85 °C	2 730 000H
SFP-STM1-SM100-15	SM	100 km	1550 nm	0 ~ -5	< -35	No	FX, STM1	-40 +85 °C	2 970 000H
SFP-STM1-SM120-15	SM	120 km	1550 nm	+5 ~ 0	< -35	No	FX, STM1	-40 +85 °C	3 719 000H
SFP-STM1-SM145-15	SM	145 km	1550 nm	+5 ~ +0.5	< -37.5	Yes	FX, STM1	-40 +85 °C	3 076 000H
SFP-STM1-SM20-W13	SM	20 km	TX1310/RX1550	-8 ~ -14	< -32	No	FX, STM1	-40 +85 °C	3 763 000H
SFP-STM1-SM20-W15	SM	20 km	TX1550/RX1310	-8 ~ -14	< -32	No	FX, STM1	-40 +85 °C	3 719 000H
SFP-STM1-SM40-W13	SM	40 km	TX1310/RX1550	0 ~ -8	< -34	No	FX, STM1	-40 +85 °C	2 590 000H
SFP-STM1-SM40-W15	SM	40 km	TX1550/RX1310	0 ~ -8	< -34	No	FX, STM1	-40 +85 °C	2 915 000H
SFP-STM1-SM60-W13	SM	60 km	TX1310/RX1550	0 ~ -5	< -34	No	FX, STM1	-40 +85 °C	2 663 000H
SFP-STM1-SM60-W15	SM	60 km	TX1550/RX1310	0 ~ -5	< -34	No	FX, STM1	-40 +85 °C	2 250 000H
SFP-STM1-SM80-W13	SM	80 km	TX1310/RX1550	+5 ~ 0	< -34	Yes	FX, STM1	-40 +85 °C	2 577 000H
SFP-STM1-SM80-W15	SM	80 km	TX1550/RX1310	0 ~ -5	< -35	Yes	FX, STM1	-40 +85 °C	2 021 000H
SFP-STM1-SM120-B1490	SM	120 km	TX1490/RX1550	+3 ~ -2	< -34	Yes	FX	-40 +85 °C	1 497 000H
SFP-STM1-SM120-B1550	SM	120 km	TX1550/RX1490	+3 ~ -2	< -34	Yes	FX	-40 +85 °C	1 497 000H
SFP-STM1-SM50-Cxx	CWDM	50 km	1270 ~ 1450	+3 ~ -4	< -35	No	FX, STM1	0 +70 °C	2 469 000H
SFP-STM1-SM80-Cxx	CWDM	80 km	1270 ~ 1450	+5 ~ 0	< -35	No	FX, STM1	0 +70 °C	2 054 000H
SFP-STM1-SM120-Cxx	CWDM	120 km	1470 ~ 1610	+5 ~ 0	< -35	No	FX, STM1	0 +70 °C	3 383 000H

## STM-4/OC12

### STM-4 / OC-12 SFP Modules

**STM-4** works at 622 Mbps over the optical interface. Typical power consumption is 1W.

SFP Reference	Fiber	Distance	Wavelength	TX Power	RX Sens	DDM	Application	T °C	MTBF
SFP-STM4-SM20	SM	20 km	1310 nm	-8 ~ -15	< -28	No	STM-1/4	-40 +85 °C	2 993 000H
SFP-STM4-SM50	SM	50 km	1310 nm	+2 ~ -3	< -28	No	STM-4	-40 +85 °C	2 488 000H
SFP-STM4-SM80-15	SM	80 km	1550 nm	+2 ~ -3	< -28	No	STM-4	-40 +85 °C	2 163 000H



## GIGABIT ETHERNET

### Gigabit Ethernet SFP Modules

**Gigabit Ethernet** operates at 1,250 Mbps over the optical interface.

SFP modules come with LC connectors. Fiber patch cables are available to connect to distribution frames and convert to different connectors. Typical power consumption is 1 W.

SFP Reference	Fiber	Distance	Wavelength	TX Power	RX Sens	DDM	Application	T °C	MTBF
SFP-GSX-MM	MM	550 m	850 nm	-4 ~ -9.5	< -18	No	GSX	-40 +85 °C	3 114 000H
SFP-GSX-MM-1310	MM	2 km	1310 nm	-1 ~ -9	< -19	No	GSX	-40 +85 °C	2 752 000H
SFP-GLX-SM10	SM	10 km	1310 nm	-3 ~ -9.5	< -20	No	GLX	-40 +85 °C	3 740 000H
SFP-GLX-SM30	SM	30 km	1310 nm	+1 ~ -4	< -24	No	GLX	-40 +85 °C	2 255 000H
SFP-GZX-SM50	SM	50 km	1550 nm	+1 ~ -4	< -24	No	GZX	-40 +85 °C	1 754 000H
SFP-GZX-SM70	SM	70 km	1550 nm	+5 ~ 0	< -24	No	GZX	-40 +85 °C	2 172 000H
SFP-GZX-SM90	SM	90 km	1550 nm	+5 ~ 0	< -27	Yes	GZX	-40 +85 °C	2 036 000H
SFP-GZX-SM120	SM	120 km	1550 nm	+5 ~ 0	< -32	Yes	GZX	-40 +85 °C	2 835 000H
SFP-GLX-SM20W13	SM	20 km	TX1310/RX1550	-2 ~ -8	< -23	No	GLX	-40 +85 °C	2 977 000H
SFP-GLX-SM20W15	SM	20 km	TX1550/RX1310	-2 ~ -8	< -23	No	GLX	-40 +85 °C	3 086 000H
SFP-GZX-SM60W13	SM	60 km	TX1310/RX1550	+5 ~ 0	< -24	No	GZX	-40 +85 °C	2 392 000H
SFP-GZX-SM60W15	SM	60 km	TX1550/RX1310	+4 ~ -2	< -25	No	GZX	-40 +85 °C	2 097 000H
SFP-GZX-SM80W1510	SM	80 km	TX1510/RX1570	+1 ~ -4	< -26	Yes	GZX	-40 +85 °C	1 194 000H
SFP-GZX-SM80W1570	SM	80 km	TX1570/RX1510	+1 ~ -4	< -26	Yes	GZX	-40 +85 °C	1 924 000H
SFP-GLX-SM50-Cxx	CWDM	50 km	1270 ~ 1610	+1 ~ -4	< -24	No	GZX	0 +70 °C	2 399 000H
SFP-GLX-SM90-Cxx	CWDM	90 km	1270 ~ 1610	+5 ~ 0	< -27	No	GZX	0 +70 °C	2 196 000H
SFP-GLX-SM120-Cxx	CWDM	120 km	1270 ~ 1610	+5 ~ 0	< -32	Yes	GZX	0 +70 °C	2 302 000H

## 2.5 GIGABIT ETHERNET AND STM-16/OC92

### 2.5 Gigabit Ethernet and STM-16 / OC-92 SFP Modules

**2.5 Gigabit Ethernet** is a nice compromise to upscale network services with more affordable equipment and SFP modules than 10-Gigabit range of products. Typical power consumption is 1W.

SFP Reference	Fiber	Distance	Wavelength	TX Power	RX Sens	DDM	Application	T °C	MTBF
SFP-STM16-SM5	SM	5 km	1310 nm	-3 ~ -9	< -20	Yes	100FX~2.5GbE	-40 +85 °C	2 993 000H
SFP-STM16-SM20	SM	20 km	1310 nm	0 ~ -5	< -20	Yes	100FX~2.5GbE	-40 +85 °C	3 251 000H
SFP-STM16-SM50	SM	50 km	1310 nm	+3 ~ -2	< -28	Yes	100FX~2.5GbE	-40 +85 °C	2 306 000H
SFP-STM16-SM80-15	SM	80 km	1550 nm	+3 ~ -2	< -28	Yes	100FX~2.5GbE	-40 +85 °C	3 076 000H
SFP-STM16-SM20-W13	SM	20 km	TX1310/RX1490	0 ~ -5	< -20	Yes	GE~2.5GbE	-40 +85 °C	2 724 000H
SFP-STM16-SM20-W14	SM	20 km	TX1490/RX1310	0 ~ -5	< -20	Yes	GE~2.5GbE	-40 +85 °C	2 554 000H
SFP-STM16-SM40-W13	SM	40 km	TX1310/RX1490	+3 ~ -2	< -23	Yes	GE~2.5GbE	-40 +85 °C	2 153 000H
SFP-STM16-SM40-W14	SM	40 km	TX1490/RX1310	+3 ~ -2	< -23	Yes	GE~2.5GbE	-40 +85 °C	2 038 000H
SFP-STM16-SM80-W14	SM	80 km	TX1490/RX1550	+3 ~ -2	< -24	Yes	GE~2.5GbE	-40 +85 °C	1 371 000H
SFP-STM16-SM80-W15	SM	80 km	TX1550/RX1490	+3 ~ -2	< -24	Yes	GE~2.5GbE	-40 +85 °C	1 371 000H
SFP-STM16-SM50-CxxD	CWDM	50 km	1270 ~ 1610	+3 ~ -2	< -28	Yes	GE~2.5GbE	0 +70 °C	3 376 000H
SFP-STM16-SM80-CxxD	CWDM	80 km	1270 ~ 1610	+5 ~ 0	< -30	Yes	GE~2.5GbE	0 +70 °C	2 444 000H



## 10-GIGABIT ETHERNET

### 10-Gigabit Ethernet SFP Modules

**10-Gigabit Ethernet** operates at 10.3 Gbps over the optical interface.

SFP Reference	Fiber	Distance	Wavelength	TX Power	RX Sens	DDM	Application	Pwr	T °C	MTBF
SFP-10G-SR-MM	MM	300 m	850 nm	-1 ~ -7.1	< -9.9	Yes	10GBASE-SR	1 W	-10 +85 °C	2 693 000H
SFP-10G-LR-SM10	SM	10 km	1310 nm	0.5 ~ -6	< -14.4	Yes	10GBASE-LR	1.5 W	-40 +85 °C	2 752 000H
SFP-10G-ER-SM40	SM	40 km	1550 nm	+4 ~ -4.7	< -15.8	Yes	10GBASE-ER	1.8 W	-40 +85 °C	1 638 000H
SFP-10G-ZR-SM80	SM	80 km	1550 nm	+4 ~ 0	< -23	Yes	10GBASE-ZR	2.1 W	-40 +85 °C	1 906 000H
SFP-10G-SM10-W1270	SM	10 km	TX1270/RX1330nm	-4 ~ +1	< -14	Yes	10GBASE-LR	1.5 W	-10 +85 °C	1 805 000H
SFP-10G-SM10-W1330	SM	10 km	TX1330/RX1270nm	-4 ~ +1	< -14	Yes	10GBASE-LR	1.5 W	-10 +85 °C	1 819 000H
SFP-10G-LR-SM20W13	SM	20 km	TX1270/RX1330nm	-2 ~ +2	< -14	Yes	10GBASE-ER	1.5 W	-40 +85 °C	1 814 000H
SFP-10G-LR-SM20W12	SM	20 km	TX1330/RX1270nm	-2 ~ +2	< -14	Yes	10GBASE-ER	1.5 W	-40 +85 °C	1 814 000H
SFP-10G-ER-SM40W13	SM	40 km	TX1270/RX1330nm	+2.0 ~ +5.5	< -14.5	Yes	10GBASE-ER	1.5 W	-40 +85 °C	1 665 000H
SFP-10G-ER-SM40W12	SM	40 km	TX1330/RX1270nm	+1.5 ~ +5	< -15	Yes	10GBASE-ER	1.5 W	-40 +85 °C	1 665 000H
SFP-10G-ER-SM40-Cxxx	CWDM	40 km	1470 ~ 1610 nm	+4 ~ -1	< -16	Yes	CWDM	1.8 W	0 +70 °C	
SFP-10G-ZR-SM80-Cxxx	CWDM	80 km	1470 ~ 1610 nm	+4 ~ 0	< -23	Yes	CWDM	2.1 W	0 +70 °C	

## COPPER RJ45 - TWINAX - VDSL2

### Copper, Twinax and VDSL2 SFP Modules

**Copper SFP** provides standard 10/100BaseT or 10/100/1000BaseT RJ45 interface.

**Twinax cable** provides practical connection between two SFP+ equipment.

**VDSL2 CO and CPE SFP** provide multi-rate Ethernet extension over a twisted copper pair with up to 150 Mbps of Ethernet bandwidth or 3 km maximum distance

SFP Reference	Description	Power	DDM	Application	T °C	MTBF	
SFP-TTX	SFP module to 10/100BaseT RJ45	100 m	0.56 W	No	100BaseT	0 +70 °C	2 499 000H
SFP-TGTX	SFP module to 10/100/1000BaseT RJ45	100 m	1.55 W	No	1000BaseT	-40 +85 °C	1 908 000H
CA-SFPP-SFPP-3M	SFP+ to SFP+ Twinax cable, 3 meters long	3 m	-	-	10GbE	0 +70 °C	-
CA-SFPP-SFPP-5M	SFP+ to SFP+ Twinax cable, 5 meters long	5 m	-	-	10GbE	0 +70 °C	-
SFP-VDSL2-CO	Gigabit SFP with VDSL2 CO modem up to 150 Mbps or 3 km	3 km	2.1 W	No	VDSL2	-20 +85 °C	
SFP-VDSL2-CPE	Gigabit SFP with VDSL2 CPE modem up to 150 Mbps or 3 km	3 km	2.1 W	No	VDSL2	-20 +85 °C	



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