

SFP Modules

Small Form-Factor Pluggable SFP and SFP+ Modules



Features

- Industrial standard small form-factor pluggable (SFP) package
- Wide specifications and fiber types available
- Provides digital diagnostics monitoring (DDM) functionality
- Comes with metal enclosure for EMI
- The Class 1 laser product complies with EN 60825-1
- Supports plug-n-play operation

Introduction

Advantech's small form-factor pluggable (SFP) transceiver family is available with a variety of types of copper SFP and fiber SFPs, SFP+. This transceiver module is compliant with the small form-factor pluggable (SFP) multi-source agreement (MSA). They are versatile and widely used because of their hot-pluggable feature.

Advantech's SFPs provide robust industrial performance with an extended operating temperature range. Through real-time monitoring, the DDM (digital diagnostic monitoring) functionality provides users critical information such as receive optical power, transmitted optical power, laser bias current, input voltage, and temperature in the network. This approach enables better fault isolation and error detection.

Ordering Information

Industrial Grade 1.25 Gbps SFP Modules

Part Number	Optical Mode	Fiber Cable Type	Typical Distance	Optical Connector	Sensitivity (dB)	Operating Temp.	DDM
SFP-GMM-550	Multi-mode	OM1/OM2	550 m	Duplex LC	-17	-40 to +85 °C (-40 to +185 °F)	Yes
SFP-GMM-2K	Multi-mode	Multi-Mode	2 km	Duplex LC	-21		
SFP-GSM-20K	Single-mode	G.652	20 km	Duplex LC	-24		
SFP-GSM3-40K	Single-mode	G.652	40 km	Duplex LC	-24		
SFP-GZX-LCI-80E	Single-mode	G.652	80 km	Duplex LC	-24		
SFP-GSS-40KTX-LC	Bi-Directional	G.652	40 km	Simplex LC	-23		
SFP-GSS-40KRX-LC	Bi-Directional	G.652	40 km	Simplex LC	-23		
SFP-GSS-20KTX	Bi-Directional	G.652	20 km	Simplex SC	-23		
SFP-GSS-20KRX	Bi-Directional	G.652	20 km	Simplex SC	-23		
SFP-GSS-40KTX	Bi-Directional	G.652	40 km	Simplex SC	-23		
SFP-GSS-40KRX	Bi-Directional	G.652	40 km	Simplex SC	-23		

1.25 Gbps Fiber Optical

		1000 Base FX									
		Multi-Mode		Single-Mode			Bi-Directional				
Fiber Cable Type		OM1/ OM2	OM1/ OM2	G.652	G.652	G.652	G.652	G.652	G.652	G.652	G.652
Optical Connector		LC	LC	LC	LC	LC	LC	LC	SC	SC	SC
Typical Distance		550 m	2 km	20 km	40 km	80 km	40 km	40 km	20 km	20 km	40 km
Wavelength	Typical (nm)	850	1310	1310	1310	1550	1310TX/ 1550RX	1550TX/ 1310RX	1310TX/ 1550RX	1550TX/ 1310RX	1550TX/ 1310RX
	TX Range (nm)	830 ~ 860	1260 ~ 1355	1285 ~ 1343	1290 ~ 1355	1530 ~ 1570	1270 ~ 1355	1530 ~ 1570	1270 ~ 1355	1510 ~ 1570	1510 ~ 1570
	RX Range (nm)	770 ~ 860	1260 ~ 1620	1260 ~ 1620	1260 ~ 1620	1260 ~ 1620	1470 ~ 1600	1260 ~ 1360	1480 ~ 1600	1250 ~ 1600	1250 ~ 1380
Optical Power	TX Range (dBm)	-9.5 ~ -4	-10 ~ -1	-8 ~ -3	-2 ~ +3	0 ~ +5	-3 ~ +2	-5 ~ 0	-8 ~ -2	-8 ~ -2	-3 ~ -2
	RX Range (dBm)	-3 ~ -17	-3 ~ -21	-3 ~ -24	-3 ~ -24	-3 ~ -24	-3 ~ -23	-3 ~ -23	-3 ~ -23	-3 ~ -23	-3 ~ -23
	Link Budget (dB)	7.5	11	15	22	24	20	18	15	15	20
	Dispersion Penalty (dB)	na	3	na	3	3	3	3	3	3	3

FMM : Fiber Multi Mode (マルチモード)
 FSM : Fiber Single Mode (シングルモード)
 FSS : Fiber Single mode Single-fiber (単芯・BIDI 伝送)
 BIDI (Bi-Directional) : TxとRxを1本の光ファイバで行う方式。T/Rで別波長。
 FXM / FXS : STM-1 (SDH) やOC-3 (SONET) 等、通信キャリア系の用途の可能性大。

Industrial Grade 100-155 Mbps SFP Modules

Part Number	Optical Mode	Fiber Cable Type	Typical Distance	Optical Connector	Sensitivity (dB)	Operating Temp.	DDM
SFP-FMM850-2K	Multi-mode	OM1/OM2	2 km	Duplex LC	-24	-40 to +85 °C (-40 to +185 °F)	Yes
SFP-FMM-2K	Multi-mode	OM1/OM2	2 km	Duplex LC	-32		
SFP-FSM-20K	Single-mode	G.652	20 km	Duplex LC	-35		
SFP-FSM-40K	Single-mode	G.652	40 km	Duplex LC	-36		
SFP-FSS-20KTX	Bi-Directional	G.652	20 km	Simplex SC	-32		
SFP-FSS-20KRX	Bi-Directional	G.652	20 km	Simplex SC	-32		
SFP-FSS-40KTX	Bi-Directional	G.652	40 km	Simplex SC	-34		
SFP-FSS-40KRX	Bi-Directional	G.652	40 km	Simplex SC	-34		

発注型番

100-155 Mbps Fiber Optical

		100 Base FX データ転送速度							
		Multi-Mode		Single-Mode		Bi-Directional			
Fiber Cable Type		OM1/ OM2	OM1/ OM2	G.652	G.652	G.652	G.652	G.652	G.652
Optical Connector		LC	LC	LC	LC	SC	SC	SC	SC
Typical Distance		2 km	2 km	20 km	40 km	20 km	20 km	40 km	40 km
Wavelength	Typical (nm)	850	1310	1310	1310	1310TX/1550RX	1550TX/1310RX	1310TX/1550RX	1550TX/1310RX
	TX Range (nm)	830 ~ 870	1270 ~ 1380	1280 ~ 1340	1280 ~ 1340	1261 ~ 1360	1480 ~ 1576	1280 ~ 1340	1480 ~ 1580
	RX Range (nm)	770 ~ 870	1260 ~ 1620	1260 ~ 1620	1260 ~ 1620	1480 ~ 1600	1260 ~ 1360	1480 ~ 1600	1250 ~ 1360
Optical Power	TX Range (dBm)	-9 ~ -3	-19 ~ -8	-15 ~ -8	-5 ~ +0	-14 ~ -8	-14 ~ -8	-5 ~ +0	-5 ~ +0
	RX Range (dBm)	-3 ~ -24	-3 ~ -32	-3 ~ -35	-3 ~ -36	0 ~ -32	0 ~ -32	-3 ~ -34	-3 ~ -34
	Link Budget (dB)	15	13	20	31	18	18	29	29
	Dispersion Penalty (dB)	3	3	3	3	NA	NA	3	3

Industrial Grade 10 Gbps SFP+ Modules

Part Number	Optical Mode	Fiber Cable Type	Typical Distance	Optical Connector	Sensitivity (dB)	Operating Temp.	DDM
SFP-XMM-LCI-400	Multi-mode	OM3	400 m	Duplex LC	-11.1	-40 to +85 °C (-40 to +185 °F)	Yes
SFP-XSM-LCI-10K	Single-mode	G.652	10 km	Duplex LC	-12.6		
SFP-XSM-LCI-20K	Single-mode	G.652	20 km	Duplex LC	-12.6		
SFP-XSM5-LCI-40K	Single-mode	G.652	40 km	Duplex LC	-16		
SFP-XSM-LCI-80K	Single-mode	G.652	80 km	Single LC	-23		
SFP-XSS-10KTX-LC	Bi-Directional	G.652	10 km	Simplex LC	-14.4	0 to +70 °C (+32 to +158 °F)	Yes
SFP-XSS-10KRX-LC	Bi-Directional	G.652	10 km	Simplex LC	-14.4		
SFP-XSS-40KTX-LC	Bi-Directional	G.652	40 km	Simplex LC	-15.5		
SFP-XSS-40KRX-LC	Bi-Directional	G.652	40 km	Simplex LC	-15.5		

10 Gbps Fiber Optical

		10Gbps FX							
		Multi-Mode	Single-Mode			Bi-Directional			
Fiber Cable Type		OM3	G.652	G.652	G.652	G.652	G.652	G.652	G.652
Optical Connector		LC	LC	LC	LC	LC	LC	LC	LC
Typical Distance		400 m	10 km	20 km	40 km	80 km	10 km	10 km	40 km
Wavelength	Typical (nm)	850	1310	1310	1550	1550	1270TX/ 1330RX	1330TX/ 1270RX	1270TX/ 1330RX
	TX Range (nm)	840 ~ 860	1260 ~ 1355	1260 ~ 1355	1530 ~ 1565	1530 ~ 1565	1260 ~ 1280	1320 ~ 1340	1260 ~ 1280
	RX Range (nm)	840 ~ 860	1260 ~ 1355	1260 ~ 1355	1530 ~ 1565	1530 ~ 1565	1320 ~ 1340	1260 ~ 1280	1320 ~ 1340
Optical Power	TX Range (dBm)	-7.3 ~ -1	-8.2 ~ +0.5	-5 ~ +0.5	-4.7 ~ +4	+0 ~ +4	-6 ~ +1	-6 ~ +1	+0.5 ~ +5
	RX Range (dBm)	-0.1 ~ -9.9	0.5 ~ -14.4	0.5 ~ -14.4	0.5 ~ -16	-7 ~ -23	0.5 ~ -14.4	0.5 ~ -14.4	0.5 ~ -15.5
	Link Budget (dB)	2.6	6.2	9.4	11.3	23	8.4	8.4	16
	Dispersion Penalty (dB)	na	na	na	3	3	3.2	3.2	3.2

Industrial Grade copper Modules

Part Number	Ethernet Speed	Typical Distance	Connector	Operating Temp.
SFP-FTX-RJ45I-AE	100 Mbps	100m	RJ-45	-40 to 85 °C (-40 to 185 °F)
SFP-GTXB	1000Mbps	100 m	RJ45	0 to 70 °C (+32 to 158 °F)
SFP-GTX*	10/100/1000 Mbps	100m	RJ-45	-40 to 85 °C (-40 to 185 °F)
SFP-10GTX	1G/2.5G/5G/10G Mbps	30m - 10G 50m- 2.5G/5G 100m- 1G	RJ-45	0 to 70 °C (+32 to 158 °F)

* 10/100/1000Mbps operation required the host system to have an SGMII interface.