

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 | -23 | | |
| SFP-GSM3-40K | Single-mode | G.652 | 40 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

| | | 1.25Gbps 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 | SC | SC | SC | SC |
| Typical Distance | | 550 m | 2 km | 20 km | 40 km | 40 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 | 1310TX/ 1550RX | 1550TX/ 1310RX |
| | TX Range (nm) | 830 ~ 860 | 1260 ~ 1355 | 1285 ~ 1343 | 1290 ~ 1355 | 1270 ~ 1355 | 1530 ~ 1570 | 1270 ~ 1355 | 1510 ~ 1570 | 1270 ~ 1355 | 1510 ~ 1570 |
| | RX Range (nm) | 770 ~ 860 | 1260 ~ 1620 | 1260 ~ 1620 | 1260 ~ 1620 | 1470 ~ 1600 | 1260 ~ 1360 | 1480 ~ 1360 | 1250 ~ 1380 | 1480 ~ 1600 | 1250 ~ 1380 |
| Optical Power | TX Range (dBm) | -9.5 ~ -4 | -10 ~ -1 | -8 ~ -2 | -2 ~ +3 | -3 ~ +2 | -5 ~ 0 | -8 ~ -2 | -8 ~ -2 | -3 ~ -2 | -3 ~ -2 |
| | RX Range (dBm) | -3 ~ -17 | -3 ~ -21 | -3 ~ -23 | -3 ~ -24 | -3 ~ -23 | -3 ~ -23 | -3 ~ -23 | -3 ~ -23 | -3 ~ -23 | -3 ~ -23 |
| | Link Budget (dB) | 7.5 | 11 | 15 | 22 | 20 | 18 | 15 | 15 | 20 | 20 |
| | Dispersion Penalty (dB) | na | 3 | na | 3 | 3 | 3 | 3 | 3 | 3 | 3 |

SFP Modules

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 | | |

100-155 Mbps Fiber Optical

| | | 100 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 |
| 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 | G.652 |
| Optical Connector | | LC | 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 | 40 km |
| Wavelength | Typical (nm) | 850 | 1310 | 1310 | 1550 | 1550 | 1270TX/ 1330RX | 1330TX/ 1270RX | 1270TX/ 1330RX | 1330TX/ 1270RX |
| | TX Range (nm) | 840 ~ 860 | 1260 ~ 1355 | 1260 ~ 1355 | 1530 ~ 1565 | 1530 ~ 1565 | 1260 ~ 1280 | 1320 ~ 1340 | 1260 ~ 1280 | 1320 ~ 1340 |
| | RX Range (nm) | 840 ~ 860 | 1260 ~ 1355 | 1260 ~ 1355 | 1260 ~ 1620 | 1260 ~ 1620 | 1320 ~ 1340 | 1260 ~ 1280 | 1320 ~ 1340 | 1260 ~ 1280 |
| 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 | +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 | 0.5 ~ -15.5 |
| | Link Budget (dB) | 2.6 | 6.2 | 9.4 | 11.3 | 23 | 8.4 | 8.4 | 16 | 16 |
| | Dispersion Penalty (dB) | na | na | na | 3 | 3 | 3.2 | 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-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 - 1G 50m- 2.5G/5G 100 m- 10G | RJ-45 | 0 to 70 °C (+32 to 158 °F) |