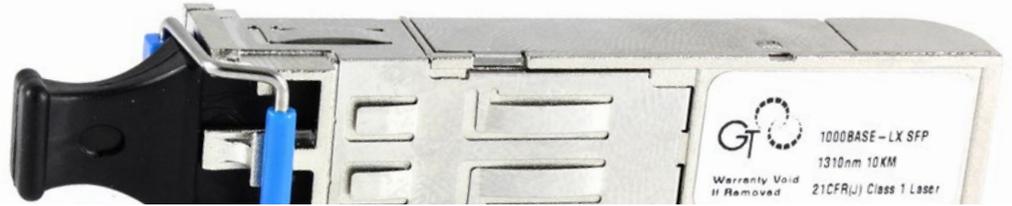# What is an SFP?
Small Form-Factor Pluggable

SFP stands for Small Form-Factor Pluggable. These transceivers are used to connect switches and routers to the network. SFPs are hot-pluggable which allows them to be plugged into an SFP port without shutting down the system. There are several types of SFPs which allow for a wide variety of combinations on a port-by-port basis. SFPs will typically have an LC fiber or RJ45 copper interface.

The History:

In 1999, the Multi-Source Agreement (MSA) was formed to address the need for faster and higher density transceivers. The SFP was designed to replace the GBIC. There were two main problems with the GBIC: It had a maximum data rate of 2.125Gbps and it was large in size. The SFP supports a faster data rate of up to 4.25Gbps and is about half the size of the GBIC.

With the release of the SFP also came Digital Optical Monitoring (DOM) capabilities. DOM provides access to real-time operating parameters such as optical Tx & Rx power, laser bias current, transceiver supply voltage, and temperature. DOM is very important for technicians when troubleshooting network issues.

What Can They Do?

The most common data rate of the SFP is 1.25Gbps, or 1000BASE-X, but can also range from 100Mbps all the way up to 4.25Gbps. The distance an SFP can send a signal is not only determined by the SFP but also by the type and quality of the cable used.

Almost all enterprise-class switches include SFP ports, enabling them to become part of a network topology. The network can be spread among different areas, floors, or buildings, and are connected by either fiber optic cables or copper CAT cables. SFP transceivers offer a wide range of detachable interfaces that allow users to select the appropriate transceiver according to the required configuration for their network.

Dimensions:
(H x W x D): 8.5 x 13.4 x 56.5 mm. SFPs typically weigh 75 grams or less

56.5 mm

13.4 mm
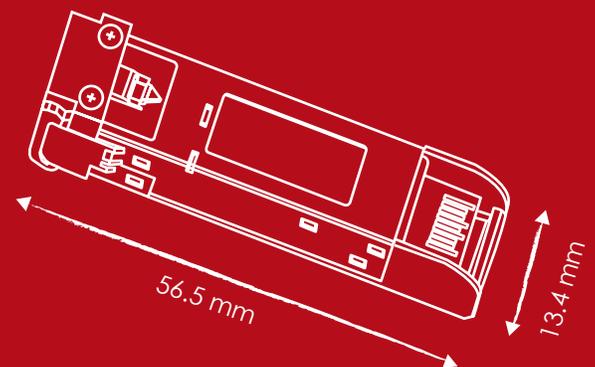
Operating Temperature:

• Commercial temperature range (COM): 0 to 70°C (32 to 158°F)

• Extended temperature range (EXT): -5°C to 85°C (23 to 185°F)

• Industrial temperature range (IND): -40 to 85°C (-40 to 185°F)

What is an SFP?
Small Form-Factor Pluggable

Types of SFP's

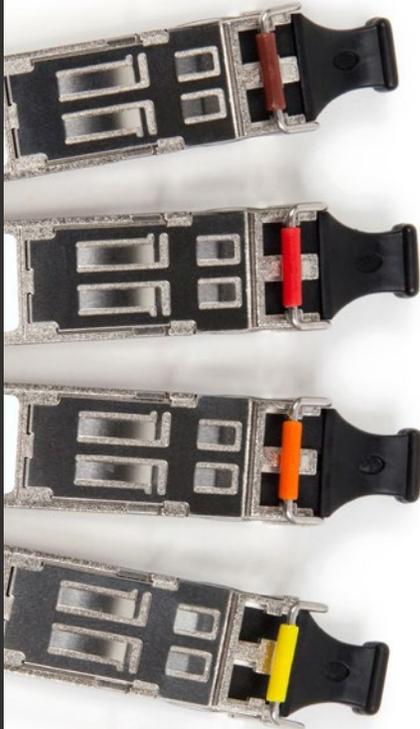## Network Protocol Data Rates

Ethernet
- 10Mbps (Ethernet)
- 100Mbps (Fast Ethernet),
- 1000Mbps (Gigabit Ethernet)

SONET
- OC-3/STM-1 (155MBps)
- OC-12/STM-4 (622Mbps)
- OC-48/STM-16 (2.488Gbps)

Fiber Channel
- 1.08Gbps
- 2.125Gbps
- 4.25Gbps

Wavelengths and Optimal Reach Classifications

Copper - RJ45 interface, Category 5, 5e, 6, or 6a UTP/FTP cable, can reach up to 100m

SX - 850nm Multi-Mode Fiber up to 550m

LX or **LH** - 1310nm Single-Mode Fiber up to 10km

EX - 1310nm or 1550nm Single-Mode Fiber up to 40km

ZX - 1550nm Single-Mode Fiber up to 80km

EZX - 1550nm Single-Mode Fiber up to 120km

BiDi - Single Strand Bi-Directional Single-Mode Fiber (Tx:1310nm/Rx:1490nm, Tx:1490nm/Rx:1310nm, Tx:1310nm/Rx:1550nm, Tx:1550nm/Rx:1310nm) up to 120km.

CWDM - 18 possible wavelengths from 1270nm to 1610nm over Single-Mode Fiber up to 120km

DWDM - 40 possible channels from C21 (1560.61nm) to C60 (1529.55nm) over Single-Mode Fiber up to 120km