SFP vs SFP+ Ports - Official Technical Overview & Hardware Datasheet

PRODUCT OVERVIEW & TECHNOLOGY DIFFERENTIATION: SFP VS SFP+ PORTS

This document provides a definitive technical comparison between Small Form-factor Pluggable (SFP) and Small Form-factor Pluggable Plus (SFP+) port architectures. Network engineers and procurement specialists must understand these distinct physical interface standards to ensure correct transceiver mating, signal integrity compliance, and line-rate performance in modern Ethernet deployments.



CORE ARCHITECTURAL DIFFERENCES

The fundamental distinction between SFP and SFP+ ports resides in the electrical signaling interface and supported data rate ranges. SFP ports operate

at line rates from 100 Mbps to 1.25 Gbps, while SFP+ ports are engineered for 8 Gbps to 10.3125 Gbps operation. Despite sharing identical mechanical footprint and cage dimensions, backward compatibility is limited: an SFP+ port will accept an SFP transceiver (operating at reduced speed), but an SFP port CANNOT accept an SFP+ transceiver due to higher frequency signaling requirements and different CDR (Clock and Data Recovery) circuitry.

KEY FEATURES

- Rate Differentiation: SFP supports 100BASE-FX, 1000BASE-T, 1000BASE-SX/LX. SFP+ supports 10GBASE-SR, 10GBASE-LR, 10GBASE-ER, and 10GBASE-T (copper).
- Signal Integrity: SFP+ ports implement enhanced EMI shielding and jitter tolerance per IEEE 802.3ae-2002; SFP follows IEEE 802.3z-1998.
- Power Consumption: SFP typically draws <1W per port; SFP+ draws <1.5W (passive DAC cables may draw <0.5W).
- Reach Capabilities: SFP supports up to 80km (1000BASE-ZX); SFP+ supports up to 80km (10GBASE-ER/ZR).
- Cabling: SFP primarily uses duplex LC multimode (up to 550m) or single-mode (up to 80km); SFP+ additionally supports passive direct-attach copper (DAC) up to 7m.



COMPLIANCE & STANDARDS

- SFP: Compliant with SFF-8074i (INF-8074i) and SFF-8472 digital diagnostics.

- SFP+: Compliant with SFF-8431 (SFP+ Electrical), SFF-8432 (Enhanced Management Interface), and IEEE 802.3ae (10 Gigabit Ethernet).

- Both: RoHS-6/6 compliant, IEC 60825-1 laser safety Class 1.

TECHNICAL SPECIFICATIONS

Parameter	**SFP Port Specification**	**SFP+ Port Specification**
Data Rate (Max)	1.25 Gbps (1000BASE)	10.3125 Gbps (10GBASE)
Backward Compatibility	SFP only	Accepts SFP and SFP+ (rate-limited)

Typical Power Budget	≤1.0 W per port	≤ 1.5 W per port (active optics)
Maximum Reach (SMF)	80 km (1000BASE-ZX)	80 km (10GBASE-ER)
Diagnostic Interface	SFF-8472 (Analog)	SFF-8472 Enhanced + SFF-8431
Recommended Cabling	Duplex LC MM/SM, Cat5e (1000BASE-T)	Duplex LC SM, DAC up to 7m, Cat6a (10GBASE-T)

ORDERING GUIDANCE (SKU COMPATIBILITY MATRIX)

When procuring line cards, switches, or transceivers, verify port labeling: "SFP" ports are rate-limited to 1.25 Gbps maximum; "SFP+" ports are rate-limited to 10.3125 Gbps. Mixed deployment on a common backplane requires the host ASIC to negotiate per-port speed. For greenfield 10GbE aggregation, specify SFP+ only. For 1GbE edge access, SFP remains cost-optimal.