Intel® Silicon Photonics

By adding photonics capability to world-leading silicon manufacturing, Intel® is developing a new class of high-speed optical connectivity products.

Intel® Silicon Photonics combines the manufacturing scale and capability of silicon with the power of light onto a single chip. We build silicon-based components that transmit and receive optical signals, moving vast amounts of information at 100 to 1600 Gigabits per second over long distances of up to several kilometers of fiber optic cables.

Today, our pluggable modules connect Ethernet switches in large data centers. As demand for bandwidth increases, silicon photonics co-packaged with switch ASICs will provide the bandwidth density necessary to scale future data center networks.

New high-speed I/O connectivity based on photonics

Intel® wafer-scale manufacturing with hybrid laser

Platform for future high-density switch integration

What is Silicon Photonics?

Silicon Photonics is a combination of two of the most important inventions of the 20th century—the silicon-integrated circuit and the semiconductor laser. With this combination, light has been integrated onto Intel's silicon platform, taking advantage of the bandwidth and reach of optical connectivity, using the scale and technology capability of silicon.

This new technology can reduce cost of ownership and improve the performance of future data center architectures by:

- Enabling high-bandwidth, software-configurable access to compute and storage
- Permitting software defined infrastructure (SDI) deployments to decouple hardware and software resources for disaggregated data centers
- Allowing optical connectivity that interoperates with other technologies, such as Ethernet switches, Smart-NICs, and FPGAs

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Bringing together the power of optics and the scalability of silicon for a high-speed, integrated optical connectivity solution.

Intel® Silicon Photonics optical transceivers are the optical interfaces for Ethernet switches, routers, and transport networking equipment, providing connectivity for large-scale cloud and enterprise data centers.

Product	Electrical Interface	Optical Line Rate	Reach	Fiber Type	Fiber Connector	Operating Temperature Range	Part Number
 100G PSM4 QSFP28	4x25G	4x25G	2 km	SMF	MTP Fiber Pigtail	0-70°C	SPTSBP3PTCDF003
 100G CWDM4 QSFP28	4x25G	100G	500 m 2 km 10 km	SMF	LC	15-55°C 0-70°C 0-70°C	SPTSBP2CLCCO SPTSBP3CLCCO SPTSBP4CLCCO
 100G SR4 QSFP28	4x25G	4x25G	100 m	MMF	MPO	0-70°C	SPTMBP1PMCDF
 100G DR/FR/LR QSFP28	4x25G	100G	500 m 2 km 10 km	SMF	LC	0-70°C	SPTSLP2SLCDF SPTSLP3SLCDF SPTSLP4SLCDF
 100G LR4 QSFP28	4x25G	100G	10 km	SMF	LC	0-70°C	SPTSBP4LLCDF (100GE) SPTSQP4LLCDF (OTU4)
 200G FR4 QSFP56	4x50G	200G	2 km	SMF	LC	0-70°C	SPTSMP3CLCDA
 400G DR4 QSFP-DD	8x50G	400G and 4x100G	500 m 2 km 10 km	SMF	MPO	0-70°C	SPTSHP2PMCDF SPTSHP3PMCDF SPTSHP4PMCDF
 400G SR8 QSFP-DD	8x50G	8x50G	100 m	MMF	MPO	0-70°C	SPTMJP1PMCDF
 100G AOC	4x25G	100G	1 - 100 m	-	-	0-70°C	SPTMJP1PMCDFxxx xxx = cable length in meters up to 100 m (e.g. 001 = 1 m, 030 = 30 m, 100 = 100 m)
 400G AOC	8x50G	400G	1 - 100 m	-	-	0-70°C	SPTMJP1PACDFxxx xxx = cable length in meters up to 100 m (e.g. 001 = 1 m, 030 = 30 m, 100 = 100 m)

Intel's multimode fiber transceiver products (SR and AOC variants) utilize VCSEL transmitters rather than silicon photonics based transmitters.