

Third-Generation SiC Chips Target Electric Vehicles

[Bosch](#) has introduced its third-generation silicon carbide (SiC) chips and is supplying samples to global automakers.

“Silicon-carbide semiconductors are the key drivers of electromobility. They control the flow of energy and make it as efficient as possible. With our next-generation SiC chips, we’re systematically expanding our technological leadership in this field and helping our customers put even more powerful and efficient electric vehicles onto the road,” says Markus Heyn, member of the Bosch board of management and chairman of the Bosch Mobility business sector. “Our ambition is clear: we want to be a globally leading manufacturer of SiC chips.”

“Our next-generation chips deliver 20 percent higher performance and are also significantly smaller than the previous generation,” Heyn says. “This miniaturization is the key to greater cost efficiency, as we can produce many more chips per wafer. That means we’re playing a key role in making high-performance electronics more widely available.” Bosch has already delivered more than 60 million SiC chips worldwide since the first generation went into production in 2021.

In recent years, Bosch has pushed ahead with its development work for SiC chips and at the same time increased its manufacturing and clean-room capacity. The company has invested around 3 billion euros in semiconductors as part of Europe’s IPCEI (Important Projects of Common European Interest) funding programs for microelectronics and communication technology.

Its wafer fab in Reutlingen, Germany, develops and manufactures the third-generation SiC chips on modern 200-millimeter wafers. In September 2023, Bosch acquired a second fab for SiC chip manufacturing in Roseville, California, and is currently equipping it with state-of-the-art, highly complex production facilities. The company is investing an additional 1.9 billion euros in the U.S. plant, which will manufacture and deliver its first SiC chips this year—initially as samples for customer trials.

“In the future, Bosch will supply its innovative SiC chips from these two fabs in Germany and the U.S.,” Heyn says. This will make for more robust and resilient supply chains in the rapidly growing electrification of the automotive industry. In the medium term, Bosch intends to expand its manufacturing capacity for SiC power semiconductors to a unit volume running into the mid-nine figure range.

Bosch uses its unique manufacturing expertise to make its chips both smaller and more powerful. The company adapted its etching process, which has existed since 1994 and is known throughout the industry as the “Bosch process.” Originally developed for sensors, this process enables the manufacture of high-precision vertical structures in silicon carbide. This design greatly increases the chips’ power density—a decisive factor for the third generation’s superior performance.

For more information, see the [announcement](#). Or for more on the company’s SiC portfolio, see the SiC power device [page](#).