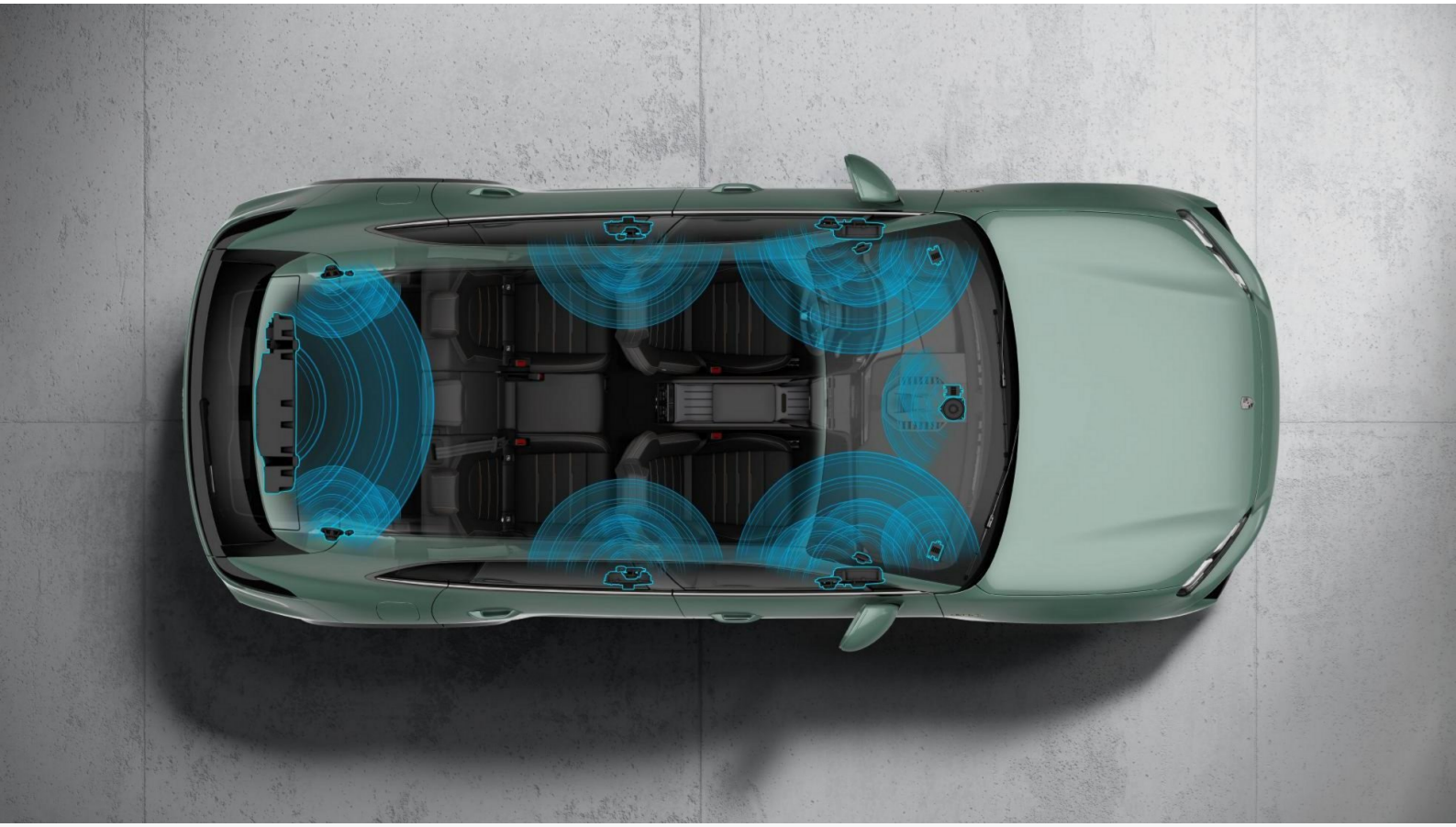

Gallium nitride for Burmester High-End Sound: the innovation is set to enter series production in future Porsche vehicle generations from 2027.

From Lab to Listening: Porsche introduces Gallium Nitride for High-End Audio

21/08/2026 Lighter, more compact and more powerful: Porsche is bringing the world's first production-ready high-end automotive audio system featuring gallium nitride technology to market. Gallium nitride (GaN) is a semiconductor material that enables significantly greater efficiency and power density than conventional silicon, allowing electronic systems to deliver higher performance from a smaller, lighter package.

Developed in collaboration with the University of Stuttgart, Porsche has adapted GaN technology for its first automotive application in the Burmester® 3D High-End Surround Sound System. A GaN-based high-performance chip handles the voltage conversion required to power the 400-watt subwoofer amplifier. The technology is scheduled to make its production debut in a future Porsche vehicle in 2027.

“A powerful bass foundation is part of the emotive experience our customers expect from a Porsche. The power reserves of our systems enable confident and dynamic sound reproduction, which is perfectly in keeping with the character of our sports cars,” says Steffen Burosch, who is responsible for audio system innovations at Porsche's Weissach Development Centre. “Sound in a Porsche is about pure emotion. By using GaN, we can enhance that experience even further. Our customers will be able to enjoy the outstanding sound quality of the Burmester® High-End Sound System while also experiencing state-of-the-art engineering.”

To protect the innovations developed as part of the project, Porsche has already filed several patent applications.

New semiconductor technology for series production

Gallium nitride is an innovative semiconductor material that first found wider application in blue light-emitting diodes (LEDs) in the 1990s. Today, GaN chips are used in a wide range of applications, from compact and lightweight USB chargers for smartphones and tablets to satellites in space.

GaN-based semiconductor switches, commonly known as transistors, enable higher switching frequencies and, thanks to their material properties, exhibit significantly lower switching losses than comparable silicon-based transistors. The resulting reduction in heat generation increases the efficiency of voltage conversion while also creating opportunities for more compact and lightweight designs of electronic components such as capacitors and inductors.

The same applies to the Burmester® 3D High-End Surround Sound System. Thanks to the significantly more efficient power conversion offered by GaN semiconductors compared with conventional silicon-based semiconductors, less energy is lost and less heat is generated. As a result, cooling requirements are substantially reduced and the heat sink can be made about 20 per cent lighter, while passive components can also be made smaller. This makes the amplifier both lighter and more compact overall. And there is an additional environmental benefit: the reduced amount of aluminium required for the heat sink, the production of which is energy-intensive, helps avoid CO2 emissions that would otherwise be generated during production of the amplifiers.

Porsche came up with the idea of harnessing the advantages of gallium nitride for use under the demanding conditions of a sports car in mid-2023. From spring 2024, a team of audio, semiconductor and sustainability experts at Porsche worked together with the Institute for Robust Power Semiconductor Systems at the University of Stuttgart to develop the first prototype of a GaN-based subwoofer amplifier.

Porsche drives GaN innovation forward

“We focused on the fundamental technical challenges of efficient voltage conversion. In a sports car,

efficiency and weight are crucial factors," says Dr Lars Heuken, who is responsible for Strategic Semiconductor Management at Porsche. "The fact that Porsche actively drives innovations itself is a prime example of how we see our role as a technology leader." Working closely with a leading international chip manufacturer and an audio development partner, the team ultimately succeeded in creating a production-ready subwoofer amplifier.

"The potential is huge – and this is just the beginning. GaN is ideal wherever power is converted," says Dr Heuken. "Many fields of application are conceivable in Porsche sports cars and we are investigating them in more detail. For example, the semiconductor can be used for power conversion in high-voltage systems. This makes GaN particularly interesting for the high-voltage systems of electric sports cars, for instance. Quality and tangible customer benefits are at the heart of all our considerations." Burosch adds: "We see further opportunities particularly in the field of automotive audio and are already defining the next areas of application."

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