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Gallium Nitride (GaN) Power Chips for EVs Market Opportunity, Growth Drivers, Industry Trend Analysis, and Forecast 2025 - 2034

https://marketpublishers.com/r/GA9C669284F8EN.html
Date: October 2025
Pages: 210
Price: US$ 4,850.00 (Single User License)
ID: GA9C669284F8EN

Abstracts

The Global Gallium Nitride (GaN) Power Chips For EVs Market was valued at USD 297 million in 2024 and is estimated to grow at a CAGR of 15.5% to reach USD 1.5 billion by 2034.

The robust expansion aligns with automakers increasingly integrating high-frequency, high-density conversion architectures at scale. As EV adoption grows alongside expanding charging infrastructure, the overall demand for efficient power electronics in both vehicles and supporting systems is accelerating. In 2024, global EV sales reached 17 million and accounted for over 20% of all new car sales. The global EV fleet has grown to nearly 58 million, fueling consistent demand for more efficient power conversion solutions. GaN-based onboard chargers are gaining traction due to their significant advantages in efficiency and size reduction. They enable increased power density and lower weight, improving EV range and system integration. Recent advancements in GaN technology also support high-density, bidirectional operations, a key feature for future vehicle-to-grid applications. The transition from discrete components to integrated GaN modules combining drivers, switches, and protection circuits has further enhanced system performance, reduced electromagnetic interference, and improved thermal management. Public–private efforts have been instrumental in accelerating the commercialization of these wide-bandgap solutions.

In 2024, the lateral GaN devices segment held a 70% share and is projected to grow at a CAGR of 16.1% through 2034. These devices have become the backbone of EV power electronics due to their suitability for onboard chargers, auxiliary systems, and DC–DC converters operating up to 650 V. Their high electron mobility and elevated breakdown field strength, enabled by AlGaN/GaN HEMT architecture on silicon, allow

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for significantly lower on-resistance at higher voltages when compared to traditional silicon-based components.

The medium-voltage GaN devices, ranging from 100 V to 650 V, held a 67% share in 2024 and are forecasted to grow at a CAGR of 16% between 2025 and 2034. This voltage class covers many EV applications, including onboard chargers and DC–DC converters in both current 400 V battery platforms and future 800 V architectures. Within this range, GaN devices deliver superior switching speeds and efficiency, enabling compact and lightweight power conversion systems critical for high-density EV applications.

China Gallium Nitride (GaN) Power Chips for EVs Market generated USD 73.4 million in 2024. As the largest EV market globally, China accounted for roughly two-thirds of global EV sales, delivering over 8 million units in 2023 alone. This massive scale has created a vast addressable market for GaN components, as every vehicle and charging site requires high-performance power electronics. Additionally, strong government support for NEVs, domestic semiconductor development, and widespread deployment of EV infrastructure continue to solidify China’s leadership over other regional players such as India, South Korea, and Japan.

Key companies actively shaping the Gallium Nitride (GaN) Power Chips for EVs Market include Transphorm, GaN Systems, Infineon Technologies, ROHM Semiconductor, Navitas, EPC, Power Integrations, Innoscience, STMicroelectronics, and Texas Instruments. To enhance their positioning, leading companies in the GaN power chip sector are heavily investing in R&D to develop high-performance, automotive-qualified GaN solutions that support higher power densities and better thermal efficiency. Many players are shifting from discrete products to integrated solutions such as co-packaged half-bridge modules combining drivers, switches, and protection features to simplify design, minimize EMI, and improve reliability. Strategic partnerships with automakers and Tier 1 suppliers are also being pursued to accelerate design wins in EV platforms.

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