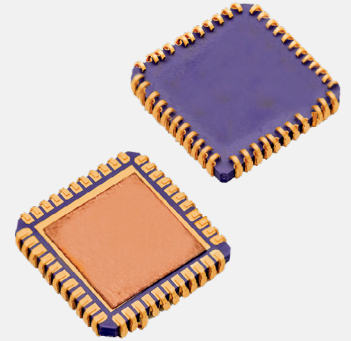


Revolutionizing Power Electronics – Paving the Way to a Greener Future

Advancing Sustainability and Performance Across Industries with SiC and GaN Power Devices

Wide Band Gap (WBG) semiconductors, specifically Silicon Carbide (SiC) and gallium nitride (GaN), have proven to be highly successful in a variety of power electronics applications. Their distinguishing feature is a significantly higher bandgap compared to silicon (Si), allowing them to withstand more than 10 times the critical electric field that Si can handle. As a result, these materials offer numerous advantages over Si in power conversion applications:



Faster Switching: SiC and GaN enable quicker switching in power electronics, leading to more efficient and responsive systems.

- **Lower Losses:** The WBG materials exhibit lower conduction and switching losses, resulting in improved energy efficiency.
- **High-Temperature Capability (SiC):** SiC has the added benefit of performing well at high temperatures, making it suitable for demanding environments.
- **Improved Power Density:** The higher efficiency and thermal performance of SiC and GaN enable higher power densities in compact designs.
- **Simplified Converter Designs:** WBG materials allow the design of simpler converter topologies, streamlining the manufacturing and implementation process.
- **Grid-Scale Energy Generation and Storage:** WBG semiconductors play a crucial role in harnessing solar and wind energy and managing power in large-scale energy generation and storage systems.
- **Transportation:** Electric vehicles (EVs) and trains benefit from the enhanced performance of SiC and GaN power electronics, along with the associated charging infrastructure.
- **High-Efficiency Electric Residential Heat Pumps:** SiC and GaN contribute to improving the energy efficiency of residential heat pumps, reducing energy consumption and costs.
- **Telecom and Data Centers:** Power supplies in these critical facilities can take advantage of WBG semiconductors for increased efficiency and reliability.
- **Industrial Applications:** Uninterruptible Power Supplies (UPS) and power converters for motor drives benefit from the superior performance of SiC and GaN.
- **Consumer Electronics:** WBG semiconductors find applications in end-user chargers/adapters, residential micro-inverters, and battery energy storage systems, enhancing efficiency and user experience.

The widespread adoption of SiC and GaN in various power electronics applications has led to remarkable progress, fostering sustainability, efficiency, and enhanced performance across numerous industries. To achieve the ambitious net carbon zero goals by 2050/2060, decarbonization must be embraced across all energy-related sectors.

This comprehensive endeavor encompasses renewable energy generation, distribution, storage, and the electrification of residential, industrial, and transportation sectors. The pivotal role in driving this transformation falls to power electronics employing SiC and GaN Wide Band Gap (WBG) semiconductors, which are spearheading the revolution in these industries. As a testament to their significance, the demand for SiC and GaN power devices is projected to experience an impressive Compound Annual Growth Rate (CAGR) exceeding 25% for the foreseeable future.



Contact us to learn more