Wide-Bandgap (WBG) Power Microchip Devices Market Enhancing Efficiency Performance Defense Aeronautics Applications 2028

global wide-bandgap power semiconductor devices market is expected to reach USD 3.36 Billion by 2028, according to a new report by Reports and Data

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The global wide-bandgap power semiconductor devices market is expected to reach USD 3.36 Billion by 2028, according to a new report by Reports and Data. Wide bandgap semiconductors are those which have a wide bandgap between the valence band and the conduction band. With wide bandgap semiconductor devices play a significant role in achieving high efficiency in high power density devices. These semiconductors have approximately ten fold better conduction capability and switching property than silicon-based semiconductors. Wide bandgap materials are inherently suitable for power electronic devices that provide fast response, and are comparatively smaller and more efficient, with capacity to endure higher input voltages and higher temperatures than their silicon-based counterparts. These characteristics, along with better longevity and greater reliability, place wide bandgap power semiconductor devices as main drivers for key emerging applications like hybrid electric automobiles and renewable energy generation and hence, stimulate the market demand. These devices also play a crucial role in enhancing the efficiency of existing applications.

As wide bandgap semiconductor power devices are light weight, easy to maintain, provide enhanced control with fault detection capability, these devices are intensively used in field of defense and aeronautics especially in applications like RADAR, SONAR, unmanned aerial vehicles, and unmanned underwater vehicles use intensive processing that generates an enormous quantity of heat and as a result want high performance and durable devices to function efficiently and provide the desired output. The above mentioned uses of WBG power semiconductor devices would further boost the market demand.

High cost involved in the production of wide bandgap power semiconductor devices would result in higher price of such devices in comparison to silicon based semiconductor devices and thus may act as a restraining factor for this market.

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These characteristics make them highly suitable for applications in the defense and aeronautics industries, particularly in areas such as RADAR, SONAR, unmanned aerial vehicles (UAVs), and unmanned underwater vehicles (UUVs). These applications require intensive processing, which generates a significant amount of heat. Therefore, high-performance and durable devices are essential for efficient operation and desired output.

The use of WBG power semiconductor devices in the defense and aeronautics sectors is expected to further drive market demand. The Asia Pacific region, in particular, is projected to be the main revenue-generating region for WBG power semiconductor devices throughout the forecast period. The market in this region is expected to grow at a compound annual growth rate (CAGR) of 23.1% during the forecast period, and it held a market share of around 44% in 2020.

The significant growth in the deployment of uninterrupted power supply devices in data centers and the increasing investments in high signal processing equipment, especially in the military and aviation industries, contribute to the market's growth in the Asia Pacific region. As a result, the implementation of wide-bandgap power semiconductor devices in this region is expected to experience a surge in demand during the forecast period.

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Key Regional Markets Covered in the Report:

North America (U.S., Canada, Mexico)
Europe (U.K., Italy, Germany, Spain, France, BENELUX, Rest of Europe)
Asia Pacific (India, Japan, China, South Korea, Australia, Rest of Asia Pacific)
Latin America (Chile, Brazil, Argentina, Rest of Latin America)
The Middle East & Africa (Saudi Arabia, U.A.E., South Africa, Rest of Middle East & Africa)
Top 10 Companies Operating in the Global Wide-Bandgap (WBG) Power Microchip Devices Market:

Transphorm, Infineon Technologies, Texas Instruments, GaN Systems, ST Microelectronics, Microsemi, Genesic Microchips, United Silicon Carbide, Exagon, and Monolith Microchip.

Further key findings from the report suggest

Silicon Carbide occupies the largest market share in the year 2020 registering a growth rate of CAGR 22.9% during the forecast period.
Silicon Carbide is more cost-intensive to manufacture than the silicon counterparts and thus has

led to the development of cost-effective manufacturing of Gallium Nitride for use wide bandgap power microchip devices. GaN is projected to grow at highest growth rate of 23.3% during the forecast period.
The market for wide bandgap microchips in uninterrupted power supply applications occupies the largest market share comprising 40% of the market with a growth rate of CAGR 22.9% during the forecast period. An Uninterruptible Power Supply finds application to safeguard important devices from mains supply issues, including spikes, voltage drops and fluctuations as well as total power failures using a dedicated battery unit. A UPS system may also be used to bridge the power gap while a standby generator is started and synchronized. These applications of UPS is expected create a surge in demand and in turn, will the demand for wide bandgap power microchip devices.
Asia Pacific is projected to be the main revenue generating region throughout the forecast period. The market is projected to grow at a CAGR of 23.1% in the forecast period and occupies a market share of around 44% in the year 2020. This can be attributed to factors such as the surging deployment of the uninterrupted power supply devices in the significantly increasing number of data centers in the region and huge investments made in advancement of high signal processing equipment particularly in military and aviation industry. The implementation for wide-bandgap power microchip devices in this region is highly likely to surge during the forecast period.
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