Power GaN Devices Market Sales Likely to Surpass Revenues Worth US$ 2.5 Bn by 2031 End

Power GaN Devices Market to expand at a CAGR of 40.3% from 2021 to 2031, Rise in demand for fast switching devices key driver of global power GaN devices market

Power GaN Devices Market

ALBANY , NY, US, January 10, 2022 /EINPresswire.com/ -- Transparency Market Research delivers key insights on the global power GaN devices market. In terms of revenue, the global power GaN devices market is estimated to expand at a CAGR of 40.3% during the forecast period, owing to numerous factors, regarding which TMR offers thorough insights and forecasts in its report on the global power GaN devices market.

The global power GaN devices market is broadly affected by several factors, including rise in demand for GaN-based high electron mobility transistors (HEMTs) for applications in power devices and radio frequency (RF) power amplifiers due to their superior material characteristics as compared to that of silicon (Si)-based materials.

Power GaN Devices Market: Dynamics

The power electronics industry has witnessed the theoretical limit reached by silicon MOSFETs and needs to move to a new element. GaN (Gallium Nitride) on diamond is an alternative material to pure GaN in the field of high power semiconductors and power electronics.

Gallium nitride is a kind of wide-gap compound semiconductor that has a high crystalline, good uniformity, and superior surface quality. GaN on diamond semiconductor substrate offers key parameters such as high thermal conductivity, high electrical resistivity, and three times smaller devices at both device and system level. These advantages make GaN on diamond power electronics devices highly attractive for fast charging, inverters, power modules, drive trains, and other energy conversation devices.

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The increase in demand for GaN on diamond based high electron mobility transistors (HEMTs) due to their properties such as reduction of the thermal resistance between the heat sources and the diamond decreases the thermal constraints providing the device designer additional options to exploit the inherent characteristics and miniaturization. Additionally, recent trend in power GaN applications in power electronics represent a prominent market for GaN electronic devices currently. Major trends in the developments for GaN power devices are p-GaN HEMTs for enhancement-mode (E-mode) operation and GaN-on-GaN technology for higher operating voltages. The breakdown voltages for p-GaN HEMTs and vertical GaN devices also exceeded to 1000 v and 1.5 kv, respectively. This is expected to fuel the demand for GaN power devices across various power devices.

Power GaN Devices Market: Prominent Regions

The power GaN devices market in Asia Pacific is expected to expand during the forecast period, owing to the presence of key market players, technological advancements, and expansion of the semiconductor and automotive sectors in the region. Asia Pacific has the presence of robust expanding economies, including China, South Korea, Japan, and Taiwan. Industrial expansion coupled with the presence of a well-established supply chain network catering to a wide range of industries including IT & telecommunication, automotive, semiconductor & electronics, industrial, aerospace & defense is expected to propel the demand for GaN power devices; consequently, driving the global power GaN devices market. China accounted for a prominent share, in terms of value, among all countries.

The power GaN devices market in Asia Pacific is projected to expand further due to significant rise in the demand for power electronics and wireless infrastructure devices. The Asia Pacific market is estimated to reach the value of US$ 1,049.03 Mn by 2031. The power GaN devices market in Asia Pacific is likely to expand at a notable CAGR of 43.3% during the forecast period, owing to the presence of a significant number of players manufacturing GaN power devices in the region.

Power GaN Devices Market: Key Players

Key players operating in the global power GaN devices market are Efficient Power Conversion Corporation, Inc., Fujitsu limited, GaN Power Inc., GaN systems, Infineon Technologies, Navitas Semiconductor, On Semiconductors, Panasonic Corporation, and VisIC Technologies.

Increasing Demand for Fast Switching Devices: Key Driver of Global Power GaN Devices Market

The power electronics industry is witnessing the theoretical performance limit of silicon

MOSFETs, and the industry is looking forward to moving to a new element. The Gallium Nitride (GaN) substrate technology offers a wide bandgap, high electron mobility conductor that has demonstrated itself as being capable of meeting the performance requirements of new applications. A high-electron-mobility transistor (HEMT) device is based on GaN, which is a potential successor to MOSFETs due to its superior electrical characteristics.

Moreover, various substrate developments based on GaN are increasing the overall capability of GaN, thereby increasing its application areas. Its improved capability as compared to other technologies is likely to boost usage in trends such as AI, voice recognition systems, biometric, and various high-speed applications.

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GaN devices are being widely used in chargers for the past few years, owing to increasing adoption of GaN devices in consumer electronics and industrial power supply. Various GaN-based chargers are available, which offer smaller size, higher speed, and higher energy-efficiency than traditional silicon-based chargers. Thus, numerous OEMs producing laptops, PCs, and smartphone manufacturers have also started to offer GaN-based chargers, along with the product owing to the need and higher demand from the consumer side.

Additionally, industrial power supplies using silicon solution achieve an efficiency in power converters of below 95%, while GaN solution boosts the efficiency up to 99%, which is a huge power conservation as per industry usage. Furthermore, increased frequency, increased power density, bi-directional power flow, and reduced component count also drive the demand for industrial power supplies using GaN technology.

This, in turn, is expected to fuel the demand for GaN power devices across various sectors over the next few years. However, complexity and cost associated with production process may hamper the market. Heteroepitaxial growth of GaN is carried out on foreign substrates such as silicon carbide (SiC), sapphire, and silicon (Si) along with rapid research to overcome this.

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