Global Power Transistor Market - Growth, Trends, Covid-19 Impact, and Forecasts (2023 - 2028)

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Report description:

The power transistor is a crucial component used in consumer electronics; their application includes elevating the performance and utility of consumer electronics devices by increasing power efficiency, reducing size and system cost, enabling smaller, sleeker designs, and providing new features such as professional-level audio quality.

Key Highlights
Power transistors are semiconductor devices widely used to amplify weak electrical signals and regulate them accordingly. They can also be employed as switches in several high-power applications such as automotive and energy & power industry.
The rising demand for power transistors in the communication and connected electronic devices and increasing investment in the fields reduce carbon footprint and enhance the productivity of the devices in which it is used.
According to KOSIS, the overall revenue from manufacturing diodes, transistors & semiconductor devices in South Korea was USD 5.9 billion in 2021 and is expected to reach USD 6.26 billion by the end of 2024. Similar trends are expected to be observed across the Asia Pacific region, propelling the market's growth in the forecast period.
The power transistors aid in dissipating heat quickly, prevent overheating, and lower CO2 emissions and electricity costs. Due to these benefits, they are a crucial component in various electronic products. Furthermore, the growing population and surging fossil fuel consumption have propelled the demand for power-efficient electronic devices.
The limitations in the operations due to the constraints such as temperature sensitivity, limitation of the operation above the switching frequency of 15 kHz, and reverse blocking capacity, among others, may hinder the market growth of the power transistors market in the long run.
The COVID-19 pandemic severely impacted the Power transistors market. Semiconductors and Electronics production facilities halted due to the slowdown and non-availability of labor across the globe. COVID-19 caused a significant and prolonged drop in manufacturing utilization, and travel bans & manufacturing facility closures, which led to a decrease in the growth of the power

transmission industry.

Power Transistor Market Trends

Consumer Electronics Sector is Expected to Boost Market Growth

Consumer electronics is a significant application segment for power transistors. The surging adoption of consumer electronics such as earphones, laptops, smartphones, wearables, and other portable devices bolsters the segment's growth.
The advent of 5G technology has increased the adoption of 5G enabled devices supporting the adoption of different foundry nodes. The rising demand for better and more efficient semiconductors in consumer electronics will propel the need for power transistors. According to Ericsson Mobility Report, 5G subscriptions with a 5G-capable device grew by 70 million during the first quarter of 2021 and are forecast to reach 580 million by the end of 2021.
The rising demand for high-definition audio, fast charging, and more energy-efficient designs for consumer electronics will foster growth for GaN technology. The GaN transistors technology will provide the adaptation needed for the digital world to continue improving.
The 5G enabled devices will witness a surge in the market in the coming years, owing to the increasing usage and surging data requirements of data processing. The chip manufacturers for 5G enabled smartphones will face demand growth for 5G chips to support the growing demand for 5G enabled devices. The increase in the semiconductor chips will contribute to the development of the semiconductor, eventually supporting the demand for power transistors.
Since the demand for power transistors is growing, a shortage of semiconductors has been observed to create strong demand in the future. Additionally, the US Senate introduces FABS Act to give tax credits to semiconductor manufacturers to expand the semiconductor fabrication capacity in line with the demand growth in the consumer electronics and automotive industries.

Asia Pacific Expected to Witness the Highest Growth

The Asia Pacific is the fastest-growing region in the power transistors markets globally, owing to the presence of major companies, such as Toshiba Corporation, and Mitsubishi Electric Corporation, among others. China, Japan, Taiwan, and South Korea are major countries with a significant market share. The region also contributes a substantial market for smartphones and 5G technology; it is also witnessing a rise in investments in automotive (especially EVs). For instance, GaN systems, a gallium nitride power semiconductor manufacturer, signed a comprehensive capacity agreement with BMW for the company's GaN power transistors, designed to increase the efficiency and power density of critical applications in EVs.
The rise in electronic equipment manufacturing across the region to cater to the rising demand for electric vehicles, consumer electronics, and energy & power is expected to foster growth in the power transistor market.
China contributes significantly to the semiconductor market. The surging demand for electric vehicles will propel the use of semiconductors in the Electric vehicle.
The consumption of semiconductors is rapidly growing in Japan, South Korea, and China, compared to other countries in the region, due to the continuing transfer of diverse electronic equipment to China. In addition, the presence of the world's top five largest consumer electronics sectors is based in China, posing enormous opportunities for semiconductor adoption across the region in the estimated timeframe.

Power Transistor Market Competitor Analysis

The Power Transistor Market is a highly competitive market due to the presence of significant players such as Fairchild Semiconductor International Inc., Champion Microelectronics Corp, Renesas Electronics Corporation, Infineon Technologies AG, Texas Instruments Inc., NXP Semiconductors N.V., STMicroelectronics N.V., Mitsubishi Electric Corporation, Linear Integrated Systems Inc. and Toshiba Corporation.

April 2022 - EPC announced the release of its product EPC2050, a 350 V GaN transistor with a maximum RDS(on) of 80 m? and a 26 A pulsed output current. This tiny size enables power solutions that occupy ten times less area than comparable silicon solutions. The application benefits from the fast-switching speed and small size of the EPC2050 include 120 V-150 V motor control for medical motors, DC-DC conversion from/to 120 V-160 V such as in aerospace applications, DC-DC solutions converting 400 V input to 12 V, 20 V or 48 V outputs and DC-AC inverters, multi-level converters such as Totem Pole PFC.
March 2022 - Transphorm, Inc. and TDK-Lambda, a group company of TDK, are expanding their AC-DC GaN-based PFH500F product line. The product line includes PFH500F-12 and PFH500F-48 in TDK's 500-watt AC-DC power supplies. The series uses 72 m?, 8x8 PQFN GaN FETs (TP65H070LDG) from Transphorm. The power transistors high power density enabled TDK to cool the GaN power supplies via thin baseplates. Inline, TDK produced a slimmer, tightly contained power module capable of supporting a large variety of broad industrial applications operating in harsh environments. The applications include custom fanless power supplies, laser, 5G communication, signaling, commercial off-the-shelf (COTS) power supplies, digital signage/displays, etc.

Additional Benefits:

The market estimate (ME) sheet in Excel format
3 months of analyst support

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