Field Effect Transistor Market - Growth, Trends, Covid-19 Impact, and Forecasts (2023 - 2028)

Market Report | 2023-01-23 | 100 pages | Mordor Intelligence

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Report description:

The Global Field Effect Transistor Market is expected to witness growth at a CAGR of 5.5% over the forecast period (2022- 2027). The growing use of electronic devices such as Television, Mobile devices, electric vehicles etc., favorably boosts market development. And FETs are extensively used in Integrated Circuits (ICs) due to their compact size. Other factors, such as rising electronic component downsizing and the adoption of different government efforts on modern power distribution and generating infrastructure, are projected to drive the market forward.

 In addition, features such as safety, infotainment, navigation, and fuel efficiency in automotive components and security, automation, solid-state lighting, transportation, and energy management in industrial parts are likely to drive the market studied. A transistor can be used as an amplifier to regulate the speed of electric motors like AC blower motors or as a solid-state switch to control actuators like fuel injectors.

 According to the IEA, worldwide sales of electric automobiles had reached 6.6 million in 2021. Electric vehicles accounted for 9% of all vehicle sales worldwide.

 The growing requirement to control power across circuits and miniaturization drives the Field Effect Transistor market. NXP semiconductors, for instance, reduced the packing size of their transistors by 55% while maintaining the same power performance. Diodes Incorporated also introduced DMTH4008LFDFWQ and DMTH6016LFDFWQ automotive-compliant MOSFETs packed in DFN2020.

 Field effects transistors (FETs) in mixer circuits regulate low intermodulation distortions. Because of their short coupling capacitors, FETs are employed in low-frequency amplifiers. Because it is a voltage-controlled device, it is used as a voltage

variable resistor in operational amplifiers. Due to the Static Electricity, Field Effect Transistors can be damaged.

 COVID-19 has also impacted the global supply chain of major electronic brands. China is one of the largest producers and exporters of various electronics input supplies such as field effect transistors, capacitors, diodes, rectifiers, amplifiers etc. Due to the continuous production standstill in China, several electronic manufacturers in the United States and Europe have been compelled to halt production manufacturing of finished electronic items like TVs, Smart Phones, and mobile phone adaptors resulting in a demand-supply gap in electronic products.

Field Effect Transistor Market Trends

The Automotive Segment is Expected to Drive the Market Growth

 The Field Effect Transistor market is being influenced by the automobile industry's rising technical improvements. Cars using traditional IC engines only require a few electrical components.

 With the increased adoption of Electric vehicles and Hybrid vehicles, automotive is one of the rising segments of the Field Effect Transistor industry. It is expected to have a significant share. Innovations like autonomous car technology, regenerative braking, and the integration of various sensors have raised the demand for Field-Effect Transistors. Additionally, government rules requiring advanced driver assistance systems (ADAS) have supported the segment's growth. Electronic components in the automobile sector are vital for safety and are exposed to high voltages and extreme Conditions. Manufacturers have responded by creating a new range of Field Effect Transistors for automotive applications.

 In December 2021, STPOWER silicon-carbide (SiC) MOSFETs were launched by STMicroelectronics, improving the power electronic devices for electric-vehicle (EV) powertrains and other applications where power density, energy efficiency, and reliability are critical to meeting goal criteria.

 The electric vehicle market is very competitive, and new manufacturers are constantly pushing the boundaries of innovation. Porsche, for instance, built its Taycan with an 800 V system, although many modern electric vehicles use 400 V batteries. As a result, established automotive component makers developed Field Effect Transistor offerings for the automobile market.

 In March 2021, Alpha & Omega Semiconductor Limited, a designer, pioneer, and global supplier of power semiconductors, power ICs, and digital power solutions, introduced AEC-Q101 approved 1200V SiC MOSFETs in an optimized TO-247-4L package. It's designed for electric vehicle (EV) onboard chargers, motor drive inverters, and off-board charging stations that demand excellent efficiency and dependability. For an automotive-qualified TO-247-4L with a typical gate drive of 15V, the 1200V SiC MOSFETs provide low on-resistance.

 In May 2022, in Mexico, BMW planned to add electric vehicles. BMW is investing one billion USD in Mexico, and the assembly factory could become the automaker's next exclusive electric car manufacturing facility. An increase in the manufacturing of electric cars boosts the Field Effect Transistor Market.

North America is Expected to Register the Major Growth

 North America is one of the most important markets for Field-Effect Transistors because of the region's automotive solid and other sectors. On Semiconductor Corporation, Diodes Incorporated, and D3 Semiconductor LLC are among the firms based in the area.

 The semiconductor industry and Field Effect Transistor manufacturing rely heavily on the United States for production, design,

and research. The region's significance fuels demand for electronic equipment exports and increasing end-user sectors that utilize large amounts of Field Effect Transistors, such as consumer electronics and automobiles.

 The semiconductor business (including discrete) is one of the most significant exporting sectors in the United States. According to the International Trade Association (ITA), most semiconductors (more than 82%) come from direct US exports and sales by US-owned subsidiaries in other countries. They include US-based R&D, IP development, design, and other high-value-added activities. According to the World Semiconductor Trade Statistics (WSTS) organization, the area shares roughly 22% of the semiconductor industry.

 The current COVID-19 pandemic has resulted in factory closures. For both factories, closures have resulted from the recent outbreak of COVID-19. China utilizes around 40-50% of worldwide semiconductor output for domestic and export manufacturing. As a result, semiconductor companies in the United States have significant revenue exposure to China.

 Furthermore, plant closures or underutilization of production facilities may result in order reductions and, as a result, fewer or delayed sales. Semiconductor companies with significant sales exposure to Apple, Qualcomm Inc., and Broadcom Inc. might be impacted in the short run. Overall, powerful electronics and semiconductor firms like Texas Instruments drive the Field Effect Transistor industry in the area, with end-consumers from numerous sectors such as consumer electronics and automotive parts. Demand is fueled by consumer demand throughout the region.

Field Effect Transistor Market Competitor Analysis

The Global Field Effect Transistor market is highly fragmented, with numerous Field Effect Transistor manufacturers providing the product. The companies are continuously investing in the product and technology to promote sustainable environmental growth and prevent environmental hazards. The companies are also acquiring other companies that specifically deal with these products to boost the market's share.

June 2022 - Scientists from the Institute of Industrial Science at The University of Tokyo fabricated three-dimensional vertically formed field-effect transistors to produce high-density data storage devices by ferroelectric gate insulator and atomic-layer-deposited oxide semiconductor channel.

Additional Benefits:

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

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