

Global Rf & Microwave Power Transistors 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 RF & Microwave Power Transistors market is expected to grow at a CAGR of 6.75% over the forecast period (2022-2027). RF transistors are used in devices such as stereo amplifiers, radio transmitters, television monitors and so on to handle high-power radio frequency (RF) signals. In applications such as radar, telecommunications, and wireless technology, RF and microwave transistors are used to amplify or switch electronic signals and power. These transistors play a role in the proper functioning of the devices.

□ The major drivers of the Global RF/Microwave Power Transistor for 5G market include rising demand, increased investment in research & development, and rapid approval of new technologies. The RF microwave power transistor amplifies or switches high-power signals in aerospace and the military. Radar systems, communication systems, electronic warfare systems, and missile guidance systems all employ it as a transmitter or receiver. The RF microwave power transistor increases efficiency while reducing size and weight in these systems.

□ In communication, the RF Microwave Power Transistor is used to amplify or switch the power of microwave transmission. It can also be used to control the signal's direction and as an amplifier or oscillator. It can also be used as a switching device to direct signals between different areas of a circuit. The RF Microwave Power Transistor is an important component in microwave system design.

□ Due to the recent increase in information speed and capacity, the output of high-power semiconductor modules used in information communication and power fields as well as the number of semiconductor chips mounted per unit area, are increasing, and overheating has emerged as an important issue. In order to produce high thermal conductivity and low thermal expansion characteristics, metal-diamond composite materials are attracting attention.

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□ The Good System has managed to produce the world's best heat dissipation attributes, with 800W/mK-class thermal conductivity and 8PPM thermal expansion coefficient, as a heat dissipation material for radiofrequency (RF) power transistors for 5G wireless communication and high-power insulated-gate bipolar transistors (IGBT) for electric vehicles.

□ Further, the covid-19 pandemic significantly impacted the market for power transistors. Due to the slowdown and lack of workforce availability around the world, semiconductor and electronic manufacturing facilities came to a standstill. COVID-19 resulted in a major and sustained dip in factory utilization, travel prohibitions, and production site closures, resulting in a slowdown in the power transmission industry's growth.

RF & Microwave Power Transistor Market Trends

Communication Sector is Expected to Boost the Market

□ As stated by Ericsson, 5G is anticipated to be the most widely deployed mobile communication technology in history, covering roughly 75% of the global population by 2027.

□ The 5G enabled devices market is analyzed to grow rapidly in the coming years, owing to rising data processing requirements and increased consumption. To accommodate the growing demand for 5G enabled devices, semiconductor manufacturers for 5G enabled smartphones will experience increased demand for 5G chips. The rise in semiconductor chips will help to advance the semiconductor industry, boosting demand for power transistors.

□ For 5G and 6G infrastructure, RF GaN-on-Silicon has significant potential. Early-generation RF power amplifiers were dominated by the long-term incumbent RF power technology, laterally-diffused metal-oxide-semiconductor (LDMOS) (PAs). GaN can provide improved RF characteristics and much higher output power for these RF PAs than LDMOS. Additionally, it can be made on silicon or silicon-carbide (SiC) wafers.

□ In December 2021, Microchip Technology Inc. added additional MMICs and discrete transistors to its Gallium Nitride (GaN) Radio Frequency (RF) power device portfolio, spanning frequencies up to 20 gigahertz (GHz). The devices combine high power-added efficiency (PAE) and high linearity to achieve new levels of performance in a wide range of applications, including 5G, electronic warfare, satellite communications, commercial and defense radar systems, and test equipment.

Asia-Pacific is Expected to Register the Fastest Growth Rate

□ Asia-Pacific is the fastest-growing area in the global power transistors market due to the presence of large businesses such as Toshiba Corporation and Mitsubishi Electric Corporation. China, Japan, Taiwan, and South Korea are among a few countries that dominate the semiconductor manufacturing industry, thereby impacting the market. The region also has a significant market for smartphones and 5G technologies and an increase in manufacturing expenditures.

□ Due to the continued transfer of various electronic equipment to China, semiconductor consumption in Japan, South Korea, and China is fast increasing in comparison to other nations in the area. Furthermore, Asia is home to the world's top five consumer electronics sectors, presenting huge prospects for semiconductor adoption across the region in the forecast period.

□ According to a three-year plan released in July 2021 by ten government entities, China planned to have 560 million 5G mobile customers by the end of 2023 and a 35 percent penetration rate of the fast wireless technology among large industrial firms. It stated that the use of 5G in various industries is significant in driving the digital, networked, and intelligent transformation of the economy and society.

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□ The semiconductor market in Taiwan is also growing due to support from the government. In April 2021, the National development fund announced that between 2021 and 2025, companies of Taiwan planned USD 107 billion investment for the semiconductor industry's growth. The government is also assisting in developing new semiconductor technologies with funding support as well as talent recruitment programs.

RF & Microwave Power Transistor Market Competitor Analysis

The RF and Microwave Power Transistors Market is a highly competitive market due to the presence of significant players such as Onsemi Corporation, 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.

□ May 2022 - STMicroelectronics and MACOM Technology Solutions Holdings Inc. announced that radio-frequency Gallium-Nitride-on-Si (RF GaN-on-Si) prototypes had been successfully produced. ST and MACOM will continue to collaborate and strengthen the relationship as a result of this accomplishment.

□ July 2021 - STMicroelectronics expanded the STPOWER family of RF LDMOS Power Transistors with a number of additional products. Three product series of transistors have been developed for RF power amplifiers (PAs) in a variety of industrial and commercial applications. The company's RF LDMOS devices combine a short conduction-channel length with a high breakdown voltage, offering high efficiency and low thermal resistance while being packed to withstand high RF power.

Additional Benefits:

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

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