Global Microcontroller (MCU) - Market Share Analysis, Industry Trends & Statistics, Growth Forecasts 2019 - 2029

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Report description:

The Global Microcontroller Market size is estimated at USD 31.45 billion in 2024, and is expected to reach USD 51.81 billion by 2029, growing at a CAGR of 10.5% during the forecast period (2024-2029).

The industry scenario is constantly evolving, driven by Industry 4.0 and connected tech. Manufacturers are continually integrating new remote features to their products, and supply chain components for real-time monitoring and microcontrollers facilitate the ease of attaching compact control units to the systems.

Key Highlights
-Microcontroller refers to compact computing units that control several peripherals and embedded systems, including home appliances, motor vehicles, robots, industrial equipment, and other devices. The unit comprises a processing unit, Input/Output (I/O) ports, on-chip storage, wireless communication modules, and several other integrative modules, which can be introduced for achieving the custom functionalities.
-The increase in the use of sensors for capturing data for monitoring various process elements is one of the fundamental driving forces for microcontrollers. The microcontroller is customized for specific usage, and the collected data is processed and shared with other aspects of the process chain. For instance, companies are looking forward to integrating RADAR, Lidar, and cameras to achieve a complete sense of the environment for autonomous vehicles and robots. These sensors are operated and interfaced with the help of microcontrollers dedicated to collecting, processing, and transferring data.
-Furthermore, the required transfer speed and the amount of data processed make room for different types of microcontrollers belonging to different architecture scales. The market majorly uses 8-bit, 16-bit, and 32-bit based microcontrollers depending upon the need of the application. Companies offer customized and ready-to-use solutions for industries, following the semiconductor manufacturing standards of wafer diameter like 200 mm.

-The COVID-19 pandemic witnessed an increment in the use of Work-from-Home electronics equipment, which shifted the focus of semiconductor manufacturing units to produce more equipment for the same. This turned the focus from other vital industries relying on microcontrollers and semiconductor chips, like automotive and industrial automation. The industry is rapidly distributing the supply chain allocation for reviving the affected industries. The process should follow through 2022 and mid-2023, witnessing promising prospects for microcontrollers globally.

Microcontroller MCU Market Trends

Automotive Applications to Drive the MCU Industry

- Introducing new-age technology in the automotive industry has encouraged the involvement of semiconductors and microcontrollers. According to IEEE Explore, an average of more than 50 Microcontroller Units (MCUs) are used in automobiles. The inclusions of connected tech, AI, autonomous driving, and other IoT services have created enormous demand for the deployment of MCUs.
- The MCUs can be configured per any requirement based on the architecture's versatility and functionality. The input/output (I/O) ports, microprocessor, connectivity options, technological platform, range of operation, power consumption, and other differentiating factors add to the customizability and flexibility of use for the MCUs in automobiles. Each MCU serves a dedicated purpose.
- In the wake of surging fuel prices and climate change, carmakers are optimizing fuel consumption by monitoring the fuel efficiency of vehicles in real-time with the help of Electronic Control Units (ECUs), which are forms of microcontrollers. An ECU is the central controlling unit in modern vehicles responsible for monitoring various vehicular functions like fueling, infotainment, remote functionality, autonomous driving functions, parking aids, and electronic driving aids (like lane-keep assist, park-assist features, etc.), and others. Hence, ECUs demand highly reliable and robust hardware to run compatible platforms and software to achieve the required crucial functions.
- Autonomous vehicles and sensor-driven safety features like automatic brake assist, collision avoidance systems, etc., are the driving factors in the future of automobiles, incorporating MCUs. The MCUs housing sensors related to each function offer local computing followed by temporary data storage and transfer to the master controlling units or remote servers.
- MCUs with automobile sensors also demand more robust and reliable quality promising accurate results and operation in various environmental constraints. For instance, in April 2022, Honda opted R-Car and RH850 by Renesas Electronics for use in the Honda SENSING 360 omnidirectional safety and driver assistance system. The 40 nm-process MCU provides good embedded security at low power consumption and high scalability for advanced automotive applications.

Asia Pacific to Exhibit the Fastest Growth in the Market

- The Asia Pacific has emerged as a significant hub for semiconductor manufacturing and semiconductor-based devices. The region is home to some of the most prominent electronics and automotive manufacturing companies. Hence, the area contributes significantly through various applications of microcontrollers like automotive, industrial automation, pharmaceutical, consumer electronics, robotics, and other end-user industries.
- China is one of the largest manufacturing giants dominating the region in the number of manufacturing units operational for many industries. With the US-China Trade war, China has been lately focussing on motivating domestic manufacturing of microcontrollers. Hence, local manufacturers are following large-scale policies of vehicle electrification and others, creating high demands for MCUs, and boosting domestic MCU manufacturing.
- APAC comprises chief contract-based semiconductor manufacturers like Taiwan Semiconductor Manufacturing Company (TSMC).

TSMC accounts for manufacturing more than 70% of the global microcontrollers sold by significant market players, like NXP Semiconductors, Texas Instruments, STMicroelectronics, etc. Other regional manufacturers comprise Foxconn, MediaTek, Qualcomm, and others, contributing significantly to the region's growth.
- Companies in this region are looking at constant innovation and upgrades to keep up with global microcontrollers' industrial evolution. For instance, Japanese semiconductor manufacturer Renesas Electronics announced a higher investment in manufacturing capacity by more than 50% by 2023. The company will focus on producing more high-end microcontrollers and other vital components for cars and electronics. Renesas aims for 40,000 200mm wafers a month by procuring more lines for outsourced production at chip foundries.

Microcontroller MCU Industry Overview

With their wide-scale availability of offerings, the wide range of applications of microcontrollers contributes to intense rivalry among the key market players. The major providers are in the process of the constant evolution of products, following different strategies to capture the market. The players are looking forward to strategic collaboration with other brands and joint product developments for coming up with problem-solving solutions.

- May 2022 - NXP Semiconductors' Multi-Protocol i. MX RT crossover microcontroller, featuring an integrated time-sensitive switch for networking, unifies Industrial IoT Communication. NXP Semiconductors announced its new i. MX RT1180 crossover microcontroller. It is the first microcontroller with an integrated Gb time-sensitive networking (TSN) switch, allowing both industrial real-time and time-sensitive communications, supporting multiple communications protocols. It aims to bridge the gap between existing industrial and Industry 4.0 systems. The i.MX RT1180 provides the required connectivity, supporting multiple protocols. To accomplish this, driving a unified and safe industrial IoT communication environment at all edges of the plant.
- April 2022 - STMicroelectronics, an international semiconductor provider, is serving customers across the electronics applications industry. Seong Ji Industrial, a global one-stop supplier of enterprise-grade wireless connectivity solutions, announced the LSM module series from SeongJi powered by ST's STM32WL for sub-GHz LPWAN. The solution marks the world's first Sigfox and LoRa System-on-Chip (SoC). The LSM100A, LSM110A, and LSM200A modules, powered by STM32WL, combine low power consumption, small size, and cost efficiency to optimize sub-GHz wireless connectivity catering to a broad spectrum of industrial and consumer applications. The modules support both Sigfox and LoRa LPWAN technologies.

Additional Benefits:

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

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