

Global AI Server MOSFET Supply, Demand and Key Producers, 2026-2032

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Abstracts

The global AI Server MOSFET market size is expected to reach \$ 4677 million by 2032, rising at a market growth of 22.0% CAGR during the forecast period (2026-2032).

In 2025, global AI Server MOSFET production reached approximately 991.61 million units with average price of 1.01 USD per unit.

AI Server MOSFET refers to power semiconductor devices used in AI servers for power conversion, power distribution, and load management. Their core function is to enable high-frequency switching, energy conversion, and system-level efficiency improvement. Key application points include PSUs, battery backup units, 48V power distribution, hot-swap and OR-ing protection, intermediate bus conversion, and VRM stages for CPUs, GPUs, ASICs, and HBM-related power rails. By product form, they can be divided into discrete MOSFETs, DrMOS, and smart power stages; by material, silicon-based MOSFETs still dominate, while SiC and GaN are gradually entering selected high-voltage and high-efficiency scenarios. Compared with conventional servers, AI servers feature much higher power density and stricter transient response requirements, which place tighter demands on RDS(on), switching loss, thermal performance, and package-level consistency.

The upstream of the AI Server MOSFET industry chain mainly includes wafer fabrication, epitaxial materials, metal targets, leadframes, packaging substrates, test equipment, and EDA/IP infrastructure. Among these, wafer process technology, packaging materials, and thermal management capability directly influence device performance and cost. The midstream consists of MOSFET design, manufacturing, and packaging/testing players, including both IDM companies and fabless firms relying on outsourced foundry and OSAT partners. Their product portfolios range from low-voltage

synchronous rectification MOSFETs to medium- and high-voltage devices used in 48V server architectures. Downstream participants include power module vendors, server PSU suppliers, motherboard and accelerator card makers, ODM/OEM manufacturers, and cloud or hyperscale data center operators. Overall, the increasing need for high-efficiency power delivery in AI servers means MOSFETs are no longer just standalone components, but are becoming deeply integrated into server power architecture, thermal design, and platform-level validation systems.

The MOSFET market for AI servers is experiencing a period of robust growth, driven by global investment in AI computing power. Its prospects are deeply tied to the deployment of high-performance computing clusters, the demand for large-scale model training, and the widespread adoption of edge inference devices. These trends place unprecedented demands on chips for ultra-high switching frequencies, extremely low conduction losses, and superior thermal performance. Leveraging its leading cloud computing giants, leading chip design companies, and active venture capital, the North American market maintains a dominant position at the source of technological innovation and the high-end market ecosystem, controlling the core value of the industry chain. The Asia-Pacific market, particularly Taiwan and mainland China, dominates production and large-scale applications, driven by their world-leading semiconductor manufacturing capabilities, massive data center construction demand, and well-developed electronics supply chains, making them the region with the strongest demand growth. European companies maintain technological influence in specific industrial and automotive applications, while the global innovation network exhibits a multi-polar, interconnected, and complementary structure. Open source ecosystems and standards alliances are accelerating technology diffusion and collaborative development.

This report studies the global AI Server MOSFET production, demand, key manufacturers, and key regions.

This report is a detailed and comprehensive analysis of the world market for AI Server MOSFET and provides market size (US\$ million) and Year-over-Year (YoY) Growth, considering 2025 as the base year. This report explores demand trends and competition, as well as details the characteristics of AI Server MOSFET that contribute to its increasing demand across many markets.

Highlights and key features of the study

Global AI Server MOSFET total production and demand, 2021-2032, (Million Units)

Global AI Server MOSFET total production value, 2021-2032, (USD Million)

Global AI Server MOSFET production by region & country, production, value, CAGR, 2021-2032, (USD Million) & (Million Units), (based on production site)

Global AI Server MOSFET consumption by region & country, CAGR, 2021-2032 & (Million Units)

U.S. VS China: AI Server MOSFET domestic production, consumption, key domestic manufacturers and share

Global AI Server MOSFET production by manufacturer, production, price, value and market share 2021-2026, (USD Million) & (Million Units)

Global AI Server MOSFET production by Type, production, value, CAGR, 2021-2032, (USD Million) & (Million Units)

Global AI Server MOSFET production by Application, production, value, CAGR, 2021-2032, (USD Million) & (Million Units)

This report profiles key players in the global AI Server MOSFET market based on the following parameters - company overview, production, value, price, gross margin, product portfolio, geographical presence, and key developments. Key companies covered as a part of this study include Infineon Technologies, onsemi, Vishay, Alpha & Omega Semiconductor, Nexperia, STMicroelectronics, Wolfspeed, Monolithic Power Systems, China Resources Microelectronics Limited, Wuxi NCE Power Co., Ltd, etc.

This report also provides key insights about market drivers, restraints, opportunities, new product launches or approvals.

Stakeholders would have ease in decision-making through various strategy matrices used in analyzing the World AI Server MOSFET market

Detailed Segmentation:

Each section contains quantitative market data including market by value (US\$ Millions), volume (production, consumption) & (Million Units) and average price (US\$/Unit) by manufacturer, by Type, and by Application. Data is given for the years 2021-2032 by year with 2025 as the base year, 2026 as the estimate year, and 2027-2032 as the forecast year.

Global AI Server MOSFET Market, By Region:

United States

China

Europe

Japan

South Korea

ASEAN

India

Rest of World

Global AI Server MOSFET Market, Segmentation by Type:

Si MOSFET

SiC MOSFET

GaN MOSFET

Global AI Server MOSFET Market, Segmentation by Structure:

Discrete MOSFET

DRMOS

Global AI Server MOSFET Market, Segmentation by Voltage:

High-voltage Section

Low-voltage Section

Global AI Server MOSFET Market, Segmentation by Application:

PSU

Hot-swap

CPU/GPU VRM

Others

Companies Profiled:

Infineon Technologies

onsemi

Vishay

Alpha & Omega Semiconductor

Nexperia

STMicroelectronics

Wolfspeed

Monolithic Power Systems

China Resources Microelectronics Limited

Wuxi NCE Power Co., Ltd

Advanced Power Electronics Co., Ltd.

TI

JoulWatt

ROHM

Yangjie Electronic Technology Co., Ltd.

Navitas

PANJIT International Inc

Suzhou Oriental Semiconductor Company Limited

Key Questions Answered:

1. How big is the global AI Server MOSFET market?
2. What is the demand of the global AI Server MOSFET market?
3. What is the year over year growth of the global AI Server MOSFET market?
4. What is the production and production value of the global AI Server MOSFET market?
5. Who are the key producers in the global AI Server MOSFET market?
6. What are the growth factors driving the market demand?

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