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Photonic Integrated Circuits for LiDAR Market Opportunity, Growth Drivers, Industry Trend Analysis, and Forecast 2025 - 2034

https://marketpublishers.com/r/PAACF593DD81EN.html
Date: October 2025
Pages: 190
Price: US$ 4,850.00 (Single User License)
ID: PAACF593DD81EN

Abstracts

The Global Photonic Integrated Circuits For LiDAR Market was valued at USD 161 million in 2024 and is estimated to grow at a CAGR of 25.3% to reach USD 1.89 billion by 2034.

Rising demand for autonomous mobility, the miniaturization of LiDAR components, the rollout of 5G, and significant cost reductions are fueling widespread adoption. The industry is also experiencing notable traction due to innovations in laser and optical technologies. Progress in silicon photonics is driving a shift toward faster, compact, and more efficient LiDAR systems. Integration of photonic components onto silicon chips allows for high-speed data transmission and enhanced signal processing, critical features in applications such as vehicle autonomy, smart cities, and next-gen telecommunications infrastructure. Enhanced bandwidth and cost-effectiveness are unlocking new use cases across sectors like data centers and intelligent transportation systems. These developments are transforming how photonic systems are built and applied globally.

The silicon photonics platform segment generated USD 109.3 million in 2024. Its growth is driven by an increased need for compact form factors, high-speed optical transmission, and scalable manufacturing processes. Trends in integrated optical circuits and cost-efficient production continue to influence this segment. Companies are advised to focus on refining silicon photonics for real-time data transmission and scalable solutions to meet telecom and automotive sector demands.

In 2024, the frequency-modulated continuous wave (FMCW) systems segment generated USD 62.5 million. Its growth stems from rising demand for advanced

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automotive sensing systems offering high resolution and long-range detection. These systems are energy-efficient and enable precise measurements, making them vital for evolving applications in autonomous driving and safety-critical use cases. Prioritizing investment in next-gen FMCW systems that offer compact design, longer range, and enhanced accuracy will help manufacturers secure a competitive edge.

United States Photonic Integrated Circuits for LiDAR Market reached USD 58.3 million in 2024. The region’s stronghold is fueled by growing adoption of autonomous vehicles, advances in smart infrastructure, rising data center requirements, and support from leading semiconductor companies. The country continues to lead in innovation surrounding photonic and LiDAR technology integration. Manufacturers aiming to scale operations are recommended to accelerate research in chip-level integration, data center connectivity, and smart mobility applications to sustain their lead in the North America market.

Notable players shaping Photonic Integrated Circuits for LiDAR Market include Intel Corporation, Ayar Labs, Scintil Photonics, TSMC, VLC Photonics (Hitachi High-Tech), IBM, GlobalFoundries, AMS (Osram), Infinera Corporation, STMicroelectronics, Rockley Photonics, Cisco Systems (Acacia), X-FAB Silicon Foundries, Tower Semiconductor, SiLC Technologies, LIGENTEC, LightIC Technologies, Effect Photonics, Hamamatsu Photonics, and Coherent Corporation. Key strategies adopted by companies in the Photonic Integrated Circuits for LiDAR Market include forming strategic alliances with automotive OEMs and telecom leaders to drive adoption at scale. Many are heavily investing in R&D to accelerate the development of compact and low-cost silicon photonics platforms and next-generation FMCW-based LiDAR solutions. Scaling production capabilities while ensuring compatibility with semiconductor fabrication processes is a priority.

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