

The Global Market for Semiconductor Lasers 2025-2035

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Abstracts

The semiconductor laser industry is emerging as a pivotal force that is shaping the future of diverse sectors, from communication and sensing to industrial applications and medical diagnostics. As the global demand for high-performance, energy-efficient, and versatile laser solutions continues to soar, the semiconductor laser market is poised for significant growth, projected to potentially reach >\$9 billion by 2035.

At the heart of this market lies a highly diversified and fragmented ecosystem, where manufacturers must navigate a complex web of technological advancements, application-specific requirements, and evolving regulatory landscapes. From the development of advanced VCSEL and EEL technologies to the integration of photonic integrated circuits (PICs), the semiconductor laser industry is constantly pushing the boundaries of what is possible, unlocking new opportunities across a wide range of industries.

In optical communication, semiconductor lasers are at the forefront of the shift towards higher-speed data transmission, with VCSELs and EELs progressing from 100G/lane to 200G/lane and beyond. The integration of AI-powered optical communication solutions is further driving the demand for semiconductor laser-based photonic integrated circuits.

Beyond communication, semiconductor lasers are proving to be indispensable in the automotive and mobility sectors, where they are enabling cutting-edge LiDAR technologies for advanced driver assistance systems (ADAS) and autonomous driving. As the competition heats up between EELs, VCSELs, and emerging FMCW LiDAR solutions, manufacturers are striving to deliver higher power, efficiency, and wavelength diversity to meet the stringent performance requirements of the automotive industry.

The medical and industrial sectors have also witnessed a surge in the adoption of semiconductor lasers, with FP and QCL lasers dominating applications ranging from material processing to surgical procedures. These laser technologies are continuously being refined, with the goal of reaching 20W power output by 2026 to drive down system costs and enhance their versatility.

Underpinning the growth of the semiconductor laser market is the critical role played by the substrate industry, which is focused on scaling to larger diameters to meet the increasing demands for both volume and quality. As the push for larger diameters accelerates, the substrate providers for materials such as InP, GaAs, GaN, and GaSb are working tirelessly to adapt and meet the evolving needs of the semiconductor laser ecosystem.

The semiconductor laser industry is poised for a bright future, as it continues to transform key industries and unlock new possibilities. With ongoing advancements in technology, the expansion of applications, and the integration of cutting-edge solutions, the market is set to reach \$5.3 billion by 2035, cementing its position as a pivotal driver of innovation across a diverse array of sectors.

The Global Market for Semiconductor Lasers 2025-2035 examines the semiconductor laser industry's evolution and market dynamics through 2035. The report provides granular market forecasts, technology assessments, and strategic insights for stakeholders across the value chain. Primary coverage includes VCSEL, Edge-Emitting Laser, and Quantum Cascade Laser technologies, with detailed analysis of their applications in optical communications, automotive, consumer electronics, industrial, medical, and aerospace/defense sectors.

Report contents include:

Market size and growth projections (2024-2035)

Technology segmentation and evolution trends

Application-specific demand drivers and constraints

Regional market dynamics and opportunities

Material systems and substrate technologies

Supply chain analysis and manufacturing considerations

Market Drivers and Opportunities:

Data center expansion and 5G infrastructure deployment

Automotive LiDAR and autonomous vehicle sensors

AR/VR applications in consumer electronics

Medical diagnostics and therapeutic applications

Industrial processing and manufacturing automation

Defense and aerospace systems

Technology Focus Areas:

VCSEL advancements for 3D sensing and datacoms

High-power EEL developments for industrial applications

QCL innovations for spectroscopy and sensing

Photonic integrated circuit integration

Novel substrate materials and manufacturing processes

Wavelength expansion and power scaling

Strategic Insights:

Competitive landscape analysis

Investment patterns and M&A activity

Supply chain vulnerabilities and mitigation strategies

Regional manufacturing capabilities

Regulatory environment and standards development

Emerging application opportunities

The report addresses critical industry challenges including:

Substrate scaling and material availability

Manufacturing yield improvement

Cost reduction strategies

Supply chain resilience

Technical barriers to market entry

Environmental and regulatory compliance

Profiles of over 160 companies. Companies profiled include 3SPTechnologies, A.L.S., Accelink, Access Pacific, Adtech Optics, Akela Laser, Alight Tech, Allwave Lasers, Alpes Lasers, Ambition Photonics, Amonics, Ams-OSRAM, Applied Optoelectronics, Arima Lasers, Astrum LT, AXT, Bandwidth10, Bright Solutions, Broadcom, Brolis Semiconductors, BWT, Changelight, Cisco (Acacia), CNI Optoelectronics, Coherent, DenseLight Semiconductors, Deray Optoelectronics, Diode Laser Concepts, DustPhotonics, Eblana Photonics, Egismos Technology, Emcore, Epistar/Jingcheng, Enlighthra, EO Technics, Femtum, Fibercom, FITELE-Furukawa, FLIR, Focuslight, Fluence Technology, Fuji Xerox, Global Communication Semiconductor, Gooch & Housego, Halo Industries, Hamamatsu, HC Semitek, Heyiled, HJ Optronics, HLJ, Infinera, Inneos/Zephyr Photonics, Innolume, Innovative Photonic Solutions, InPhenix, Intense Photonics, IPG Photonics, Jenoptik, JX Nippon, Kyocera SLD Laser, LaserComponents, Laserline, Lasermate, LaserMaxDefense, LasersCom, Lasertel, LaSiC, LDX Optronics, Lemon Photonics, Lextar, Lidrotec, Liteon, Lumentum, Lumibird, Lumics, Lumispot, LuxNet, Masimo Semiconductor, Ming Chuang Intelligent, Mitsubishi Electric, MKS Instruments, Modulight, Nanoplus, NcodiN, Necsel, Nichia, NKT Photonics, nLIGHT, Nolatech, Norcada, Norlase, Northrop Grumman, Octlight, Oeca, Optek Technology, OptiGOT, OptiPulse, OPTOENERGY, Optoway Technology, Optowell, OQmented, OSI Laser Diode,

Osram, Panasonic Semiconductor, PD-LD, Pegasus Lasersysteme, Photodigm, POET Technology, Praevium Research, Ranovus, QD Laser, Qianmu Laser, Qianzhao Optoelectronics, QPC Lasers, QSI Laser, QUANTier, Quantum Light Instruments, Quantune Technologies, Quside, Raycan, Raysees Technology, Redfern Integrated Optics, Ricoh, Rohm Semiconductor, Sacher Lasertechnik, San'an and more.....

Contents

1 EXECUTIVE SUMMARY

- 1.1 Market overview
- 1.2 Market forecasts
 - 1.2.1 Laser bare-dies and wafers
 - 1.2.2 By market
 - 1.2.3 By region
 - 1.2.4 By technology
 - 1.2.5 By material
 - 1.2.6 By wavelength

2 INTRODUCTION

- 2.1 The Evolution of Semiconductor Lasers
- 2.2 Applications
 - 2.2.1 Optical Communication
 - 2.2.2 Industrial Processing
 - 2.2.3 Medical Diagnostics and Therapeutics
 - 2.2.4 Consumer Electronics
 - 2.2.5 Automotive and Mobility
 - 2.2.6 Aerospace and Defense
- 2.3 Key Trends Shaping the Semiconductor Laser Market
 - 2.3.1 Advancements in Laser Technologies
 - 2.3.2 Integration of Photonic Integrated Circuits
 - 2.3.3 Increasing Demand for Energy-Efficient and Compact Solutions
 - 2.3.4 Geopolitical Factors and Supply Chain Challenges

3 SEMICONDUCTOR LASER TECHNOLOGIES

- 3.1 Vertical-Cavity Surface-Emitting Lasers (VCSELs)
 - 3.1.1 Principle of Operation and Classification
 - 3.1.2 Advancements in VCSEL Technology
 - 3.1.2.1 Increasing Power Density through Multijunction Designs
 - 3.1.2.2 Extending VCSEL Wavelengths from NIR to SWIR
 - 3.1.2.3 Challenges in Developing GaN-based Visible VCSELs
 - 3.1.3 VCSEL Applications and Competitive Landscape
 - 3.1.3.1 Automotive LiDAR

- 3.1.3.2 Optical Communication (Datacom and Telecom)
- 3.1.3.3 Consumer Electronics
- 3.1.3.4 Industrial Sensing and Illumination
- 3.2 Edge-Emitting Lasers (EELs)
 - 3.2.1 Principle of Operation and Classification
 - 3.2.1.1 Distributed Feedback (DFB) Lasers
 - 3.2.1.2 Distributed Bragg Reflector (DBR) Lasers
 - 3.2.1.3 Fabry-Pérot (FP) Lasers
 - 3.2.2 EEL Advancements in Optical Communication
 - 3.2.2.1 Directly Modulated Lasers (DMLs)
 - 3.2.2.2 Externally Modulated Lasers (EMTs)
 - 3.2.2.3 Continuous-Wave Distributed Feedback (CW-DFB) Lasers
 - 3.2.3 EEL Applications in Industrial, Medical, and Automotive Sectors
- 3.3 Quantum Cascade Lasers (QCLs)
 - 3.3.1 Principle of Operation and Wavelength Coverage
 - 3.3.2 QCL Applications in Industrial, Medical, and Defense

4 SEMICONDUCTOR LASER SUBSTRATE INDUSTRY

- 4.1 GaAs Substrates
 - 4.1.1 Scaling to Larger Diameters
 - 4.1.2 Addressing the Increasing Demand for VCSELs
- 4.2 InP Substrates
 - 4.2.1 Challenges and Opportunities in InP Substrate Scaling
 - 4.2.2 Impact on Telecommunication and Data Communication Applications
- 4.3 GaSb Substrates
 - 4.3.1 Wavelength Coverage and Use Cases
 - 4.3.2 Substrate Scaling and Manufacturing Considerations
- 4.4 GaN Substrates
 - 4.4.1 GaN-based Laser Diodes for Displays and Lighting
 - 4.4.2 Substrate Availability and Technological Advancements
- 4.5 Optical Communication
 - 4.5.1 Datacom Applications
 - 4.5.1.1 Data Center Interconnects
 - 4.5.1.2 Ethernet and Fiber Channel Transceivers
 - 4.5.1.3 Emerging 400G and 800G Datacom Trends
 - 4.5.2 Telecom Applications
 - 4.5.2.1 Wavelength-Division Multiplexing (WDM)
 - 4.5.2.2 Fiber-to-the-Home (FTTH) and 5G Backhaul

- 4.5.2.3 Submarine Cable Transmission
- 4.6 Mobile and Consumer Electronics
 - 4.6.1 Smartphone Cameras and Proximity Sensors
 - 4.6.2 Augmented and Virtual Reality
 - 4.6.3 Laser Projectors and Display Technologies
- 4.7 Automotive and Mobility
 - 4.7.1 ADAS and Autonomous Driving
 - 4.7.1.1 LiDAR Systems
 - 4.7.1.2 Laser Radar (LADAR)
 - 4.7.2 In-Cabin Sensing and Illumination
 - 4.7.3 Laser-based Headlights and Taillights
- 4.8 Industrial Applications
 - 4.8.1 Material Processing
 - 4.8.1.1 Cutting, Welding, and Drilling
 - 4.8.1.2 Additive Manufacturing
 - 4.8.2 Laser Marking and Engraving
 - 4.8.3 Laser-based Sensing and Monitoring
- 4.9 Medical Applications
 - 4.9.1 Therapeutic Lasers
 - 4.9.1.1 Surgical Lasers
 - 4.9.1.2 Aesthetic and Dermatological Lasers
 - 4.9.2 Diagnostic Lasers
 - 4.9.2.1 Optical Coherence Tomography (OCT)
 - 4.9.2.2 Laser-based Spectroscopy
- 4.10 Aerospace and Defense
 - 4.10.1 Laser Rangefinders and Target Designators
 - 4.10.2 Laser Communications and Free-Space Optics
 - 4.10.3 Directed Energy Weapons
- 4.11 Semiconductor Laser Industry Ecosystem and Supply Chain
 - 4.11.1 Manufacturer Strategies and Vertical Integration
 - 4.11.1.1 Fully Integrated Manufacturers
 - 4.11.1.2 Foundry-based Manufacturers
 - 4.11.2 Specialized Chip Suppliers
 - 4.11.3 Key Players and their Positioning
 - 4.11.3.1 Leading Semiconductor Laser Manufacturers
 - 4.11.4 Substrate Suppliers and their Role
 - 4.11.5 Substrate Manufacturing Capabilities and Trends

5 SEMICONDUCTOR LASER MARKET FORECASTS

- 5.1 Semiconductor Laser Bare-Die Market
 - 5.1.1 Revenue Forecast by Application
 - 5.1.2 Optical Communication
 - 5.1.3 Mobile and Consumer Electronics
 - 5.1.4 Automotive and Mobility
 - 5.1.5 Industrial
 - 5.1.6 Medical
 - 5.1.7 Aerospace and Defense
- 5.2 Shipment Forecast by Application
- 5.3 Semiconductor Laser Substrate Market
- 5.4 Semiconductor Laser Market by Technology
 - 5.4.1 VCSEL
 - 5.4.2 Edge-Emitting Lasers (EELs)
 - 5.4.3 Quantum Cascade Lasers (QCLs)
 - 5.4.4 Photonic Integrated Circuits (PICs)
- 5.5 Semiconductor Laser Market by Wavelength
 - 5.5.1 Near-Infrared (NIR)
 - 5.5.2 Short-Wave Infrared (SWIR)
 - 5.5.3 Visible
- 5.6 Semiconductor Laser Market by Material System
 - 5.6.1 III-V Compounds (GaAs, InP, GaSb)
 - 5.6.2 Group IV (Si, Ge)
 - 5.6.3 III-Nitrides (GaN)

6 FUTURE OUTLOOK

- 6.1 Semiconductor Lasers as Enablers of Technological Advancements
- 6.2 Importance of Substrate Scaling and Material Innovations
- 6.3 Emerging Applications Driving Market Growth
- 6.4 Challenges in Achieving Cost Parity and Addressing Regulatory Hurdles
- 6.5 Future Opportunities and Industry Trends
 - 6.5.1 Continued Advancements in VCSEL and EEL Technologies
 - 6.5.2 Increasing Adoption of Photonic Integrated Circuits
 - 6.5.3 Integration of Semiconductor Lasers in Emerging Applications
 - 6.5.4 Advancements in Substrate Manufacturing and Material Engineering

7 COMPANY PROFILES 188 (162 COMPANY PROFILES)

8 APPENDICES

8.1 Glossary of Terms

8.2 12. List of Abbreviations

8.3 Research Methodology

9 REFERENCES

List Of Tables

LIST OF TABLES

Table 1. Global market forecast for laser bare-dies and wafers 2024-2035, revenues (US\$).

Table 2. Global market forecast for laser bare-dies and wafers 2024-2035, Units.

Table 3. Global market forecast by market segment 2024-2035, revenues (US\$).

Table 4. Global market forecast by market segment 2024-2035, Units.

Table 5. Global market forecast by region 2024-2035, revenues (US\$).

Table 6. Global market forecast by region 2024-2035, Units.

Table 7. Global market forecast by technology 2024-2035, revenues (US\$).

Table 8. Global market forecast by technology 2024-2035, Units.

Table 9. Global market forecast by material 2024-2035, revenues (US\$).

Table 10. Global market forecast by material 2024-2035, Units.

Table 11. Global market forecast by wavelength 2024-2035, revenues (US\$).

Table 12. Global market forecast by wavelength 2024-2035, Units.

Table 13. The Evolution of Semiconductor Lasers.

Table 14. Semiconductor Laser Technology Comparison.

Table 15. VCSEL Technology Advancements.

Table 16. Challenges in Scaling Up Semiconductor Laser Production.

Table 17. Challenges in Scaffolding for Semiconductor Lasers.

Table 18. EEL Technology Advancements.

Table 19. Semiconductor Laser Technologies for Optical Communication.

Table 20. Semiconductor Laser Technologies: Tunable Lasers.

Table 21. Quantum Cascade Laser (QCL) Applications.

Table 22. Datacom Applications of Semiconductor Lasers.

Table 23. Telecom Applications of Semiconductor Lasers.

Table 24. Automotive and Mobility Applications of Semiconductor Lasers.

Table 25. Industrial Applications of Semiconductor Lasers.

Table 26. Medical Applications of Semiconductor Lasers .

Table 27. Aerospace and Defense Applications of Semiconductor Lasers.

Table 28. Semiconductor Laser Packaging Types.

Table 29. Key Substrate Manufacturers.

Table 30. Semiconductor Laser Market Revenue Forecast (\$M), 2024-2035.

Table 31. Laser Bare-Die Revenue Forecast for Telecom & Infrastructure, by Application (\$M).

Table 32. Laser Bare-Die Shipment Forecast for Telecom & Infrastructure, by Application (Munits).

Table 33. Laser Bare-Die Revenue Forecast for Mobile & Consumer, by Application (\$M).

Table 34. Laser Bare-Die Shipment Forecast for Mobile & Consumer, by Application (Munits).

Table 35. Laser Bare-Die Revenue Forecast for Automotive & Mobility, by Application (\$M).

Table 36. Laser Bare-Die Shipment Forecast for Automotive & Mobility, by Application (Munits).

Table 37. Laser Bare-Die Revenue Forecast for Industrial, by Application (\$M).

Table 38. Laser Bare-Die Shipment Forecast for Industrial, by Application (Munits).

Table 39. Laser Bare-Die Revenue Forecast for Medical, by Application (\$M).

Table 40. Laser Bare-Die Shipment Forecast for Medical, by Application (Munits).

Table 41. Laser Bare-Die Revenue Forecast for Aerospace & Defense, by Application (\$M).

Table 42. Laser Bare-Die Shipment Forecast for Aerospace & Defense, by Application (Munits).

Table 43. Pump Source Laser Bare-Die Revenue Forecast for Industrial Market (\$M).

Table 44. Semiconductor Laser Shipment Forecast (Munits), 2024-2035.

Table 45. Laser Substrate ASP by Material (\$).

Table 46. Semiconductor Laser Substrate Market Revenue Forecast (\$M), 2024-2035.

Table 47. Laser Substrate Revenue Forecast by Material (\$M).

Table 48. Semiconductor Laser Substrate Shipment Forecast (Kunits), 2024-2035.

Table 49. Laser Substrate Shipment Forecast by Material (Kunits) 2024-2035.

Table 50. Laser Bare-Die Revenue Forecast by Technology (\$M).

Table 51. Laser Bare-Die Shipment Forecast by Technology (Munits).

Table 52. Laser Bare-Die Revenue Forecast by Wavelength (\$M) 2024-2035.

Table 53. Laser Bare-Die Shipment Forecast by Wavelength (Munits) 2024-2035.

Table 54. Laser Bare-Die Revenue Forecast by Material (\$M).

Table 55. Laser Bare-Die Shipment Forecast by Material (Munits).

Table 56. Challenges Facing the Semiconductor Laser Industry.

Table 57. Future Opportunities and Industry Trends.

List Of Figures

LIST OF FIGURES

Figure 1. Semiconductor laser supply chain.

Figure 2. Global market forecast for laser bare-dies and wafers 2024-2035, revenues (US\$).

Figure 3. Global market forecast for laser bare-dies and wafers 2024-2035, Units.

Figure 4. Global market forecast by market segment 2024-2035, revenues (US\$).

Figure 5. Global market forecast by market segment 2024-2035, Units.

Figure 6. Global market forecast by region 2024-2035, revenues (US\$).

Figure 7. Global market forecast by region 2024-2035, Units.

Figure 8. Global market forecast by technology 2024-2035, revenues (US\$).

Figure 9. Global market forecast by technology 2024-2035, Units.

Figure 10. Global market forecast by material 2024-2035, revenues (US\$).

Figure 11. Global market forecast by material 2024-2035, Units.

Figure 12. Global market forecast by wavelength 2024-2035, revenues (US\$).

Figure 13. Global market forecast by wavelength 2024-2035, Units.

Figure 14. Semiconductor Laser Industry Ecosystem and Supply Chain.

Figure 15. Semiconductor Laser Market Revenue Forecast (\$M), 2024-2035.

Figure 16. Laser Bare-Die Revenue Forecast for Telecom & Infrastructure, by Application (\$M).

Figure 17. Laser Bare-Die Shipment Forecast for Telecom & Infrastructure, by Application (Munits).

Figure 18. Laser Bare-Die Revenue Forecast for Mobile & Consumer, by Application (\$M).

Figure 19. Laser Bare-Die Shipment Forecast for Mobile & Consumer, by Application (Munits).

Figure 20. Laser Bare-Die Revenue Forecast for Automotive & Mobility, by Application (\$M).

Figure 21. Laser Bare-Die Shipment Forecast for Automotive & Mobility, by Application (Munits).

Figure 22. Laser Bare-Die Revenue Forecast for Industrial, by Application (\$M).

Figure 23. Laser Bare-Die Shipment Forecast for Industrial, by Application (Munits).

Figure 24. Laser Bare-Die Revenue Forecast for Medical, by Application (\$M).

Figure 25. Laser Bare-Die Shipment Forecast for Medical, by Application (Munits).

Figure 26. Laser Bare-Die Revenue Forecast for Aerospace & Defense, by Application (\$M).

Figure 27. Laser Bare-Die Shipment Forecast for Aerospace & Defense, by Application

(Munits).

Figure 28. Pump Source Laser Bare-Die Revenue Forecast for Industrial Market (\$M).

Figure 29. Semiconductor Laser Shipment Forecast (Munits), 2024-2035.

Figure 30. Laser Substrate ASP by Material (\$).

Figure 31. Semiconductor Laser Substrate Market Revenue Forecast (\$M), 2024-2035.

Figure 32. Laser Substrate Revenue Forecast by Material (\$M).

Figure 33. Semiconductor Laser Substrate Shipment Forecast (Kunits), 2024-2035.

Figure 34. Laser Substrate Shipment Forecast by Material (Kunits) 2024-2035.

Figure 35. Laser Bare-Die Revenue Forecast by Technology (\$M).

Figure 36. Laser Bare-Die Shipment Forecast by Technology (Munits).

Figure 37. Laser Bare-Die Revenue Forecast by Wavelength (\$M) 2024-2035.

Figure 38. Laser Bare-Die Shipment Forecast by Wavelength (Munits) 2024-2035.

Figure 39. Laser Bare-Die Revenue Forecast by Material (\$M).

Figure 40. Laser Bare-Die Shipment Forecast by Material (Munits).

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