

Ultrafast Lasers - Market Share Analysis, Industry Trends & Statistics, Growth Forecasts (2024 - 2029)

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Abstracts

The Ultrafast Lasers Market size is estimated at USD 2.46 billion in 2024, and is expected to reach USD 5 billion by 2029, growing at a CAGR of 15.20% during the forecast period (2024-2029).

Ultrafast lasers are a variety of lasers that emits a series or train of pulses, each lasting less than a nanosecond. They are known for their ultra-short pulse duration and high peak intensity, allowing precise and controlled material processing. They are used for cutting, drilling, ablating, and structuring various materials.

Ultrafast lasers offer high precision in material processing, allowing for extremely accurate and intricate fabrication and modification of materials. These lasers can process almost every type of material, making them versatile tools for various applications.

The market growth for ultrafast lasers is primarily driven by the increasing demand in the materials processing and semiconductor industries, finding applications in several end users like automotive, consumer electronics, communications technology, and healthcare. The high dimensional accuracy enabled by ultrafast lasers and micromachining are significant factors boosting the demand for ultrafast lasers. These lasers are used for photomask repairs in the semiconductor industry. They are also employed for slicing and dicing activities

The demand for smaller, more complex components necessitates a higher level of dimensional accuracy, which ultrafast lasers deliver with their ultrashort pulse durations and minimal heat-affected cones. This capability improves product

quality and reduces production time and costs. As technology advances, the market for ultrafast lasers is expected to expand further to meet the growing need for superior dimensional accuracy.

Manufacturing ultrafast lasers involves many complexities stemming from the advanced technology and precision required to produce these devices. Understanding the manufacturing complexities requires delving into the intricate process of creating these high-performance devices.

The COVID-19 pandemic caused disruptions in the global economy. It also halted the production facilities of the electronics and semiconductors markets. The slowdown in manufacturing capacity, unavailability of workers and raw materials, travel bans, and facility closures led to a slowdown in the market's growth. With the proliferation of automation and a growth in the demand for precision manufacturing, lasers are witnessing higher application and demand after the pandemic effect.

Ultrafast Lasers Market Trends

Consumer Electronics to Witness Significant Growth

Most consumer electronics applications require a focused laser beam delivered in highly repeatable pulses at a rapid repetition rate for maximum productivity and precision. Fiber lasers' outstanding beam quality, flexibility, and stability are ideal for micromachining applications. Recently, IPG significantly expanded its product portfolio from the traditional infrared into the green and ultraviolet wavelengths and developed picosecond and high femtosecond pulse capabilities, which greatly broaden the scope of consumer electronics applications able to benefit from fiber laser technology.

In addition, the consumer electronics industry covets IPG fiber lasers and integrated automated systems for their unique combination of reliability, flexibility, efficiency, high power, beam quality, compactness, and cost-effectiveness.

The studied sector is driven primarily by the increases in demand from the consumer electronics sector and fast-paced technological developments, which force OEMs to introduce unique products continuously in the market. Consumer electronics providers primarily rely on electronic manufacturers who offer benefits like cost savings, reduced time-to-volume, quality, decreased time-to-market, and flexibility to provide their

products in the market.

According to the Consumer Technology Association, in the United States, consumer technology retail revenue is forecast to increase slightly between 2022 and 2024, reaching over USD 500 billion at the end of the period. Hardware accounts for most of the revenue, bringing in around USD 345 billion in 2024.

Most of the electronic appliances in the market nowadays are downsized and demand tighter dimensional tolerances so that the elements can fit inside ever-smaller form factors, driving the maturation of the ultrafast laser. The electronic manufacturing process needs to inspect the tinier component features and improve accuracy.

Ultrafast lasers are crucial in manufacturing specific smartphone components, such as microprocessors and semiconductors. The increasing adoption of smartphones is going to aid the studied market's growth significantly.

Asia-Pacific is Expected to Hold Major Market Share

The Asia-Pacific is home to some of the world's largest manufacturing economies, including China, Japan, South Korea, and Taiwan. The ongoing expansion of manufacturing industries in sectors such as automotive, electronics, aerospace, and medical devices creates a significant demand for industrial lasers to support various machining, cutting, welding, and marking applications.

The Asia-Pacific houses some important players in the market, such as Han's Laser Technology Industry Group, among others. The region is known for its capabilities in the automotive and medical industries, which are expected to drive its market growth. Also, various players have invested in driving their growth and development, as the Asia-Pacific is expected to witness the highest growth rate in the market.

Moreover, the automotive industry in the region is moving toward electrification and miniaturization while requiring high rigidity, design flexibility, and productivity. Blue lasers with high optical absorption efficiency are in high demand in copper fabrication for automotive motors and batteries. The highly productive processing requires a laser beam source with high output power and beam quality.

The region is the biggest manufacturer of semiconductor and electronics products

owing to the presence of companies like Taiwan Semiconductor Manufacturing Company. Taiwan produces more than 60% of the global semiconductors and over 90% of the advanced ones. Most of the semiconductors are manufactured by TSMC.

Ultrafast Lasers Industry Overview

The Ultrafast laser market is fragmented and highly competitive due to multiple players. The market appears to be moderately concentrated. Vendors in the market are taking part in new product rollouts with crucial R&D investments and partnerships that significantly boost market growth. Additionally, companies have acquisitions as their growth strategy. The market consists of laser/photonic giants, like Amplitude Laser Group Coherent Inc., Ekspla (EK SMA group), MKS Instruments Inc. (Newport Corporation), and Clark-MXR Inc.

January 2024 -The IPG Photonics Corporation highlighted new and innovative fiber laser solutions at Photonics West January 30 – February 01, 2024, in San Francisco. The 2,000-square-foot booth displays include a wide range of laser sources, integrated systems, and industry-specific solutions, along with numerous showcases of application samples.

June 2023 - Coherent Corporation introduced an ultra-low-cost, next-generation nanosecond pulsed UV laser for high-contrast marking applications in industrial electronics, consumer goods, equipment, and packaging. The new array lasers are available with 5W and 10W output power and operate at pulse repetition rates between 50kHz and 300kHz.

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