CCD Image Sensors - Market Share Analysis, Industry Trends & Statistics, Growth Forecasts (2025 - 2030)

Market Report | 2025-04-28 | 100 pages | Mordor Intelligence

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Report description:

The CCD Image Sensors Market is expected to register a CAGR of 3.1% during the forecast period.

Key Highlights
- The adoption of CCD image sensors for automatic optical inspection (AOI) and the better camera facility in the smartphone industry is among the significant factor driving the market. CCD image sensors offer better QE at the longest wavelengths, higher dynamic range, and better uniformity than CMOS imagers, which are crucial for space science and hyperspectral applications
- In the smartphone section of the consumer electronics industry, the new technologies-based innovations for better camera facility features to diverse solutions for mobile devices to take better photographs. Additionally, for the automotive industry, to enable safer driving experiences, frame transfer CCD sensors and interline transfer CCD sensors are being widely adopted. The growing demand in the industrial sector for improved performance, particularly for applications operating in near-infrared wavelengths, has extensive usage of CCD image sensors to avoid reducing image sharpness.
- CCD image sensors are more popular and cost-effective in high-end, professional consumer electronic products. CCD image sensors are more expensive because they are manufactured using a more specialized manufacturing process. A unique manufacturing process allows CCD devices to transport charges across the chip without distortion, leading to sensitive, high-quality sensors in terms of fidelity and light sensitivity. CMOS chips use more conventional (and cheaper) manufacturing processes.
- In most industrial applications, cameras with CCD sensors are widely used. CCD sensors have been mass-produced for longer, making them more mature. They tend to have higher quality and more pixels. The demand for CCD sensors is constantly increasing as these sensors tend to be used in cameras that focus on high-quality images with lots of pixels and excellent light sensitivity. In contrast, complementary metal-oxide-semiconductor (CMOS) sensors traditionally have lower quality, resolution, and sensitivity.

- Even though the CMOS image sensors dominate the imaging detector market, there are industrial and scientific imaging applications where CCD imager sensors are still in demand, and the preferred choice from both technical and commercial perspectives, the CCD sensors continue to provide the crucial imaging capability in sciences.
- However, due to the COVID-19 pandemic, several companies in this sphere thought it would take a hit regarding supply chain issues for smartphone manufacturers. However, companies only had minimal effect on the production of CCD image sensors, including the impact on the procurement of materials. This has been positive news for the end-users who rely on the chips, as they need not face any problem procuring image sensors for their latest products.

CCD Image Sensors Market Trends

High Quality Image Cased Inspection Expected to Hold Significant Market Share

- In the end-user application industry, the usage of CCD image sensors is required for obtaining better quality images for industrial inspection to keep track of quality control and maximizing the yield in modern manufacturing, machine vision systems for automation, and removing the human element.
- Industrial production in nations such as China and India requires improved and automated inspection capabilities, and this is expected to support the market demand over the forecast period. 3D vision systems are among the innovative vital application areas for image sensors, which are currently used for industrial automation and machine vision. 3D vision with high-speed cameras and laser light can detect depth and effectively see objects' shapes.
- The growing demand for advanced industrial production has been driving partnerships between the US and Chinese companies, which helps China advance in image sensor technology. However, the trade war between the two nations is expected to impact the value chain flow negatively. This will further develop the Asia-Pacific CCD image sensors.
- Partnerships and collaboration among the technology enablers are joint in this market. For instance, in China, TowerJazz, a manufacturer of advanced analog integrated circuits, has a partnership with Changchun Changguang Yuanchen Microelectronics Technology Inc. for backside illumination (BSI) manufacturing in Changchun. To provide the BSI process segment in China, TowerJazz uses CMOS image sensors.

Asia-Pacific to Witness Significant Growth

- Asia-Pacific is expected to dominate the CCD image sensors market due to the demand generated from China and India, especially in the consumer electronics segment. China is considered the world's manufacturing hub, and the demand for CCD image sensors is high in consumer products requiring high image quality. A better semiconductor supply chain presence has further helped in market demand.
- China and India further plan to install CCTV camera devices to develop smart cities and improve law enforcement infrastructure. CCD image sensors may experience increased demand for strategic places requiring high-quality images.
- The high market growth is mainly attributed to the rising purchasing power of consumers, government expenditure on surveillance-related infrastructure, and increasing exposure to technological advancements.
- Players active in the regional market, such as the CZ industry and technology co., Ltd. (CZIT), a China-based company is delivering Tcd1304dg UV coated CCD linear image sensor for spectrometer module, which is being used for original equipment manufacturer (OEM) modular of the gas analyzer. Cost is essential for these vendors to operate in the regional market.

CCD Image Sensors Industry Overview

The CCD Image Sensors Market is very competitive in nature. The market is highly concentrated due to various small and large players. All the major players account for a significant market share and focus on expanding their consumer base worldwide. Some of the significant players in the market are On Semiconductor Components Industries, LLC, Hamamatsu Photonics K.K., Teledyne e2v (Teledyne Imaging), Sharp Corporation, Stemmer Imaging AG, Oxford Instruments, and many more.

In April 2021, Teledyne e2v, a part of the Teledyne Technologies company and Teledyne Imaging Group, was contracted by the ESA (European Space Agency) to develop an improvised version of the previously supplied CCD69 detector or sensor. Utilizing the experience and data from the ESA Aeolus mission, hosting the first Doppler Wind Lidar in space, Teledyne e2v will further enhance the performance and sensitivity of the ultraviolet detector that could ultimately be deployed in the next-generation space-based Doppler Wind Lidar instruments.

In February 2021, Teledyne commended the NASA group on the successful landing of the mars rover perseverance. The company sensors will sense, power, and help analyze the chemical composition of the minerals and surface during the Mars 2020 mission. Teledyne provided CCD image sensors to drive the SuperCam and Scanning Habitable Environments with the Raman and Luminescence for Organics & Chemicals (SHERLOC). These instruments search for the minerals and organic compounds, determining if they have been altered by the watery environments and prove signs of previous microbial life on the planet.

Additional Benefits:

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

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