Driven by renewed mobile and automotive applications, the CMOS image sensor (CIS) industry is expected to expand at a compound annual growth rate (CAGR) of 10.4% from 2015 to 2021, reaching US$18.8B market value by 2021.

Yole Développement expects sustained growth of the CMOS image sensor industry for the next five years. Increasing camera content in smartphones will more than offset slower smartphone volume growth. The trend for dual and 3D cameras will have a major impact on CIS volumes. While it is too early to fully describe the strategy of the main actors yet, some products are already on the market. The 2016 report comprehensively covers key market and technology choices.

One big story this year is the consumer market, which is recovering from the total collapse of digital photography. While action cameras seem to have reached a ceiling, new applications such as drones, robots, virtual reality and augmented reality are ready to rejuvenate this emblematic market.

The Automotive camera market has established itself as a key growth market for CIS. The Advanced Driver Assistance (ADAS) trend is further increasing pressure on vendors to provide sensors beyond their current technical capabilities. Image analysis is the new frontier and early usage of artificial intelligence is catching people’s imagination. We are therefore in the middle of an explosive growth pattern that will not slow down before 2021. An exceptionally high 23% CAGR is predicted in automotive for the 2015-2021 period.

For similar reasons to automotive, namely increasing usage of image analytics and improved performance and productivity, the security, medical and industrial market are currently thriving and all deserve specific analysis.

For all these different CIS market segments our 2016 report will provide updated details about applications, volume and revenues as well as technical analysis.

KEY FEATURES OF THE REPORT
Get the sample of the report on www.i-Micronews.com
• Market forecast in $US, units, and wafer shipments through 2021
• Market segmentation with seven different segments: mobile, consumer, computing, automotive, medical, security, industry/defense/space
• Ecosystem analysis
• Roadmap for technology evolution and future developments
• Estimated 2015 player market share by market segment
• Detailed application market forecasts through 2021

OBJECTIVES OF THE REPORT
Identification and analysis of CIS applications:
• Determination of the range of applications
• Market and technology segmentation
• Market trends and forecasts
• Key players market description
Analysis and description of the sensor technologies involved:
• Sensor forecast by application and technology
• Major global actors
• Technology trends
• Main drivers and challenges

WHAT’S NEW
• Updated market landscape and forecast
• Recent M&A activity
• Dual and 3D camera strategies
• Application review by market segment
• New analysis field: virtual reality and augmented reality
• Updated technology roadmap toward Hybrid Backside Illumination
• Key advances in CMOS image sensors

BEYOND $10B: THE CMOS IMAGE SENSOR INDUSTRY KEEPS GROWING NEW MARKET AND TECHNOLOGY DYNAMICS

Transformation of the mobile camera function

![Chart showing transformation of mobile camera function](image-url)
THE CIS INDUSTRY HAS BECOME AN ATTRACTIVE PART OF THE SEMICONDUCTOR INDUSTRY, GENERATING MORE THAN $7B OF M&A LAST YEAR

Big moves in the CIS industry have greatly modified the competitive landscape. Sony is now a market, production and technology leader. Samsung and Omnivision have remained strong. Notable mergers and acquisitions this year include the purchase of Axis by Canon for $2.8B, Fairchild by On Semiconductor for $2.4B and Omnivision by a Chinese investor consortium for $1.9B. Other notable news items are the sale of Toshiba’s CIS business to Sony for $155M and in 2016 Toshiba’s medical business to Canon for $5.9B.

Sony truly demonstrated its leadership in 2015. Its capital expenditure hit $2B, a level never seen before. That Sony has 50% of the world’s production capacity with ‘only’ 35% global market share shows its ambition. Its current lack of profitability shows that market pressure is extremely high. It is also in the middle of key transformative changes to adapt to the impressive growth of the last five years.

Nevertheless we expect competition in CIS will remain relatively open as long as the growth pattern is maintained and key technology changes occur almost every other year.

SK Hynix is a great example of how quickly a prominent position can be obtained. The company has propelled itself into the top 10 in very little time. It has been able to monetize the increasing resolution of smartphone front-facing cameras, therefore capturing business from Galaxycore and Omnivision.

Navigating through this pivotal time is difficult. Giant tech companies seem to rise and fall overnight. This report gives a global overview of key markets and technologies for CIS. It shows the present situation and the dynamic forces shaping the future.

The CIS industry has become an attractive part of the semiconductor industry, generating more than $7B of M&A last year.
technology from the digital part at a time when sensors are integrating ever more features, such as Autofocus (AF) and Optical Image Stabilization (OIS).

The two key drivers for the main smartphone camera are:
- Size in the X, Y and Z dimension of the camera module
- Image performance, in particular resolution, low light performance, focus and stabilization

Performing well in these two areas, dual camera technology will be a game-changer, grabbing significant market share in a short time and driving CIS industry volume and revenue. Another important change is brewing on the front face of the smartphone, driven by human-to-machine interface technology.

It is important to understand the implications of dual and 3D sensing cameras, which are part of the computational revolution. Our report will provide the updated knowledge you need to navigate these uncharted waters.

COMPANIES CITED IN THE REPORT (non exhaustive list)

Related Reports
- Sensors and Data Management for Autonomous Vehicles
- Market & Technology Report

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MARKET & TECHNOLOGY REPORT
From 1999, Pierre Cambou has been part of the imaging industry. Pierre took several positions at Thomson TCS which became Atmel Grenoble in 2001 and e2v Semiconductors in 2006. In 2012 he founded a start-up called Vence Innovation (now Inyrene) in order to bring to market a disruptive infrared interaction technology. He has an Engineering degree from Université de Technologie de Compiègne and a Master of Science from Virginia Tech. More recently he graduated from Grenoble Ecole de Management’s MBA. He joined Yole Développement as Imaging Activity Leader in 2014.

From 1996 to 1999 Jean-Luc Jaffard paved the way of imaging activity at STMicroelectronics being at the forefront of the emergence and growth of this business. At STMicroelectronics Imaging division he has been appointed Research Development and Innovation Director managing a large multidisciplinary and multicultural team and was later on promoted Deputy General Manager and Advanced Technology Director in charge of identifying, sourcing or developing the breakthrough Imaging Technologies and Applications to transform them into innovative and profitable products. In 2010 he was appointed STMicroelectronics Intellectual Property Business Unit Director. In 2014 he created the Technology and Innovation branch of Red Belt Conseil, to support High Tech actors like SME, Research Institutes, Start-ups, Analysts, Investors and public authorities. Jean-Luc Jaffard owns multiple patents in semiconductor and Imaging domains and has been invited speaker in many conferences worldwide. He studied Electronic and Microelectronic and has been graduated from Ecole Supérieure d’Électricité of Paris in 1979.
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