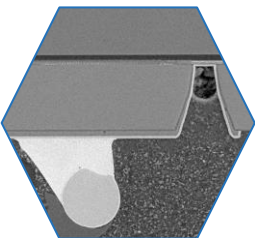
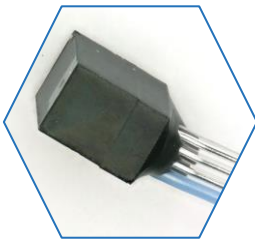


ams' NanEye Mini Camera

Cost-effective 1 mm² miniature camera with customizable wafer-level optics for endoscopy and novel medical imaging devices.



Title: ams' NanEye Mini Camera

Pages: 90

Date:
January 2021

Format:
PDF & Excel file

Price:
EUR 3,990

Reference:
SPR21585

The global single-use endoscopes and endoscopy capsule market was valued in 2020 at \$1.4B with an expected compound annual growth rate of 23% over the next five years according to Yole Développement's report [Status of Medical Imaging Equipment and Detectors 2020](#). This growth is driven by superior sterility compared to reusable endoscopic equipment, freedom from maintenance and reprocessing costs, and innovative new technologies. As a leader in wafer-level optics (WLO) and tiny cameras, ams is well positioned to service this market. Perhaps their most iconic product in this space is the NanEye miniature camera.

This full reverse-costing study was conducted to provide insights into the technology, process flow, manufacturing cost and selling price of the NanEye. The NanEye can be ordered with a variety of possible configurations. In this study, we look at the configuration with the RGB sensor and minimum necessary optical complexity.

To achieve an exceedingly small size and minimal cost, the NanEye relegates memory and image processing functionality off-chip and uses low-voltage differential signaling to stream image data at 38 Mbps. The NanEye includes a wafer-level packaged (WLP) 1 x 1 mm² 249 x 250-pixel front-side illuminated CMOS image sensor designed by AWAIBA (acquired by ams in 2015) and WLO technology developed by Heptagon (acquired by ams in 2016). Through-silicon

via technology connects the sensor to the 4-pad solder-masked ball grid array package on the backside, facilitating integration into novel imaging products. The camera can be ordered with several preset optical configurations with an F-stop range of F2.4 - 6.0 and a field of view (FOV) range of 90° - 160°. The version analyzed in this report has a quite simple WLO configuration, giving an estimated 40° FOV.

This report divides the technology and cost analysis into three parts: the CMOS image sensor, WLP, and WLO. For each there is a complete physical analysis, manufacturing hypothesis, and costing estimate. Also included is a comparison of the NanEye with Omnivision's OVM6948 CameraCubeChip and Nemotek's wafer-level camera.

COMPLETE TEARDOWN WITH

- Analysis of the camera module structure, including CIS, WLP and WLO
- Detailed optical and SEM photos
- Precise measurements
- Supply chain evaluation
- Manufacturing cost analysis
- Estimated selling price
- Technology comparisons to Omnivision's OVM6948 and Nemotek's wafer-level camera

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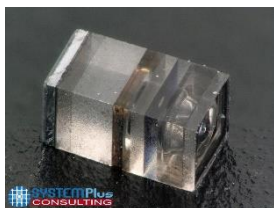


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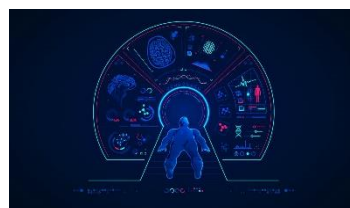
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OmniVision's OVM6948 CameraCubeChip

The smallest camera in the world for endoscopes is based on a fully wafer bonded technology, with CIS, packaging and optic on the same wafer.

April 2020 - EUR 3,990*



Status of Medical Imaging Equipment and Detectors 2020

Semiconductor technologies continue to revolutionize the medical imaging market by enabling point of care and disposable systems.

June 2020 - EUR 6,490*

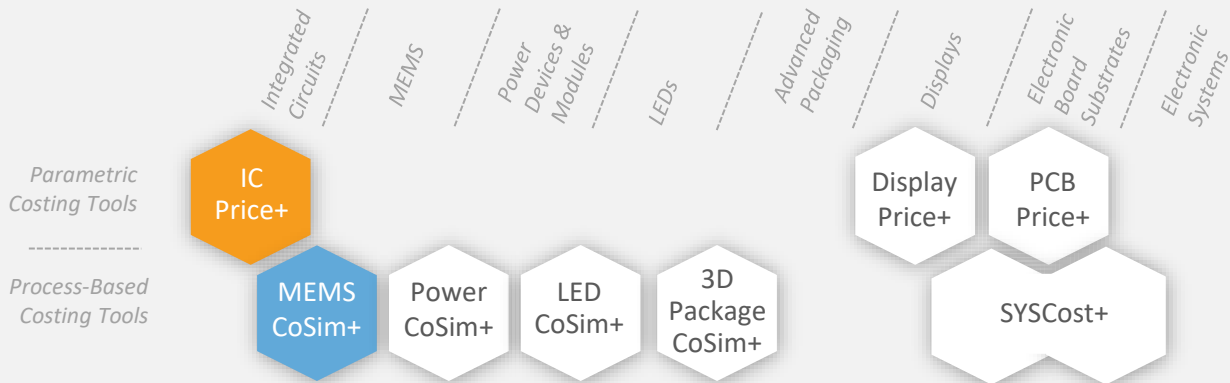


Smartphone Camera Module Comparison 2020 Vol. 1

Overview of the latest flagship smartphone cameras released in 2019 with detailed analyses of the Huawei P30 Pro, Samsung Galaxy S10 5G/S10+ and Apple iPhone 11 Pro.

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COSTING TOOLS



Our analysis is performed with our costing tools MEMS CoSim+ and IC Price+.

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Cost simulation tool to evaluate the cost of any MEMS process or device.

IC Price+

The tool performs the necessary cost simulation of any Integrated Circuit: ASICs, microcontrollers, DSP, memories, smartpower...

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WHAT IS A REVERSE COSTING®?

Reverse Costing® is the process of disassembling a device (or a system) in order to identify its technology and calculate its manufacturing cost, using in-house models and tools.



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System Plus Consulting is specialized in the cost analysis of electronics from semiconductor devices to electronic systems. A complete range of services and costing tools to provide in-depth production cost studies and to estimate the objective selling price of a product is available.

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