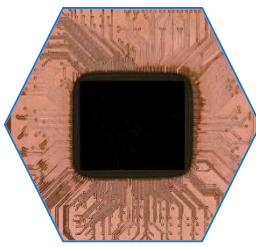
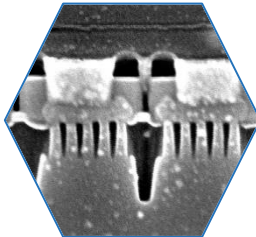


Ambarella CV2 Computer Vision SoC

Ambarella vision processor using Samsung’s 10nm process targeting video surveillance, home security camera and machine vision applications.



Ambarella is one of the leading developers of low-power and ultra high-definition video processing processors. Ambarella introduced the CV2 with full System on Chip (SoC) functionality using Samsung’s 10nm technology process. The CV2 SoC combines advanced computer vision, video encoding, image processing and stereo vision on a single chip.

This second generation computer vision product has improved performance with up to 20 times better processing performance compared to the first-generation CV1 processor. The CV2 processor consumes little power, and the computer vision architecture enables object recognition with high accuracy.

Significant die area is devoted to the stereo image processor, the Image Signal Processor (ISP), and the video codec. The quad core Arm processor with L2 cache occupies a relatively small area compared to other circuit blocks. The main functional areas take up approximately 66% of the active area of the die.

A full teardown has been conducted to provide insights into the Ambarella CV2 Computer Vision SoC, which is integrated in Hanwha Technwin’s Wisenet Network Camera. To reveal all the details of Ambarella’s SoC, this report features multiple analyses including a floor plan

analysis to understand the high-level chip architecture with Intellectual Property (IP) block area contribution measurements. It identifies all the chip features and Samsung’s 10nm process. The report includes package and CV2 die cross section and the back-end construction analysis for packaging structure.

The complete process is built from 3D X-Ray images, optical, SEM cross-sections, material analysis and delayering. This report includes detailed manufacturing process and an estimation of the wafer, die and component cost.

COMPLETE TEARDOWN WITH

- Detailed photos
- Precise measurements
- Materials analysis
- Floor plan analysis
- 3D X-ray images
- Manufacturing process flow
- Supply chain evaluation
- Manufacturing cost analysis

Title: Ambarella CV2 Computer Vision SoC
Pages: 119
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Reference: SPR21638

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AUTHORS



Belinda Dube is working for System Plus Consulting as an Engineer & Analyst, Semiconductor Memories. Belinda is also engaged in the development of reverse engineering & costing analyses with the power electronics and compound semiconductors team.



Don Scansen has partnered with System Plus Consulting to launch the new die architecture and front-end process analysis of advanced SoC devices including APU, CPU, GPU, and FPGA. Don previously supported clients ranging from individual patent owners to Fortune 500 companies providing competitive analysis and intellectual property support. He holds a PhD in electrical engineering.



Véronique Le Troadec has joined System Plus Consulting as a laboratory engineer. Coming from Atmel Nantes, she has extensive knowledge in failure analysis of components and in deprocessing of integrated circuits.

RELATED ANALYSES



Apple M1 System-on-Chip

A deep-dive analysis of Apple’s first in-house CPU for Mac.
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Qualcomm Snapdragon 888 System on Chip with 5G Modem

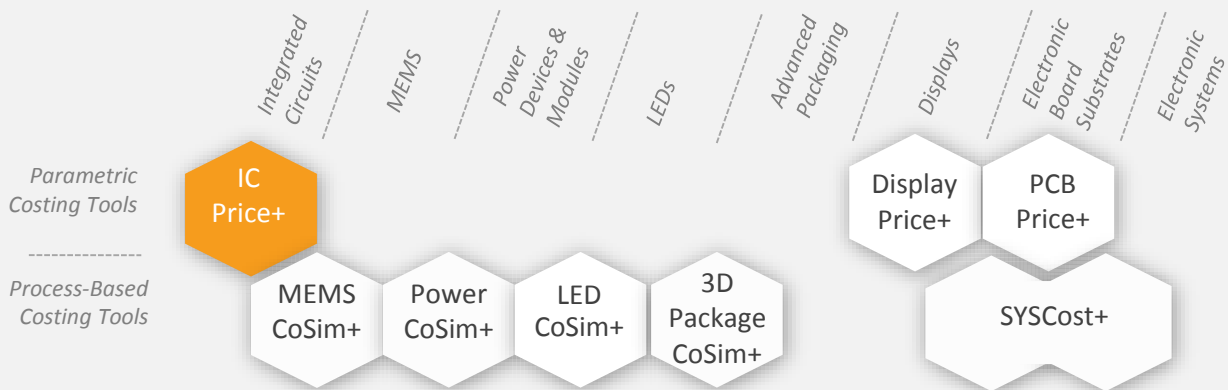
Deep dive analysis of Qualcomm’s SoC architecture using Samsung 5nm process technology.
May 2021



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September 2020

COSTING TOOLS



Our analysis is performed with our costing tool IC Price+.

System Plus Consulting offers powerful costing tools to evaluate the production cost and selling price from single chip to complex structures.

IC Price+

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

ABOUT SYSTEM PLUS CONSULTING

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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Prices of the purchased services are those which are in force on the date the order is placed. Prices are in Euros and worked out without taxes. Consequently, the taxes and possible added costs agreed when the order is placed will be charged on these initial prices.

System Plus Consulting may change its prices whenever the company thinks it necessary. However, the company commits itself in invoicing at the prices in force on the date the order is placed.

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System Plus Consulting delivered services are to be paid within 30 days end of month by bank transfer except in the case of a particular written agreement.

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When payment terms are over 30 days end of month, the Buyer has to pay a deposit which amount is 10% of the total invoice amount when placing his order.

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The transport costs and risks are fully born by the Buyer. Should the customer wish to ensure the goods against lost or damage on the base of their real value, he must imperatively point it out to System Plus Consulting when the shipment takes place. Without any specific requirement, insurance terms for the return of goods will be the carrier current ones (reimbursement based on good weight instead of the real value).

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System Plus Consulting responsibility will not be involved in non execution or late delivery of one of its duties described in the current terms and conditions if these are the result of a force majeure case. Therefore, the force majeure includes all external event unpredictable and irresistible as defined by the article 1148 of the French Code Civil?

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