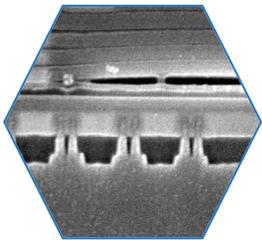
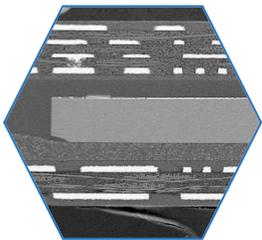


Samsung Exynos 2100 System-on-Chip

5G mobile processor using Samsung's 5nm FinFET process with embedded packaging.



System-on-chip (SoC) circuits using 5nm were introduced in late 2020/early 2021, and Samsung now addresses a growing mobile processor market that complements 5G connectivity. Samsung's Exynos 2100 5G mobile processor is a high-end SoC using Samsung's smallest technology. This SoC die competes with the Qualcomm Snapdragon 888 and Apple A14 processor.

The processor die design uses an 8-core chipset. It has one core Cortex-X1 at 2900 MHz, three core Cortex-A78 at 2800 MHz, and four core Cortex-A55 at 2200 MHz. The SoC is built on a 5nm EUV process designed to boost the power efficiency of mobile devices. The chip is specifically designed to cater to 5G high performance and hyper-fast processing speed. The Exynos 2100 SoC also integrates an advanced multi-IP governor technology used to optimize power usages. The chip manufacturer claims that mobile phones powered by the Exynos 2100 have increased battery life compared to mobile devices powered by Samsung's previous-generation processors. Samsung DRAM memory comes in different capacity on different smartphone versions.

This full teardown includes a package analysis and a separation of the processor package and the DRAM memory, and details the processor die and capacitor layout in the package. Only the DRAM memory package and cross-section are included. 3D x-ray images detail the package and substrate structure, and a package analysis reveals a package-on-

package component that includes the memory package soldered on the processor package. The processor die is assembled in flip-chip and embedded in the package substrate. A floorplan analysis discloses the high-level chip architecture and an estimation of IP block area, while high-resolution SEM and TEM images expose Samsung's 5nm process technology. This report also provides a materials analysis that details the materials used to build the processor component, and cross-section analyses are included that examine the manufacturing process of Samsung's processor. A cost analysis is also included, offering an estimation of the wafer cost, die cost, and component cost of the Exynos 2100 processor.

COMPLETE TEARDOWN WITH

- Detailed photos
- Precise measurements
- Materials analysis
- Floorplan
- TEM on the 5nm FinFET
- 3D x-ray images
- Manufacturing process flow
- Supply chain evaluation
- Manufacturing cost analysis

Title: Samsung Exynos 2100 System-on-Chip

Pages: 130

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Format: PDF & Excel file

Reference: SPR21613

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AUTHORS



Belinda Dube is working for System Plus Consulting as an Engineer & Analyst, Semiconductor Memories, especially DRAM and 3D NAND flash memory. At the same time, she also investigates IC technologies as well as advanced packaging. Belinda is also engaged in the development of reverse engineering & costing analyses with the power electronics and compound semiconductors team.

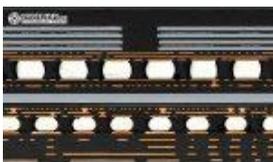


Don Scansen has partnered with System Plus Consulting to launch the new die architecture and front-end process analysis of advanced SoC devices including APU, CPU, GPU, and FPGA. Don previously supported clients ranging from individual patent owners to Fortune 500 companies providing competitive analysis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



Qualcomm Snapdragon 888 System on Chip with 5G Modem

Deep dive analysis of Qualcomm's SoC architecture using Samsung 5nm process technology.

May 2021



Ambarella CV2 Computer Vision SoC

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

August 2021

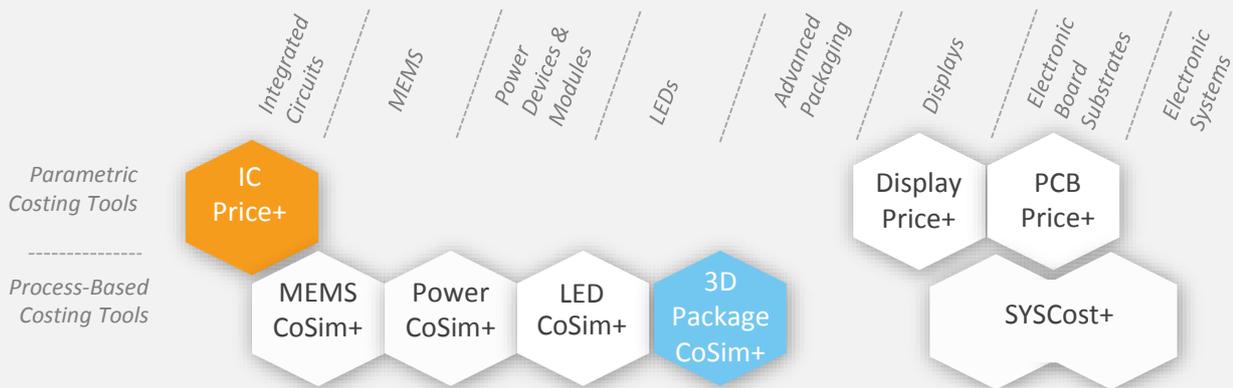


Processor Quarterly Market Monitor

For the first time, the processor monitor is including FPGA, CPU, GPU, and APU including all the IDMs, Fabless companies, and Foundries in the business.

October 2019

COSTING TOOLS



Our analysis is performed with our costing tools IC Price+ and 3D Package CoSim+.

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...

3D Package CoSim+

Cost simulation tool to evaluate the cost of any Packaging process: Wafer-level packaging, TSV, 3D integration...

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.

Our services:

- **STRUCTURE & PROCESS ANALYSES**
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- **CUSTOM ANALYSES**
- **COSTING SERVICES**
- **COSTING TOOLS**
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