

DESIGN WIN FOR SMARTPHONE: THE STRATEGIC CHOICES MADE BY SAMSUNG, APPLE, XIAOMI...

Smartphone Design Win Quarterly Monitor – Q1, 2021

Q1 2021 TECHNICAL DYNAMICS :

- Design wins:
 - System Plus Consulting announces an average of 188 chips per smartphone, against 176 chips in Q4 2020.
 - Top 3 vendors: this period shows Qualcomm leading the market with 17% of the total design wins. Then after, we see Qorvo and Murata.
 - USA dominates the market with 47% design wins. Japan and China are following.
- eBoM¹:
 - Memory represents 28% of eBoM cost in Q1 2021.
 - NAND & DRAM drive the cost, with only 4 players involved: Samsung, Kioxia, SK Hynix and Micron.
- Die area:
 - The total die area in Q1 2021 reaches 10,339 mm².
 - The market is mainly dominated by two countries, USA and Korea with more than 76% market shares².
 - Samsung is leading the die area utilization in Q1 2021, with 30% of the total die area.
 - Without doubt, memory is the main driver.
 - Memory accounts for 4,262 mm² of dies area in Q1 2021

LEADING-EDGE TECHNOLOGIES AND TECHNOLOGY NODES

Huge investments worldwide from the likes of TSMC and SK Hynix, underpin this technology node right now, making this metric one to watch. “We've all heard about the buzz in Europe, the US, Taiwan and South Korea surrounding investments to establish a supply chain for these leading-edge technologies,” asserts **Romain Fraux, CEO of System Plus Consulting**. “In this context, it's really important to track how these technology nodes are being used in the smartphones industry.”

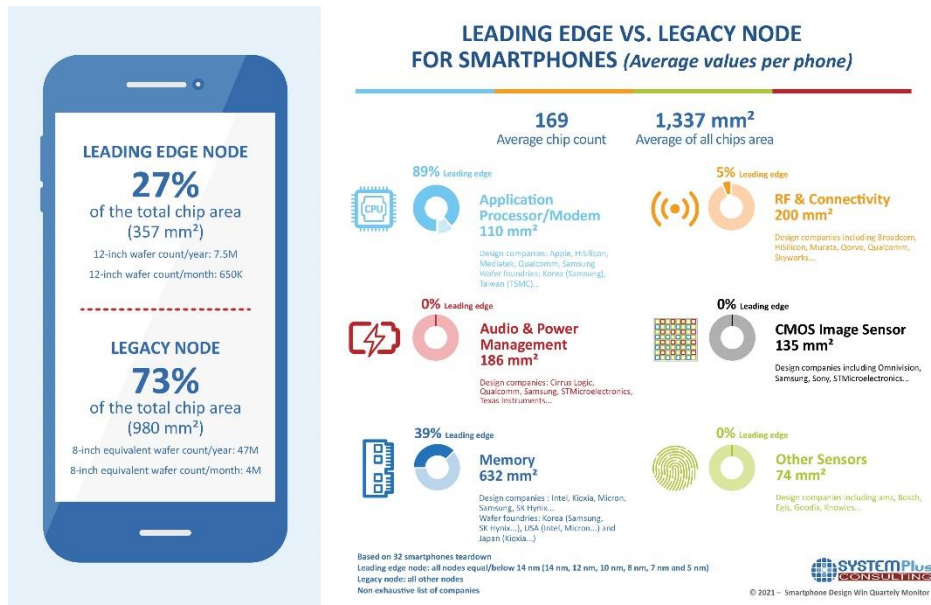
Technology nodes of 14 nm down to 5 nm represent 27% of die area in devices. Importantly, around 1.9 million units of 12-inch wafers are shipped per quarter using these technology

¹ eBoM: Engineering Bill of Material

² Based on the die area in mm²

nodes. Meanwhile some 2.2 million and 1.0 million units of 12-inch wafers are shipped with the legacy 28-16 nm and 90-32 nm nodes per quarter, respectively.

“You won't see a metric like this anywhere else,” highlights **Fraux**. “For silicon wafer manufacturers, for example, this is so important as you can understand your market in terms of wafer size, technology and other segments.”



COMPONENT, PACKAGING AND SILICON CHIP: WHAT ARE THE TECHNICAL CHOICES MADE BY SAMSUNG, APPLE...?

Electronic costing and technology experts at System Plus Consulting have released the Smartphone Design Win Monitor which provides unique industry insight into the latest component, packaging and silicon chip choices of smartphone makers.

Much of the detail is based on teardowns from System Plus Consulting, which uncover the innovative design features and new semiconductor components within a smartphone. “You can often find some online data on, say, chipset providers, but this will only provide a small part of the entire picture,” says **Romain Fraux**. “With our quarterly Smartphone Design Win Monitor, we are providing an exhaustive view of the content of the smartphones we've analysed in terms of technology choice, based on our many tear-downs.”

THE US AREA HAS CAPTURED A MIGHTY 47% OF DESIGN WINS

Each Smartphone Design Win Monitor looks at 8 representative handsets per quarter, tracking the shipment market share – so if one vendor has 20% market share then around 20% of the phones analysed will come from that vendor.

“The Monitor includes a database with historical and latest information, providing a one-year view so readers can understand trends on an annual basis,” explains **Audrey Lahrach, Technology & Cost Analyst, deeply involved in the development of the Smartphone Design Win Monitor at System Plus Consulting**. Detail is provided on the phone and IC³ manufacturer with, for example, data and graphs illustrating the design wins per vendor from quarter to

³ IC: Integrated Circuit

quarter. Indeed, in the most recent quarterly update, Qualcomm has a clear lead on design wins, followed by Qorvo and Murata.

Likewise, data on design wins per nationality - which represents the country of a company's headquarters - are provided. Latest figures reveal how the US has captured a mighty 47% of design wins, a figure that had changed very little from the previous quarter.

Data is also provided on package footprint per vendor, category and packaging technology. For example, in the latest Monitor, Qualcomm and Samsung are leading the pack on footprint but huge variations are seen from quarter to quarter.

In a similar vein, recent data on electronic bill of materials - eBoM - reveals that, at least for now, memory is driving the cost of phones, with 28% in Q1 2021 against 34% in Q4 2020. This excludes display, battery, PCB⁴ and mechanical components.

In addition, data on die, wafer and technology indicates that Samsung - a key provider of memory chips - now leads die area utilization, with 3,123 mm² (30%).

More information in the dedicated article: [Smartphone Design Win Monitor : discover the decisions that global manufacturers make article.](#)



System Plus Consulting's [Smartphone Design Win Monitor](#) will be published every beginning of March (Q1), June (Q2), September (Q3) and December (Q4)...

Targeting financial investors, device maker marketing teams, companies involved in the supply chain for equipment, packaging, materials and more, the quarterly update offers a clear view of the semiconductor companies leading this rapidly growing market, drawing comparisons between OEM⁵s and including easily digestible information on the supply chain and technology evolution. This smartphone monitor utilizes data from representative phones (65+ phones per year torn down in the System Plus Consulting Phone Teardown Track Module).

Stay tuned on reverse-costing.com to get further information about our activities!

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⁴ PCB: Printed Circuit Board

⁵ OEM: Original Equipment Manufacturer

About the authors

Romain Fraux is the CEO of System Plus Consulting, part of our Yole Group of companies. System Plus Consulting's activities are dedicated to reverse costing analyses of electronics, from semiconductor devices to electronic systems. Supporting industrial companies in their development, Romain and his team are offering a complete range of services, costing tools and reports. They deliver in-depth production cost studies and estimate objective selling price of a product, all based on a detailed physical analysis of each component in System Plus Consulting laboratory. Romain has been working for System Plus Consulting for more than 15 years and was previously the company's CTO. He holds a bachelor's degree in Electrical Engineering from Heriot-Watt University of Edinburgh (Scotland), a master's degree in Microelectronics from the University of Nantes (France), and a Master of Business Administration.

Audrey Lahrach serves as a Technology & Cost Analyst, MEMS, Sensors & Display at System Plus Consulting, part of Yole Développement. With significant expertise in the field of MEMS & sensors, including inertial, pressure and gas, as well as in the field of display technologies, Audrey produces reverse engineering & costing analyses while also running custom projects. Her mission is performed in collaboration with the laboratory team, and together they define the objectives of the analyses and determine the methodologies to reveal the structure of the devices and all materials required for their development and production. Audrey's aim is to determine and understand the technology choices made by the leading sensing companies, from the materials to the device itself. Thanks to her previous experience with CMOS image sensors and camera manufacturing, Audrey is also involved in the development of System Plus Consulting's imaging activities. Audrey holds a master's degree in Microelectronics from the University of Nantes (France).

About System Plus Consulting

System Plus Consulting specializes in the cost analysis of electronics, from semiconductor devices to electronic systems. Created more than 20 years ago, System Plus Consulting has developed a complete range of services, costing tools and reports to deliver in-depth production cost studies and estimate the objective selling price of a product... [More](#)

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