

Fan-Out packaging: what will be the next killer applications? ¹

OUTLINE:

- Market update: Fan-Out is a stable-growing market with a forecast 15,9% CAGR² between 2019 and 2025. The market value should reach US\$3 billion at the end of the period.
- Mobile & consumer end-markets influence the overall trend of Fan-Out packaging.
- Fan-Out market class:
A new market class, UHD³ Fan-Out has been introduced by Yole Développement's analysts.
HD⁴ Fan-Out remains a battle between TSMC and Samsung.
The industry is developing more and more technologies within core Fan-Out.
- Unquestionably the market leader in 2019, TSMC will see its market share slowly decreasing by 2025: active Fan-Out packaging players like ASE, ESWIN... are all expected to move forward.
- COVID-19 impact: Yole Développement is expecting a contraction of mobile and consumer activities in 2020. What will be the status of the Fan-Out business?

*“Fan-out packaging continues to evolve, establishing a new market class, UHD Fan-Out,” asserts **Favier Shoo, Technology & Market Analyst at Yole Développement (Yole)**. “Being actively explored and validated as one of the high performing and multi-die packaging platforms, Fan-Out Packaging is breaking through into new applications in 5G and HPC. In the Fan-Out Packaging: Technologies and Market Trends report, 2020 edition announces 15,9% CAGR between 2019 and 2025 to become a US\$3 billion market at the end of the period”.*

Fan-Out packaging is increasingly being adopted in 5G, HPC and RADAR 77-GHZ announces Yole in its 2020 Fan-Out report. Fan-Out packaging is going to experience one of the sharpest growths for AiP⁵ applications (5G-driven) at a whopping 76% CAGR between 2020 and 2025. Separately, (x)PU die partitioning and (x)PU + HBM⁶ applications are growing strongly at 20%

¹ Extracted from :

- Fan-Out Packaging Processes Comparison 2020 report, System Plus Consulting
- Equipment and Materials for Fan-Out Packaging report, 2019, Yole Développement
- Fan-Out Packaging: Technologies and Market Trends report, 2020, Yole Développement
- Advanced Packaging Quarterly Market Monitor, Q1, 2020, Yole Développement

² CAGR : Compound Annual Growth Rate

³ UHD : Ultra High Density

⁴ HD : High Density

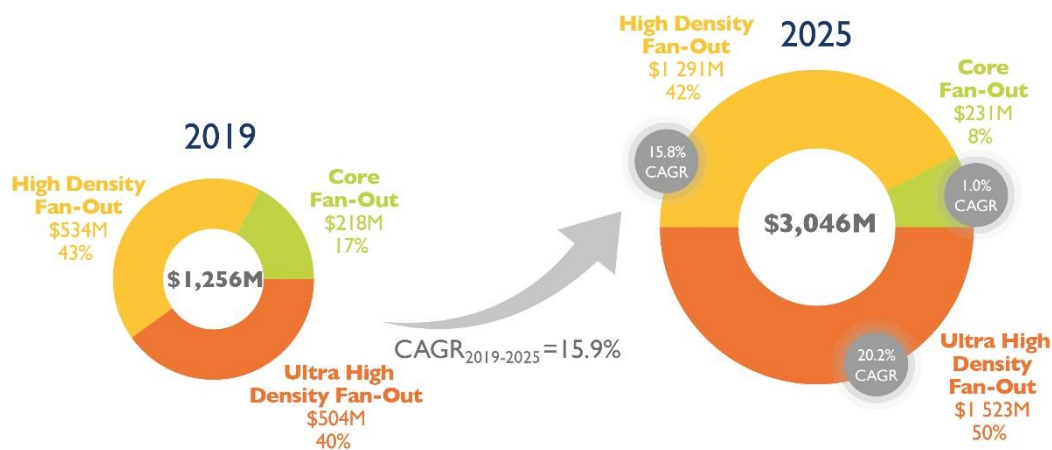
⁵ AiP : Antenna in Package

⁶ HBM: High Bandwidth Memory

CAGR and 52% CAGR respectively, over the same period. Both applications are showing a need for higher computing performance. Connectivity related applications, including Bluetooth, plus MEMS⁷, PA⁸ and switches, are expected to power forward with a 14% CAGR. Which companies will strongly change the Fan-Out market landscape? What are their market shares? What are the new Fan-Out packaging-based products? Yole’s analysts give you today an impressive and accurate update of this industry.

2019-2025 Fan-Out packaging revenue forecast per market class

(Source: Fan-Out Packaging Technologies and Market 2020 report, Yole Développement, 2020)



In its [2020 Fan-Out report](#), Yole re-classifies the Fan-Out business and introduces dedicated Fan-Out packaging market classes, UHD Fan-Out, HD FO and Core Fan-Out. With this new approach, Yole’s objective is to allow readers to get in-depth and relevant understanding of the Fan-Out industry, its organization, and interactions between the leading advanced packaging companies. Indeed, the Fan-Out report 2020 edition delivers detailed information about the strategies of the leading companies within individual market classes which allow advanced packaging companies to gain significant competitive advantages. “Depending on how industry players would like to position themselves in the marketplace, any technology strategy must embrace a combination of options and approaches targeted on customers demand,” adds Favier Shoo from Yole.

In addition to this market segmentation, Yole daily follows the evolution of the advanced packaging industry with a dedicated market research tool, [Advanced Packaging Quarterly](#)

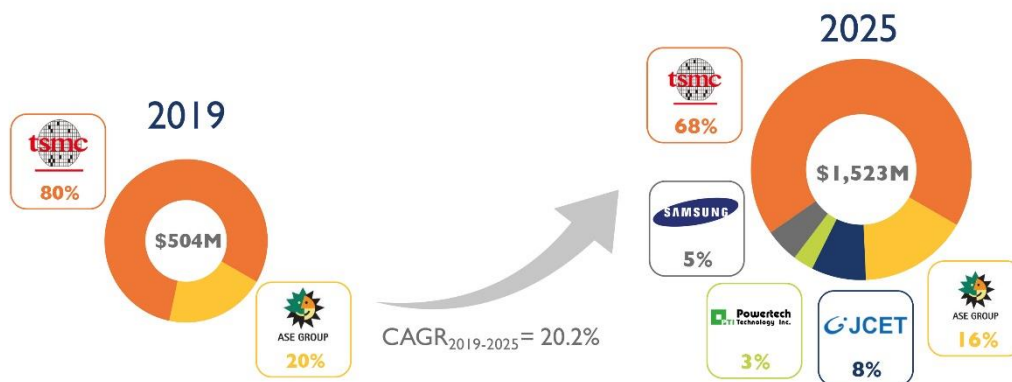
⁷ MEMS : Micro Electro Manufacturing Systems

⁸ PA : Power Amplifier

Market Monitor. On a quarterly basis, analysts combine all market data and trends and deliver a powerful tool with accurate market indicators fully dedicated to the advanced packaging industry. The aim of Yole’s team is to give a closer look at the main markets and players. In addition to WLCSP and Fan-Out, the Advanced Packaging Quarterly Market Monitor will soon cover 2.5/3D and FC packaging. Yole’s Advanced Packaging Quarterly Market Monitors are published every beginning of June (Q2), September (Q3) and December (Q4).

2019-2025 Ultra High Density Fan-Out revenue forecast by manufacturers*

(Source: Fan-Out Packaging Technologies and Market 2020 report, Yole Développement, 2020)



*Market share is based on revenue as estimated from each manufacturer’s production forecast. Breakdown of High Density (HD) & Core Fan-Out market class by manufacturers is detailed in the report

Projected at 20.2% CAGR, UHD Fan-Out revenue will grow to US\$1,532 million by 2025. New HPC⁹ products will emerge and more UHD Fan-Out will be needed as a cost-effective high-end package as compared to 2.5D interposers. Samsung Electronics is the leading IDM¹⁰. PTI is the leading FOPLP¹¹ OSAT¹², specializing in memory packaging. JCET China is the leading OSAT in China. All three are known to have started qualifying UHD FO with various customers, and it is included in their roadmaps.

In parallel, revenue from HD Fan-Out is expected to reach US\$1,291 million by 2025 with a CAGR of 15.8%.

On the other hand, Core Fan-Out growth is moderately stagnant at 1% CAGR from 2019 to 2025. Although revenue from FOPLP is growing at 57% CAGR and FOWLP at 14% CAGR, FOWLP will still generate more than 2/3 of combined revenue in 2025.

⁹ HPC : High Performance Computing

¹⁰ IDM : Integrated Device Manufacturer

¹¹ FOPLP : Fan-Out Panel Level Packaging

¹² OSAT : Outsource Semiconductor Assembly and Test

Yole releases today its annual Fan-Out Technology & Market Report in a complex industrial and economic context. The COVID-19 outbreak has significantly impacted the industry and Yole's experts have delved deeply to gain a better understanding.

According to Yole's analysts, the COVID-19 outbreak is expected to trigger a contraction of mobile and consumer activities in 2020. And the Fan-Out packaging industry, with 59% of its market value exposed to mobile & consumer market, is no exception. However, a substantial rebound in 2021 is expected as more technology related industries are optimistic that market will return to normal by 2021. Fan-Out Packaging market value will hence benefit from this rebound by 2021.

All year long, System Plus Consulting and Yole pursue their investigations. With valuable Fan-Out technology & market reports including [Fan-Out Packaging Processes Comparison 2020](#) from System Plus Consulting, [Equipment and Materials for Fan-Out Packaging](#), [Fan-Out Packaging: Technologies and Market Trends](#) and the [Advanced Packaging Quarterly Market Monitor](#) from Yole Développement, both partners analyze industrial announcements and debate with leading players.

Analysts also deliver their vision through dedicated articles published on i-Micronews. Discover the latest one focused on the leading company TSMC and its strategy: [TSMC: The final word has not been spoken yet](#)

Stay tuned on [i-Micronews](#) to follow our activities including webcasts, articles, interviews, reports and more!

The Battlefields of Fan-Out Packaging – Webcast powered by Yole Développement and System Plus Consulting is still available. Watch the recorded version and send us your questions on [i-Micronews](#).



Press contacts

Sandrine Leroy, Director, Public Relations, leroy@yole.fr

Marion Barrier, Assistant, Public Relations, marion.barrier@yole.fr

Le Quartz, 75 Cours Emile Zola – 69100 Villeurbanne – Lyon –France – +33472830189
www.yole.fr - www.i-micronews.com – [LinkedIn](#) – [Twitter](#)

About our analyst

Favier Shoo is a Technology and Market Analyst in the Semiconductor & Software division at Yole Développement, part of Yole Group of Companies. Based in Singapore, Favier is engaged in the development of technology & market reports as well as the production of custom consulting reports.

During 7 years at Applied Materials as a Customer-Application-Technologist in the advanced packaging marketplace, Favier developed a deep understanding of the supply chain and core business values. As an acknowledged expert in this field, Favier has provided training and held numerous technical review sessions with industry players. In addition, he has obtained 2 patents.

Prior to that, Favier worked at REC Solar as a Manufacturing Engineer to maximize production capacity.

Favier holds a Bachelor in Materials Engineering (Hons) and a Minor in Entrepreneurship from Nanyang Technological University (NTU) (Singapore). Favier was also the co-founder of a startup company where he formulated business goals, revenue models and marketing plans.

About the report

Fan-Out Packaging: Technologies and Market Trends

Samsung and PTI, with panel-level packaging, have entered the Fan-Out battlefield. - – Performed by Yole Développement

Companies cited:

3D-Plus, 3M, AGC, Amkor, Ajinomoto, AKG, Analog Devices, Apple, ASE, A*Star (IME), AT&S, Atotech, Aurora semiconductors, BASF, BK Ultrasound, Blackberry, Boschman, Brewer Science, Broadcom, Bosch, China Mobile, Cirrus Logic, Cypress, Deca Technologies, Denso, Dialog Semiconductor, Dow Dupont, Evatec, Fitbit, Freescale (NXP), Fujifilm, Global Foundry, Google, Hella, HiSilicon, Hitachi chemicals, Huawei, Huatian, Infineon, Intel, Lenovo, LGE, Marvell, Maxim IC, Mediatek, Medtronic, Nagase ChemteX, Nanium (Amkor), Nepes, Nepes Laweh, Nepos, Nokia, NXP, Oppo, Onda, PTI, Qualcomm, Qorvo, Rena, Rohm, Samsung, Schmoll Maschinen, SEMCO, SEMSYSCO, Shinko Electric, Sivers IMA, Spectrum, SPIL, STATS ChipPAC (JCET), STMicroelectronics, Synaptics, Synergy, TI, TSMC, Unimicron, Xiaomi and more...

Related reports

- [Fan-Out Packaging Processes Comparison 2020](#)
- [Equipment and Materials for Fan-Out Packaging](#)

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](#)

About Yole Développement

Founded in 1998, Yole Développement (Yole) has grown to become a group of companies providing marketing, technology and strategy consulting, media and corporate finance services, reverse engineering and reverse costing services and well as IP and patent analysis. With a strong focus on emerging applications using silicon and/or micro manufacturing, the Yole group of companies has expanded to include more than 80 collaborators worldwide... [More](#)

For more information and images, please visit [i-Micronews](#)

###