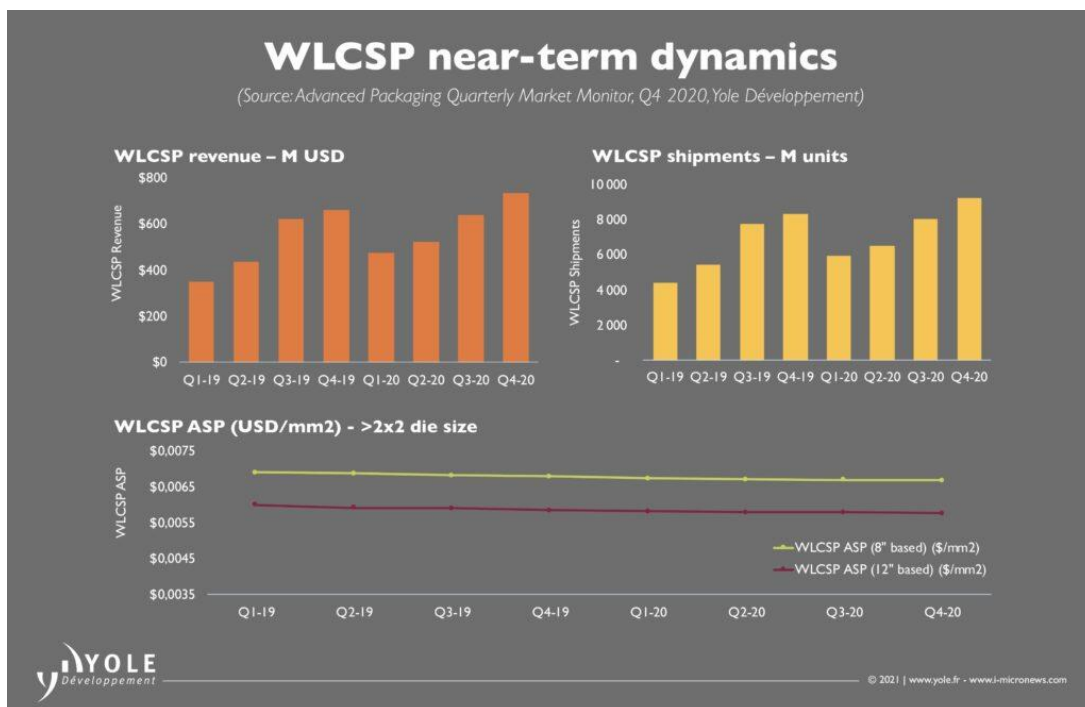




WLCSP packaging market is expected to grow at ~6% CAGR reaching estimated 37 billion units by 2025 according to the **Advanced Packaging Quarterly Market Research Monitor** performed by **Yole Développement (Yole)**. WLCSP devices are primarily found in smartphones in variety of applications such as PMICs, connectivity module, Audio Codec module, RF transceivers, antenna tuners, switches, filters, fast charging ICs, MCUs. Besides the smartphone market, wearable remains a prime target for inexpensive, efficient and reliable WLCSP packages providing miniaturization and scalability required for wearable applications.

Wearable market is expected grow at 12% CAGR from 2019-2025. The new smart earbuds market represents another growth zone for WLCSP packages where thin and small are critical requirements.



With its acquisition of PTI wafer bumping assets in Singapore, **UTAC** is well positioned to provide a “full turnkey” solution for its WLCSP product line as WLCSP package type remains the largest package type found in mobile and consumer applications. Prior to the acquisition, UTAC had capability to support backgrinding, die singulation, and back-end services. With available capability of 300 mm bumping line, UTAC can now perform plated and ball-drop wafer level packages which clearly boosts its product portfolio.

In addition, UTAC can play more aggressive role in these emerging markets for wearable and smart earbuds segment in addition to somewhat saturated smartphone market that is going strong around 1.3 billion units+ per year globally.

With recent coronavirus pandemic requiring stay at home situation, consumer electronics such as smartphones, wearable, and earbuds are expected to experience rapid rise in demand. With this acquisition, UTAC is poised to participate in these 37 billion units+ market for WLCSP product line where it can provide full bumping and back-end services capturing significant market share and impacting its top and bottom line.

Yole’s Senior Technology & Market Analyst, Vaibhav Trivedi talked with **Asif Chowdhury, Senior Vice President of Marketing, Japan Sales & Corporate Business Development of UTAC group**, about the company’s technology, strategy, and market status and applications. Discover the details of their discussion below.

Vaibhav Trivedi (VT): Please briefly introduce yourself and your activities at UTAC to i-Micronews’ readers?

Asif Chowdhury (AC): Sure. My name is Asif Chowdhury and I wear a few hats within the UTAC Group. I am in charge of our world-wide marketing and also corporate business development. One of my roles is to provide market and product related guidance to our CEO and the boards with respect to where we should focus our investment and resources. I am also in charge of UTAC’s Japan business.



Production floor – Courtesy of UTAC, 2021

VT: UTAC has enhanced technology portfolio and opens up possibilities to gain deeper access into WLCSP market with the acquisition of PTI wafer bumping factory in Singapore. Could you explain UTAC's key motivations in this acquisition?

AC: We have a factory dedicated to WLCSP back-end, probe and assembly, here in Singapore. With significant WLCSP back-end and wafer service capacity, we have been very successful in this business despite not having wafer bumping capability. We have engagement with many of the top IDMs and fabless semiconductor companies for back-end WLCSP processing as well as wafer services. This wafer bumping asset purchase in Singapore nicely complements our WLCSP back-end capability and capacity. The two facilities are literally less than 10 minutes away from each other allowing us to provide full turn key WLCSP solution to our customers.



Automated Guided Vehicle – Courtesy of UTAC, 2021

VT: WLCSP has been garnering much attention because of its success and establishment in key applications in smartphones and wearables. What is your view on the key trends of WLCSP industry?

AC: I am absolutely aligned with the WLCSP growth prediction of ~6% CAGR through 2025 published in your quarterly [Advanced Packaging Quarterly Market Research Monitor](#). Frankly, I think it could potentially be higher. As you have mentioned, the growth so far has been and likely continue to be fueled by primarily by 5G smartphone applications. We do see a wider application such as IoT and automotive for example, a very key market for UTAC. With the convergence of various fundamental technologies such as 5G mmWave, AI, AR/VR, autonomous vehicle etc. I expect that we will finally witness the proliferation of Internet of Everything during this decade. These novel products and applications are poised to continue to drive up the growth of WLCSP as a key packaging solution.

VT: When does UTAC expect to start production using this new wafer bumping facility?

AC: We are already in low-volume production. Looking at customer interests and potential RFQ activities, I would not be surprised if we are running full capacity by end of the year.

VT: What capacity and wafer starts do you expect to achieve with this bumping facility initially and by end of 2021?

AC: The exact capacity and volume varies by processes such number of RDL layers, ball drop etc. But based on the mix we see, we expect to run at full capacity for 12-inch wafer bumping by end of the year. (unfortunately, can't reveal the exact capacity we have)

VT: What production plans do you have for this facility such as WLCSP and plated product lines?

AC: The current capability includes 1-to-4-layer plated bump, ball drop and Cu-pillar bump for 12" wafers for WLCSP and Flip Chip BGAs, QFNs and SIPs. We plan to put in 8" wafer bumping capability for our many Analog customers. We are also reviewing options for Fan-Out WLCSP. Primary applications for our products will be 5G and automotive.



Automatic Guided Vehicle between factory levels – Courtesy of UTAC, 2021

VT: Does UTAC plan to expand its customer base with this turnkey solution offering? What is your business development plan?

AC: We do have a fairly robust customer base and we absolutely plan to expand our customers' business with this turnkey solution. While we have been very successful in engaging in back-end WLCSP in Singapore, our ability to grow has been somewhat muted for the lack of wafer bumping capability to be honest. Having long-term relationship with many top semiconductor companies, we were able to get certain business commitment for turnkey WLCSP business while we were in the process of closing the deal of the bumping assets. We are in qualification with some and advanced stages of discussion with various customers to start the turnkey WLCSP in Singapore.

VT: How much growth in UTAC revenue are you targeting with addition of this wafer bumping factory?

AC: I have some good news to share in this regard without getting into specifics. In 2020, our revenue grew by almost 22% YoY as our investment in certain advanced packaging over the years started to pay dividend. With that and with the wafer bumping, we expect our revenue to grow by double digit in 2021 again.

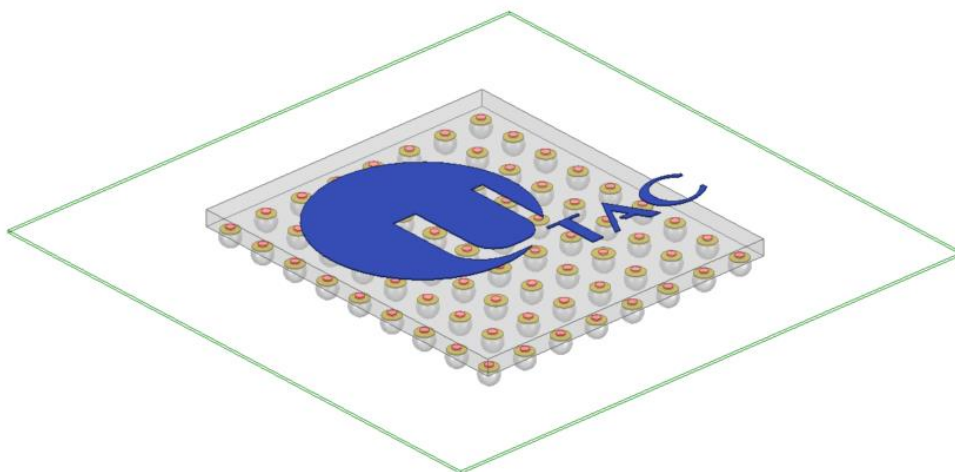
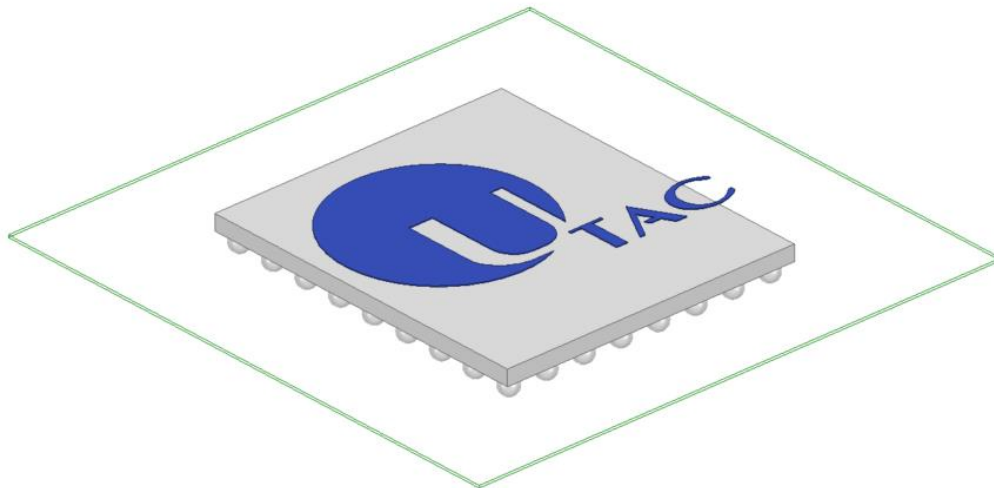
VT: Is UTAC looking at additional wafer capability investment in southeast Asia at this time?

AC: Well, we just acquired the wafer bumping capability. We do have future plans to expand both capability and capacity. For example, we do plan to invest in 8-inch wafer bumping capability for our many analog customers. We are also reviewing some Fan-out WLCSP options. But for now, we are focused on working with our customers to qualify and fill up the

current capacity. Having said that, we are always open to invest in wafer probe and test solutions for our customers for WLCSP business. As you may be aware, test and probe are 30% of our overall revenue – highest among all the OSATs.

VT: What are UTAC's core products/packages that makes UTAC leader in packaging eco-system?

AC: We are razor focused on a few technologies which makes us a key player in the packaging eco-system. We believe that we have leadership position in leadless packaging technology which includes QFNs and advanced QFN technologies including array QFNs and side wettable flange QFNs for automotive market. Advanced wafer processing is also one of our key focus areas – we are one of the first OSATs to implement plasma dicing technology. We have made significant progress in advancing in MEMs packaging area, another of our focus area. Power packaging such as Cu Clip is also growing significantly in our Thailand manufacturing site. We are also working on cost-effective image sensor packaging and testing for automotive and industrial application and have won several businesses for such applications from top IDMs. Additionally, I must add that our advanced wafer probe and final test capability, including testing of automotive products, puts us at a unique spot in the packaging OSAT eco-system. And now we have acquired wafer bumping capability to complement or world-class WLCSP back-end manufacturing.



VT: What product/package mix do you envision in five years in terms of wafer level package versus laminate based packages in UTAC portfolio?

AC: We expect our WLCSP package to grow significantly and outpace our laminate product business in the next few years. We are reviewing potential engagement in fan-out technology also. Our laminate products are a relatively small portion of our package portfolio.

VT: What applications and market does UTAC plan to pursue with this wafer bumping factory?

AC: Other than going after the handset and 5G applications, we want to increase our share in automotive WLCSP applications. We are already doing wafer-level tri-temperature testing for various automotive application and in discussion with customers for wafer bumping for automotive application.

VT: What is UTAC's growth roadmap for wafer level capability in terms of market, revenue, and customer base expansion?

AC: We have plans to invest in 8" WLCSP as well provide fan-out WLCSP in the near future. For market, as I have mentioned already, our plan is to target automotive application as well as 5G and other potential IoT application through the next few years. Most top global semiconductor companies are already our customers. But we want to expand business with them with full turnkey WLCSP solution among other things.

VT: What can we expect from UTAC in the next 2 – 3 years?

AC: We are in a very good position financially having reduced our debt by over 60% in the last three years. Not sure if you are aware but we got acquired by a global investment firm mid last year. We just announced two new manufacturing sites in China. With the backing of our new ownership, our continual investments in certain key technologies such as power, MEMs, special SIP, automotive and image sensor packaging solutions, test and our latest investment in wafer bumping, I feel that we are in a relatively good position to take the company to the next level of growth, growing over a \$1B in 2021. Hopefully, we will have the market wind behind our back.

VT: Would you like to add few words for i-Micronews' readers?

AC: Perhaps a thank you to i-Micronews' publishers for a wonderful and informative publication, one of my sources for market information and intelligence. For the readers who are interested in our newly acquired wafer bumping capability, I want to say stay tuned for further updates in the near future.

Interviewee



Asif Chowdhury is the Senior Vice President of Marketing and Corporate Business Development and Head of Japan Sales at UTAC Group located in Singapore. Asif has over twenty-five years of experience in the semiconductor industry. He has worked in various aspect of semiconductor assembly and test business including package design and development, product/business line management, sales, R&D and business development. Before joining UTAC Asif had held senior positions at Amkor Technology in Chandler (Arizona), Tokyo and Seoul and Analog Devices in Wilmington (Massachusetts). Asif holds a BS in Mechanical Engineering from University of Texas at Arlington, an MS in Mechanical

Engineering from Southern Methodist University, an MS in Finance and an MBA from Northeastern University.

Interviewers



Vaibhav Trivedi is a Senior Technology & Market analyst at Yole Développement (Yole) working with the Semiconductor & Software division. Based in the US, he is a member of Yole's advanced packaging team and contributes to analysis of ever-changing advanced packaging technologies. Vaibhav has 17+ years of field experience in semiconductor processing and semiconductor supply chain, specifically on memory and thermal component sourcing and advanced packaging such as SiP and WLP.

Vaibhav has held multiple technical and commercial lead roles at various semiconductor corporations prior to joining Yole.

Vaibhav holds a Bachelor of Science in Chemical Engineering, and Master of Science of Material Science from University of Florida in addition to an MBA from Arizona State University.



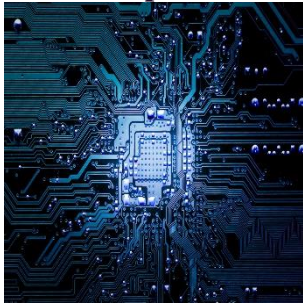
Favier Shoo is a Team Lead Analyst in the Packaging team within Semiconductor, Memory and Computing Division at Yole Développement (Yole), part of Yole Group of Companies. Based in Singapore, Favier manages an international team and develops the technical expertise and market know-how within the team. Favier also focuses on the production of technology & market reports, conducts strategic consulting and custom studies. As an acknowledged professional in the semiconductor packaging marketplace, Favier is regularly engaged in international conferences, with presentations, keynotes, and panel review sessions.

During 7 years at Applied Materials as a Customer Application Technologist in the advanced packaging field, Favier developed an in-depth understanding of the supply chain and core business values. Prior to that, Favier worked at REC Solar as a Manufacturing Engineer to maximize production utilization.

Favier holds a Bachelor's 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.

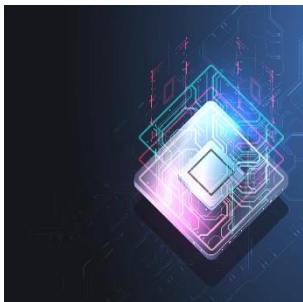
This interview has been conducted in collaboration with Emilie Jolivet, Director of the Semiconductor, Memory & Computing Division, Stefan Chitoraga, Technology & Market Analyst, Packaging at Yole Développement (Yole) and Santosh Kumar, Principal Analyst & Director Packaging, Assembly & Substrates, Yole Korea.

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Advanced Packaging Quarterly Market Research Monitor

Flip chip packaging and Wafer level packaging reach new heights crossing \$12 B threshold by 2025 amid coronavirus pandemic as global demand for semiconductor devices soars to new high.



Status of the Advanced Packaging Industry

OSATs, foundries, and IDMs all want to impact the growing advanced packaging market.

Source: <http://www.utacgroup.com>
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Source: <https://www.i-micronews.com/utac-a-company-well-positioned-to-provide-full-turnkey-wlcsp-solutions-an-interview-with-utac/>