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AMKR.OQ - Q4 2024 Amkor Technology Inc Earnings Call

EVENT DATE/TIME: FEBRUARY 10, 2025 / 10:00PM GMT

OVERVIEW:

Company Summary

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PRESENTATION

Operator

Good day, ladies and gentlemen, and welcome to the Amkor Technology fourth-quarter and full-year 2024 earnings conference call. My name is Diego, and I will be your conference facilitator today. (Operator Instructions) As a reminder, this conference is being recorded.

I would now like to turn the call over to Jennifer Jue, Head of Investor Relations. Ms. Jue, please go ahead.

Jennifer Jue - *Amkor Technology Inc - Vice President, Investor Relations and Finance*

Thank you, operator. Good afternoon, everyone, and thank you for joining us for Amkor's fourth quarter 2024 earnings conference call. Joining me today are Giel Rutten, our Chief Executive Officer; and Megan Faust, our Chief Financial Officer. Our earnings press release was filed with the SEC this afternoon and is available on the Investor Relations page of our website, along with the presentation slides that accompany today's call.

During this presentation, we will use non-GAAP financial measures, and you can find the reconciliation to the US GAAP equivalent on our website. We will make forward-looking statements about our expectations for Amkor's future performance based on the environment as we currently see it. Of course, actual results could differ.

Please refer to our press release and SEC filings for information on risk factors, uncertainties and exceptions that could cause actual results to differ materially from these expectations. Please note that the financial results discussed today are preliminary, and final data will be included in our Form 10-K.

And now I'll turn the call over to Giel.

Giel Rutten - Amkor Technology Inc - President, Chief Executive Officer

Thank you, Jennifer. Good afternoon, everyone, and thank you for joining the call today. Amkor delivered fourth quarter results in line with guidance with revenue of \$1.63 billion and EPS of \$0.43. For the full year 2024, revenue was \$6.3 billion, a 3% decline from the previous year. The year met our expectations except for the weakness in the automotive and industrial end markets where we had expected improvement in the second half.

During the year, we achieved several significant milestones. Advanced packaging revenue increased 3% year-over-year and Advanced SiP reached a record of \$3.1 billion. The computing end market reached a record of \$1.2 billion driven by growth in ARM-based PCs and 2.5D technology for AI GPUs.

We qualified our new Vietnam facility and ramped production for system and package and memory devices. We solidified our US manufacturing strategy and secured \$407 million in CHIPS funding to support our planned Arizona facility, and we expanded our partnership with TSMC to support advanced packaging in the US and with Infineon to support power modules in Europe.

Despite the dynamic macro environment and short-term challenges, we remain focused on strengthening our technology leadership in advanced packaging, expanding our global footprint and partnering with lead customers in growth markets.

Now let me discuss each of our end markets. In the fourth quarter, revenue in our communications end market declined 25% sequentially due to a change in build pattern for new iOS phones and temporarily lower content in the latest iOS phone due to a SiP socket that we are not participating in. This socket gap drove the 7% decline in our total communication revenue for the full year 2024. The iOS revenue decline was slightly offset by Android growth of 9% for the full year.

For 2025, we expect our communications business to be muted in the first half, followed by above-seasonal growth in the second half. We're closely collaborating with our strategic customer and are confident in recovering the SiP socket in the next-generation iOS phones. We expect continued improvement in Android revenue and are projecting total communication revenue to be flat year-on-year.

Revenue in our computing end market increased 13% sequentially and 16% for the full year to record levels. Strong demand for AI GPUs and ramping programs supporting ARM-based PCs led the growth, while weakness in traditional servers and networking dampened upside.

Within the past few weeks, dynamics within the AI data center supply chain have impacted our 2.5D growth expectations for the year. We accelerated transition to a new AI GPU product family, together with new trade restrictions have resulted in an adjusted near-term outlook. We expect to continue running volume for 2.5D AI GPUs but at a lower level than previously anticipated.

As we navigate these dynamics, we remain confident in our project pipeline, including our new 2.5D customer that continues to ramp volume and our first programs on the next-generation RDL interposer technology, which started low-volume production. The uncertainty of political environments limit visibility for the full year. However, we expect our computing end market to show mild growth for the full year.

In the fourth quarter, revenue in our automotive and industrial end market declined 8% sequentially, missing our flat to mild growth expectations. Customer forecasts deteriorated throughout the quarter due to macro weakness and tight inventory control.

For the full year, the automotive and industrial end market declined 16% compared to ['23], and we have experienced seven quarters in a row of year-on-year declines. From our peak in 2022, revenue has declined nearly \$300 million, primarily due to declines in mainstream products. For 2025, we expect advanced packaging programs in automotive to grow in the mid-teens percent and remain optimistic about the recovery in our mainstream portfolio, although the timing is uncertain. Overall, we anticipate softness in the first part of the year and mild full year growth.

Revenue in our consumer end market increased 10% for full year 2024 driven by the ramp of a new wearable program utilizing advanced SiP technology. This program helped to offset headwinds in other traditional consumer applications. Our revenue in the fourth quarter remained relatively steady after a steep ramp in the third quarter. For 2025, we expect mild growth driven by a full year of production for the wearable program and modest improvements in traditional consumer programs.

Now I will turn to our first quarter outlook. For Q1, we expect revenue of \$1.275 billion, reflecting a year-on-year decline of 7%, primarily due to the temporary socket gap in the current iOS phones. For full year 2025, we foresee a muted first half followed by a strong second half, driven by the content recovery in the next generation of iOS phones. With each of the end markets expected to be flat to slightly up, we expect total company revenue to be flat to low single-digit growth for the year.

With that, I will now turn the call over to Megan to provide more detailed financial information.

Megan Faust - *Amkor Technology Inc - Chief Financial Officer, Executive Vice President*

Thank you, Giel, and good afternoon, everyone. Fourth quarter financial performance met expectations with all financial metrics within our guidance range. Revenue of \$1.63 billion declined more than seasonal sequentially, primarily due to our communications end markets as well as prolonged weakness in the automotive and industrial end markets.

Fourth quarter gross profit was \$247 million, and gross margin was 15.1%. Gross margin increased 50 basis points from Q3 primarily due to a change in product mix with a lower proportion of advanced SiP. Our gross margin is also being impacted by the ramp of our new Vietnam facility. In Q4, this had approximately 80 basis points of burden.

Operating expenses for the quarter came in lower than expected at \$112 million, partially due to lower incentive compensation. Operating income was \$134 million, and operating income margin was 8.3%. Favorable foreign currency partially offset higher-than-expected taxes, resulting in net income for the fourth quarter of \$106 million or EPS of \$0.43. Fourth quarter EBITDA was \$302 million, and EBITDA margin was 18.5%.

Now let's turn to our full year 2024 performance. Revenue of \$6.3 billion was down 3% year-on-year. Due to the prolonged cycle and low utilization, the manufacturing teams strictly adhered to cost containment measures to maintain profitability. Gross profit for the year was \$933 million, and gross margin was 14.8%.

Operating income was \$438 million, and operating margin was 6.9%. Our full year effective tax rate was 17.5%. Net income for the year was \$354 million, resulting in EPS of \$1.43. EBITDA was \$1.1 billion, and EBITDA margin was 17.3%.

Amkor has exhibited strict financial discipline. CapEx For 2024 was \$744 million, an 11.8% capital intensity. We focused our investments on expanding capacity for 2.5D in Korea and for advanced SiP in both Korea and Vietnam. Free cash flow for the full year was \$359 million, demonstrating efficient working capital management and operational performance.

We ended the year with \$1.6 billion of cash and short-term investments and total liquidity of \$2.3 billion. Our total debt as of the end of the quarter is \$1.2 billion, and our debt-to-EBITDA ratio is 1.1 times.

Moving on to our first quarter outlook. We anticipate revenue of approximately \$1.275 billion, representing a year-on-year decline of 7%. With the underutilization expected across our factories and the burden associated with our new Vietnam facility as it ramps scale, profitability will be constrained. We expect gross margin to be between 10% and 13%.

We expect Q1 operating expenses of around \$120 million. We expect our full year effective tax rate to increase to around 20% due to new global tax regulations. First quarter net income is expected to be \$23 million at the midpoint of guidance, resulting in EPS of \$0.09. Our CapEx forecast for 2025 is \$850 million, of which 5% to 10% is estimated for our new advanced packaging facility in Arizona.

Amkor has demonstrated resilience in this dynamic environment, and we are proud of the milestones we reached in 2024, strengthened our technology portfolio in advanced packaging for 2.5D and advanced SiP, expanded our broad geographic footprint by successfully beginning production in Vietnam and securing CHIPS funding for our planned US manufacturing location and enhanced partnerships with industry leaders and growth markets.

With that, we will now open the call up for your questions. Operator?

QUESTIONS AND ANSWERS

Operator

Thank you. And at this time, we will be conducting the question-and-answer session. (Operator Instructions)

Toshiya Hari, Goldman Sachs.

Toshiya Hari - Goldman Sachs - Analyst

Hi. Good afternoon. Thank you for taking the question. Maybe one for Giel on the communications business. You talked a little bit about the lower content in sort of the iPhone and the impact it had and then, I guess, your expectation for that to come back in '25. I guess what -- well, first of all, I guess, if you can clarify or confirm how significant the hit was from that in the most recent quarter, that would be really helpful. And then what gives you the confidence that you or your partner can indeed sort of regain that content in the back half of the year? Thanks.

Giel Rutten - Amkor Technology Inc - President, Chief Executive Officer

Toshiya, yes, let me try to give you a bit background on this SiP socket. First of all, the confidence to get back into this slot in the next generation, we have a long-standing track record with this lead customer of Amkor in bringing new technology and new products to market. We started the development of this new socket for next-generation phone generation in already 2024. We prepare mass production and we have clear line of sight of the ramp that will happen in the third quarter of 2025.

It was a strategic decision by the end customer to do it the way that we decided to do it because it was an important, let's say, changeover in their architecture of the phone. So in that sense, we have clear line of sight. It is a significant impact. So let's see -- the Q4 impact would be roughly -- Megan, can you help here?

Megan Faust - Amkor Technology Inc - Chief Financial Officer, Executive Vice President

Yes. So as far as the Q4 impact, Toshiya, really the build pattern was the bigger piece of the Q4 impact. The socket gap was the lesser of the two. As we look at Q1, I think the way to think about it is with our year-over-year decline of 7% as our guide for Q1, the biggest driver of that is communication. And so that's where the socket gap is notable, is in a year-over-year decline.

Toshiya Hari - Goldman Sachs - Analyst

Got it. Thank you so much. And then as my follow-up, maybe one for Megan on the gross margin side of things. So you're guiding to 10% to 13% in Q1. You went through the puts and takes as it pertains to Q1. But how should we think about trajectory into Q2 and the back half? Vietnam, I assume, stays a headwind. But as volumes grow and mix evolves, how should we think about gross margins progressing as you move throughout '25?

Megan Faust - Amkor Technology Inc - Chief Financial Officer, Executive Vice President

Sure. So yes, for our Q1 guide, that's going to follow a pretty traditional incremental flow-through as far as the math's concerned with our range that we provided for Q1. As we look out towards the remaining part of the year, I would still say our financial model does support, the 30% to 40% incremental flow-through. This has evolved from our previous incremental flow-through of 40% to 50% given the lift in material content that's happened over the past five years.

Back in 2019, when we came out with that original model, we were at 40% material content, and today, we're at 55%. So I would say 30% to 40% is now the better financial model given our profile. As we look towards 2025, the way to think about that would be the same incremental flow-through. From a Vietnam perspective, that will have around 100 basis points burden in Q1. So that's incorporated into our guide. That is going to gradually reduce over the course of the year such that as we exit 2025, we will be at breakeven operating income. So that will have less of an impact on the full year.

Operator

Joe Moore, Morgan Stanley.

Joseph Moore - Morgan Stanley - Analyst

Great, thank you. I guess you talked about autos eroding over the course of the quarter, but you also talked about your optimism for 2025. Can you just give us a sense for what gives you the confidence in that growth? What are the specific package types that can offset the macro weakness that we're seeing?

Giel Rutten - Amkor Technology Inc - President, Chief Executive Officer

Joe, this is Giel. You were referring specifically to one specific market?

Joseph Moore - Morgan Stanley - Analyst

Yes, to automotive.

Giel Rutten - Amkor Technology Inc - President, Chief Executive Officer

To automotive. Well, the automotive market in the fourth quarter disappoint us because we share we were expecting a single-digit improvement in the fourth quarter, but it came in significantly lower at the 6% below our previous quarter. So that's disappointing.

Now going forward, if we take our project pipeline in automotive, we see strength in the advanced packaging for automotive, specifically for ADAS devices, in-car networking and infotainment, where we have strength with the, let's say, newcomers as well as the incumbent player for advanced packaging. So in that sense, we have a strong project pipeline, and that builds confidence that 2025 will be, let's say, a flat year in automotive.

For our mainstream products, now the line of sight is not that clear. It declined significantly over last year, but we believe that we reached the trough. That's at least the feedback that we're getting from our customers, and we expect a gradual improvement for our mainstream portfolio although visibility is still very vague.

Joseph Moore - Morgan Stanley - Analyst

Very helpful, thank you.

Operator

Peter Peng, JPMorgan Chase and Company.

Peter Peng - *JP Morgan - Analyst*

Hi. Thanks for taking my question. Maybe if you can spend a little bit of time talking about the dynamic at your marquee customer. And then more importantly, as that customer ramps down given their Blackwell rollout, how are you expecting to kind of backfill that with either maybe expanding more customers, et cetera? Maybe if you can just spend some time on that dynamic.

Giel Rutten - *Amkor Technology Inc - President, Chief Executive Officer*

Yeah. Good point, Peter. Let me try to explain you the dynamics here. I mean, in the broader sense in the compute market, we see that as an important market for us with a significant opportunity for growth over the next couple of years. So in the AI market, specifically for AI GPUs, we still see, let's say, the second generation being introduced now.

And for a couple of reasons, we see our 2.5D business to be below expectation in the first quarter of 2025, specifically related by the accelerated ramp of the next-generation GPU families. And then the second element there is the -- these China restrictions that came in by the end of 2024, and that had impact on several devices that we were planning to ramp in the first quarter and the second quarter.

Now next to these, I would call it short-term dynamics. We are confident in our overall project and customer pipeline. We are ramping with our second customer in 2.5D in the first quarter. That's ongoing. We're also expanding our technology portfolio to RDL-based technology. We have two devices ramping up, of which one is already in production in the first quarter. And we have a strong project pipeline going forward in further, let's say, AI-based technology.

Now if we look to the next-generation GPU devices that are currently in a bridge-based technology, we consider us, there, a technology follower, not a technology leader. And we work on that technology and R&D, and we have several engagements with more than one customer to bring that into production in 2026.

Peter Peng - *JP Morgan - Analyst*

And then maybe if you can just talk about how you're thinking about OpEx spending through the year just given the more muted revenue expectations.

Giel Rutten - *Amkor Technology Inc - President, Chief Executive Officer*

Okay, I'll leave that to Megan.

Megan Faust - *Amkor Technology Inc - Chief Financial Officer, Executive Vice President*

Peter, yes, so Q4 OpEx did come in lower than we expected. As we're looking at Q1, we're expecting that to increase mainly for your seasonal reset of incentive comp. From a full year, I would anticipate total OpEx being pretty similar to 2024. We are going to continue to invest in our technology road map as well as other technology surrounding power modules.

So we're anticipating similar. That would also include continued strict head count control, reduction of discretionary and travel spend, and deferral of other projects to maintain a lower level of OpEx similar to what we achieved in 2024.

Peter Peng - *JP Morgan - Analyst*

Great. Thank you.

Operator

Craig Ellis, B Riley Securities.

Craig Ellis - B. Riley - Analyst

Yeah. Thank you very much for taking my questions. I'll stick within compute to start it off. What I was hoping to understand is if we look at the real strong growth within the segment, in 2024, how much of that came from AI PCs versus GPU-based systems? And as you look at 2025, how would you expect those different opportunities to contribute to the growth that you expect?

Giel Rutten - Amkor Technology Inc - President, Chief Executive Officer

Thanks, Craig. Let me start with the growth in GPUs for AI data centers. We would consider that the major part of the growth that we have seen in 2024. That was within the 2.5D technology, and there, we ramped that and we were able to quadruple that revenue for 2.5D in 2024 according to plan. So that was the major part of our record year in our compute market.

Now we see the debt market, we still continue as a good potential going forward. We're diversifying our customer base. We're diversifying our technology base, and we have a significant installed base on capacity and capabilities in order to diversify our business beyond the current customer base.

If we take the segment of AI-based PCs, then we have a couple of customers that are introducing new products there. Some customers are more successful than others, but I believe that that's still an emerging segment where we are well positioned. We have products in the market currently with two lead customers in that market. There are fabless companies. So in that sense, we see further growth going forward, certainly when AI moves to edge devices like PCs but ultimately also to smartphones.

Craig Ellis - B. Riley - Analyst

That's real helpful color, Giel. And the follow-up question is one that's less a modeling question and more a new program question. So in 2024, it was impressive because the company had ARM-based PCs and AI and a very good wearables program, and those benefited multiple segments.

And as you look at 2025, clearly, there's an opportunity to recapture some SiP share, and it seems like there is the foundation for continued growth in AI. But as we look at the company-specific things that will benefit Amkor, how would you set that list? And if you were to rank order it, how would it look one through four, one through five? Thank you.

Giel Rutten - Amkor Technology Inc - President, Chief Executive Officer

Yeah. Let me scan through the opportunities as we see it, Craig. I mean let's start with communication. We already covered that. Now regaining the SiP socket in the next-generation phone is critical. That will not initiate growth. We expect a flat communication year, although we see some more recovery in the Android side, but we currently plan for a flat communication year.

If we take automotive in the previous, let's say, question, I covered that. We definitely see upsides on the advanced products in automotive, both for ADAS as well as infotainment. With lease customers there, we have a strong pipeline. And we also see that next-generation products are being introduced, and that will refresh that pipeline to the market, and that will materialize in revenue in 2025.

Mainstream products in automotive stays a little bit vague, and that also includes our power and power modules going into that market. The EV market is a little bit soft at this moment, but there is definitely hope and feedback from customers that even on the mature side of automotive, we

will see recovery during the year. Not a breakthrough but at least we now have seen almost three years in a row of decline, and we hope that we see a flat to slightly up year in '25.

Now then move into the compute segment. We have many, let's say, opportunities going forward. There's also a significant uncertainty because this is the segment that is being hit by recent China restrictions. We had a strong pipeline there. And currently, we discount these devices -- because of that uncertainty, we didn't want to include that in our planning on the 2.5D and also on the RDL-based technology. We definitely see upsides, but we are conservative to call that a growth year. We currently see this as, let's say, slightly up, worst case to flat year for 2025.

And then last but not least, the consumer market. We expect that the current program will run for the full year 2025, and that will contribute to a flat to slightly up year. Again, also significant uncertainty on the more mature products still. So we're guiding quite conservative there for the full year, and we take a conservative look. So all in all, there are no breakout opportunities, but I believe, I would say, we have a solid project pipeline going into all the market segments.

Operator

Randy Abrams, UBS.

Randy Abrams - UBS Equities - Analyst

Thank you. My first question, I actually wanted to touch on the CapEx where you're guiding to \$825 million. And I know you said you have some for Vietnam. But given that conservative outlook, maybe go through on the remaining piece, where the allocation of spend and priorities between test, assembly or any other special investment, I think, you mentioned on the power module side?

Giel Rutten - Amkor Technology Inc - President, Chief Executive Officer

Yeah, I'll leave that to Megan to cover this, Randy. Thanks for the question.

Megan Faust - Amkor Technology Inc - Chief Financial Officer, Executive Vice President

Hi Randy, our target is \$850 million. I think I heard you say \$825 million. I just wanted to clarify that. And so how that rolls out, about 70% of that is intended for capacity and capability. And the primary areas are in the high-performance computing market. We're intending to spend similar dollars on our high-performance computing for leading-edge technology, so the next generation of RDL and bridge technology as we work on those next generations.

The second area would be advanced SiP and then the third largest would be test. So following that capacity and capability, we have about 25% on facilities and construction. And that's a little bit more elevated than what our historical intensity would be, but that is because we're allocating about 5% to 10% for our Arizona facility. And then the last 5% is on quality and R&D. We have earmarked certain investments for quality, including automation in our factories.

I did want to point out that the CHIPS funding that would be tied to some of these investments is tied to certain milestones and so the timing of receipt for those is uncertain and is not incorporated into those guides. We do not expect to receive material grants in 2025 given those milestones.

Randy Abrams - UBS Equities - Analyst

Okay. Good color on that. I actually wanted to ask because of a lot of commentary in the market there is on tariffs affecting a few areas. First, if you're seeing any pull-ins. There's been some talk on consumer side, but also given Mexico, Canada, like if anything happening on automotive. So that's one, if it's affecting timing of shipments.

Second is on shifts. There's some talk about whether Taiwan gets some tariffs. And if you're seeing any potential customer engagement or swing where that's the way to bypass tariff, could shift assembly. So curious on geographic shift, if there could be any swings for your business from that side, too.

Giel Rutten - Amkor Technology Inc - President, Chief Executive Officer

Well, Randy, let me make a few remarks on tariffs. I mean currently, the impact is a little bit vague still because the tariff situation is not really well defined yet. Short term, we don't expect a significant impact. I mean, the impact that you referred to in automotive, we currently don't see that. We believe that there is still about three-month inventory in the supply chain, which is still an elevated inventory level. And so I don't expect any constraints there driving short-term impact on prices.

Now with respect to Taiwan, it's difficult to say I cannot comment to that, but I didn't hear any specifics here. On the other hand, what we saw is a significant impact on the latest rulemaking of the US administration that came in, in December '24 and December '25. I already referred to that with respect to the export of certain products into China related to AI that's significantly stricter than before, where products that were allowed to be exported are now on the list of limited or restricted exported products.

Also, we see that in the OSAT environment and in the foundry environment, there is a discrimination between approved companies and design companies and approved OSAT, and that took quite a bit of work on our side to look at the compliance. But I feel that could, to some extent, work in our benefit, although there is still uncertainty going forward. So a bit of uncertainty, and difficult to say what the specifics will be, Randy.

Operator

Charles Shi, Needham.

Charles Shi - Needham - Analyst

Yeah. I want to go back to the full year outlook. You guys are expecting probably flat, up a little bit for the full year given the slow start to the year, right, Q1 down 7% year-on-year. It does seem to require some really above-seasonal growth into second half. But might -- if you help us a little bit more here, what is the normal seasonality? Like half of a half, maybe we can use that metric. And what's the expectation for that particular metric that would inform us that you're going to have above-seasonal growth in the second half of the year?

Giel Rutten - Amkor Technology Inc - President, Chief Executive Officer

Yeah, Charles, that's a good question. Let me ask Megan to give you more details to increase your level of understanding.

Megan Faust - Amkor Technology Inc - Chief Financial Officer, Executive Vice President

Hi Charles, So our seasonal pattern for the growth or for a typical year would be 45% in the first half and 55% in the second half. And so given the dynamics happening within the communications market, where our first half will be muted and I would say lower than seasonal and with our confidence that we will regain that socket, it's going to amplify that first half, second half.

We've already given the flat to low single-digit growth for the full year. So as you're looking at those models, that will require the second half growth to be quite considerable. It could even rise to the levels that were similar to Q4 '22. And so with that, you would be able to see how the shape of the year could be magnified even to a 40-60 pattern.

Charles Shi - *Needham - Analyst*

That's very helpful. Maybe a question on regaining the socket with your high-end smartphone customer. So I think you mentioned you do have the line of sight for that particular socket to be going into production in maybe Q3, sounds like, this year. So how confident you are in terms of that particular socket will definitely go into this year's model? Well, we did have a little bit of surprise last year, right, heading into Q3 and Q4. And what's your confidence level right now for regaining that particular socket?

Giel Rutten - *Amkor Technology Inc - President, Chief Executive Officer*

Yes. The confidence level is high. Charles, I already mentioned before that we have a long-standing track record with this customer to bring new technology to the market. There's a clear cooperation model with strict milestones that are identified and also the preparation for mass production in the third quarter, that timing and that plan and the, let's say, the milestones for mass production are well defined.

So as I mentioned before, this was a strategic decision of the end customer. We're confident and all the indications that we get with respect to project execution as well as mass production milestones are pointing that we are ready for Q3 '25 ramp for this product.

Charles Shi - *Needham - Analyst*

Thank you.

Operator

Tom Diffley, DA Davidson.

Thomas Diffely - *D.A. Davidson & Co. - Analyst*

Yeah. Good afternoon. I appreciate the chance to ask the question. Giel, I wanted to talk a little bit more about the high-end compute market. Obviously, you ramped up very quickly over the last year and a half your 2.5D capability or capacity. I'm curious, when you look at moving to the next-generation package type, is that going to require just an upgrade to your existing capacity or is that completely new capacity and then you ought to backfill the old 2.5D with new clients?

Giel Rutten - *Amkor Technology Inc - President, Chief Executive Officer*

Yeah, that's a good question, Tom. Actually, we mentioned in our last earnings call that the investments that we did in 2024 was, to a high extent, fungible capacity. And that means that it can be used in a broader sense for wafer-based technology, and we include the 2.5D. We include RDL-based technology and in the next step also in, let's say, in bridge technology for next-generation devices.

So it's a fungible technology, and we prove that also now that with limited volumes or we adjusted our volumes for 2.5D, it enables us to ramp the devices that we currently have in RDL-based technology. We ramped that up in parallel. So yeah, I think that's how we see it at this point in time, Tom.

Thomas Diffely - *D.A. Davidson & Co. - Analyst*

So when you look at the \$850 million in CapEx, that's going to increase overall capacity, not just transform it into the newer capacity then?

Giel Rutten - Amkor Technology Inc - President, Chief Executive Officer

That's how we see it. I mentioned before, we have a broad project pipeline. We're also seeing the opportunity in the AI data centers to broaden beyond the, I would say, the main GPU in data centers, and that goes into a domain like CPUs and networking in data centers. They all use advanced packaging technology. So our project pipeline is not only related to the GPUs but definitely expands into other devices that go into the data centers.

Thomas Diffely - D.A. Davidson & Co. - Analyst

That's very helpful. And as a follow-up, Megan, I was wondering if you could get some more specifics about what is behind the tax raise from '24 to '25.

Megan Faust - Amkor Technology Inc - Chief Financial Officer, Executive Vice President

Sure, Tom. It's related to the Pillar Two and how that is being adopted at specific jurisdictions. So we're anticipating a couple of percentage impact to our effective tax rate for the full year.

Thomas Diffely - D.A. Davidson & Co. - Analyst

Okay. I appreciate your time.

Operator

Steven Fox, Fox advisors.

Steven Fox - Fox Advisors - Analyst

Hi. Good afternoon. Thanks for all the color so far. I was just wondering if there's a way just to step back from all the program-specific color that you provided, just to talk about the state of some of the broader markets, you're -- what you're assuming happens in the second half, specifically on edge devices, AI PCs and smartphones and on the more traditional auto markets that you're serving. Then I had a follow-up.

Giel Rutten - Amkor Technology Inc - President, Chief Executive Officer

Well, Steven, that's a very good question, but that doesn't make it an easy question to answer. We believe that AI will continue over the next years to provide opportunities. It started off with opportunities in devices that were used for training.

And we now go into inference, and then we go to edge devices. We also see applications being launched also in the edge devices like in PCs but also in smartphones recently with applications in the iOS phones but also in the Android phones already.

So all of that will drive an upgrade on the hardware side and upgrades on the hardware side. Ultimately, we believe that, that will drive an upside for semiconductors in general. And we believe in that pipeline, with our technology base with our at-scale capacity and with our partnership network, including feeding into the foundries that we are well positioned to capture these opportunities over the next couple of years.

Steven Fox - Fox Advisors - Analyst

Fair enough. Sorry, I didn't mean to put you on the spot like that. And then just as a follow-up, can you just give us a sense for when you would expect to start receiving the CHIPS Act grants, like not exactly month but just sort of how many quarters into the capacity expansion would you start hitting the hurdles to receive funding back from the US government?

Megan Faust - Amkor Technology Inc - Chief Financial Officer, Executive Vice President

Steven, so with respect to how the grants are outlined, they're attached to certain milestones during the project. So as we start our construction and as we move into 2026, we'll be able to give you a better feel for that. I think what's important to keep in mind is what our total investment for that project is expected to be, and that's over three to five years.

We've shared that, that could be about \$2 billion. And between the CHIPS grant as well as investment tax credits combined, that together could be about \$800 million in reduction. The timing of how that comes in is where it's a bit choppy from a cash flow perspective. So we'll make sure to update that as soon as we have more information.

Operator

Steve Barger, KeyBanc Capital Markets.

Steve Barger - KeyBanc - Analyst

Giel, with seven quarters of automotive declines, it just seems strange that that's all inventory. Are there any customers or product lines across ADAS or infotainment or electrification that seem to be getting desourced or cannibalized? Or is this really chasing down inventory and demand levels?

Giel Rutten - Amkor Technology Inc - President, Chief Executive Officer

Yes, that's a good question, Steve. I mean the -- if we look at the seven quarters decline in a row, and I mentioned that in my prepared remarks, it is mostly the mainstream portfolio. If we take the advanced packaging portfolio, we see more strength there even in an overall declining automotive and industrial market. That's still stable to up year-on-year.

So we believe that ADAS, infotainment, in-car networking continues to be a growth area. And also the inventory level is less prominent than on the mainstream products. I think the mainstream products, if I look at the latest reporting of our top six automotive customers, they see a gradual decline in the excess inventory. And they believe that during 2025, first half, that would be stable.

And after that, we would go into a mode where inventory gets replenished. Now while we were overshooting delivering product into that inventory after COVID, currently, the end customer, the automotive customers are probably undershooting a little bit because they go back to a very lean inventory level. And but we expect that, that situation will turn.

So step back, on the advanced products, inventory is much less, and we keep that business running, and we see upsides in 2025. The main declines are on the mainstream products, mostly wire bond, lead frame products, still significant volume also on microcontrollers that go into automotive but certainly also in industrial applications, and that will take longer. And although it's still vague what '25 will bring, there is optimism at our customer base.

Steve Barger - KeyBanc - Analyst

Can you tell us what percentage of automotive is advanced products now? Or what percentage is flat to up versus the stuff that's more challenged?

Giel Rutten - Amkor Technology Inc - President, Chief Executive Officer

Well, we generally don't report it, but I would say the mainstream product is still more than 50%, although advanced product is ramping up much quicker than mainstream. So as a rough estimate, let's say, 60% to 40%, that would be, what it was, with 40% being advanced products and 60%, our mainstream portfolio.

Steve Barger - KeyBanc - Analyst

Got it. And then just a quick follow-up. I know test has become a more important part of your business, and I imagine 2.5D was the driver of that. So how has your outlook for tester utilization rates changed? Or are you seeing other areas of the business ramp where test intensity is increasing?

Giel Rutten - Amkor Technology Inc - President, Chief Executive Officer

Yes. Good question. We see test clearly as an area of opportunity. If we take our communication business, then we have a very high test rate, so the products that we are assembling but also testing. That's also the case for automotive. For some other areas, we have less test rates, but we're definitely investing in that.

We believe that there is a high, maybe a too high concentration of tests in Taiwan currently, with the test houses being there, et cetera. And feedback that we're getting out of the supply chain is that that's considered to be a risk.

So we're actively working to find, let's say, a test location and test capacity that can accommodate an expanding specifically compute supply chain where there's a high concentration in Taiwan. So yes, test is important. We're actively working on expanding that and then prominently prominently in the compute segment.

Operator

And at this time, I'm showing no further questions. I would like to turn the call back over to Giel for closing remarks.

Giel Rutten - Amkor Technology Inc - President, Chief Executive Officer

Thank you. Thanks for all the questions. Let me recap the key messages. Year '24 met our expectations, except for the prolonged weakness in the automotive and industrial end markets. We set record revenue for computing and advanced SiP.

For full year 2025, we expect a stronger-than-seasonal second half driven by content recovery in the next generation of IOS phones. We continue to invest in our technology leadership, expanding our global footprint and partnerships with industry leaders. Thank you for joining the call.

Operator

Thank you, ladies and gentlemen. This concludes today's conference call. You may not disconnect.

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