Advantest Corporation
IR Technical Briefing
Q&A Summary

December 21, 2021

Q: You are poised to see substantial growth in the number of display driver IC (DDIC) testers that you ship in FY21. Do you expect further acceleration in that growth in FY22? Also, are you experiencing any constraints in your production capacity?

A: We are currently in the process of refining our forecast for FY22. Customer inquiries are strong, and my personal feeling is that demand will grow YoY in FY22. You also asked about production concerns. With the active involvement of our management, we are working on the procurement side of our supply chain on a daily basis to ensure that we are able to respond to customer demand to the maximum extent possible.

Q: Your order backlog is up significantly. How many months of lead time do you require for DDIC testers at present? I am curious as to how far out your visibility on demand extends.

A: At present, our lead time for DDIC testers is roughly six months. We are in talks with customers premised on timelines extending out half a year from now, meaning to around June or July of next year.

Q: I would like to ask about slide 23. The graphic depicting increasing test times does not seem to reflect factors such as resolution or gradations, which also impact test times. Is it not possible that test times will increase beyond what is shown in that graphic? At the same time, test costs are likely to continue to mount as test times continue to increase. What kind of solutions do you have to help your customers keep their test costs down? Lastly, what do you mean when you reference better ensuring reliability, including by "high test coverage?"

A: The graphic on slide 23 indicates roughly the amount of test time added by touch sensor and OLED functionality, respectively. While test times will differ depending on the specs of individual devices, they will mostly fall within the ranges shown here.
You also asked about proposals we provide to help reduce test costs as they rise along with test times. Increasing parallelism is more difficult with DDICs than with other SoCs, so we propose methods for increasing parallelism by dividing up the tests and otherwise discuss optimal testing approaches with our customers.

A specific example of demand for stronger quality assurance guarantees is the fact that automotive chips need to be tested at low, normal, and high temperatures, which is not a requirement when testing DDICs for smartphones or TVs. Testing automotive chips requires more than twice the time required for testing chips for other applications given the very granular functionality testing required to ensure the quality that automotive chips demand.

Q: What risks do you see in the competitive environment for DDIC testers? Will you be able to maintain your dominant position going forward?

A: Our strength lies in our customer base and installed base that span the test supply chain. Fabless companies find that choosing our products gives them easier access to OSAT capacity. OSATs find that choosing our products makes it easier to get business from fabless companies. This dynamic is one of the reasons that customers prefer us.
The test programs and device interfaces that our customers use when employing our testers become valuable assets for them. Casting those assets aside to switch to another company's testers would require a customer to spend heavily on engineering. As such, even if competitors were to enter the field, we believe that the space that they would occupy would be limited.

Q: My understanding is that fierce competition hurt the profitability of your DDIC testers in the past. Have your current products improved upon that damaged profitability?

A: As the functionality of DDICs has increased, average tester prices have risen, improving profitability. The T6391, which is our latest model, has achieved what we see as healthy profitability, albeit not as high as that of our high-end SoC testers.

Q: You said that 55% of DDICs are used in TVs and mobile phones. What are the applications for the remaining 45%?

A: The remaining 45% includes monitors used with desktop computers and the like, laptops, tablets, and smartwatches.

Q: Based on your discussion of the long test times for automotive chips, I am anticipating tester demand in that space to grow in the future. Could you tell us what percentage of DDIC tester demand automotive applications currently account for and what kind of growth you expect going forward?

A: The main automotive application for DDICs is LCDs. Around 5% of LCD panels are used in automotives, and as we note in our presentation materials, a market research company forecasts a CAGR of around 5%.

Q: Slide 7 shows your forecasts for the DDIC market based on LCD DDIC units and OLED DDIC units. If you were to express this in revenue terms, what sort of annual growth would you be anticipating?
Also, could you additionally share your growth outlook for the DDIC tester market, by which I mean, do you expect growth in the DDIC tester market to equal that of the DDIC market, or is tester revenue per DDIC growing as test times increase?

A: For example, the average price of a smartphone OLED DDIC has risen to around twice that of an LCD DDIC, so if we were to express our DDIC market outlook in revenue rather than unit terms, annual growth for revenue would be higher.
Given the variety of market factors at play, forecasting DDIC tester market growth in quantitative terms is difficult. However, we believe that growth in the DDIC tester market will exceed the unit-based DDIC growth outlook given that tester prices are rising with the device pin counts and speeds that testers support and that test times are increasing.

Q: I want to confirm whether stronger DDIC quality requirements (the “quality buy”) boosting tester demand is a phenomenon limited to automotive DDIC. Also, if possible, could you describe the scale of demand for DDIC testers by application, including automotive applications, and tell us what sort of growth you anticipate by application going forward?

A: At present, it is only automotive DDICs that are subject to stronger quality requirements. Our testers can test DDICs regardless of their intended application, so we do not track demand trends by application in detail. However, based on the technical questions that we receive from our customers and other factors, we estimate that growth is strongest for smartphone OLED display demand.

Q: My impression is that historically speaking, your DDIC tester revenue has been highly volatile from year to year. However, is it evolving into a market from which you can expect growth for a certain amount of time given the increasing impact of the “quality buy?”

A: The DDIC tester market has historically been exposed to replacement demand for TVs in Olympic years and to the mobile phone demand cycle. In recent years, however, the increase in test times spurred by DDIC functionality gains has had a greater impact. If we

additionally take into account the likelihood of growth in automotive displays increasing "quality buy" demand, we feel that the DDIC tester market has evolved into one from which we can expect long-term growth.

Q: Is there any connection between your strength in DDIC testers and your strength in GPU testers?

A: Our strength in DDIC testers owes in part to the deep relationships that we have established with leading companies in this field. We are at a distinct advantage because we do business with every DDIC manufacturer and are able to develop our testers based on input from these customers regarding future technological trends. We have established a similar position in GPU testers. It is this positioning that makes us strong in both fields.

Q: You say that you expect explosive growth in the market for near-eye displays. Could you tell us how you expect your DDIC tester business to benefit from the expansion in that market, including in terms of scale?

A: People are saying that 2022 will be "Year One" for VR, but given hurdles to be overcome in terms of telecom network infrastructure and product pricing, we believe that it will likely take a while before the near-eye display market explodes. However, we do see major potential in metaverse-related markets, in part because of how the hyperscalers are promoting the concept. If the use of AR glasses and head-mounted displays spreads to the business world and everyone comes to own a VR or AR display device the way we own smartphones today, the sheer number of such devices would likely drive significant growth in demand for DDIC testers.

We are also hopeful for technological reasons. VR and AR devices use next-generation displays offering very high definition, such as micro-OLED and micro-LED displays. Because of the proximity of near-eye displays to the eye, they require smaller pixel pitches and greater gradations. Greater gradations require longer DDIC test times, so DDICs for near-eye displays are likely to require longer test times than the current DDICs for smartphone OLED displays.

Note

This document is prepared for those who were unable to attend the information meeting and is intended only for reference purposes. The original content has been revised and edited by Advantest for ease of understanding.

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