eMemory 4Q22 Earnings Call Q&A Transcript

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Q&A Transcript

1. **Why did your revenue substantially increase in December 2022 compared to March/June/September? Why did the revenue of January this year decrease compared to Q4 last year and the year before?**

   >> Last December, we received a lot of PUF-related licensing revenue. Due to fewer working days in January, part of our licensing revenue will be recognized in February instead. In terms of royalties, it was affected by the sharp decline in the capacity utilization rate for mature processes.

2. **China has successfully built legacy node manufacturing processes with its own technology in recent years, especially for SMIC and Huawei. What role does eMemory play in this situation? How do you view future contributions of this for eMemory?**

   >> Similar to situations with other foundries, this will help increase the adoption of OTP, MTP, and PUFsecurity solutions.

3. **We know that eMemory's royalty is based on foundry shipments of the previous quarter. If the utilization rate of major foundries only improves in H2, do we have to wait until Q4 to see royalty growth?**

   >> We witnessed customers who made inventory adjustments earlier restart their wafer production for new products at foundries. In addition, we have accumulated hundreds of new product designs in the past two years. Some of them will start production in Q2 ahead of new product launch in the second half. Overall, we believe royalty will pick up momentum in the second half of the year. The revenue momentum for the year will be driven by PUF- related licensing.

4. **January revenue has declined compared to Q4, and the decline is much more significant than overall foundries. What is the reason?**

   >> In addition to the continuous growth below 28nm, many customers of mature process applications have undergone drastic inventory adjustments, and some chip customers even stopped all wafer production. This already occurred in the royalty report last quarter but is more evident as more customers cut wafer for existing products.

   However, some customers who were the first to adjust their inventories have already begun to place wafer orders for new products at foundries. In addition, many new product applications accumulated in the past two years will be mass-produced one after another, so we think this is a short-term seasonal adjustment. Our growth momentum will restore in the second half.

5. **What new applications in 28nm, 12/14/16nm and 6/7nm have been designed in but not in mass-production yet?**

   >> 28nm: WiFi, TWS, RF IC, high-speed interface IC
   16/14/12nm: DTV, SSD controller, Surveillance, STB
   7nm: FPGA, ADAS, SSD controller, DTV

6. **Cadence has changed its strategy and is looking to cooperate with Taiwanese IP manufacturers for outsourcing efforts. Does eMemory have any related projects?**

   >> We are cooperating in security solutions.

7. **There are many kinds of PUF in the market. What is the biggest difference between our PUF and other kinds of PUF? Is it necessary to use PUF for security? Is it possible to pass security standards without PUF?**

   >> 1) To answer the first part of the question, PUF needs to meet three conditions to provide the best root of trust: a) be highly random, b) be unique, c) be reliable, d) be easy to create. The biggest problem of PUFs on the market is their lack of randomness and reliability. *(cont.)*

2) Using PUF as the random secret for the root of trust will quickly generate high-quality unique keys for security purposes. Doing so is much safer than other security methods.

3) Without using PUF, high-security standards cannot be met. The disadvantages of not using PUF include:

a) Inability to generate high-entropy random numbers. Instead, a post-processing circuit will be required to accumulate or improve the quality of random numbers.

b) Providing a chance to attack, because root of trust will be stored in an insecure external flash.

8. **Has a client ever re-designed a chip to remove your IP to save money/to use a competitor?**

>> Unlike standalone products with easy replacement characteristics, our embedded logic NVM IPs are hard to be replaced directly. We only lost one key customer in the past 22 years, which was Hisilicon, due to sanctions by the US government, which hit our royalty in 2021 Q1 (from high single digit percent of royalty to 0%). Besides, customers only adopted our IPs for more applications and will replace other solutions (including the free eFuse or other vendors) step by step, as semiconductors innovation only moves forward, not backward.

9. **Will your business model inevitably lead to an exponential growth of royalties?**

   >> No business model will guarantee growth. Our royalty model is the most difficult one to achieve in all IP fields. Unless the technology is exclusive and a must- have, typically, customers are unwilling to pay the royalties.

   Even with a royalty model, we still need to work hard to gain new customers and get into new applications to ensure our growth is sustainable in the long term. In addition, continuing innovation for new technologies to maintain a leading position in our industry are all important to ensuring a cooperative relationship with most leading customers.

10. **Is eMemory IPs being used for AI-related applications? Why does AI need to use eMemory's IP?**

    >> Yes, we have customers in AI applications. Our PUFrt (the root of trust IP) can be used as the root of trust for AI chips, while PUFcc (crypto-coprocessor IP) can generate unique keys to encrypt AI models and application code.

11. **ChatGPT is mainly built on NVIDIA's A100, and various ISPs and solutions compete to invest in this field. What are the business opportunities and applications for NeoPUF in DPU?**

    >> NeoPUF will protect the data (encryption and access control) of DPU (data center processor) chips by acting as a root of trust and security solution.

12. **According to your earnings call last quarter, NeoPUF has two projects on the 4/5nm platform. What kind of applications are they based in?**

    >> Last time, we only mentioned that NeoPUF has completed N5 tape-out and is moving to N4/N3. Currently, our OTP just qualified in N5, and N4P, N5A, and N3E will be tape-out in the first half of the year.

13. **Over the past two years, the AMOLED panel production capacity in South Korea and China has been revealed. What is the growth potential of AMOLED DDI for eMemory? Is there any difference between Embedded RAM and RAMless in using NeoFuse?**

    >> The introduction of AMOLED production capacity will drive more OTP usage. RAMless DDI use OTP for parameter setup and adjustment for driver IC, while embedded RAM DDI has an additional requirement to repair the SRAM using OTP.

14. **PUF-related revenues have recently experienced exponential growth, will eMemory simultaneously expand on your R&D engineers?**

    >> The most difficult part for IP development is the initial concept of invention and building the infrastructure to commercialize the IP business. R&D resources need to be built in the early stage, and IP development takes at least 3-5 years to complete. When we receive a license fee, the infrastructure should be already mostly completed.

    Our upcoming plans for hiring R&D will focus more on software, including new product development, product verification and maintenance, software application platform development, and more. As a result, in addition to IP and integrated solutions, we can also provide security as a service.

15. **Why did your royalty revenue per wafer shipped decline when your % of revenues from 12-inch wafers increased so much?**

    >> Our wafer shipment was 9.17 million in 8-inch equivalent last year, royalty per wafer was USD $9.1, up 9.6% compared to 2021.

16. **What is your progress on the v9 confidential computing cooperation with Arm? When can we see the contribution? In addition to v9, are there any other activities with Arm?**

    >> We have completed system design verification. We expect it will be adopted into advanced processes such as HPC and AI applications.

    In addition, we are also developing together in IoT and automotive applications.

17. **At the TSMC conference, the CEO mentioned that the analog process could move to 7nm. Will this be an opportunity for eMemory?**

    >> Most specialty processes need OTP or MTP. As requirements for product applications become more advanced, the circuit becomes more complex, so a larger OTP density is required. The foundry solution, eFuse, will no longer be enough.

    Our OTP can be used in specialty processes and mass-produced by customers for 7nm, so this presents an opportunity for us. In addition to density, there are also security requirements, so both PUF and OTP must be used. In addition, we've recently seen customers replacing it with ROM and repairing SRAM.

18. **Countries worldwide are significantly increasing their defense budgets, especially on missiles and drones, which are being mass-produced rapidly. Does eMemory see any opportunities for eMemory IPs in manufacturing military equipment? Are there any customers currently in negotiation? If so, for what processes/applications and countries?**

    >> We are mainly cooperating with US foundries, targeting American customers.

19. **We know the more advanced the process, the higher the wafer price and the higher the royalties for eMemory. However, will shrinking chip size decrease the customer demand? How should shareholders evaluate the impact of future 3nm and 2nm on eMemory's operations?**

    >> Customers migrate to more advanced processes to add more functional transistor IPs to the chip design. Usually, chips become bigger, not smaller. For us, the advanced manufacturing process means new applications and markets, which can increase our total addressable market. 2nm and 3nm also means the increase of our addressable market.

20. **AI has attracted a lot of attention because of ChatGPT. Will it cause security problems? Is there an opportunity for eMemory to break into relevant applications?**

>> AI models and input data must be protected to prevent hackers from using chatGPT for inappropriate things. AI applications must also be certified and tied to the chip root of trust. Cybersecurity concerns can be avoided by integrating and binding software and hardware to authenticate the identity of AI robots or the genuineness of AI applications.