

# eMemory 3Q23 Earnings Call Q&A Transcript

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## Q&A Transcript

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**1. Charles just gave a great talk about SRAM repair. What is the current solution for SRAM repair? Under what circumstances would SRAM repair use eMemory's solution? How big is this market?**

>> SRAM is mainly embedded in processors (CPU, AP, GPU, etc.) If the density of the OTP for SRAM repairment exceeds 8kbits, eFuse is insufficient, so you will need to switch to AntiFuse (NeoFuse). All processors represent a potential market. As the SRAM density continues to grow, the potential market for adoption will also increase.

**2. What's your view on the penetration rate over the next few years?**

>> We foresee an increase in foundry penetration rate due to our extensive development in technology platforms across multiple foundries. More than 100 process platforms are under development each year, with an average of 400 new product tape-outs growing to an average of 600 new product tape-outs per year, designing in our OTP, MTP and PUF-related security technologies.

**3. There are ongoing concerns for operations in data centers to be secure and confidential. I heard that AMD, Google, Microsoft and Nvidia recently worked together to develop a Caliptra initiative to define standards for hardware root of trust (HROt). Are you guys a part of this standard? Follow up: what does this mean for eMemory?**

>> Caliptra is an open-source standard that aims to integrate security mechanisms into chips and plays a crucial role in the Open Compute Project (OCP) reference design. Its primary goal is to establish an open-source standard for the Hardware Root of Trust (HROt), which is essential for hardware-based security functions embedded in CPUs, GPUs, SoCs, ASICs, Network Chips, SSDs, and more.

As far as we know, this is the first time TRNG, OTP and PUF are collectively addressed within a single standard, which happens to be our strengths and expertise. This also means the HROt of the processor for data centers must include hard macros, TRNG, OTP, and PUF, as key components. However, since hard macros are unavailable through open source, they must be obtained through licensing from us.

While Caliptra is still in its early stages, we foresee broader adoption for hardware-based security in data centers in the future, which opens up significant opportunities for our PUF-based technologies.

**4. China's mature manufacturing processes are severely oversupplied. Will foundry wafer prices decline in the future and affect your royalty revenue?**

>> The OTP in mature processes is a very stable cash cow for us due to limited R&D resources. The leading edge and additional royalties from PUF-related security solutions will drive the ASP of future royalties. On the other hand, because of overcapacity, foundries are allocating resources to develop specialty processes to add value and differentiation, such as our MTP-related technology, which witnessed substantial licensing growth this year. The royalty rate for MTP-related technologies is double that of OTP, which will also increase the penetration rate of mature processes and the growth of royalties per wafer.

**5. In your partnership with Arm, which areas are you targeting? When will you start to see real contributions from them?**

>> We are working with them on Confidential Computing Architecture and Corstone Architecture, covering applications such as Smartphones, Automotive and IoT (edge computing). There are license contributions from Automotive and IoT customers already.

**6. Are your IPs used in chiplets? What is its current proportion of revenue?**

>> Customers use our OTP for multi-chip repair because traditional eFuse is unsuitable for post-packaging modifications. For example, in recent years, ISPs that need to be packaged with DRAM and CIS are driving customers to use our OTP for ISPs. As a result, ISP has contributed to over 10% of our royalties this year.

Furthermore, DRAM manufacturers have also licensed our technology for DRAM repair and after 3D or 2.5D chip packaging with logic chips. We expect more adoptions of our IPs for similar applications in the future.

**7. eMemory recently announced the purchase of new offices. Does this mean you also have major employee expansion plans in the works?**

>> We've been using our current office for over 15 years, but our employee count has increased by more than 50%, so the existing office space is not enough. We acquired a new office to provide employees with a better working environment and be prepared for expansion in the future.

**8. Are your IPs being adopted for 7nm and below? When will you start receiving royalties?**

>> Over 25 tape-outs from the past have now entered production. We expect a significant growth in royalties beginning from next year.

**9. Will the US government's latest ban on China's AI chips affect your business?**

>> We do not have any impact since the banned chips don't use our IP yet.

**10. As generative AI proliferates on edge devices, will this increase the adoption of eMemory IPs?**

>> Edge devices all need security protection so that they can securely connect to cloud services. Particularly, with generative AI embedded in edge devices, the AI models and training data must also be protected. Our PUF-based security IPs will have a big market in edge devices.

**11. You experienced substantial growth in licensing revenue this year. May I ask what is the reason? Does this mean that future royalties will also increase?**

>> The growth of our licensing revenue is mainly driven by the strong demand for all of our technologies, which will also drive the strong momentum of future royalties.

**12. Will changes in GAA (Gate All Around) and Backside Power Delivery Network affect your technologies?**

>> No, this will not affect us. We are developing our IP in related processes.

**13. As foundries begin to build outside of Taiwan, will your expenses increase?**

>> Our R&D is still based in Taiwan and will not expand along with foundry expansion overseas. This is because we provide technology and design licensing, which does not require on-site execution in local foundries.

**14. There have been many discussions recently regarding the use of Arm CPU in PCs. How will this affect your partnership with Arm?**

>> Arm's CPU application in PC belongs to their Client Business. Similarly, CPU in mobile also belongs to Client Business. Our PUFrt will be used in the Runtime Security Engines (RSE) of Arm's mobile CPU. Once verified, it may also be used in the CPU for PC.

**15. What opportunities or threats do you face in the design of processors such as CPU/GPU/NPU?**

>> Future computing processors will move toward Confidential Computing, which requires high-level security functions. As we have successfully developed PUF-based Root of Trust security IP, which provides very strong security functions for these processors, we have a great opportunity to license these IPs to these Confidential Computing processors. Besides, in order to enhance the computation performance, these processors all need high-density SRAM, our NeoFuse OTP plays an important role for SRAM repair. We expect our IPs to cover a huge market in these processor-related applications.

**16. In the past 6 years, NeoMTP's licensing revenue was more than \$400 million NTD. Last year it was \$90 million NTD. The year before, it even reached \$140 million NTD. However, in the past 6 years, NeoMTP's royalty revenue was less than \$200 million NTD. Can you explain the gap? What will NeoMTP's royalty growth look like next year, particularly with your Korean business?**

>> The licensing of MTP covers five technologies: NeoEE, NeoMTP, NeoFlash, RRAM and MRAM. Over the past few years, MTP's licensing revenue mainly came from foundries. MTP's development and verification period is relatively long, typically exceeding two years. As a result, it takes at least five years before customers even move from tape-out, to production, to royalty contribution. However, since these technologies have already been adopted into mainstream applications, we anticipate accelerated growth in royalty in the future.

**17. According to pages 28/29 of the 2Q23 Investor Conference Presentation, the number of cases in the production/development for 4/5nm and 6/7nm is very small. Is this problem risk-related? What is the future outlook for these two major nodes?**

>> The 4/5/6/7 nanometers in the presentation refer to each process node's licensing and development progress, not the finalized number of designs. For example, N7 NeoFuse/NeoPUF and N6 NeoFuse/NeoPUF represent two process nodes, not tape-out numbers. The actual number of accumulated tape-outs for N7 and N6 exceeds 25. For precise tape-out numbers, please refer to our Management Report instead.

**18. TSMC mentioned that the 7nm revenue declined this quarter in their earnings. Will this affect eMemory's subsequent royalty contribution?**

>> Our TSMC 7nm applications are just entering mass production but are independent of the applications currently in production at TSMC. TSMC is actively developing mixed mode-related technologies like RF to increase the foundry utilization rate of 7nm, which will drive more applications to adopt our IPs.

**19. Regarding Charles' talk, have you seen any customer adoption for SRAM repair?**

>> We have AI-related tape-out, which uses our OTP for SRAM repair due to high SRAM density. With the increasing SRAM density in AI and HPC processors, we foresee increasing demand of our OTP for SRAM repair.

**20. If the Arm partnership is very successful, what does this potentially mean for eMemory?**

>> Arm is the leading CPU IP company with more than 95% of the market share in mobile. The successful co-development of PUF-based Root of Trust security into their CPU has the following implications :

1. Our PUF-based security Root of Trust solution is the best in the market.
2. We can enter the mobile market with Arm, which currently holds over 95% of the market share.
3. We expect our market share in the Confidential Computing market will also be very big.

**21. PUF-based technologies have seen substantial growth in licensing contributions this quarter.**

**Who are some of your current customers/applications that have adopted PUF?**

>> Other than CPU partners, we have also licensed to DPU, AI, Edge Computing, HPC, IoT and ADAS customers.

**22. What's your conversion rate (hit rate) from new tape-outs to royalty revenue?**

>> The conversion rate from tape-out to mass production exceeds 95%. We have a high conversion rate because most of our tape-outs come from the mature applications of big companies. Almost all of these tape-outs will successfully move to production, resulting in royalty revenue.

**23. What is your progress on 3nm and 5nm?**

>> This year, 5nm technology will be adopted in self-driving, data center, and AI-related applications. Meanwhile, 3nm technology is undergoing verification at major foundries. In addition to our collaboration with CPU partners, we already have ADAS and processor customers, as well as a US cloud service provider requesting our IP for 3nm. We are confident about the verification process and anticipate customer design-ins next year.

**24. Do you only license your IPs to China and Taiwan? Do you have US customers like Intel and GF?**

>> Approximately 30 foundries worldwide have licensed our technologies, including Intel and GF.