

Investor FAQ

Q1: According to the press release with ARM, can eMemory explain what kind of platform is under planning and what level of cooperation we can expect? How will this contribute to your profits in the future?

Answer:

We have been cooperating with ARM for more than a year to increase the security level of their IoT applications. ARM creates CPU IP, which is soft IP. The CryptoIsland platform that they use to work with us is of the highest security level. We have since worked together to collaborate on the manufacturing processes of different foundries, from OTP to PUF, which will all be promoted through ARM's global sales network in the future. Customers who use this platform will also be charged licensing fees and royalties, just like a regular customer would.

Q2: How does the security IP strategy and payment method differ from what you have done in the past?

Answer:

We are currently building an open platform to promote our products. Since PUF-based security function is a type of digital design, it can be put on the open platform for download. This allows customers to do simulations and to verify the design. We will provide soft IP (circuit design) and hard IP (OTP and PUF) during the tape-out process, then charge licensing fee which includes the design service and usage fee. In addition, we will directly receive the functional IP royalties from the clients during mass production. In addition, when customers use eMemory's OTP and PUF during their mass production processes, eMemory will also receive royalties from the foundry. As a result, the total royalties we receive will include two components: security IP royalties (paid by chip customers) and OTP/PUF royalties (paid by foundries).

Q3: Who are your competitors in the Hardware Security IP area? Do you think there are competitors who can surpass your progress in the future?

Answer:

Our products are PUF-based hardware security IPs. The demand for Hardware security IP is beginning to increase because people are starting to realize it can provide a higher level of security protection than software security. PUF is the unique

property of the chip which comes from variations in the manufacturing process and results in a unique fingerprint for the chip. This fingerprint can then be used as a random number generator to create a key that protects the data stored in chips, as well as the communication between chips. One of eMemory's competitive advantage is NeoPUF which is derived from NeoFuse. Having developed more than 400 platforms in 23 wafer foundries around the world, we have a wealth of experience that no other company can compete with. On top of that, we continue to add at least 20 more process platforms every year. In addition, our business model is based on charging royalties from the foundries where our NeoPUF and NeoFuse Platform are built, and most of our development costs are absorbed by our foundry partners. Therefore, at present, our business model and wide spread of processes platforms provide a very big advantage for us to surpass our competitors in this field.

Q4: How does the security platform offered by SRAM PUF and Microsoft compare to that of eMemory?

Answer:

SRAM PUF has been in the market for ten years and their main supplier is Intrinsic ID which was a division of Philips Labs. Intrinsic ID owns the technology of error correction algorithm while the technology of SRAM owned by the factory. The SRAM needs error correction algorithm because of the following reasons: SRAM PUF is a volatile memory, when there is no power, the data in SRAM will disappear; and when you turn on the power again, the data of SRAM may change and doesn't revert back to its original data. The volatility of SRAM PUF makes it difficult to be used as a PUF due to its unreliability. However, many early customers who rely on SRAM PUF don't have an alternative. Therefore, we developed eMemory's NeoPUF which is a derivative of our OTP. Compared with SRAM PUF, NeoPUF is more robust and unpredictable and offers better functionality and cost-efficiency.

For a more detailed comparison between SRAM PUF and NeoPUF, we actually have two articles here at:

- 1) <https://blog.pufsecurity.com/2020/02/19/sram-puf-is-increasingly-vulnerable/>
- 2) <https://blog.pufsecurity.com/2020/03/27/neopuf-a-reliable-and-non-traceable-quantum-tunneling-puf/>

The platforms of both Microsoft and Google are for doing cloud business. They are not using PUF for their security methods which make them vulnerable to certain

attacks. We're currently under discussion with them on how we can collaborate to enhance the security of their cloud platform through our security IP.

Q5: You mentioned during the 2019 Q4 quarter that AMOLED Driver has entered the Korean supply chain. When can we expect the Driver designed by them to start contributing to the revenue? Will their foundry be in Taiwan or South Korea?

Answer:

eMemory has made good progress with the OLED driver's suppliers of South Korea's largest mobile phone company. We currently have multiple chip projects with Korean mobile phone company (ISP, OLED, PMIC). These projects are in various stages ranging from verification of the product, to upcoming mass production. Therefore, we already licensed designs last year. We expect that the royalties will start coming in after mass production starts in the second half of this year.

Q6: When can we see the production of CIS/ISP contribute to the revenue?

Answer:

ISP is mainly applied with CIS chips, mobile phones, or surveillance. We expect ISP to go into mass production during the second half of this year. There are also many Chinese clients who mainly focus on ISP. We collaborated with them on projects such as surveillance, which have undergone mass production. We expect the production volume to increase this year.

Q7: The PMIC (power management integrated circuit) grew more than 15% last year. What do you anticipate the revenue to look like this year? Is there a chance for eMemory to partner with the 12-inch BCD process for PMIC? How would the mobile chip leading firms evaluate PMIC's performance in the future?

Answer:

The growth of PMIC was in fact more than 15% last year. This is due to continuous content increase in smart phones. Some of our clients are planning to migrate from 8-inch 0.13 um process to the 12-inch 55nm process. Due to higher wafer, we anticipate that this move will increase our royalties received from each chip. For 5G application, in addition to high current and high voltage (BCD process), it also requires better performance on computing power and speed. As a result, we noticed that our biggest PMIC client added an extra 28nm PMIC to their products. Recently,

we also have a new Korean client who has begun to adopt our IPs in their PMIC products.

To sum up, we have a very positive view of PMIC in the future based on the following reasons:

- 1) The unit price of PMIC has increased due to advanced processes.
- 2) The number of PMIC needed by each mobile phone has increased because of the higher requirement of 5G.
- 3) The Korean client has started to adopt our IP in their PMIC.

Q8: Can you comment on the future developments of consumer electronics? For example, what do you expect the development of DTV, TWS, and WiFi to be like in a year or two?

Answer:

For DTV, we expect eMemory's IP in almost all of 8K TV SOCs this year. Our TWS and WiFi clients will design in our OTP to unify different design specifications into one version. This can help save costs of designs. At present, we already have a lot of clients who are in the design stage so we can expect to receive licensing revenue and royalties from production next year.

Q9: Bluetooth and TWS chips have already been in the market for a while. Why did eMemory enter the field now? What solutions did other clients use in the past? Why do you expect them to switch to eMemory's solutions now?

Answer:

When the product become mature, most clients will accept OTP in order to save the cost of masking and shorten the time to market. They use OTP to unify designs of different product models with one mask version.

Q10: You mentioned last quarter that 25nm DRAM will go into mass production so we can expect to receive royalties during Q3 this year. With that being said, are there any new DRAM projects that are currently under development?

Answer:

Our IP not only improves the yield of DRAM but also strengthen their product characteristics. We could see the benefit during fabrication process, multi-chip packaging, and system repairing by employing our IPs. We expect royalty

contribution increase significantly later of this year as customers increase production volume. Even though eMemory was relatively late in entering the DRAM market, our IP has the best reliability and much fast operation speed than other solutions. Currently we are discussing partnerships with multiple potential clients.

Q11: 40nm OLED has already gained contribution from Taiwanese clients. How about the 28nm one?

Answer:

The contribution of 40nm OLED to our revenue has indeed increased substantially not only from Taiwanese clients, but also Korean and Chinese clients. At the same time, Korean clients have started shipping out products with the 28nm OLED. As a result, we can expect to see the royalties from the 40/28 nm OLED to have a great contribution to our revenue in the future.

Q12: Is eFuse still available for those process platforms that are below 5nm? If so, where do you see the opportunity for eMemory's anti-Fuse to be adopted in advanced process nodes? If not, where do you expect mobile phone APs to adopt eMemory's anti-Fuse?

Answer:

We always keep up with the development pace of technology nodes to catch up with foundry's most advanced process platform. Since there are only few mobile AP clients in the world which used to cooperate with foundries at an early development stage. We are continuing working hard to find the entry points. In addition to do simple settings, the function of eFuse should include security. However, it is obvious that eFuse is not a sufficient security option. To address this concern, we have PUF. Since our PUF is derived from OTP, clients can easily add PUF to OTP without taking too much extra space. If AP clients want to enhance the security level of their products, we would suggest that they adopt the use of PUF.