eMemory Q3 2021 Results – Earnings Call Transcript

November 10th, 2021 16:00-17:00

Opening remark by Chairman, Dr. Charles Hsu

Good afternoon, everyone. Thank you for attending our conference call today.

This quarter, our new president, Michael Ho, has officially taken office. Michael has nearly 20 years of management experience with eMemory and holds over 30 patents in the semiconductor technology field. Before becoming president, Michael was the senior president and oversaw sales, product marketing, global business development, and customer engineering services. During his tenure as senior vice president, Michael successfully expanded global business, making eMemory one of the world's top ten silicon intellectual providers. We are confident that his professional knowledge and expertise will continue to help drive the company's growth.

As mentioned in the previous quarters, eMemory has entered a multi-year growth cycle. We have started to receive royalties for 16nm and 7nm. With these production record, we expect more customer adoptions to come and will be our next driving force after 28nm. In addition, customer adoption of PUF-based solutions and emerging memory will increase license, then royalties, which will drive our growth beyond the next 3-5 years. Later, I will explain what role PUF plays in Confidential Computing, which is considered one of the next big trends of the decade.

Next, I would like to invite our president, Michael Ho, to share our third-quarter performance.

Operating results and future outlook by President, Mr. Michael Ho

Good afternoon everyone.

First, I will begin with our third-quarter results.

1) The third-quarter revenue was five hundred and ninety-four million NT dollars (NT$ 594 mil), up 9.8% sequentially, and up 34.7% year-over-year, or up 11.1% sequentially, and up 42.8% year-over-year in US dollars.

2) The operating expenses were two hundred and seventy-eight million NT dollars (NT$ 278 mil), up 7.3% sequentially, and up 13.8% year-over-year, mainly attributable to the increase in salary and other related human resource expenses, such as increases in bonuses and rewards

3) This brings us to the operating income of three hundred and seventeen million NT dollars (NT$ 317 mil), with an increase of 12% sequentially, and 60.5% year-over-year. Therefore, the operating margin increased by 1.1 percentage points sequentially and by 8.6 percentage points year-over-year to 53.3%.

4) Overall, our third-quarter EPS was 3.72 NT dollars (NT$ 3.72) and ROE was 53.2%.

For the first three quarters of 2021, the revenue was one billion seven hundred and thirty-two million NT dollars (NT$ 1.732 bil), up 35.3% year-over-year. The operating expenses increased by 14.8%, and the operating margin was 54.1%, with an increase of 8.2 percentage points. EPS is NT$ 10.92, and ROE is 52.1%.

Now let's move on to revenue contributions by licensing and royalty.

1) Licensing in the third-quarter accounted for 31.7% of the revenue, up 8.1% sequentially, and up 69.8% year-over-year, or up 9% sequentially, and up 80% year-over-year in US dollars.

2) Royalties in the third-quarter contributed 68.3% of the total revenue, increasing 10.6% sequentially, and increasing 22.9% year-over-year, or up 12.1% sequentially, and up 30.3% year-over-year in US dollars.

3) In the first three quarters of 2021, the total revenue grew 35.3% as compared to the previous year. Licensing and royalty have a growth of 61.0% and 26.2% respectively. In terms of US dollars, the total revenue increased 43.4% year-over-year, with licensing and royalty both increasing 70.8% and 33.6%, respectively.

In terms of revenue contribution by specific IPs, the results are as follows:

1) **NeoBit** accounted for 20.7% of total licensing revenue in the third-quarter, decreasing 22% sequentially, but increasing 56.5% year-over-year, mainly due to new applications in 8-inch, such as Automotive and IoT related. Its royalties accounted for 47.3% of total royalty, up 11.2% sequentially, but down 9.5% year-over-year as some PMIC and DDI customers migrated into 12-inch and used NeoFuse instead. Many new NeoBit tape-outs accumulated in the past years, such as legacy PMIC, Automotive and IoT-related products will drive the growth of NeoBit royalty once it enters into mass production.

2) **NeoFuse** accounted for 49.5% of total licensing revenue in the third-quarter, down 8.7% sequentially, but up 36.2% year-over-year. Its royalties increased 10.9% sequentially and 88.7% year-over-year due to increasing production from existing and new products, such as WiFi 6/6E, OLED, DTV, DRAM, and others. This brings the royalty of NeoFuse to 49.7% of total royalties.

3) **Our PUF-Based Security IPs** contributed to 1.5% of licensing revenue and have royalty contribution in the fourth quarter. Our partnership with global customers is actively ongoing. We expect more contribution in the future.

4) **As for MTP technology**, licensing revenue accounted for 28.3% of total licensing revenue, increasing 164.6% sequentially, and 367.6% year-over-year, mainly due to contribution from Chinese customers. Royalty from MTP decreased 2.7% sequentially, but up 6.3% year-over-year to contribute 3% of total royalties.

In the first three quarters of 2021:

1) <u>For NeoBit</u>, the licensing revenue increased 67.7% year-over-year, but royalty decreased 5.5%, accounting for 40% of the total revenue.

2) <u>For NeoFuse</u>, the licensing and royalty revenue grew 26.2% and 92.5% year-over-year, contributing to 50% of the total revenue.

3) <u>For PUF-Based Security IP</u>, licensing revenue increased 8% year-over-year, about 0.6% of total revenue.

4) <u>For MTP technology</u>, the licensing and royalty revenue increased 328.7% and 10.2% year-over-year, accounting for 9.4% of the total revenue.

Now looking at royalties for 8-inch and 12-inch wafers:

1) 8-inch wafers, which accounted for 52.3% of royalties, increased 9% sequentially, and 6.7% year-over-year, due to applications expanding into Automotive and IoT-related applications.

2) 12-inch wafers contributed to 47.7% of royalties, increased 12.3% sequentially, and 47.4% year-over-year, mainly due to customers increasing production for TDDI, OLED, ISP, DTV, STB, WiFi 6/6E, Bluetooth, Ethernet, Switch, TWS, DRAM, and others. In addition, 12/16nm and 7nm royalties already started to contribute in the fourth quarter.

There were 149 product tape-outs completed in the third-quarter, which reflects that our IP demand remains strong. We will provide more information in the management report.

In the next section, I will address our future outlook. We expect the growth of revenue to continue in the last quarter of 2021 and beyond.

1) For the licensing revenues, as the demand for all our technologies continues to remain strong, we expect licensing revenue to continue growing in the fourth quarter and beyond.

2) For the royalty revenues, 8-inch and 12-inch royalties will continue their growth momentum. 8-inch royalties will grow due to demand and content increase for Automotive and IoT, for example, PMIC, MCU, Fingerprint, and Sensor-related applications. 12-inch royalties will have a strong growth since 28/22nm related products are ramping up production.

Now, looking at new business development:

Our new applications are centered on the business development of hardware security.

1) NeoFuse, in advanced processes, is being adopted for AI, HPC and Automotive applications, especially in 7nm and 6nm nodes.

2) Business activities for PUF-based security solutions are in progress in IoT, Industrial IoT, AI, Blockchain, FPGA, Data Processor Unit (DPU), Mobile Storage (UFS), and Automotive applications. Our PUFrt (root-of-trust IP) and PUFcc (crypto co-processor IP) have been adopted by several customers across various applications.

3) Our collaboration with ARM will expand from IoT to CPU Security architecture.

4) eMemory has received the TSMC OIP Partner of the Year Award for the twelfth year in a row, demonstrating the trust our partners have in us.

For new IP technology development:

1) In Q3, NeoFuse has been qualified in TSMC's N6 process. This security-enhanced OTP combines NeoFuse with NeoPUF to protect data, targeting Mobile, Consumer, AI, Networking, 5G Infrastructure, GPU, and High-performance Computing. Some customers have already completed design-in, and 5nm is undergoing reliability verification.

2) Our ReRAM IP has been qualified in UMC's 40nm process. We are one of the world's first companies to provide this emerging memory and offer more comprehensive solutions for Automotive, Edge Computing, AI and AIoT markets.

We will extend ReRAM technology to more leading process nodes and specialty processes such as BCD and high voltage.

3) PUF-based solutions are under development for implementation in WiFi 6/6E for AIoT edge devices and AI image processors.

Next, I will pass the time to Charles.

Confidential Computing Architecture by Chairman, Dr. Charles Hsu

(Page 15: Why Confidential Computing)

With the rise of IoT and AI applications, tremendous amounts of data are generated. The processing of this huge amount of data requires not only high speed computing, but also secure computing such that the sensitive data is safeguarded.

The processing of data, includes data at rest, in transit, and data in use. For the data at rest and in transit, we can encrypt the data so that they cannot be compromised. However, for data in use, such as the execution of program code and its related instruction set, the data cannot be encrypted and need to be plain data for CPU to execute.

In the current computer system, data in use are brought into virtual memory, which is shared by different applications and is therefore not protected. This has resulted in attacks on CPU, such as the Meltdown and Spectre attack on Intel's CPU. To solve this issue, confidential computing architecture is needed.

In the following slides, I will introduce the evolution of confidential computing.

(Page 16:   Introduction of Confidential Computing I)

Non-confidential computing in traditional architecture is illustrated in *Figure 1*. The CPU and memory take care of the application. Since a single CPU can only run one application at a time, this CPU solely uses the memory.

To improve the security of such structure, the CPU's security function can encrypt and manage memory as shown in *Figure 2.*

(Page 17: Introduction of Confidential Computing II)

However, as CPU moves to a multicore structure, which can tackle many applications simultaneously, the architecture will evolve to the one shown in *Figure 3.* The applications are divided into two sections; one is a secure section, which will be operated in a trust zone, and the other is a non-secure section.

In the trust zone, the operation of the application happens inside the so-called security enclave, which means data and code are all protected by its security function. On the other hand, for the non-secure section, data and code are stored in the virtual memory, which is shared by many applications.

(Page 18: Introduction of Confidential Computing III)

As more applications are required to operate in the trust zone, the dedicated memory, which was supposed to be solely used by its corresponding CPU, becomes inefficient. To improve such case, the secure applications will also need to use the virtual memory to increase its storage capacity and flexibility as shown in *Figure 4*. In order to secure these applications by using virtual memory, the data and code will be tagged for the specific application, such that the other applications are not able to access them. Even if it can be accessed, the data is not meaningful since they are tagged (or encrypted). The PUF is needed for such function since it can efficiently scramble the data and code and descramble using the same PUF number.

(Page 19: How can PUF help in CCA?)

Recently, the new rise of DPU, which unloads the data storage and security functions of CPU, is targeted at helping CPU architecture move towards confidential computing. We are working with some companies to implement our PUF into their security architecture.

By applying PUF to protect the data and code in the virtual memory, PUF can enable the computing to become confidential computing and can help protect all devices of the internet and cloud.

Closing comment by Chairman, Dr. Charles Hsu

Thank you once again, for your patience and support for eMemory. We will continue to work hard on IP innovation and security solutions for our customers and bring higher returns for our shareholders. Thank you!