eMemory 3Q23 Earnings Call Transcript
November 8th, 2023, 16:00-17:00 Taiwan Time

OPENING REMARKS

Dr. Charles Hsu, Chairman

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

With strong demand for licensing and accumulated new tape outs entering the mass production stage to contribute royalty, we are moving into the next multi-year growth cycle. Starting next year, we will see significant growth across all our technologies.

For NeoBit 8-inch applications, the inventory adjustment phase has come to an end. We have seen customers placing wafer orders one after another. The growth of 12-inch NeoFuse royalty will also be accelerated as more than 70 tape-outs in 16/12/7nm move into production.

Our MTP-related technologies, which we have been cultivating for more than 20 years, are now making their way into DDR5 and other mainstream applications. We expect licensing and royalties to see significant growth in the coming years.

In addition, our PUF-based security-related technologies have increased demands in various applications. Particularly, our PUF-based Root of Trust is adopted in Arm's Confidential Computing for Mobile, Auto and Edge Computing. PUF-based security will be a strong growth driver, and we are very confident in our future growth.

Next, I invite our president, Michael Ho, to share our third-quarter performance and future outlook.

FINANCIAL RESULTS

Michael Ho, President

Q3 2023 Financial Results

Good afternoon, everyone. Now, let's begin with our 2023 third-quarter financial results. The third-quarter revenue was seven hundred and eighty-seven million NT dollars (NT$ 787 mil), up 13% sequentially but down 0.4% year-over-year.

Operating expenses were three hundred and seventy million NT dollars (NT$ 370 mil), up 12.8% sequentially, mainly attributable to the increase in bonuses and rewards.

Operating income was four hundred and seventeen million NT dollars (NT$ 417 mil), with an increase of 13.1% sequentially but decreasing 6.3% year-over-year.

Operating margin increased by 0.1 percentage point sequentially but decreased by 3.3 percentage points year-over-year to 53%.

Net income was four-hundred and six million NT dollars (NT$406), up by 15.4% sequentially but down 0.1% year-over-year.

EPS for the quarter was 5.44 NT dollars (NT$ 5.44) and ROE was 57.2%.

Revenue across Different Streams

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

Licensing in the third-quarter accounted for 32.9% of the total revenue, up 3.8% sequentially and 79.2% year-over-year.

Royalties in the third-quarter contributed 67.1% of the total revenue, increasing 18.1% sequentially but decreasing 18.3% year-over-year.

Total revenue for the third-quarter increased by 13% compared to the previous quarter but decreased by 0.4% compared to the previous year.

Revenue by Technology

With that, I will comment on our revenue contribution by specific IPs.

NeoBit accounted for 27.4% of total licensing revenue in the third-quarter, increasing 25.5% sequentially and up 87.4% year-over-year. Its royalties accounted for 22.1% of total royalty, down 14.5% sequentially and down 50.1% year-over-year.

NeoFuse accounted for 38.4% of total licensing revenue in the third-quarter, down 12.3% sequentially but up 48% year-over-year. In terms of total royalty revenue, NeoFuse royalties increased by 32.5% sequentially and 2.7% year-over-year, accounting for 75.6% of total royalties.

PUF-Based Security IPs contributed to 22.1% of licensing revenue, increasing 108.7% (one-hundred and eight point seven) sequentially and increasing 189.4% (one-hundred eighty-nine point four) year-over-year. Its royalties accounted for less than 1% of total royalties, down 91.5% compared to the previous quarter, and down 97.8% compared to the previous year.

MTP technology accounted for 12.1% of total licensing revenue, down 39.9% sequentially but up 59% year-over-year. Royalty from MTP increased 39% sequentially but down 44% year-over-year, accounting for 2.3% of total royalties.

Q3 2023 Royalty Revenue by Wafer Size

Now, let's look at royalties for 8-inch and 12-inch wafers.

8-inch wafers, accounted for 36.3% of royalties, down 3.8% sequentially and down 36.5% year-over-year.

12-inch wafers contributed 63.7% of royalties, increasing 35.7% sequentially but decreasing 2.3% year-over-year.

In total, 139 product tape-outs were completed in the third-quarter. We will provide more information in the management report.

FUTURE OUTLOOK

Michael Ho, President

In the next section, I will address our future outlook.

We expect our revenue in the fourth-quarter to grow further than in the third-quarter.

For licensing revenues: Strong licensing demand will continue to drive the growth momentum of licensing fees.

For royalty revenues: We expect royalties to regain growth momentum as new processes and applications enter production.

Moving on to new IP technology and business development:

1. Our development of special processes such as HV, HK, BCD, embedded flash, and emerging memory (RRAM/MRAM) continues to move into more advanced nodes, driving more applications and sustained growth in royalty revenues per wafer.

2. Security-related applications are the focus of our development in advanced processes. In addition to licensing to major foundries, we expect to complete licensing to US foundries this quarter.

This concludes my comments. Next, I will pass the time to Charles.

CHAIRMAN REMARKS

<u>Dr. Charles Hsu, Chairman</u>

<u>Page 12: OTP for SRAM Repair in High-Performance Computing (HPC)</u>

As you may know, our NeoFuse OTP has been used in 2x and 1xnm DRAM for the repairing functions. This quarter, I will be introducing a new topic. NeoFuse OTP has extended its application into SRAM repair for HPC chips.

In HPC, in order to achieve high performance computation, high density SRAM cache memory is necessary. As the SRAM memory density is getting higher, the SRAM yield will decrease due to more defects in larger SRAM blocks.

Instead of disposing the faulty bit, it makes more sense to repair it. So today, I will talk about what is SRAM repair and why NeoFuse OTP is the best solution for it, in addition to DRAM repairs.

(Page 13: Embedded SRAM for Advanced Nodes)

High-Performance Computing (HPC) are processors that perform at high speeds. Applications using HPC increase computing capabilities and require more SRAM memory and increase in density. For example, smart sensing, Automotive Driving Assistance (ADAS), voice recognition, and Large Language Models (LLM) are applications that use HPC, including CPU, DPU, GPU, AI Accelerator and more.

These applications require technology in advanced nodes and High-Density Embedded SRAM to deal with faster computing and larger training models. As more multi-core high-performance CPUs are used for data processing, more SRAM is needed for cache memory.

A application using HPC also have a larger chip area so there is a higher chance of manufacturing defects, lower yield and lower reliability. Therefore, SRAM repair in advanced nodes is a must.

(Page 14: Scheme of SRAM Repair)

SRAM repair is basically replacing bad memory bits with redundant memory bits. Redundant memory bits are extra bits reserved for bad memory bits.

The redundancy repair scheme illustrated on the slide is adding spare memory columns or rows to replace bad memory bits. Usually during the testing phase after fabrication (CP/FT), the location of the bad memory bits is stored in the Switch Box which is typically located in an OTP or eFuse. The row/column of the bad memory bits are "switched" out with the row/column containing the repair memory bits.

This diagram here shows a memory array (full of memory bits) on the left side. Bad memory cells are marked with a red "X" and redundant memory bits are located on the right. The location of the column containing the bad memory bits will be saved in the Switch Box, so the specific column can be identified, and the redundant column can "repair" by replacing the bad memory bits.

(Page 15: Why OTP is a Must for SRAM Repair)

To repair SRAM, we need to store the location of bad memory cells. If you consider the area cost effect, yield, reliability, and flexibility, then NeoFuse OTP is a better solution for storing a Switch Box compared to eFuse.

NeoFuse OTP has a smaller cell size than eFuse. For high density SRAM repair, the requirement for OTP density is also higher. The advantage of cost saving by using OTP is superior to eFuse since the size of OTP block is much smaller than eFuse block. Besides, the programming mechanism of eFuse is to burn out the Fuse. The yield of eFuse is much worse than OTP.

Other than size and yield, reliability is also an issue. Aside from OTP's excellent production record, eMemory's OTP also passed rigorous testing to guarantee data retention for at least 10 years, which is not always the case for eFuse.

For flexibility, OTP is also much more flexible than eFuse since it has better coverage for different form factors of memory, such as 3D or multi-chip packages, and can guarantee higher yield during production.

When it comes to SRAM repair, it is important to know that more advanced process nodes will more likely have memory defects due to smaller feature size, which leads to larger repair density. Therefore, having a good OTP solution is important in ensuring we can meet the requirements for memory repair in advanced processes.

This concludes my remarks. Next, we will enter the Q&A session.

CLOSING REMARKS

Dr. Charles Hsu, Chairman

For more information about our PUF-based security IPs and technology, we encourage you to visit our PUFsecurity website at https://www.pufsecurity.com/ and check out our articles and other materials.

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