eMemory 2Q22 Earnings Call Transcript

August 10th, 2022, 16:00-17:00 Taiwan Time

OPENING REMARKS

Dr. Charles Hsu, Chairman

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

Our second-quarter operating results hit a record high, reflecting our continuous efforts to invent new technologies and develop new application areas.

Although the semiconductor industry has entered several quarters of inventory adjustments, we remain confident in our long-term growth.

The reasons are as follows:

1. Over the past two years, we have accumulated over 1,000 tape-outs with more than 200 new applications in 28nm or below. These new products will enter mass production to drive the growth of our royalties. Furthermore, our technology development has reached 4/5nm, with customers' production in 6/7nm. These new process platform are new market for our future growth.
2. Customers are accelerating their product development, no matter high-performance computing, AIoT, autonomous driving, or industrial automation, security will be a must. We are seeing this trend from our PUF-based licensing revenue, which has grown more than 10 times compared to the previous year.

All in all, we remain confident in the company growth in the future.

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

FINANCIAL RESULTS

Michael Ho, President

Q2 2022 Financial Results

Good afternoon everyone. Now, let's begin with our 2022 second-quarter financial results. The second-quarter revenue was seven hundred and ninety-six million NT dollars (NT$ 796 mil), up 9.5% sequentially, and up 47.1% year-over-year.

Operating expenses were three-hundred and thirty-six million NT dollars (NT$ 336 mil), up 7.1 % sequentially, and up 30% year-over-year, mainly attributable to the increase in salary and other related human resource expenses, such as the increase in bonuses and rewards.

Operating income is four hundred and sixty million NT dollars (NT$ 460 mil), with an increase of 11.3% sequentially, and 62.7% year-over-year. The operating margin increased by 1 percentage point sequentially, and increased by 5.6 percentage points year-over-year to 57.8%.

EPS for the quarter was 5.48 NT dollars (NT$ 5.48) and ROE was 69.5%.

Revenue in Different Stream

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

Licensing in the second-quarter accounted for 25.2% of the total revenue, up 4.8% sequentially and up 15% year-over-year. In US dollars, the licensing was the same as last quarter and up 10.6% year-over-year.

Royalties in the second-quarter contributed 74.8% of the total revenue, increasing 11.2% sequentially, and increasing 62.3% year-over-year, or up 5.4% sequentially, and up 57% year-over-year in US dollars.

Total revenue in the first half of 2022 grew 33.8% as compared to the previous year. In terms of US dollars, the total revenue increased 33% compared to the previous year.

Revenue by Technology

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

NeoBit accounted for 22% of total licensing revenue in the second-quarter, increasing 26.4% sequentially but decreasing 11.4% year-over-year. Its royalties accounted for 40% of total royalty, up 14.6% sequentially and up 38.2% year-over-year.

NeoFuse accounted for 46.9% of total licensing revenue in the second-quarter, down 24.2% sequentially and down 8% year-over-year. The main reason is that many of our customers who originally only used NeoFuse have adopted our PUF-based security solutions, such as Root of Trust, to improve their security application levels. In addition to the existing NeoFuse royalty, PUF-based royalty will double the total royalties, driving the growth of our future royalty revenue. In terms of total royalty revenue, NeoFuse royalties increased 9.7% sequentially and 84.5% year-over-year, accounting for 56.4% of total royalties.

PUF-Based Security IPs contributed to 23.4% of licensing revenue, increasing 576.4% sequentially 2,163% year-over-year as a result of strong demand for our security IPs. Its royalties accounted for 0.1% of total royalties which is up 47.6% compared to the previous quarter, and up 100% compared to the previous year. We anticipate PUF-based security IPs to continue its growth momentum in H2 and beyond.

MTP technology accounted for 7.7% of total licensing revenue, decreasing 39.3% sequentially and decreasing 23.7% year-over-year. Royalty from MTP decreased 1.1% sequentially, but increased 67.7% year-over-year.

In the first half of 2022, the licensing and revenue are as follows:

NeoBit licensing revenue increased 2.6% year-over-year and royalty increased 15.7%, accounting for 34.5% of the total revenue.

NeoFuse licensing and royalty revenue grew 13.1% and 69.8% year-over-year, respectively, contributing to 56.5% of the total revenue.

PUF-based security IP licensing revenue increased 609.9% year-over-year, while royalty revenue increased 100%, accounting for 3.6% of the total revenue.

MTP technology licensing revenue decreased 44.6% year-over-year but royalty revenue increased 82.1%, accounting for 5.4% of total revenue.

Royalty Revenue by Wafer Size

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

8-inch wafers, which accounted for 51.1% of royalties, increased 12.1% sequentially, and 56.3% year-over-year due to growth in wafer shipment and ASP from the increasing penetration rate of various applications.

12-inch wafers contributed to 48.9% of royalties, increasing 10.3% sequentially, and 69.1% year-over-year due to increasing penetration rate for 28nm and below.

In total, 177 product tape-outs were completed in the second-quarter, with 6/7nm tape-out increasing significantly. 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 the growth of revenue to continue in the third-quarter.

For licensing revenues: licensing revenue will grow due to the continued strong demand for our IPs, especially NeoFuse and PUF-based security solutions.

For the royalty revenues: 8-inch and 12-inch royalties will continue their growth momentum from the increasing penetration rate in various applications.

Increasing new tape-outs (NTO) from 6/7 nm will also drive higher ASP and royalty growth further.

Moving on to new business development:

1. PUFrt (Root of Trust IP) and PUFcc (Security Co-processor IP) continue to be adopted by applications in IoT, Industrial IoT, FPGA, Data Processor Unit (DPU), CPU, Setup Box, Mobile Storage (UFS), and Automotive.
2. Our collaboration with Arm is progressing very successfully and we anticipate more joint-marketing activities before the end of the year.

For new IP technology development:

1. 22nm ReRAM IP is adopted by wearable and IoT applications.
2. NeoFlash is being licensed to multiple foundries as Embedded Flash solutions in specialty processes, targeting Smart Power and Smart MCU related applications.
3. PUF-based IPs have tape-out in N5 and are developing in N4/N3.
4. We successfully developed PUF-based Embedded Flash solutions to protect digital assets.

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

CHAIRMAN REMARKS

Dr. Charles Hsu, Chairman

Why is Random Number Generation Important in Gaming?

(Page 13: Seven Layers of Metaverse: Gaming)

You might recall that in my last talk, I talked about Metaverse security and gave a brief overview of the seven layers of the Metaverse. To refresh your brains, the conceptual framework of the Metaverse consists of seven layers. The first layer is what consumers will be experiencing and goes all the way to the backbone of the Metaverse, such as service/equipment providers.

Today, I will be diving deeper into how PUF-based technology can apply to the experience layer (transition) of the Metaverse. In particular, the role of random number generation in gaming.

(Page 14: Random Number Generation in Gaming)

Random number generators (RNG) are algorithms or hardware components that create random values. In gaming, random numbers determine random events, such as your chances of picking up a rare item or even which shape of block you get on Tetris.
Video games obtain their variables from naturally changing local values, for example, a game console's internal clock or the sequence of buttons you pressed. Sometimes these numbers are easy to hack, especially for seasoned gamers.

(Page 15: Example: RNG in Games)

Using role-playing games (RPG) as an example, players typically complete missions by slaying monsters, challenging bosses and acquiring powerful items. (transition) As you play through the game, the monsters you kill will randomly drop new equipment where it can then be looted. (transition)

Every item has a quality level. For simplification purposes, we will talk about the common items and the legendary items. When a monster drops an item, the game randomly determines its quality, with chances for a legendary item being extremely low.

(transition) In mobile RPGs, while the game is free to play, microtransaction options allow gamers to buy in-game items that supposedly guarantee certain weapon drops. The drive to acquire better items keeps people addicted to games and spending a lot of money.

(Page 16: Software vs. Hardware Random Numbers)

Software-based RNG
When developing computer games, programmers usually use seeded software-based random numbers, which use a seed number to create other numbers through a mathematic algorithm. Each time a new number is generated, it is built upon the seed number and the past values, resulting in a sequence of random numbers.

However, the seemingly random output sequence is deterministic because the seed is a fixed number so the sequence is reproducible. A good real-life example is programmers who use certain logic or patterns to determine random numbers.

Typically software-based random numbers are good enough for and often used in games to offset players' chances and keep the game exciting.

In the RPG example's case, the random number will determine the weapon revealed during a drop or microtransaction purchase.

Hardware-based RNG

I previously mentioned that computers need the physical world's randomness to generate true random numbers. A good real-life example is leaves that fall from a tree. The location where the leaves land will be truly random and unpredictable.

Similarly, silicon devices themselves generate noises that are random in nature. While these noises are smaller, we can design circuits to amplify or accumulate these noises. Then, we can digitize the analog noise signals into digital random numbers.

(Page 17: Software RNG is Often Criticized in Games)

While software-based random numbers keep games unpredictable and fresh, they are criticized for their lack of true "randomness."

A computer can't just pull out a random number as easily as rolling a dice, which is why today's gaming world often uses software-based random number generators because not all system platforms have entropy harvested from the physical world. Moreover, if the random numbers are generated with a specific platform, they could potentially be controlled, compromising the fairness of the random numbers.

Because of this, many question if in-game purchases guarantee anything. (transition) Many players spend thousands of dollars on in-game purchases, and certain microtransactions have been compared to a gambling simulator, leading to controversies in the gaming industry. (transition) Some countries have even banned certain games since it violates anti-gambling laws, as seen in this article. (transition) In fact, Taiwan's Ministry of Economic Affairs recently announced that they will require game companies to disclose their odds of winning in the face of these unfair game practices.

Thus, replacing software-based random numbers with true hardware-based random numbers is an inevitable trend to create a gaming ecosystem with better fairness.

(Page 18: Who does this Affect?)

Players

From the players' perspective, whether it's an RPG, speed game, gambling game, etc., credibility is important. Players want assurance that there's some form of fairness in their games.

Many people go so far as to look at the data and percentages around games to determine if the results they're getting and the money they're spending will have a fair outcome.

Game Providers

For providers, it is vital to have a verifiable, quantifiable RNG that provides necessary transparency to players.

Digital Assets

Perhaps an overlooked aspect is the potential items purchased in these games. As the world transforms, items used and purchased in games, such as the weapons we mentioned in RPG games, can evolve to NFT. With the involvement of virtual assets, the credibility of NFTs has become more important than ever. Assets need to be traceable from their origin to determine their authenticity. Furthermore, NFTs also require security protection.

(Page 19: How PUFtrng Improves Gaming)

With PUF-based TRNG, this becomes possible because it uses an on-chip physical entropy source to produce secure unsystematic numbers.

Generating random numbers on the blockchain decentralizes the process of generating random numbers from the providers to third parties, bringing more transparency, fairness, verifiability, and tamper resistance to the random number generation process. Since gameplay requires massive data and is played by numerous players worldwide, many random numbers are needed. Implementing PUFtrng on blockchain nodes will produce enough random numbers on the chain to accommodate the volume of random numbers required.

The game servers will request random numbers from the blockchain nodes when operating games. Once produced, the random numbers will be uploaded to the blockchain. Since blockchain is an open database, it maintains a public record of the random numbers used in gaming. Given this record, everyone can track the random numbers used in each microtransaction to verify whether the random result is fair or not.

Security

The application of PUFtrng can further extend to creating secure private keys that encrypt online data, and PUF-based OTP can even store these secret keys. As a result, every time a transaction takes place, such as sending cryptocurrencies, the key pair can be used to secure your transactions. Security is critical in the future when game-based transactions promote the exchange of NFTs and other valuable assets. Our PUF-based security solutions can be easily and widely used in gaming applications, which is an important part in the “experience” layer of the Metaverse.

CLOSING REMARKS

Dr. Charles Hsu, Chairman

For more information about our PUF-based security IPs, 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 IP innovation and security solutions for our customers and bring higher returns for our shareholders. Thank you!