Q3 2024 Investor Conference

Nov 8th, 2024

Embedded Wisely, Embedded Widely

ememory

IPR Notice

Cautionary Statement

This presentation contains forward-looking statements, which are subject to risk factors associated with semiconductor and intellectual property business. It is believed that the expectations reflected in these statements are reasonable. But they may be affected by a variety of variables, many of which are beyond our control. These variables could cause actual results or trends to differ materially which include, but are not limited to: wafer price fluctuation, actual demand, rapid technology change, delays or failures of customers' tape-outs into wafer production, our ability to negotiate, monitor and enforce agreements for the determination and payment of royalties, any bug or fault in our technology which leads to significant damage to our technology and reputation, actual or potential litigation, semiconductor industry cycle and general economic conditions. Except as required by law, eMemory undertakes no obligation to update or revise any forward-looking statements, whether as a result of new information, future events, or otherwise.

Contents

Review of Operations

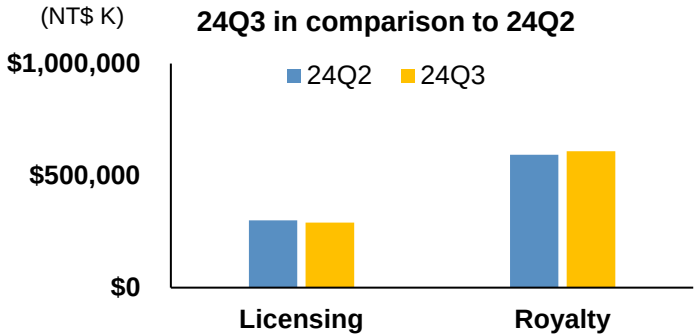
Q3 2024 **Financial Results**

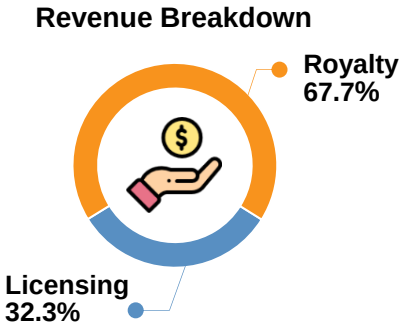
(thousands of NT dollars)

	Q3 2024	Q2 2024	QoQ	Q3 2023	YoY	Q1-Q3 2024	Q1-Q3 2023	Change (YoY)
Revenue	899,477	893,010	0.7%	787,091	14.3%	2,595,251	2,151,467	20.6%
Gross Margin	100%	100%	-	100%	-	100%	100%	-
Operating Expenses	394,561	397,829	-0.8%	369,873	6.7%	1,174,533	998,395	17.6%
Operating Income	504,916	495,181	2.0%	417,218	21.0%	1,420,718	1,153,072	23.2%
Operating Margin	56.1%	55.5%	0.6ppt	53.0%	3.1ppts	54.7%	53.6%	1.1ppts
*Net Income	413,969	475,096	-12.9%	405,903	2.0%	1,319,642	1,070,690	23.3%
Net Margin	45.5%	53.0%	-7.5ppts	51.5%	-6.0ppts	50.3%	49.4%	0.9ppt
EPS (NT$)	5.54	6.36	-12.9%	5.44	1.8%	17.68	14.35	23.2%
ROE	54.6%	67.3%	-12.7ppts	57.2%	-2.6ppts	58.0%	50.3%	7.7ppts

***Net income attributable to Shareholders of the Company**

Revenue across **Different Streams**





Revenue

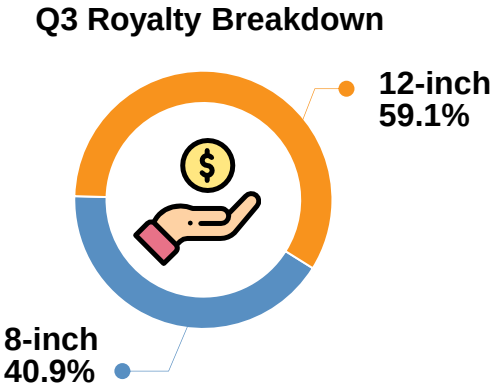
NT$ Thousands	Q3 2024	Q2 2024	Change (QoQ)	Q3 2023	Change (YoY)	Q1-Q3 2024	Q1-Q3 2023	Change (YoY)
Licensing	290,639	299,711	-3.0%	259,151	12.2%	818,679	651,911	25.6%
Royalty	608,838	593,299	2.6%	527,940	15.3%	1,776,572	1,499,556	18.5%
Total	899,477	893,010	0.7%	787,091	14.3%	2,595,251	2,151,467	20.6%

Revenue by **Technology**

Technology	Q3 2024								
	Total Revenue			Licensing Revenue			Royalty Revenue		
	% of Q3 Revenue	Change (QoQ)	Change (YoY)	% of Q3 Licensing	Change (QoQ)	Change (YoY)	% of Q3 Royalty	Change (QoQ)	Change (YoY)
NeoBit	27.7%	7.3%	32.6%	31.2%	23.2%	27.8%	26.0%	-0.1%	35.5%
NeoFuse	58.4%	1.3%	5.3%	30.9%	-10.1%	-9.7%	71.5%	4.0%	9.1%
PUF-Based	3.9%	-6.2%	-38.6%	12.0%	-6.5%	-39.0%	0.0%	-	-
MTP	10.0%	-14.0%	107.8%	25.9%	-15.3%	139.5%	2.5%	-7.0%	25.0%

Technology	Q1-Q3 2024					
	Total Revenue		Licensing Revenue		Royalty Revenue	
	% of Revenue	Change (YoY)	% of Licensing	Change (YoY)	% of Royalty	Change (YoY)
NeoBit	25.8%	17.9%	25.9%	36.3%	25.8%	11.0%
NeoFuse	61.0%	18.0%	37.8%	9.2%	71.6%	20.4%
PUF-Based	3.5%	-10.8%	11.1%	-10.6%	0.0%	-
MTP	9.7%	79.1%	25.2%	85.5%	2.6%	55.0%

Royalty Revenue by **Wafer Size**



- 8-inch wafers contributed 40.9% of royalty, down 1.2% sequentially but up 30.0% yearly.
- 12-inch wafers contributed 59.1% of royalty, up 5.5% QoQ and up 7.0% YoY.

Wafer Size	Q3 2024			Q1-Q3 2024	
	% of Q3	Change (QoQ)	Change (YoY)	% of Q1-Q3	Change (YoY)
8-Inch	40.9%	-1.2%	30.0%	42.0%	17.3%
12-Inch	59.1%	5.5%	7.0%	58.0%	19.4%

Future Outlook

Future Outlook

Licensing & Royalty:

- **Licensing:**
  - Licensing revenue will continue its growth momentum due to strong demands from both foundries and chip companies.
- **Royalties:**
  - We expect royalty will continue its growth momentum as accumulated tape outs in 16/12/7/6nm enter the production stage, along with continued market share gains in mature applications.

Future Outlook

New IP Technology & Business Development:

- **New IP Technologies:**
  - NeoFuse/NeoPUF were successfully verified in the N3P process, with design in and evaluation cases ongoing.
  - NeoMTP for 4-color ESL/e-Paper display driver has been successfully verified in customer products and will soon ramp up.
  - We are developing 2nm technologies with leading foundries.
- **Business Development Platform:**
  - The CPU architecture for security IP is expected to start contributing to revenue.
  - eMemory and Siemens are offering a groundbreaking SRAM repair toolset that integrates Siemens' Tessent MemoryBIST software with eMemory's NeoFuse OTP.
  - PUFsecurity is collaborating with Arm on PSA Certified RoT Component Level 3 Certification for its Crypto Coprocessor, providing a robust security subsystem essential for the AIoT era.

eMemory Enables HPC in AI Applications

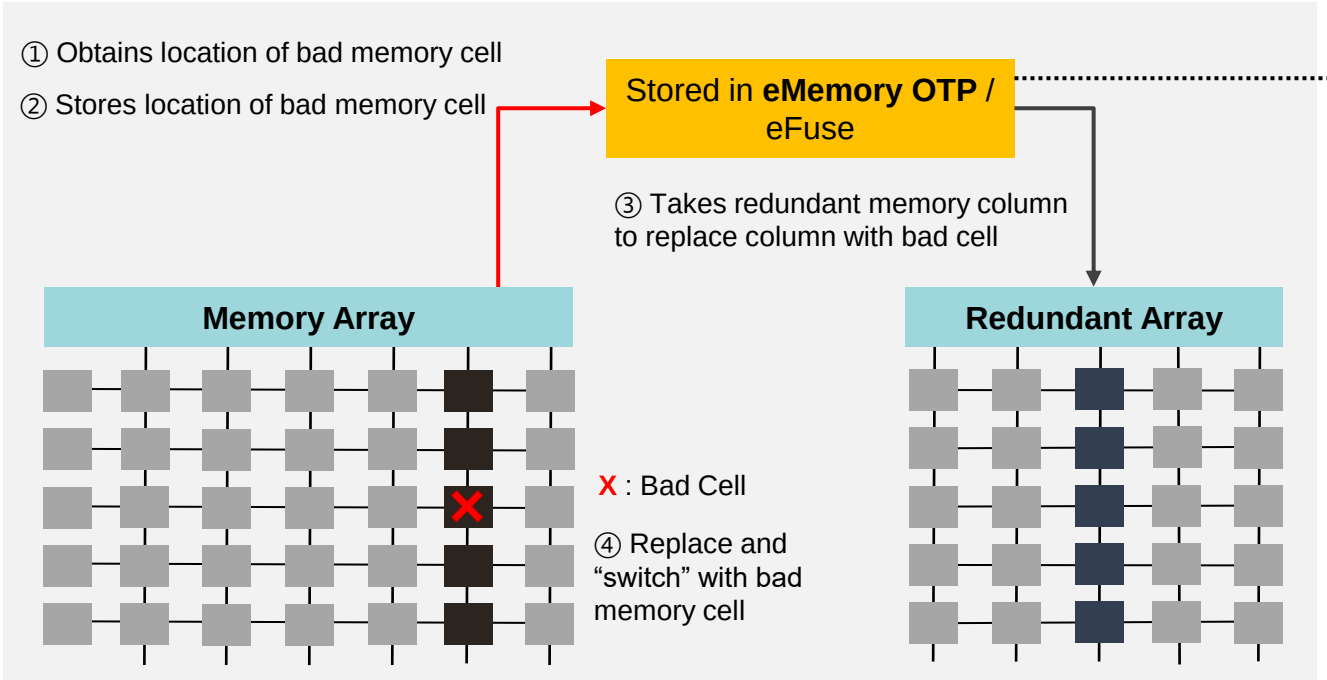
Why is **High-Density SRAM** needed in **AI?**

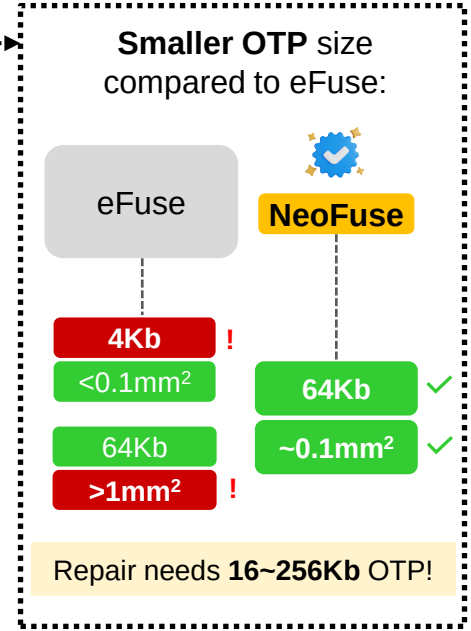
- To increase the speed of AI accelerators, **high-density SRAM** is needed for use in:

Buffer Memory	AI Model Training	Computing in Memory (CIM) for Inference
• High-density SRAM helps improve data transfer speed and reduce energy costs by acting as a fast **intermediate storage** between different processing stages.	• High-density SRAM helps **store** vast amounts of data for AI accelerators to access quickly to speed up training.	• High-density SRAM enables **in-memory computation** by storing large datasets and performing computations on them without transferring data to separate processors.

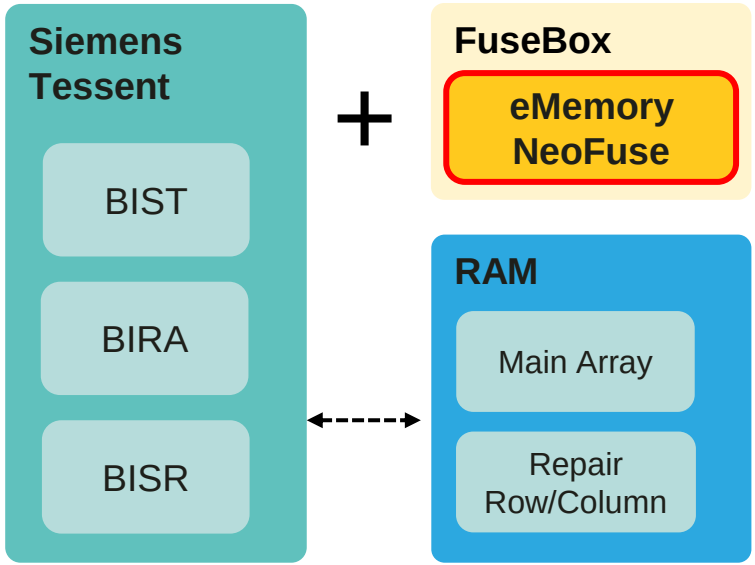
eMemory enables **High-Yielding** SRAM

- SRAM yield decreases as technology is scaled due to smaller dimensions. To **increase yield**, **eMemory's OTP** is required.





Partnering for Success: **eMemory and Siemens**



BIST = Built-in Self Test
BIRA = Built-In Redundancy Analysis
BISR = Memory Built-in Self Repair

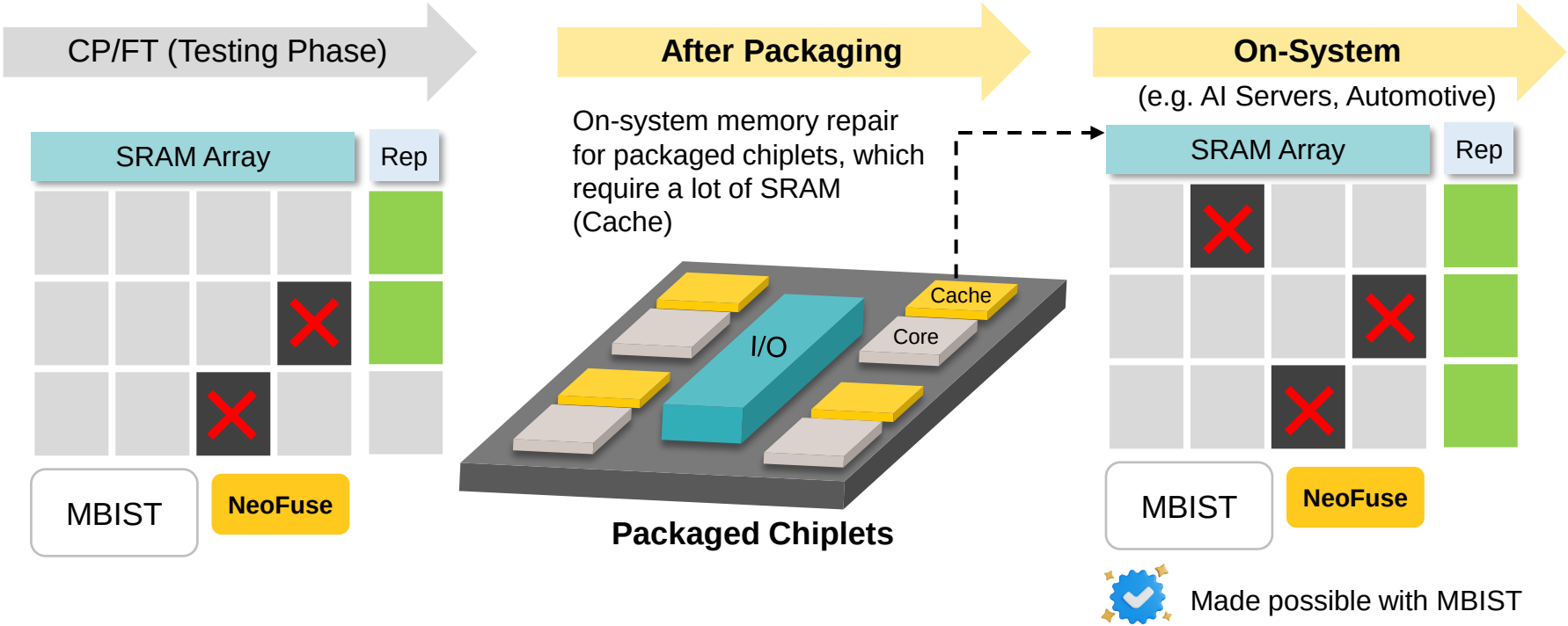
eMemory provides OTP with interface for Siemens MBIST:

- **Tessent** provides memory BISR functions with BIST and BIRA
- **NeoFuse OTP** provides defect-free OTP using BIRA, BISR and adapter to Tessent
- **New MBISR**: Tessent MBISR + NeoFuse, scanning defective SRAM by word/column and logging to the OTP

1. **Compact**
2. **Flexible**
3. **Robust**

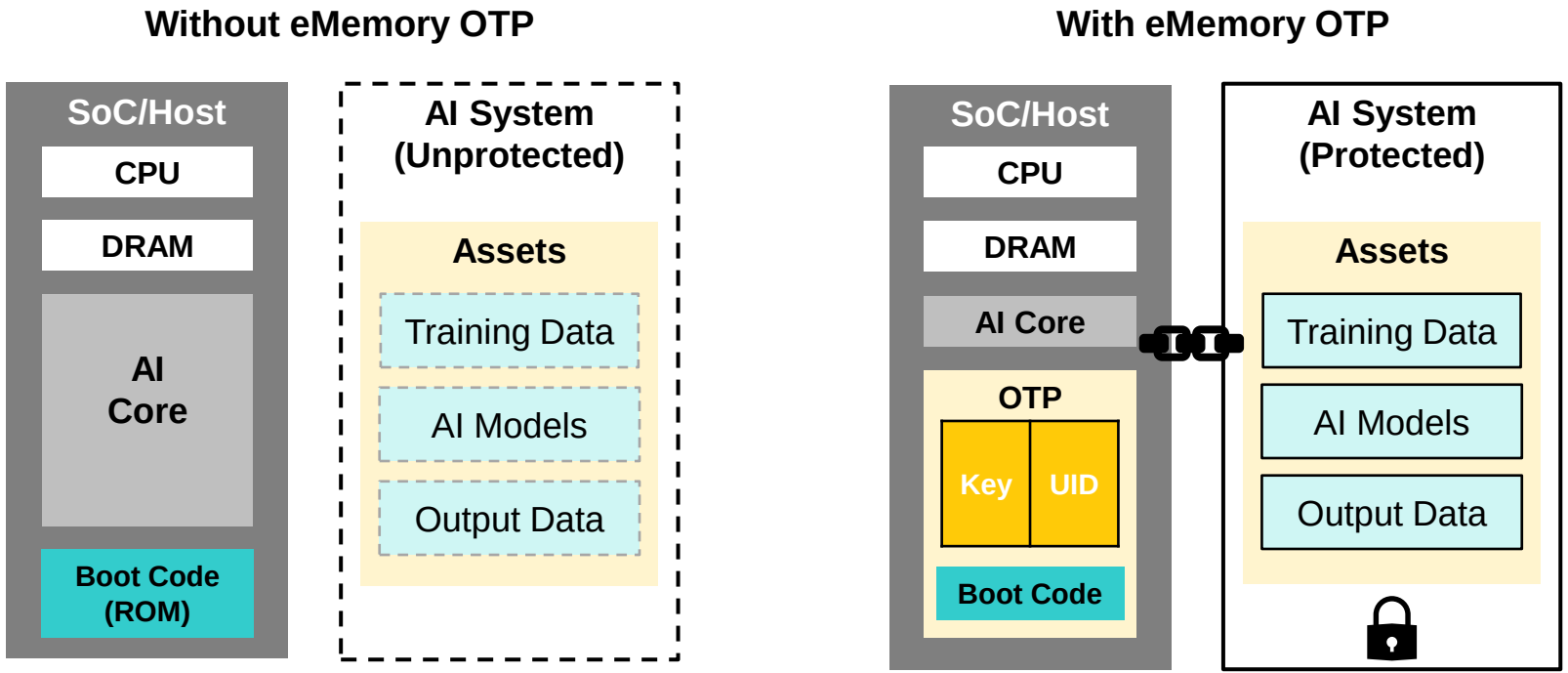
On-System Repair for AI Accelerators

- Memory Built-in Self-Test (MBIST) offers **on-system repair** capabilities, which are essential for high-speed high-reliability applications and chiplet **architecture** or **after system** packaging.



eMemory enables HPC in **AI Applications**

- **eMemory's OTPs** can also **store boot codes**, **root key** and **unique ID** for the root of trust in **AI systems**.



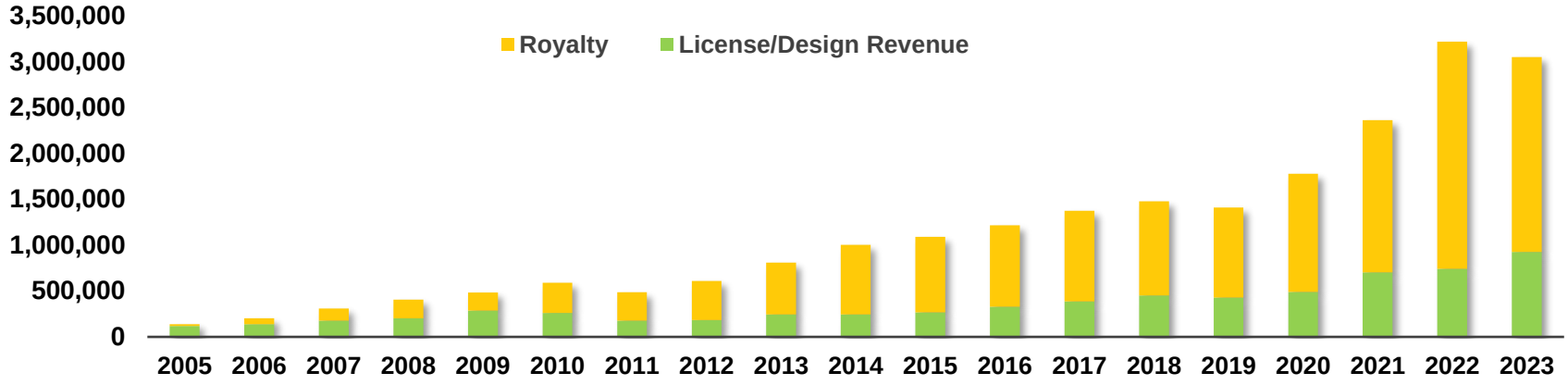
Q&A

Appendix

Company Overview

- eMemory is the global leader of embedded non-volatile memory IP

Revenue Trend
(Unit: NT$ 1,000)



Founded
In 2000

Based in Hsinchu, Taiwan. IPO in 2011. Over 62M wafers shipped.

1240+
Patents Issued

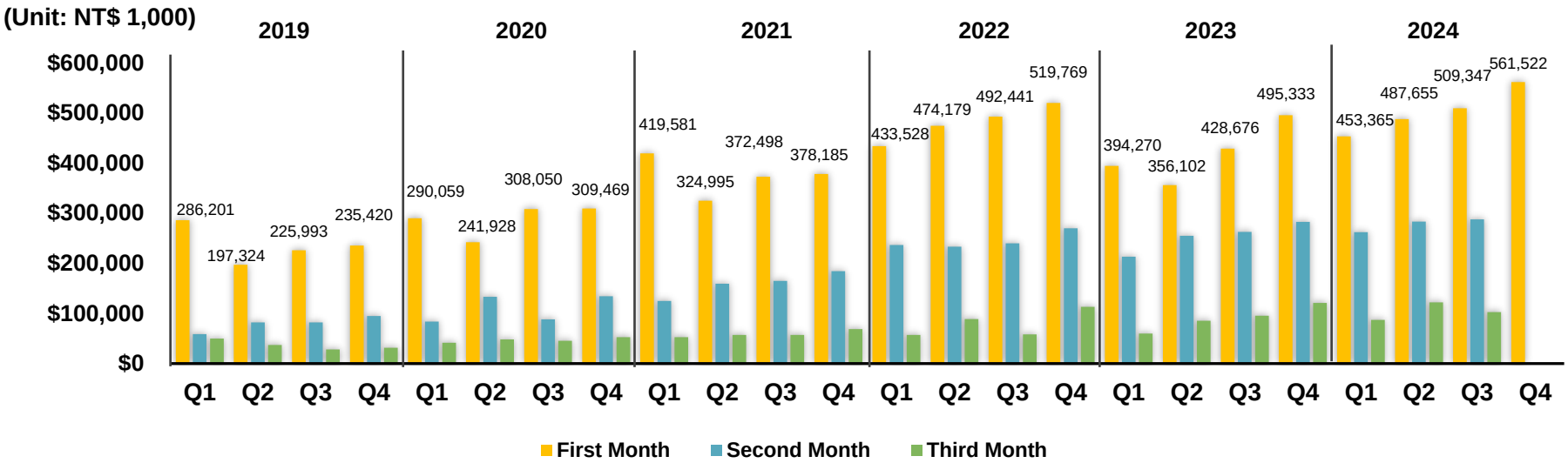
200 pending patents. 357 employees with 68% R&D personnel.

Best IP Partner
With TSMC

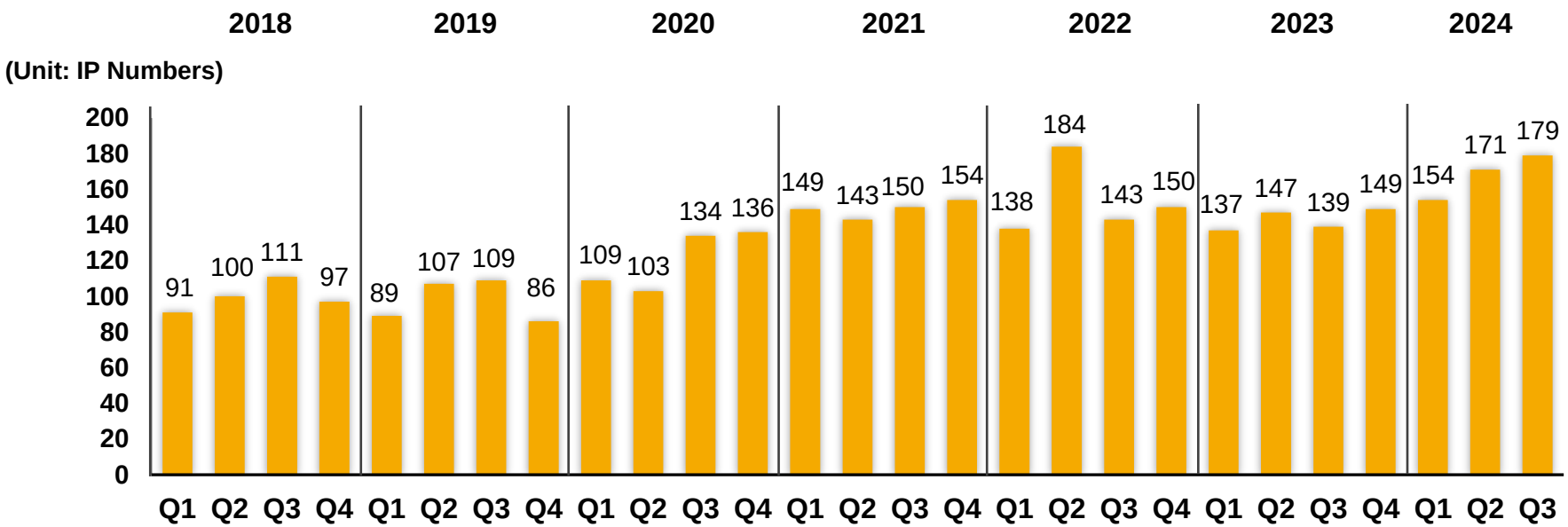
TSMC Best IP Partner Award since 2010.

Quarterly Revenue **Pattern**

- 1st month: Receive License Fees of the month and Royalty from most foundries on previous quarter's wafer shipments.
- 2nd month: Receive License Fees of the month and Royalty from other foundries.
- 3rd month: License Fees Only.



Quarterly Number of **New Tape-outs**



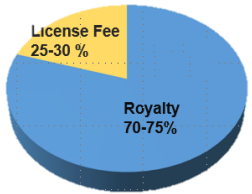
Worldwide Customers

- Our IP solutions are adopted by leading foundries, IDMs and fabless worldwide

Country	Foundry	IDM	Fabless
Taiwan	4	1	343
China	11	0	1313
Korea	4	0	101
Japan	1	9	87
North America	2	2	359
Europe	2	2	234
Others	1	0	120

Business Model

- Recurring royalty is the backbone of our business



Revenue Breakdown

- 70-75% revenue are from royalty based on wafer production
- More adoption = more volume shipment
- More advanced node wafers = higher ASP per wafer

1-4 years

1-4 years

License Fee
Foundries Process Development

Design License Fee
Fabless Product Development

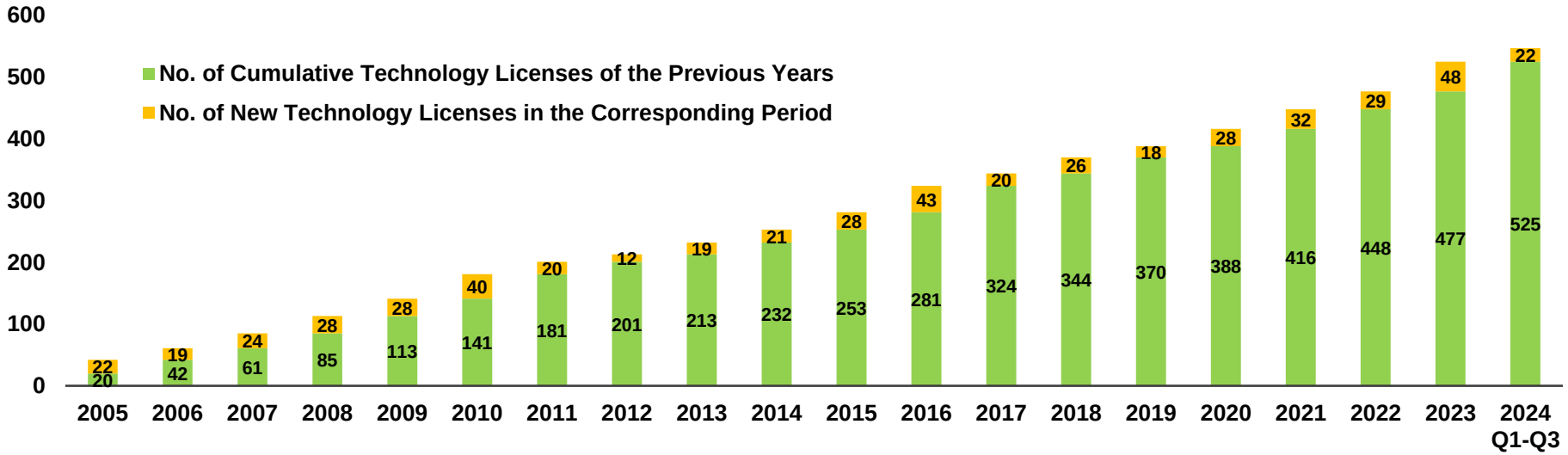
Royalty
Wafer Mass Production

Technology **Licenses**

Number of Licenses

Year	2016	2017	2018	2019	2020	2021	2022	2023	2024 Q1-Q3
License	43	20	26	18	28	32	29	48	22

Note: Terms (including number of process platforms and licensing fees) for each technology license are set contractually. Payments are made according to set milestones, and there are no particular seasonal factors involved.



New Technology Under Development

- New technologies are being developed for 170 platforms by Q3 2024.
- 3 licensing contracts were signed.

Technology	2nm	3nm	4/5nm	6/7nm	12/16nm	22/28nm	40nm	55/65nm	80/90nm	0.11~ 0.13um	0.15~ 0.18um	>0.25um
NeoBit	-	-	-	-	-	-	-	1	2	11	14	1
NeoFuse	1	3	1	1	8	17	9	11	8	5	2	-
PUF-Based	-	1	1	-	2	1	-	1	-	-	-	-
MTP	-	-	-	-	-	1	2	9	11	18	28	-

Note: As of September 30th, 2024

Technology Development

- Developments by process nodes

12" Fabs	Production	Development	IP Type	Process Type
2nm	0	1	OTP	GAA
3nm	0	4	OTP, PUF	FF, FFP
4/5nm	6	2	OTP, PUF	FF, FF-Auto
6/7nm	4	1	OTP, PUF	FF, FF+
12/16nm	9	10	OTP, PUF	FF, FF+, FFC. FFC+, LPP, DRAM, HV
22/28nm	55	19	OTP, PUF, MTP	LP/ULP/ULL, HPC/HPC+, HV-OLED, DRAM, SOI, ReRAM, MRAM, E-Flash, BCD, WoW
40nm	25	11	OTP, PUF, MTP	LP/ULP, E-Flash, HV-DDI/OLED, ReRAM, BCD+
55/65nm	57	22	OTP, PUF, MTP	LP/ULP, E-Flash, HV-DDI/OLED, DRAM, CIS, BCD, PM
80/90nm	30	18	OTP, MTP	HV-DDI/OLED, LP, Generic, BCD, CIS
0.11/0.13um	21	8	OTP, MTP	HV-DDI, BCD, Generic
0.15/0.18um	12	16	OTP, MTP	BCD, Generic
Total	219	112		

8" Fabs	Production	Development	IP Type	Process Type
80/90nm	9	3	OTP	HV-DDI, LL, BCD
0.11/0.13um	84	26	OTP, MTP	HV/HV-MR, BCD, LP/LL, CIS, Green, Flash, SOI, Generic
0.152/0.16/0.18um	245	28	OTP, MTP	HV/HV-MR, BCD, LP/LL, CIS, Green, Generic
0.25um	42	1	OTP	BCD
0.3/0.35um	53	0	OTP, MTP	UHV, BCD
0.4/0.5um	11	0	OTP	UHV, BCD
Total	444	58		

Note: As of September 30th, 2024

THANKS

Embedded Wisely, Embedded Widely

For more information, please visit:
eMemory Website: https://www.ememory.com.tw/
PUFsecurity Website: https://www.pufsecurity.com/