



Q4 2023 Investor Conference

February 6th, 2024

Embedded Wisely, Embedded Widely

ememory



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Review of Operations



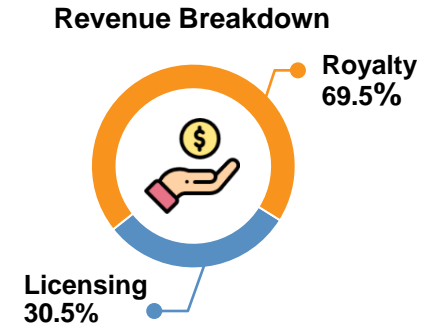
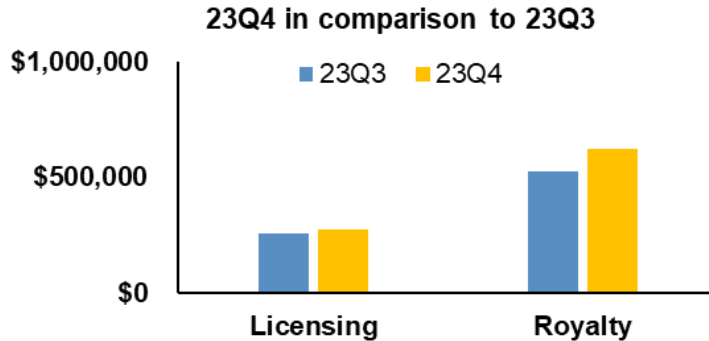
Q4 2023 Financial Results

(thousands of NT dollars)

	Q4 2023 (unaudited)	Q3 2023	Change (QoQ)	Q4 2022	Change (YoY)	FY 2023 (unaudited)	FY 2022	Change (YoY)
Revenue	898,858	787,091	14.2%	902,704	-0.4%	3,050,325	3,216,711	-5.2%
Gross Margin	100%	100%	-	100%	-	100%	100%	-
Operating Expenses	359,330	369,873	-2.9%	368,090	-2.4%	1,357,725	1,363,293	-0.4%
Operating Income	539,528	417,218	29.3%	534,614	0.9%	1,692,600	1,853,418	-8.7%
Operating Margin	60.0%	53.0%	7.0ppts	59.2%	0.8ppt	55.5%	57.6%	-2.1ppts
*Net Income	403,753	405,903	-0.5%	430,536	-6.2%	1,474,443	1,611,909	-8.5%
Net Margin	44.5%	51.5%	-7.0ppts	47.6%	-3.1ppts	48.0%	49.9%	-1.9ppts
EPS (NT\$)	5.41	5.44	-0.6%	5.77	-6.2%	19.76	21.61	-8.6%
ROE	53.1%	57.2%	-4.1ppts	62.2%	-9.1ppts	48.5%	58.2%	-9.7ppts

*Net income attributable to Shareholders of the Company

Revenue across Different Streams



Revenue

NT\$ Thousands	Q4 2023	Q3 2023	Change (QoQ)	Q4 2022	Change (YoY)	FY 2023	FY 2022	Change (YoY)
Licensing	273,927	259,151	5.7%	205,104	33.6%	925,838	742,072	24.8%
Royalty	624,931	527,940	18.4%	697,600	-10.4%	2,124,487	2,474,639	-14.1%
Total	898,858	787,091	14.2%	902,704	-0.4%	3,050,325	3,216,711	-5.2%

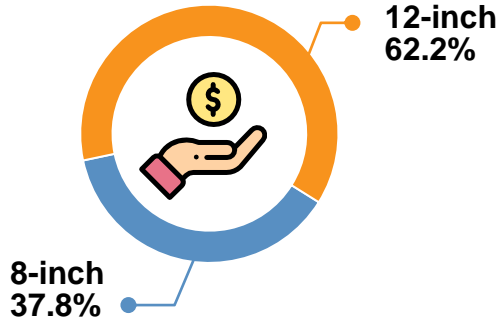
Revenue by Technology

Technology	Q4 2023								
	Total Revenue			Licensing Revenue			Royalty Revenue		
	% of Q4 Revenue	Change (QoQ)	Change (YoY)	% of Q4 Licensing	Change (QoQ)	Change (YoY)	% of Q4 Royalty	Change (QoQ)	Change (YoY)
NeoBit	23.2%	11.2%	-22.3%	26.3%	1.4%	97.9%	21.9%	17.1%	-41.1%
NeoFuse	65.6%	18.1%	7.2%	42.8%	18.0%	18.3%	75.5%	18.2%	4.7%
PUF-Based	3.3%	-47.8%	-35.0%	10.9%	-47.9%	-29.0%	0.0%	87.2%	-97.8%
MTP	7.9%	64.1%	85.3%	20.0%	74.4%	99.1%	2.6%	37.1%	50.5%

Technology	FY 2023					
	Total Revenue		Licensing Revenue		Royalty Revenue	
	% of FY Revenue	Change (YoY)	% of FY Licensing	Change (YoY)	% of FY Royalty	Change (YoY)
NeoBit	25.5%	-27.1%	24.6%	48.2%	25.9%	-39.8%
NeoFuse	63.3%	3.4%	43.3%	4.3%	71.9%	3.2%
PUF-Based	4.3%	7.4%	14.2%	13.4%	0.0%	-87.1%
MTP	6.9%	30.6%	17.9%	88.4%	2.2%	-38.1%

Royalty Revenue by Wafer Size

Q4 Royalty Breakdown



- 8-inch wafers contributed 37.8% of royalty, up 23.4% sequentially but down 28.5% yearly.
- 12-inch wafers contributed 62.2% of royalty, up 15.5% QoQ and up 5.9% YoY.

Wafer Size	Q4 2023			FY 2023	
	% of Q4	Change (QoQ)	Change (YoY)	% of FY	Change (YoY)
8-Inch	37.8%	23.4%	-28.5%	41.1%	-27.7%
12-Inch	62.2%	15.5%	5.9%	58.9%	-1.3%

Future Outlook



Future Outlook

Licensing & Royalty:

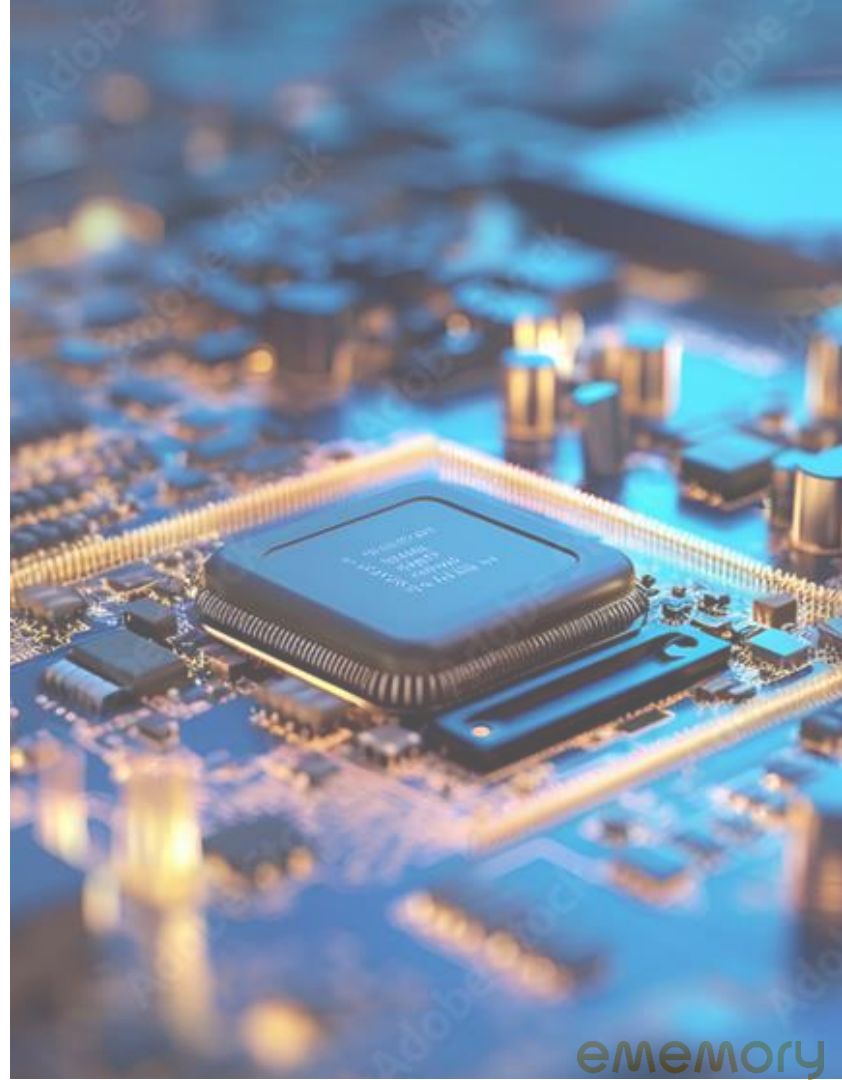
- Licensing:
 - Strong licensing demand will continue to drive the growth momentum of licensing fees.
- Royalties:
 - We expect royalties in the first quarter to be temporarily affected by a customer moving to more advanced node, resulting in a single-digit QoQ decline but growth YoY.
 - Overall, revenue will decline by single digits quarterly, but increase by double-digits yearly.

Future Outlook

New IP Technology & Business Development:

- Specialty processes (HV, HK, BCD, embedded flash, and emerging memory):
 - There will be more foundry technology licensing this quarter.
 - Per wafer royalty ASP will increase due to ongoing development into more advanced nodes.
 - The continued adoption of RRAM by more customers will drive increasing applications and contribute to royalty growth in the future.
- Advanced processes:
 - Last quarter, we successfully licensed our 3nm OTP and PUF technology to a US foundry customer and will be collaborating on the development of the most leading processes.
 - PUF-based security has been successfully adopted in a leading US high-performance computing (HPC) customer's related application.
 - There are multiple projects in 3/4/5nm under progress.

Enhancing Security from AI Servers to AI Edge Computing



eMemory's Contribution to AI ■

- AI will be widely adopted from Edge Devices to Data Centers in the future.
- AI systems consists of many components including:

Computation and Processing

- CPU
- GPU
- DPU
- Accelerators

Storage

- SRAM
- DRAM/DRAM Modules
- CXL
- SSD
- HDD

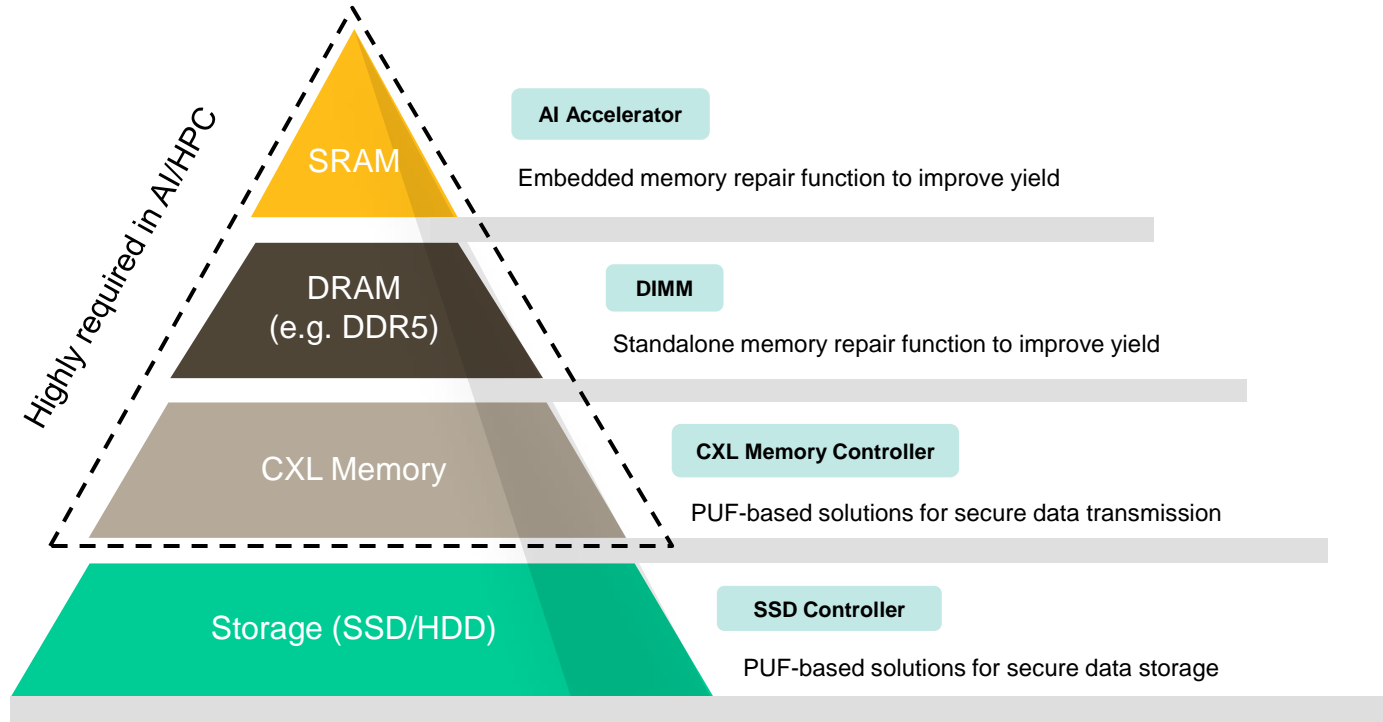
Sensing and Acting

- Sensors
- Actuators

- eMemory's IP OTP/MTP/Root of Trust (PUFrt) have started to be deployed on all the above components.

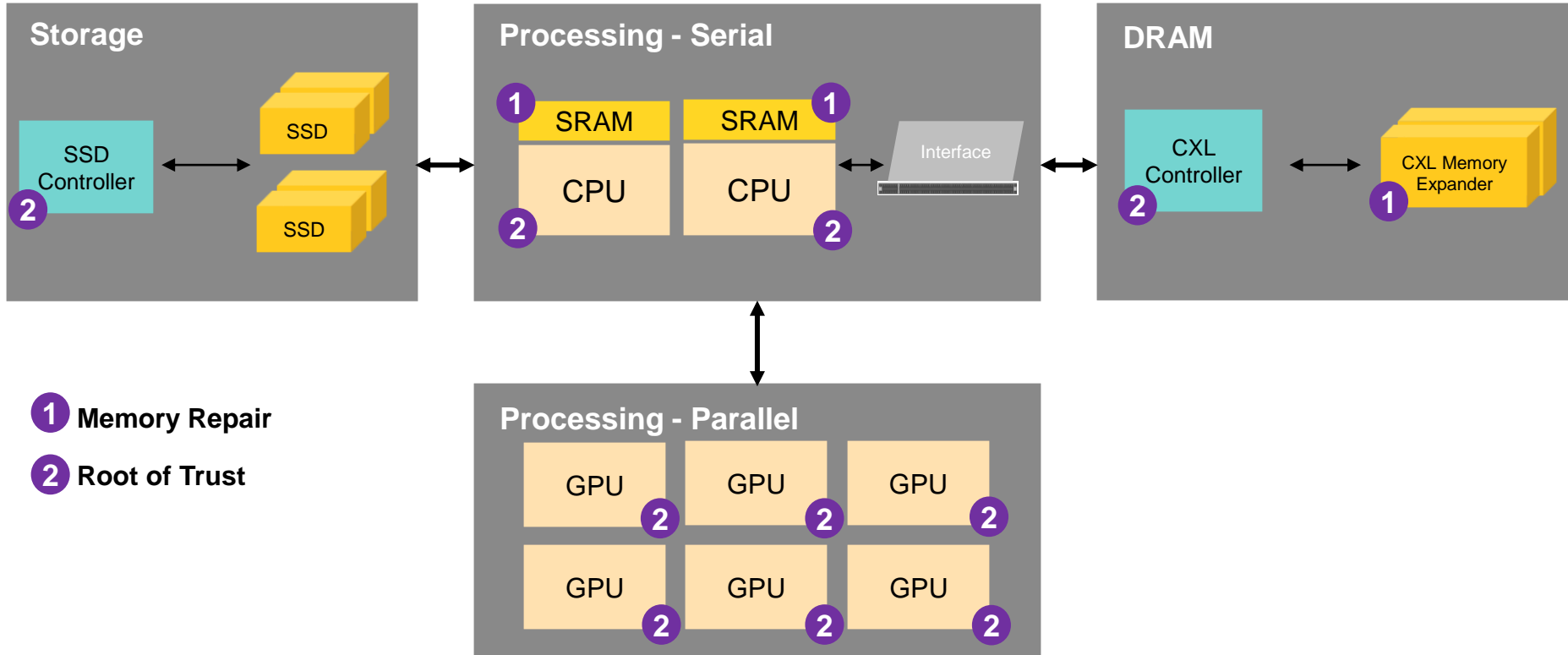
Example: eMemory Helps Memory

- eMemory's security IP and OTP/MTP IP 1) ensure data security and 2) improve yield for SRAM and DRAM.



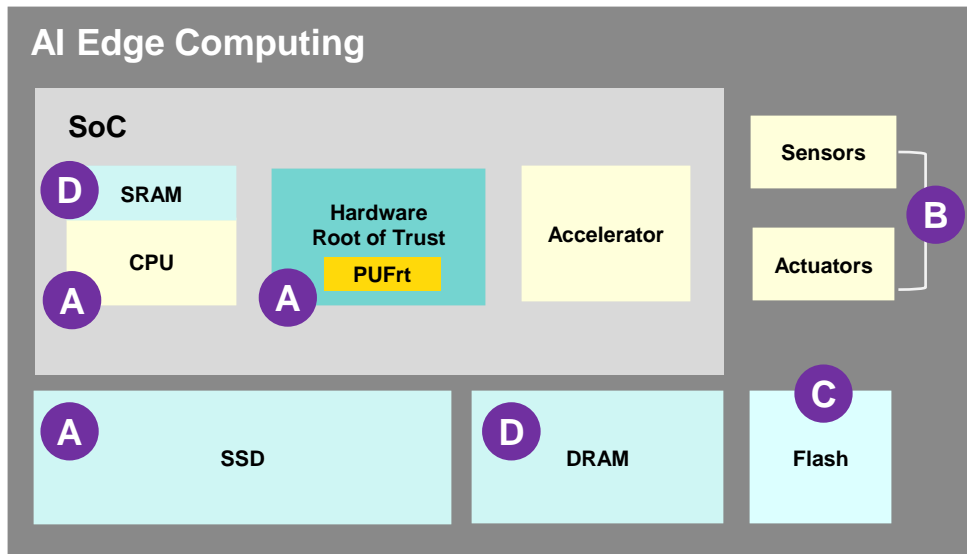
eMemory Solutions for AI Servers .

- eMemory IPs will play a crucial role in AI servers.



eMemory Solutions for AI Edge Devices

- eMemory solutions are used in 1) protecting AI models, 2) trimming analog devices, and 3) data and program storage in NeoFlash.



- A. Root of Trust** to provide:
 - Key Storage
 - Key Generation
 - Cryptographic processing for protecting AI model, input data, and output results
 - Confidential Computing
- B. OTP** is needed for trimming analog circuits in Sensors and Actuators
- C. NeoFlash** will be used to replace conventional eFlash due to much lower cost
- D. Memory repair**

IR Website



IR Website Demo.

The screenshot shows a web browser displaying the eMemory Investor Relations page. The browser's address bar shows the URL `ememory.com.tw/en-US/Investor/Overview`. The website header includes the eMemory logo and navigation links for Company, Products, Applications, Resources, Investor Relations, and ESG. The main banner features a photograph of four stacks of coins of increasing height, each with a small green plant growing from it. The text "Investor Relations" is overlaid on the banner. Below the banner, the "FY2022 Performance" section displays four key metrics: Revenue (NT\$3,217M), Operating Margin (58%), EPS (21.51), and Dividend Rate (>95%). The website also contains a paragraph about eMemory's technology, a paragraph about its proprietary IP technologies, a paragraph about its security solutions, and a paragraph about its hardware security education platform. A small envelope icon is visible in the bottom right corner of the website content area.

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Company Products Applications Resources Investor Relations ESG

Investor Relations

FY2022 Performance


NT\$3,217M	58%	21.51	>95%
Revenue	Operating Margin	EPS	Dividend Rate

eMemory Technology Inc. is the world's largest pure-play developer and provider of logic-based non-volatile memory (Logic NVM) technology. The company has licensed its intellectual property to semiconductor foundries, integrated device manufacturers (IDMs), and fabless design houses around the world.

eMemory's proprietary IP technologies include NeoBit, NeoFuse, NeoMTP, NeoEE and NeoPUF. Products developed with these core technologies have been made into more than 68 billion ICs used in various consumer, industrial and automotive applications.

Taking eMemory's patented anti-fuse OTP, NeoFuse, and quantum-tunneling PUF, NeoPUF, as the foundation, eMemory's subsidiary, [PUFsecurity](#), develops a full suite of security solutions for securing our ever more connected world.

Founded by PUFsecurity, [PUFacademy](#) is a hardware security education platform. We bridge the gap between industry and academia and raise the global awareness of hardware security.



Q&A



Appendix

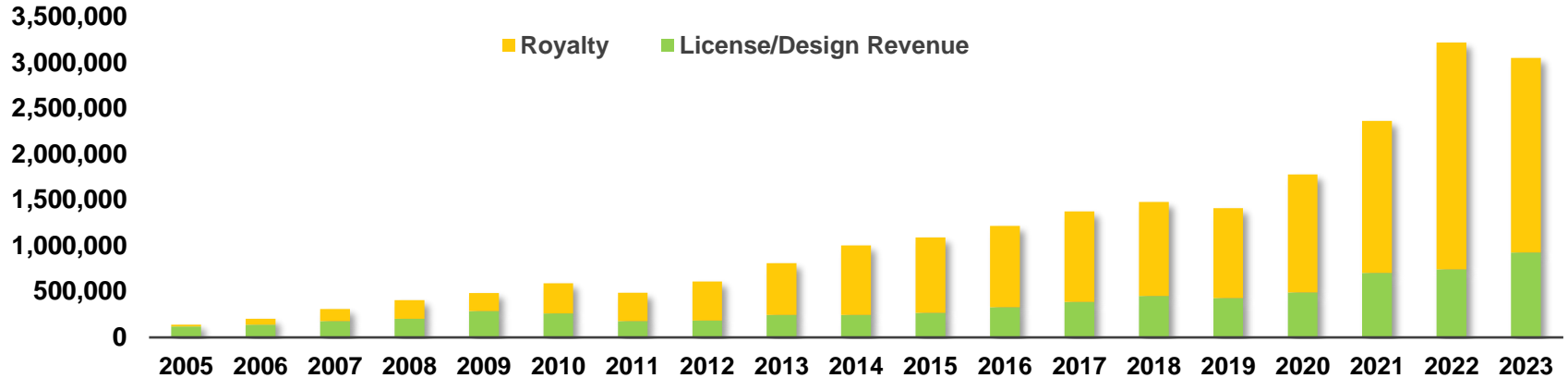


Company Overview

- 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 53M wafers
shipped.

**1170+
Patents Issued**

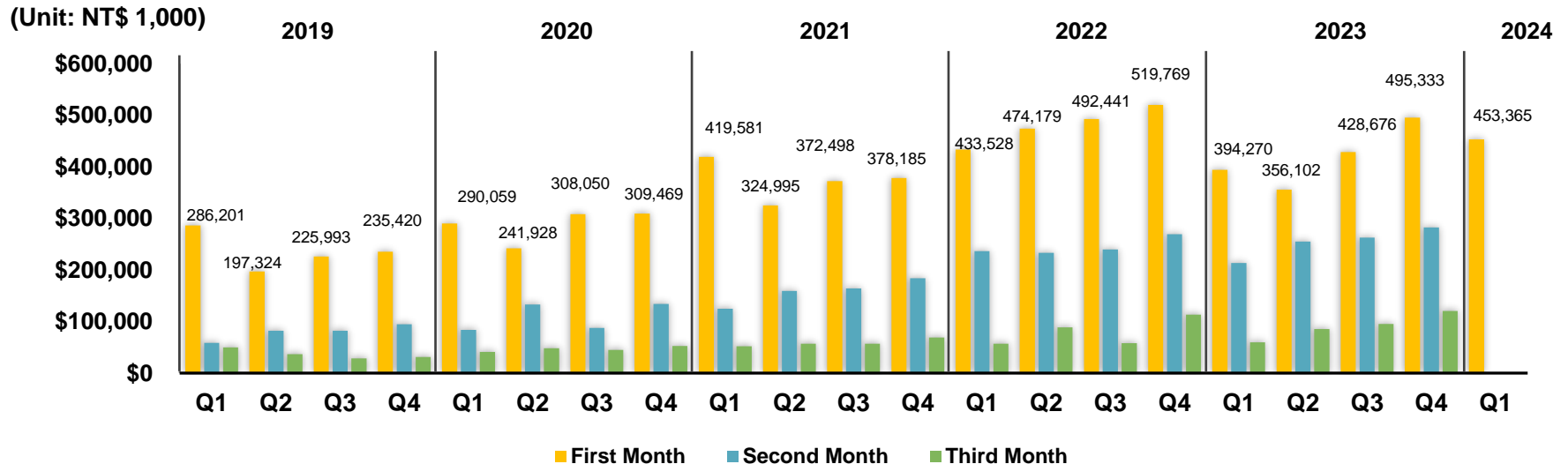
200 pending patents. 351
employees with 68% R&D
personnel.

**Best IP Partner
With TSMC**

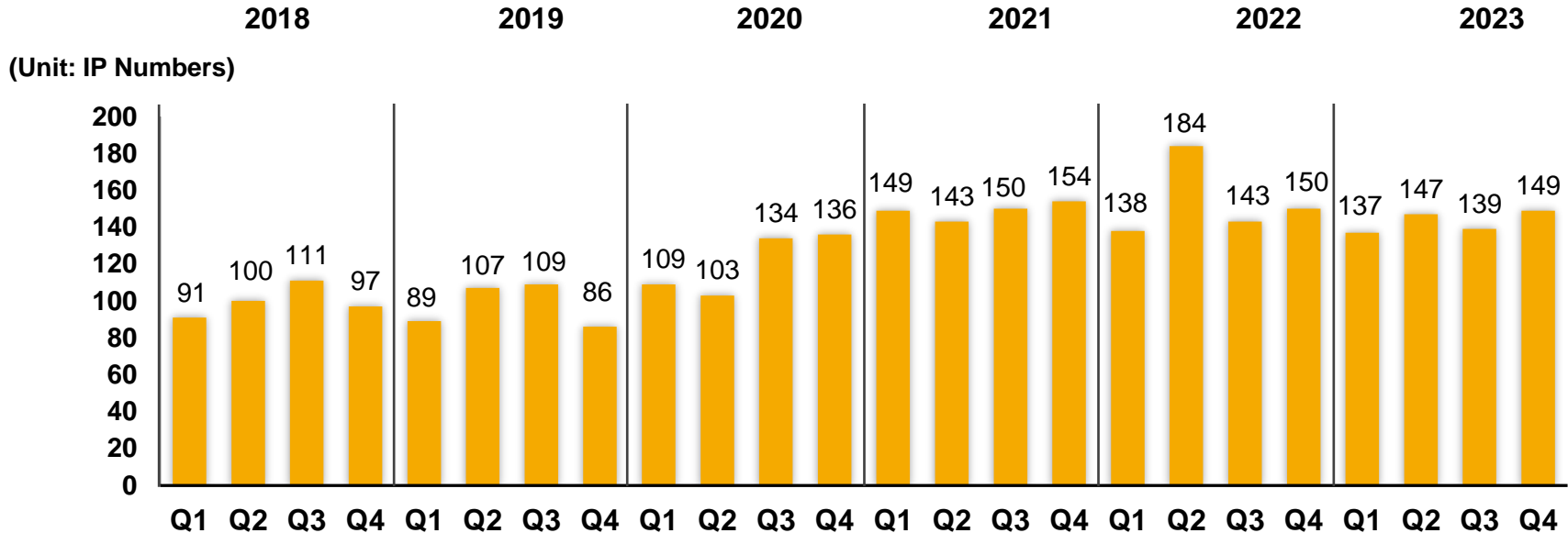
TSMC Best IP Partner Award
since 2010.

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

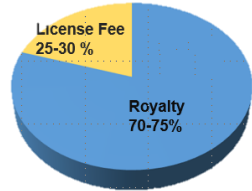
- Our IP solutions are adopted by leading foundries, IDMs and fables worldwide

Country	Foundry	IDM	Fabless
Taiwan	4	1	318
China	9	0	1185
Korea	4	0	98
Japan	4	7	81
North America	1	1	365
Europe	2	1	224
Others	1	0	110



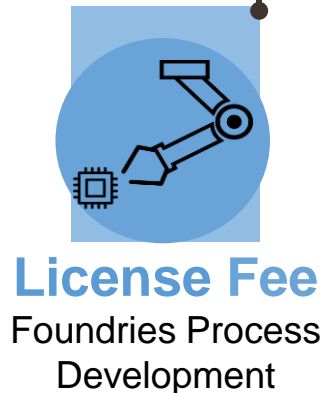
Business Model

- Recurring royalty is the backbone of our business



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

Revenue Breakdown



1-4 years



1-4 years

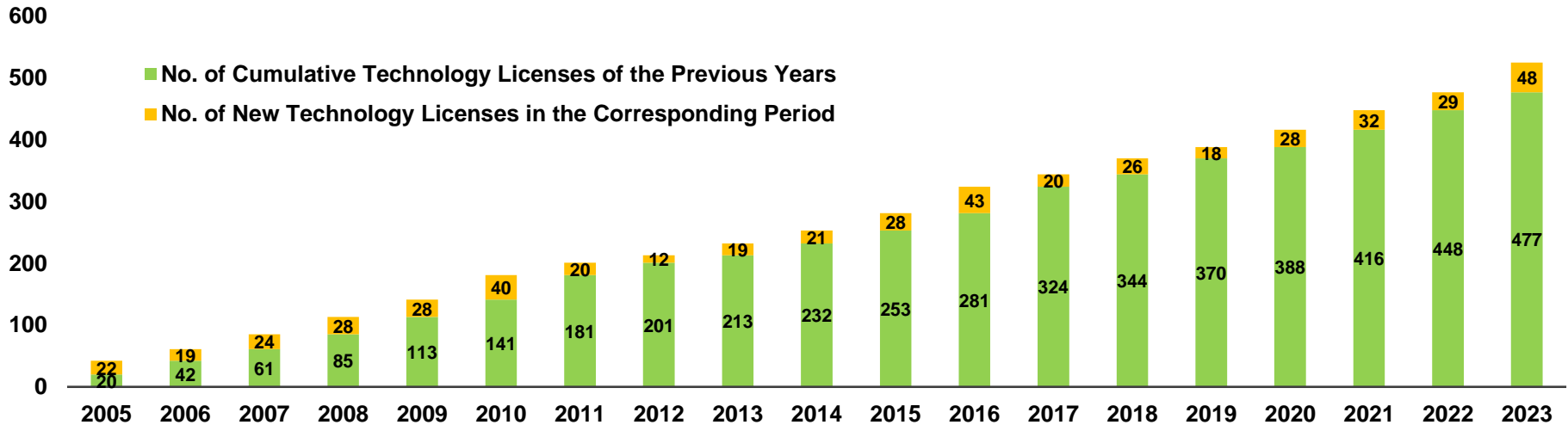


Technology Licenses

Number of Licenses

Year	2016	2017	2018	2019	2020	2021	2022	2023
License	43	20	26	18	28	32	29	48

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 147 platforms by Q4 2023.
- 14 licensing contracts were signed.

Technology	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	-	-	-	-	-	-	2	2	13	9	1
NeoFuse	3	1	1	6	15	6	16	9	4	4	-
PUF-Based	1	3	-	1	1	-	1	-	-	-	-
MTP	-	-	-	-	1	1	6	7	13	20	-

Note: As of December 31st, 2023

Technology Development

- Developments by process nodes

12" Fabs	Production	Development	IP Type	Process Type
3nm	0	4	OTP, PUF	FF, FFP
4/5nm	4	4	OTP, PUF	FF, FF-Auto
6/7nm	4	1	OTP, PUF	FF, FF+
12/16nm	9	7	OTP, PUF	FF, FF+, FFC, FFC+, LPP, DRAM, HV
22/28nm	50	17	OTP, PUF, MTP	LP/ULP/ULL, HPC/HPC+, HV-OLED, DRAM, SOI, ReRAM, MRAM, E-Flash, BCD
40nm	23	7	OTP, PUF, MTP	LP/ULP, E-Flash, HV-DDI/OLED, ReRAM, BCD+
55/65nm	44	25	OTP, PUF, MTP	LP/ULP, E-Flash, HV-DDI/OLED, DRAM, CIS, BCD, PM
80/90nm	27	15	OTP, MTP	HV-DDI/OLED, LP, Generic, BCD, CIS
0.11/0.13um	21	3	OTP, MTP	HV-DDI, BCD, Generic
0.15/0.18um	8	11	OTP, MTP	BCD, Generic
Total	190	94		

8" Fabs	Production	Development	IP Type	Process Type
80/90nm	9	3	OTP	HV-DDI, LL, BCD
0.11/0.13um	78	27	OTP, MTP	HV/HV-MR, BCD, LP/LL, CIS, Green, Flash, SOI, Generic
0.152/0.16/0.18um	238	22	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	431	53		

Note: As of December 31st, 2023

THANKS

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For more information, please visit:

eMemory Website: <https://www.ememory.com.tw/>

PUFsecurity Website: <https://www.pufsecurity.com/>

