



# Q1 2024 Investor Conference

May 8<sup>th</sup>, 2024

Embedded Wisely, Embedded Widely

**ememory**



# IPR Notice

All rights, titles and interests contained in this information, texts, images, figures, tables or other files herein, including, but not limited to, its ownership and the intellectual property rights, are reserved to eMemory. This information may contain privileged and confidential information. Some contents in this information can be found in Logic Non-Volatile Memory (The NVM solutions from eMemory), published in 2014. Any and all information provided herein shall not be disclosed, copied, distributed, reproduced or used in whole or in part without prior written permission of eMemory Technology Inc.

eMemory, NeoBit, NeoFuse, NeoEE, NeoMTP, NeoROM, EcoBit and NeoPUF are all trademarks and/or service marks of eMemory in Taiwan and/or in other countries.



# 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

- 1 Review of Operations
- 2 Future Outlook
- 3 Caliptra : Building a Silicon Root of Trust in Datacenters and Every Chip
- 4 Q&A
- 5 Appendix

# Review of Operations





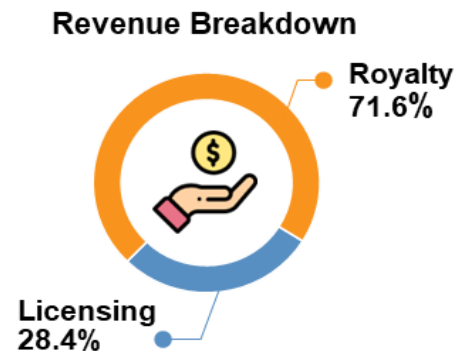
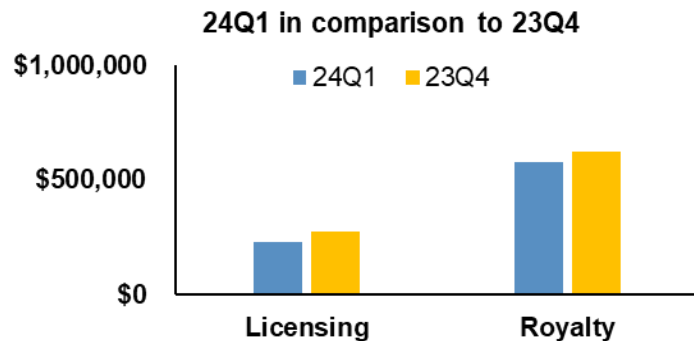
# Q1 2024 Financial Results

(thousands of NT dollars)

	Q1 2024	Q4 2023	Change (QoQ)	Q1 2023	Change (YoY)
<b>Revenue</b>	<b>802,764</b>	<b>898,858</b>	<b>-10.7%</b>	<b>667,751</b>	<b>20.2%</b>
<b>Gross Margin</b>	<b>100%</b>	<b>100%</b>	<b>-</b>	<b>100%</b>	<b>-</b>
<b>Operating Expenses</b>	<b>382,143</b>	<b>359,330</b>	<b>6.3%</b>	<b>300,657</b>	<b>27.1%</b>
-Operating Expenses exclude employee and director bonuses	279,605	279,173	0.2%	226,189	23.6%
-Employee and director bonuses	102,538	80,157	27.9%	74,468	37.7%
<b>Operating Income</b>	<b>420,621</b>	<b>539,528</b>	<b>-22.0%</b>	<b>367,094</b>	<b>14.6%</b>
<b>Operating Margin</b>	<b>52.4%</b>	<b>60.0%</b>	<b>-7.6 pts</b>	<b>55.0%</b>	<b>-2.6 pts</b>
<b>*Net Income</b>	<b>430,577</b>	<b>403,753</b>	<b>6.6%</b>	<b>313,090</b>	<b>37.5%</b>
<b>Net Margin</b>	<b>52.7%</b>	<b>44.5%</b>	<b>8.2 pts</b>	<b>46.1%</b>	<b>6.6 pts</b>
<b>EPS (NT\$)</b>	<b>5.77</b>	<b>5.41</b>	<b>6.7%</b>	<b>4.20</b>	<b>37.4%</b>
<b>ROE</b>	<b>53.2%</b>	<b>53.1%</b>	<b>0.1 ppt</b>	<b>38.9%</b>	<b>14.3 pts</b>

\*Net income attributable to Shareholders of the Company

# Revenue across Different Streams



## Revenue

NT\$ Thousands	Q1 2024	Q4 2023	Change (QoQ)	Q1 2023	Change (YoY)
Licensing	228,329	273,927	-16.6%	143,049	59.6%
Royalty	574,435	624,931	-8.1%	524,702	9.5%
Total	802,764	898,858	-10.7%	667,751	20.2%

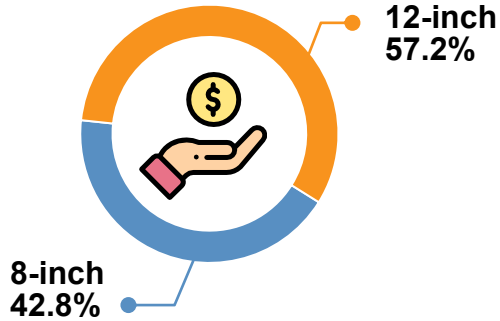
# Revenue by Technology

Technology	Q1 2024								
	Total Revenue			Licensing Revenue			Royalty Revenue		
	% of Q1 Revenue	Change (QoQ)	Change (YoY)	% of Q1 Licensing	Change (QoQ)	Change (YoY)	% of Q1 Royalty	Change (QoQ)	Change (YoY)
NeoBit	23.6%	-8.9%	1.0%	20.9%	-33.5%	70.0%	24.7%	4.0%	-11.1%
NeoFuse	67.0%	-8.7%	26.0%	52.6%	2.3%	69.3%	72.8%	-11.4%	17.4%
PUF-Based	2.3%	-38.9%	9.2%	8.0%	-39.0%	10.2%	0.0%	15.9%	-59.0%
MTP	7.1%	-20.3%	56.3%	18.5%	-22.8%	53.7%	2.5%	-12.2%	64.7%



# Royalty Revenue by Wafer Size

## Q1 Royalty Breakdown



- 8-inch wafers contributed 42.8% of royalty, up 4% sequentially but down 0.2% yearly.
- 12-inch wafers contributed 57.2% of royalty, down 15.4% QoQ but up 18.1% YoY.

Wafer Size	Q1 2024		
	% of Q1	Change (QoQ)	Change (YoY)
8-Inch	42.8%	4.0%	-0.2%
12-Inch	57.2%	-15.4%	18.1%

# Future Outlook



# Future Outlook

## Licensing & Royalty:

- Licensing:
  - Due to strong demand from foundries and chip design customers for all of our technologies, the growth momentum of licensing revenue will continue to increase.
- Royalties:
  - Our royalty will grow, driven by 1500 new tape-outs from the past three years in the pipeline entering mass production (i.e. 6nm DTV, 7nm ADAS, 12 nm SSD and ISP, as well as 22/28nm networking, switch, and smart image processor...)

# Future Outlook

## **New IP Technology & Business Development:**

- Specialty processes (HV, HK, BCD, embedded flash, and emerging memory):
  1. NeoFuse is developing towards FinFET in HV process for OLED DDI applications.
  2. RRAM is expanding into more processes.
  3. NeoFlash continues progressing in specialty processes for Automotive PMIC and MCU-related products.
- Advanced processes:
  1. NeoFuse has successfully qualified for the N5 automotive process with customer design in.
  2. PUFrt collaboration with CPU vendors in 3nm is progressing successfully.

# Future Outlook

## Business Collaboration Platforms:

- Non-volatile Memory (NVM) and PUF-based Technologies
  - We are expanding cooperation with all new foundries to license our technologies besides existing foundries.
- Security IPs:
  - We have completed the agreement with the largest CPU IP company to integrate our security solution into the CPU architecture.

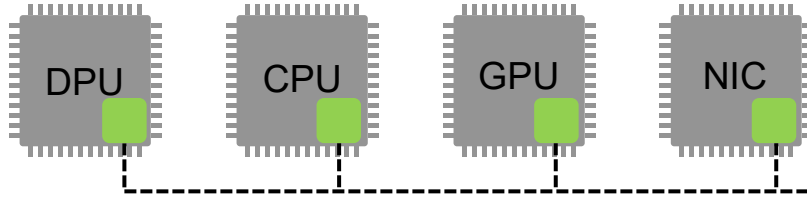
# Caliptra : Building a **Silicon Root of Trust** in Datacenters and Every Chip





# Why is **Caliptra** so Important?

**Datacenter  
Chips**



*Caliptra  
Root of Trust*

Every chip needs Root of Trust

**Caliptra 1.0**

Complete specification,  
firmware coverage,  
countermeasures and testing

September  
2021

May  
2022

March  
2023

August  
2023

October  
2023

March  
2024

**Project Start**  
Founders begin  
the effort

**OCP Intro**  
Specification is  
formalized at Open  
Compute Project

**Open Source**  
Charter is adopted at  
Linux Foundation

**Functional RTL**  
Founders contributed  
RTL Op8 pre

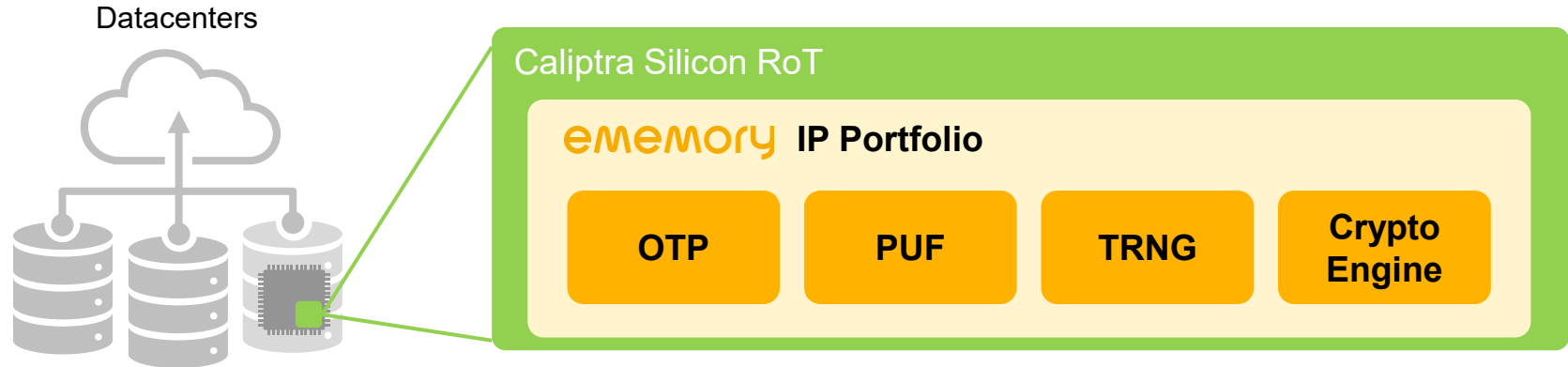
**Full Functionalities  
Defined**  
All flows are defined  
and are implemented  
in RTL

**Validation  
Completed**  
RTL, ROM are fully  
validated and ready for  
chip design-in

March  
2024

# What is the Important Role of eMemory in Caliptra?

- eMemory's root of trust IP is ready to meet Caliptra's requirements.



## Unique Chip Identity



Chip Fingerprint

## Secure Attestation



Device Certificate

## Secure Boot



Boot into Trusted Operating System

# Q&A



# Appendix

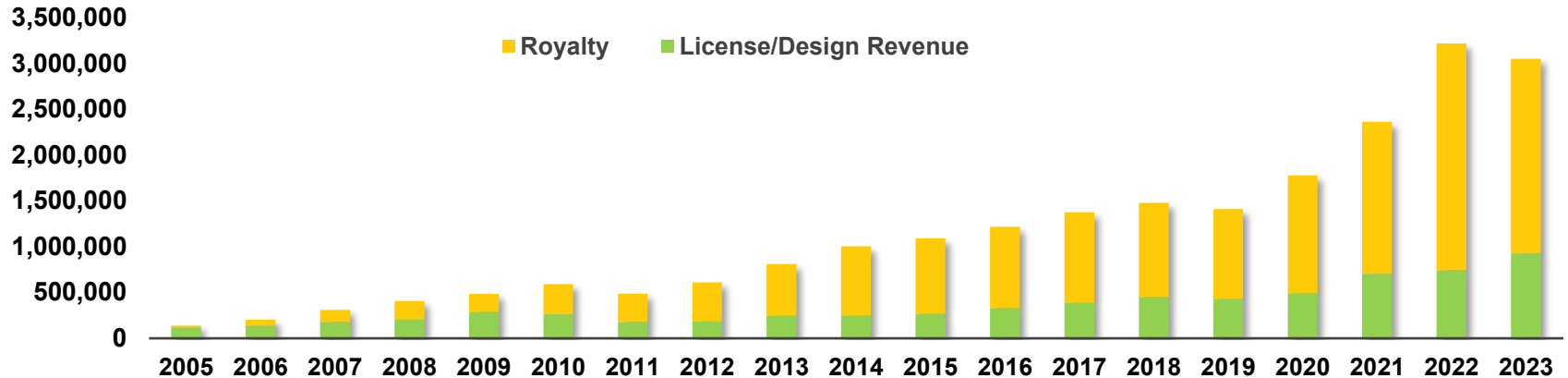


# Company Overview

- 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 58M wafers  
shipped.

**1200+  
Patents Issued**

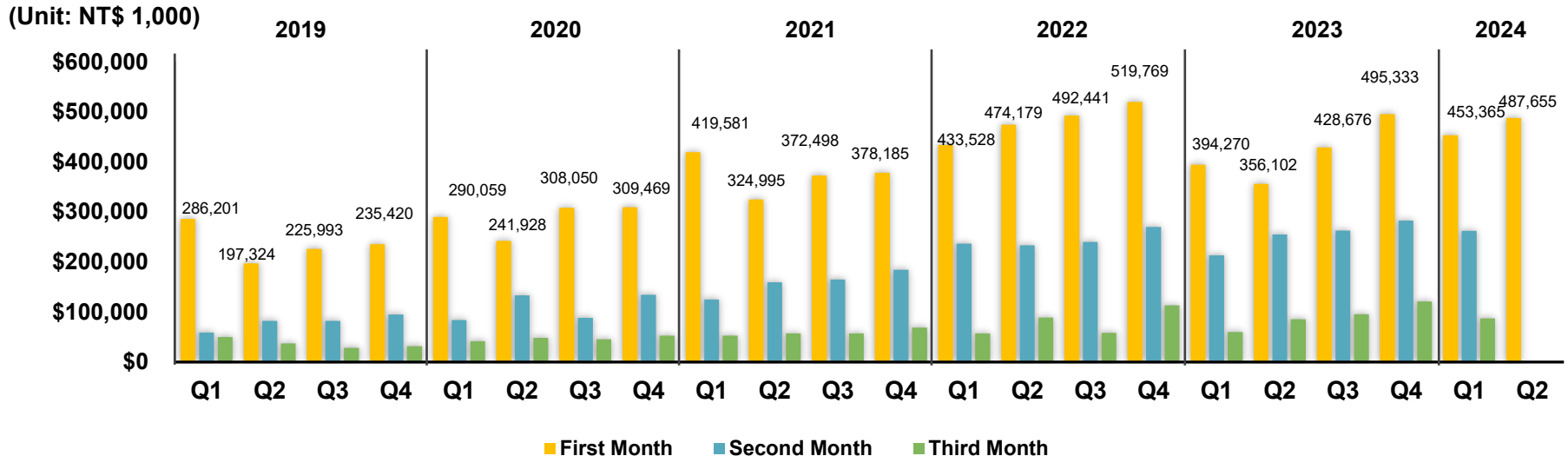
193 pending patents. 360  
employees with 67% R&D  
personnel.

**Best IP Partner  
With TSMC**

TSMC Best IP Partner Award  
since 2010.

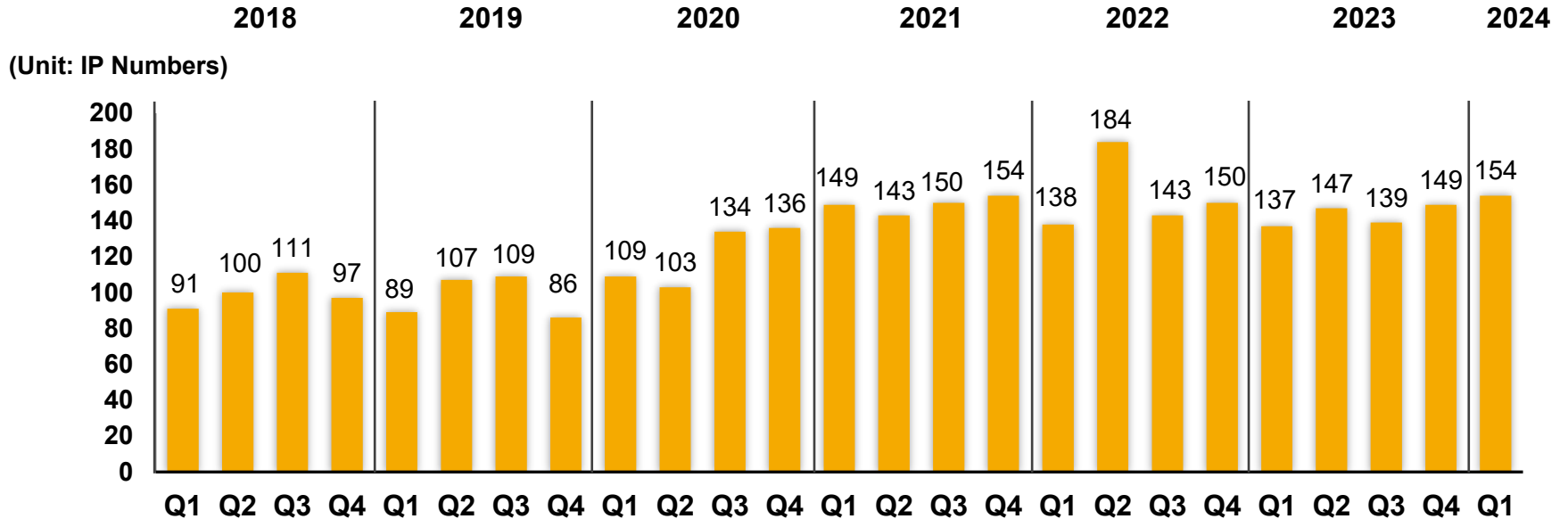
# Quarterly Revenue Pattern

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





# Quarterly Number of New Tape-outs



# Worldwide Customers

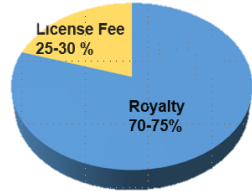
- Our IP solutions are adopted by leading foundries, IDMs and fables worldwide

Country	Foundry	IDM	Fabless
Taiwan	4	1	318
China	11	0	1185
Korea	4	0	98
Japan	1	9	81
North America	2	2	365
Europe	2	2	224
Others	1	0	110



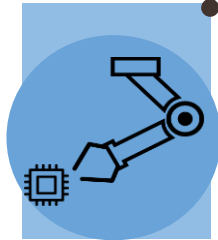
# Business Model

- Recurring royalty is the backbone of our business



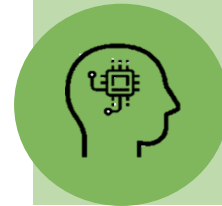
- 70-75% revenue are from royalty based on wafer production
- More adoption = more volume shipment
- More advanced node wafers = higher ASP per wafer

**Revenue Breakdown**



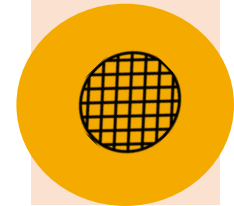
**License Fee**  
Foundries Process  
Development

1-4 years



**Design License Fee**  
Fabless Product  
Development

1-4 years



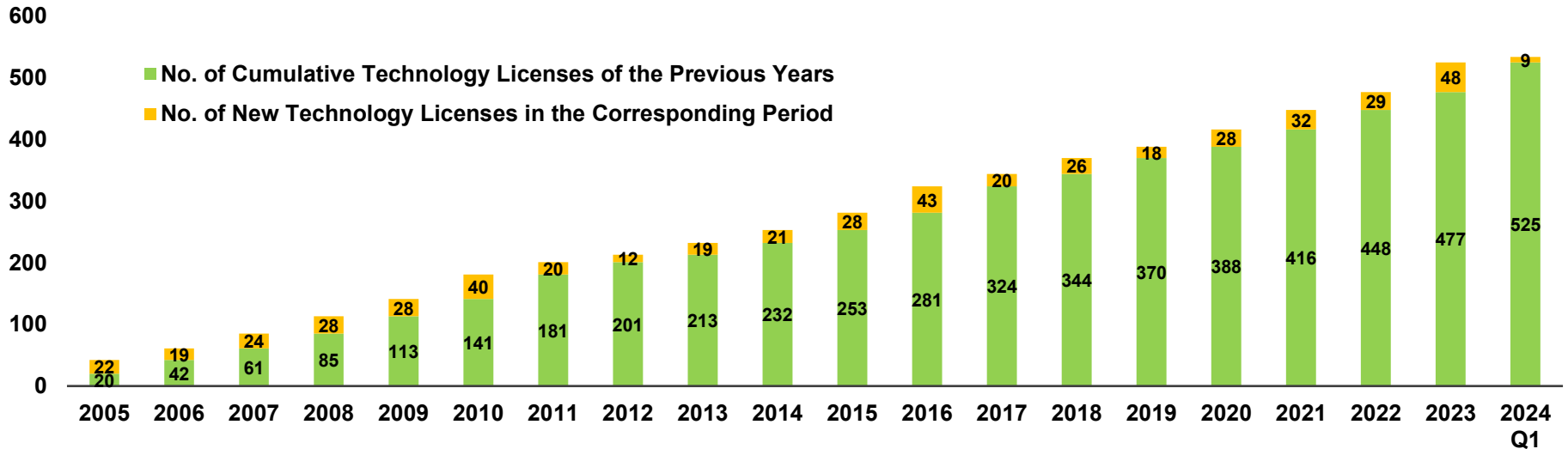
**Royalty**  
Wafer Mass Production

# Technology Licenses

Number of Licenses

Year	2016	2017	2018	2019	2020	2021	2022	2023	2024 Q1
License	43	20	26	18	28	32	29	48	9

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 149 platforms by Q1 2024.
- 9 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	12	11	1
NeoFuse	3	-	1	7	18	6	13	8	5	4	-
PUF-Based	1	-	-	1	2	-	1	-	-	-	-
MTP	-	-	-	-	1	1	5	8	15	21	-

Note: As of March 31<sup>st</sup>, 2024

# Technology Development

- Developments by process nodes

12" Fabs	Production	Development	IP Type	Process Type
3nm	0	4	OTP, PUF	FF, FFP
4/5nm	6	0	OTP, PUF	FF, FF-Auto
6/7nm	4	1	OTP, PUF	FF, FF+
12/16nm	9	8	OTP, PUF	FF, FF+, FFC, FFC+, LPP, DRAM, HV
22/28nm	50	21	OTP, PUF, MTP	LP/ULP/ULL, HPC/HPC+, HV-OLED, DRAM, SOI, ReRAM, MRAM, E-Flash, BCD, WoW
40nm	24	7	OTP, PUF, MTP	LP/ULP, E-Flash, HV-DDI/OLED, ReRAM, BCD+
55/65nm	51	21	OTP, PUF, MTP	LP/ULP, E-Flash, HV-DDI/OLED, DRAM, CIS, BCD, PM
80/90nm	28	15	OTP, MTP	HV-DDI/OLED, LP, Generic, BCD, CIS
0.11/0.13um	21	5	OTP, MTP	HV-DDI, BCD, Generic
0.15/0.18um	11	11	OTP, MTP	BCD, Generic
<b>Total</b>	<b>204</b>	<b>93</b>		

8" Fabs	Production	Development	IP Type	Process Type
80/90nm	9	3	OTP	HV-DDI, LL, BCD
0.11/0.13um	81	27	OTP, MTP	HV/HV-MR, BCD, LP/LL, CIS, Green, Flash, SOI, Generic
0.152/0.16/0.18um	240	25	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
<b>Total</b>	<b>436</b>	<b>56</b>		

Note: As of March 31<sup>st</sup>, 2024



# THANKS

## Embedded Wisely, Embedded Widely

For more information, please visit:

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

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

