



# eMemory

## **Investor Presentation**

**eMemory Technology Inc.**

**December 2017**

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## *eMemory – the Embedded IP Expert*

- **About eMemory**

- **Technologies**

- **Financials**

# Company Overview

## Key Facts

- Founded 2000
- IPO 2011
- Headquartered Hsinchu Taiwan
- Over 1,300 customers worldwide

## People & Innovation

- 238 employees (70% IP developers)
- Over 3,800 customer tapeouts
- Over 480 patents Issued, another 250 pending

## Achievement

- The world's 7<sup>th</sup> largest IP provider
- Over 18.5 mlns of wafers shipped
- TSMC Best IP Partner Award since 2010

## IP Portfolio

- NeoBit
- NeoFuse
- NeoEE
- NeoMTP
- NeoPUF
  - NeoPUF Entropy
  - NeoPUF Key Manager



## Global Customers

	Foundry	IDM	Fabless
Taiwan	5	0	261
China	8	0	513
North America	1	2	242
Europe	2	1	111
Korea	3	0	71
Japan	4	8	52
Others	1	0	53

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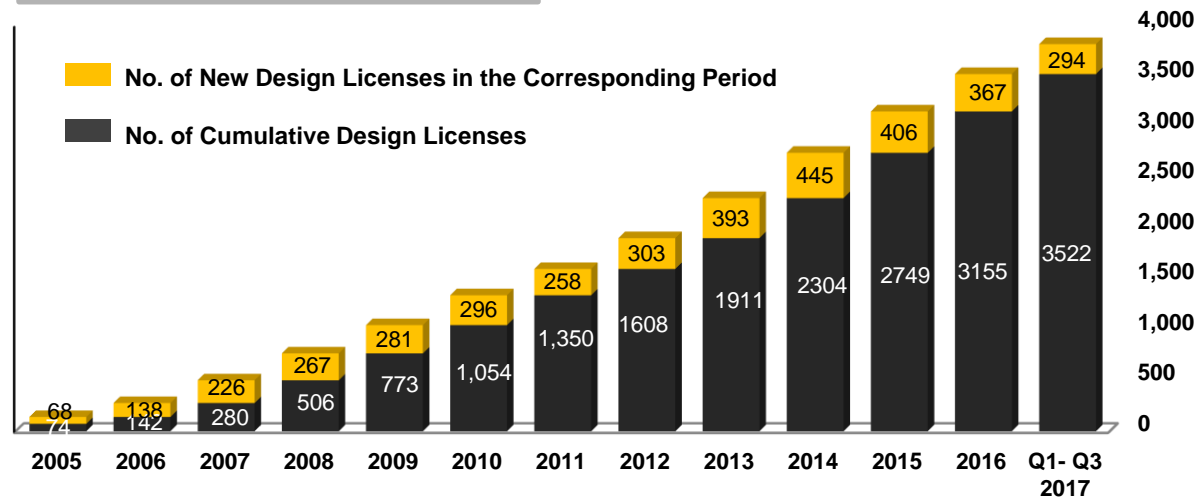
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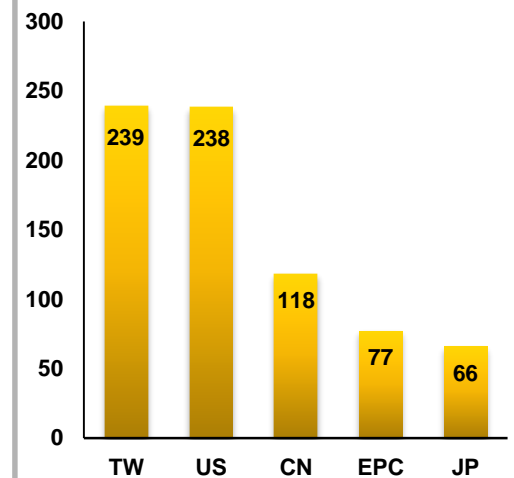
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## Cumulative Customer Tapeout



## Patent



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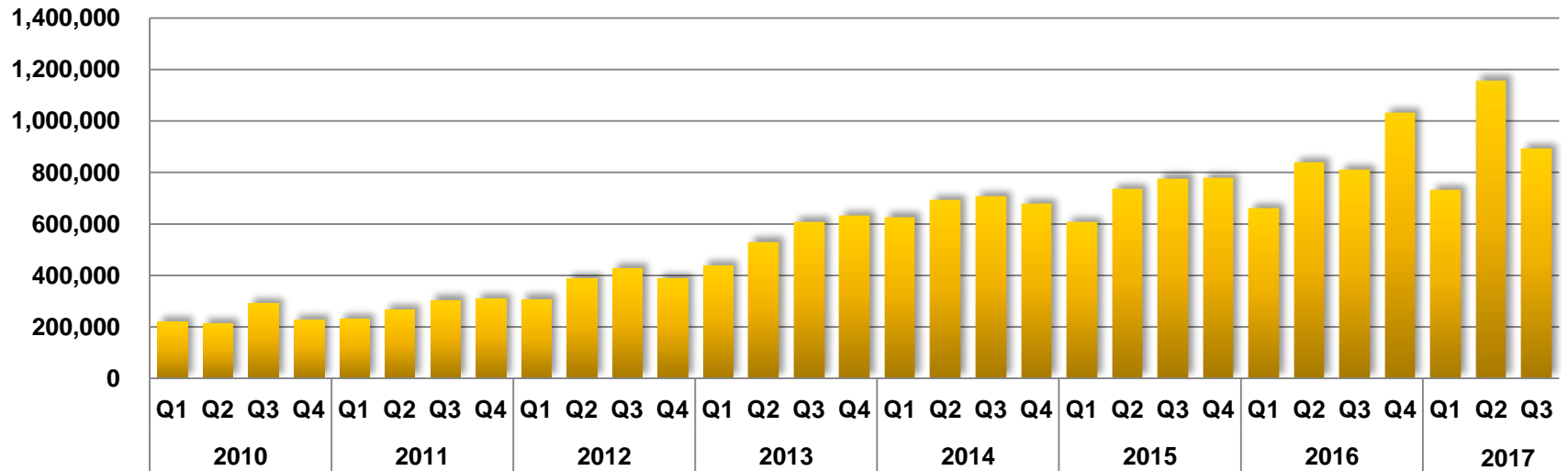
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## Licensed Wafer Shipments



# Company Overview

Key Facts	People & Innovation	Achievement	IP Portfolio
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- One-time programmable memory
- Floating gate technology
- Most widely used OTP IP



- One-time programmable memory
- Antifuse technology
- Secure storage, code protection
- 7nm technology



- Multi-time programmable memory
- Up to 1K endurance cycles
- Cost-effective



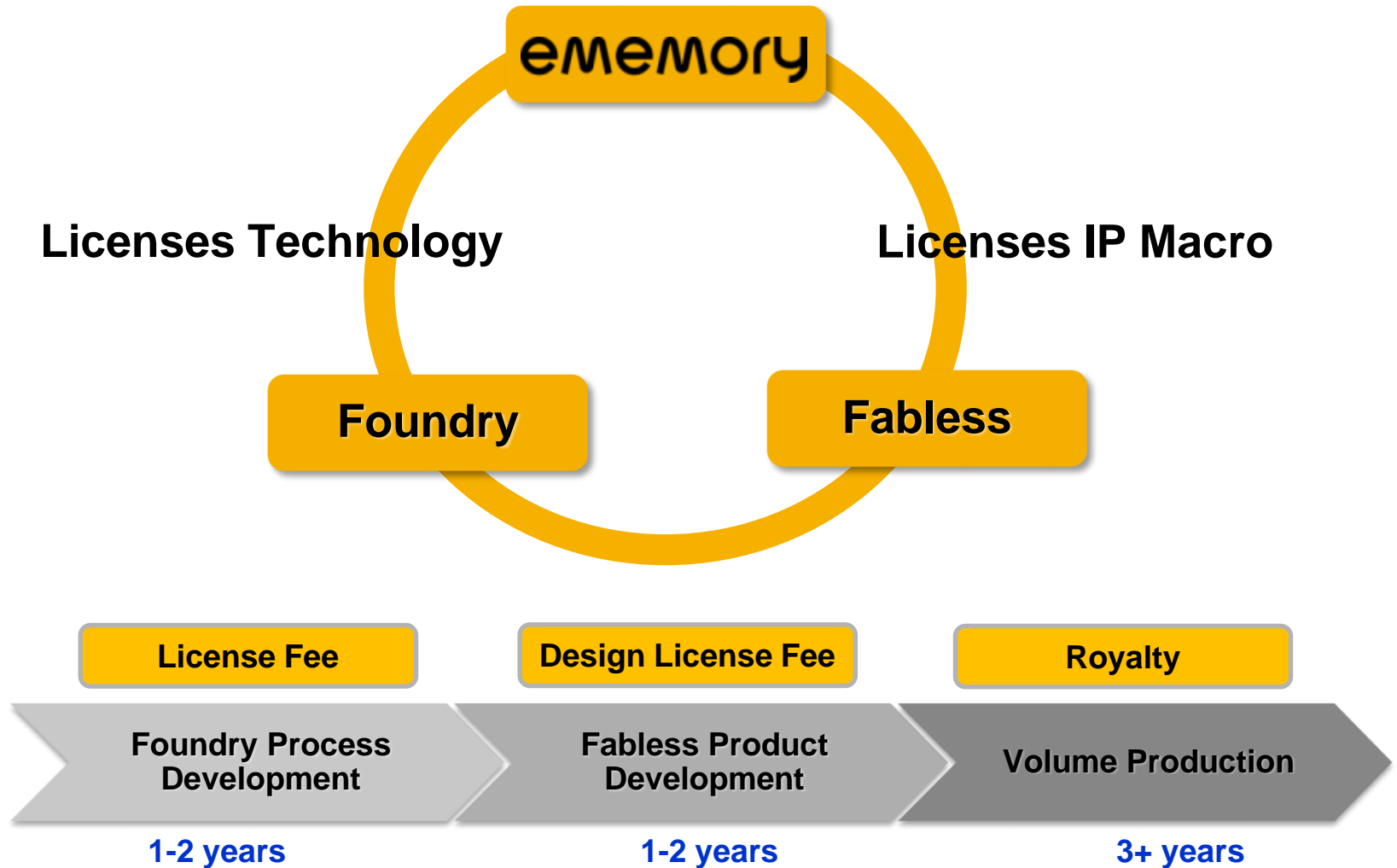
- Security solution based on PUF
- Device Unique ID & Entropy
- Enable authentication, encryption, secure boot etc.
- 7nm technology



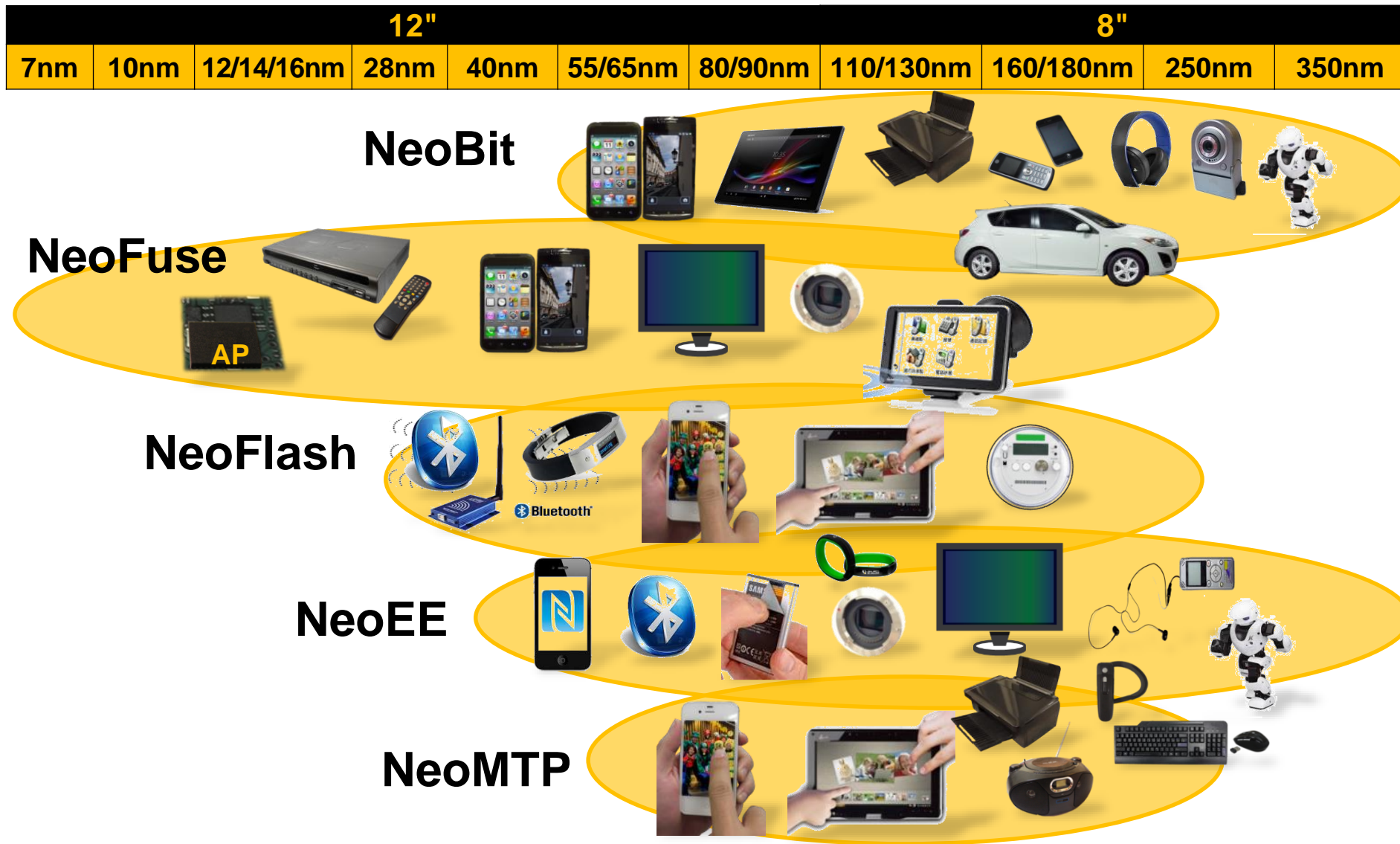
- EEPROM solution
- Low Power
- Up to over 500K endurance cycles



# Business Model



# Application Markets

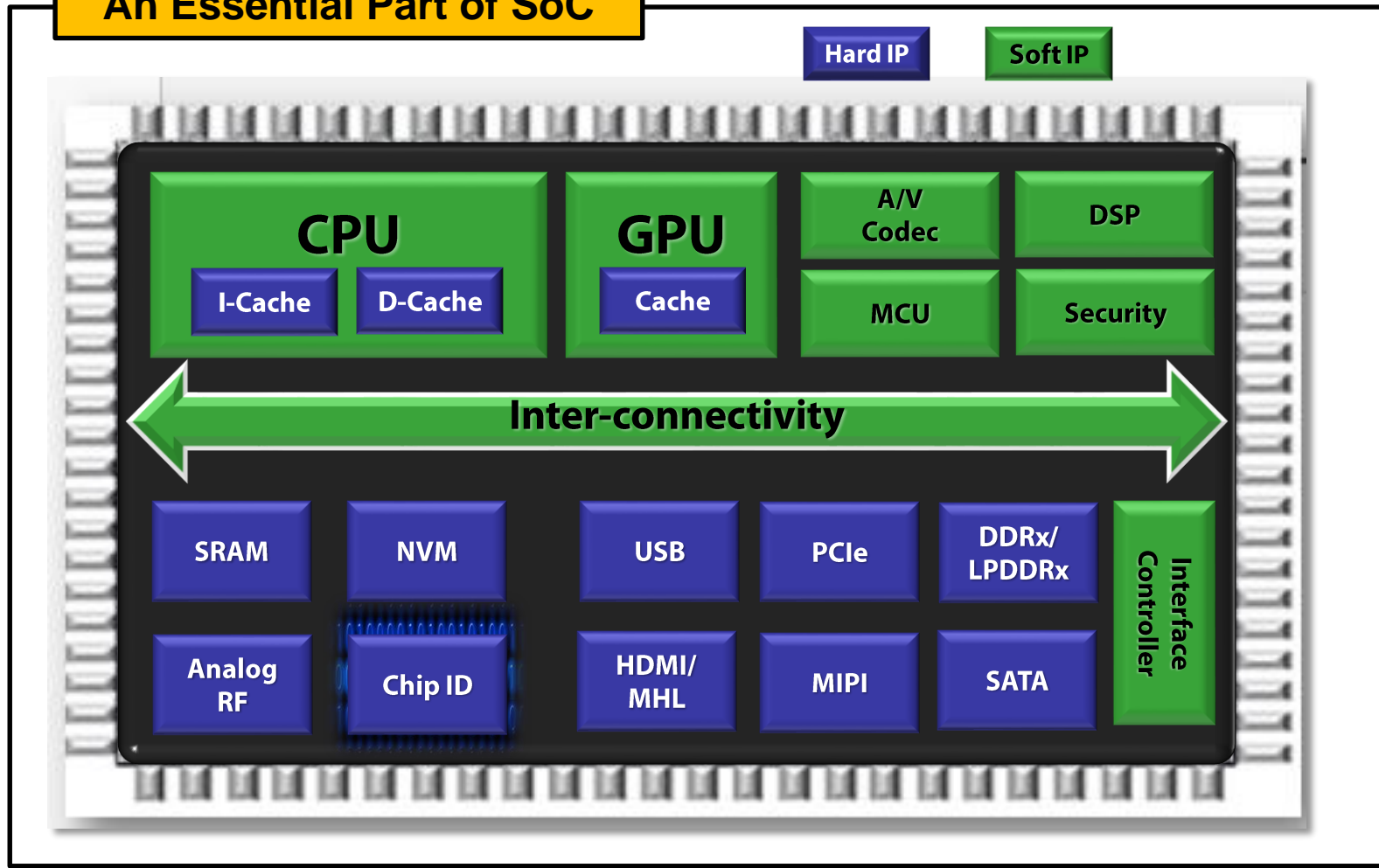


## *eMemory – the Embedded IP Expert*

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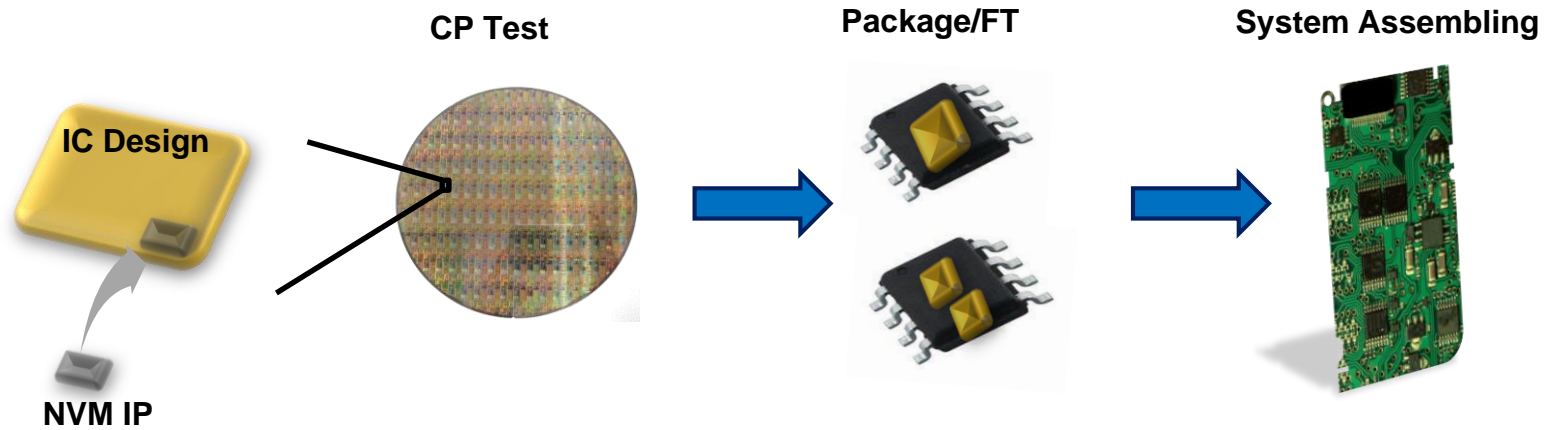
# Embedded Memory, Embedded Chip ID

## An Essential Part of SoC



# Embedded NVM

Programmable, Configurable

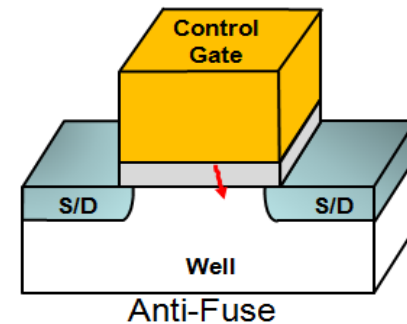
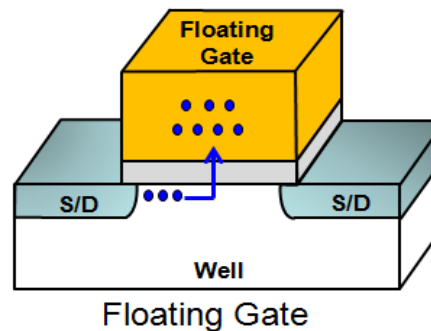


Secure Data Storage

**eFuse Key: Data is easily observed**



**Invisible Hardware Key : Data is hard to be detected**



# Against Reverse-Engineering

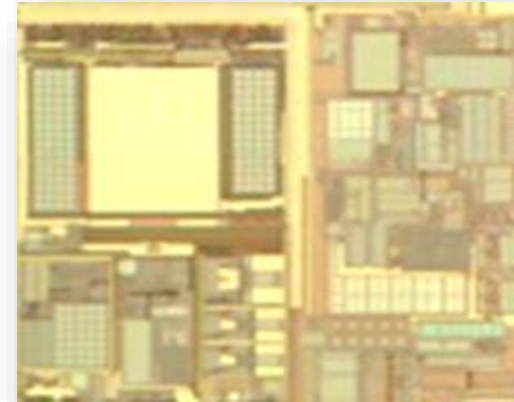
Authorized Product



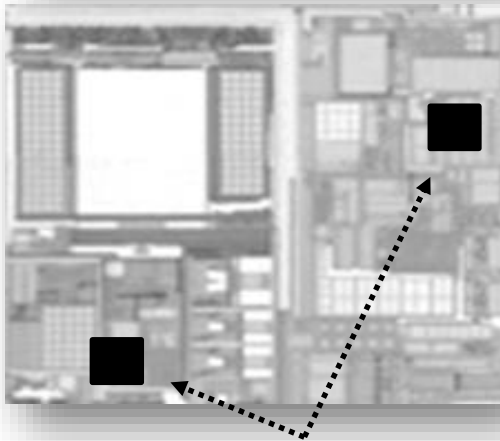
Without protection



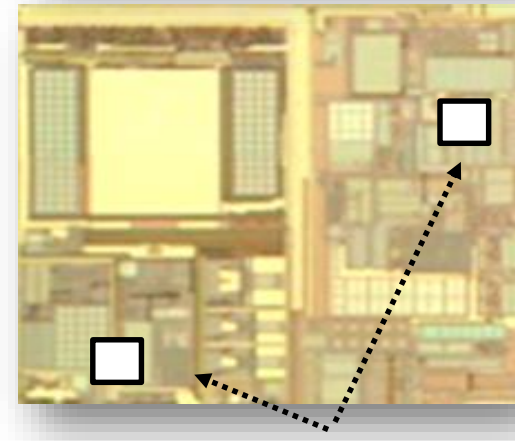
Fake Product



With protection

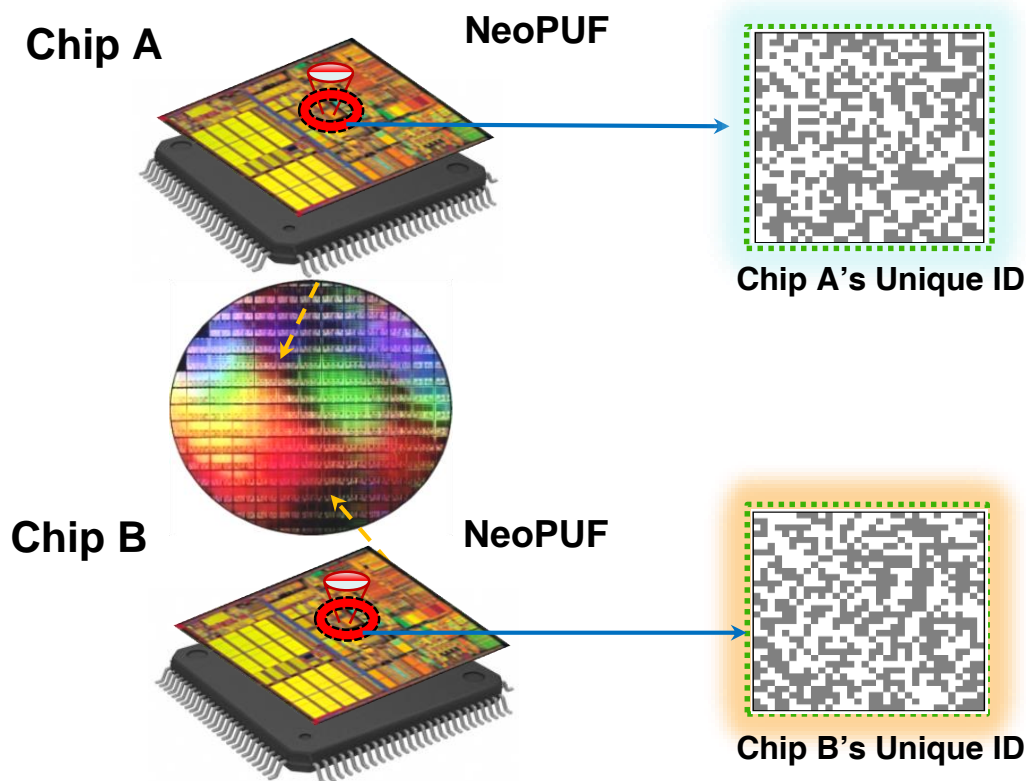


Security IP/Code by Authorized Use



Can NOT Work w/o Security IP/Code

# Embedded Chip ID



## Ideal for Crypto Applications

### Physically Unclonable Functions

- **Deep-rooted Root of Trust**  
Based on uncontrollable silicon manufacturing variations
- **Unclonable & Unpredictable**  
Manufacturing variations cannot be controlled or replicated
- **Chip-Unique**  
Every Chip bears its unique
  - Chip ID
  - Entropy source



# Run by Chips, Secured with Chips



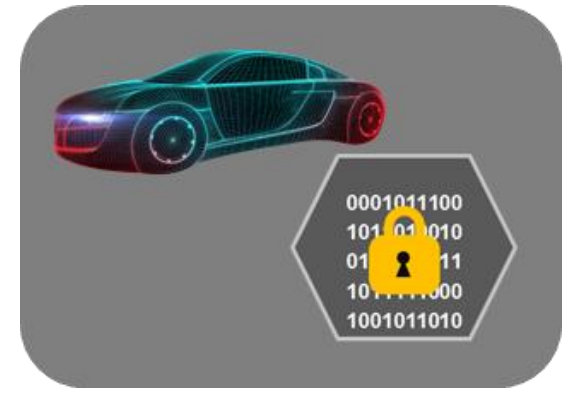
## Against Counterfeiting and Hacking



**Chip Vendor/OEM IP Protection**



**Secure IoT/IIoT  
Smart Card/Smart Payment**



**Data Center  
Connected Car**



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# Financial Income Statement

Amount in Thousands of NT Dollars, except margins/EPS/ROE

	Q3 2017	Q2 2017	Q3 2016	change (QoQ)	change (YoY)
Revenue	384,423	332,220	309,367	15.7%	24.3%
Gross Margin	100%	100%	100%	-	-
Operating Expenses	205,291	188,562	173,605	8.9%	18.3%
Operating Margin	46.6%	43.2%	43.9%	3.4ppts	2.7ppts
Net Income	194,062	135,610	130,299	43.1%	48.9%
Net Margin	50.5%	40.8%	42.1%	9.7ppts	8.4ppts
EPS	2.56	1.79	1.72	43.0%	48.8%
ROE	40.2%	29.6%	28.9%	10.6ppts	11.3ppts

# Q3 Revenue Breakdown

Revenue (thousands of NT dollars)

K NTD	Q3 2017	Q2 2017	QoQ	Q3 2016	YoY	Q1 – Q3 2017	Q1 – Q3 2016	YoY
Licensing	101,087	134,140	-24.6%	86,712	16.6%	309,373	250,403	23.6%
Royalty	283,336	198,080	43.0%	222,655	27.3%	744,519	658,829	13.0%
Total	384,423	332,220	15.7%	309,367	24.3%	1,053,892	909,232	15.9%

Number of Licenses

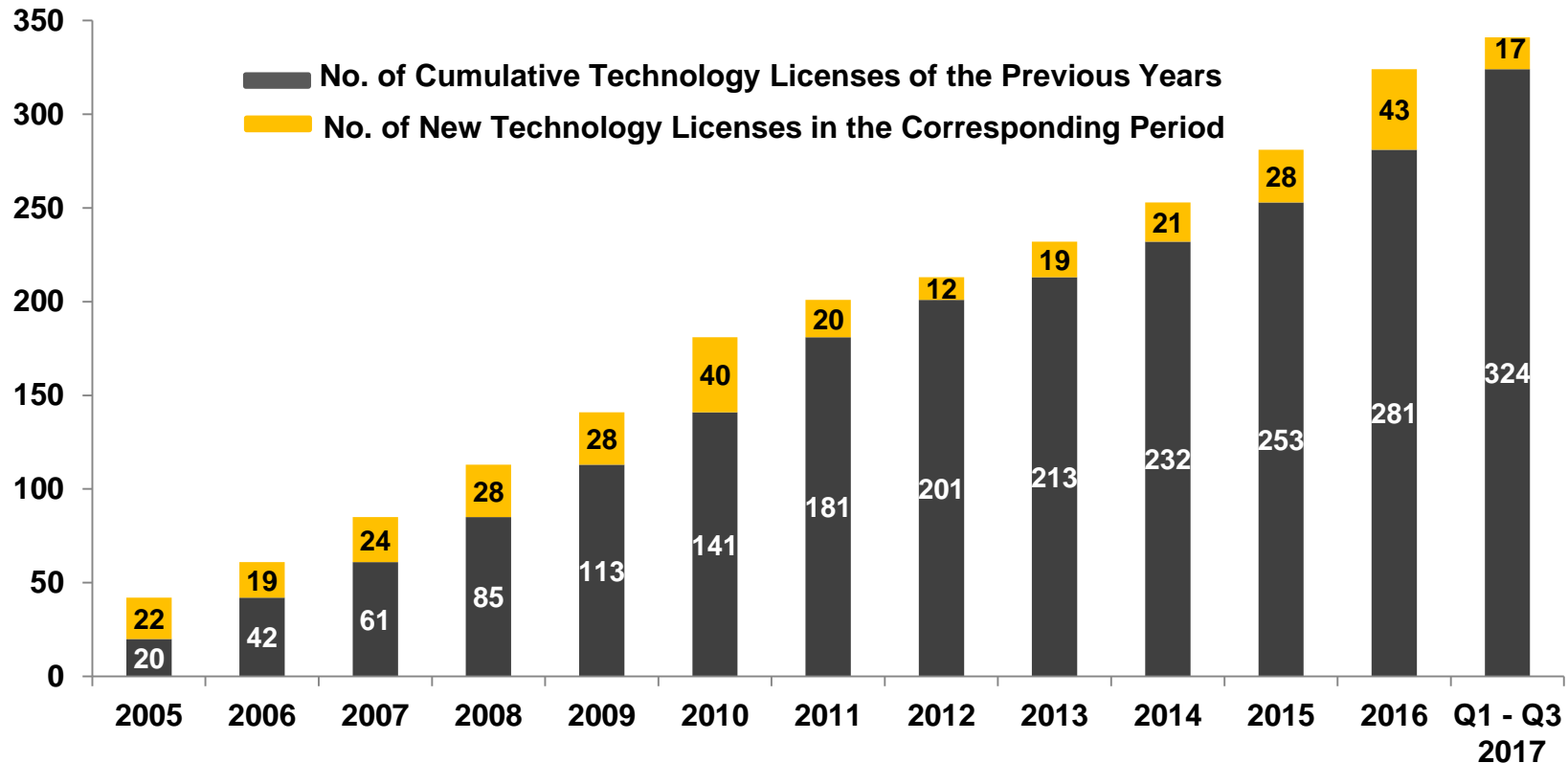
		Q3 2017	Q2 2017	2016	2015
Technology Licenses		4	8	43	28
Design Licenses	NRE	23	13	56	57
	Usage	87	77	311	349

# Technology Licensing

## Number of Licenses

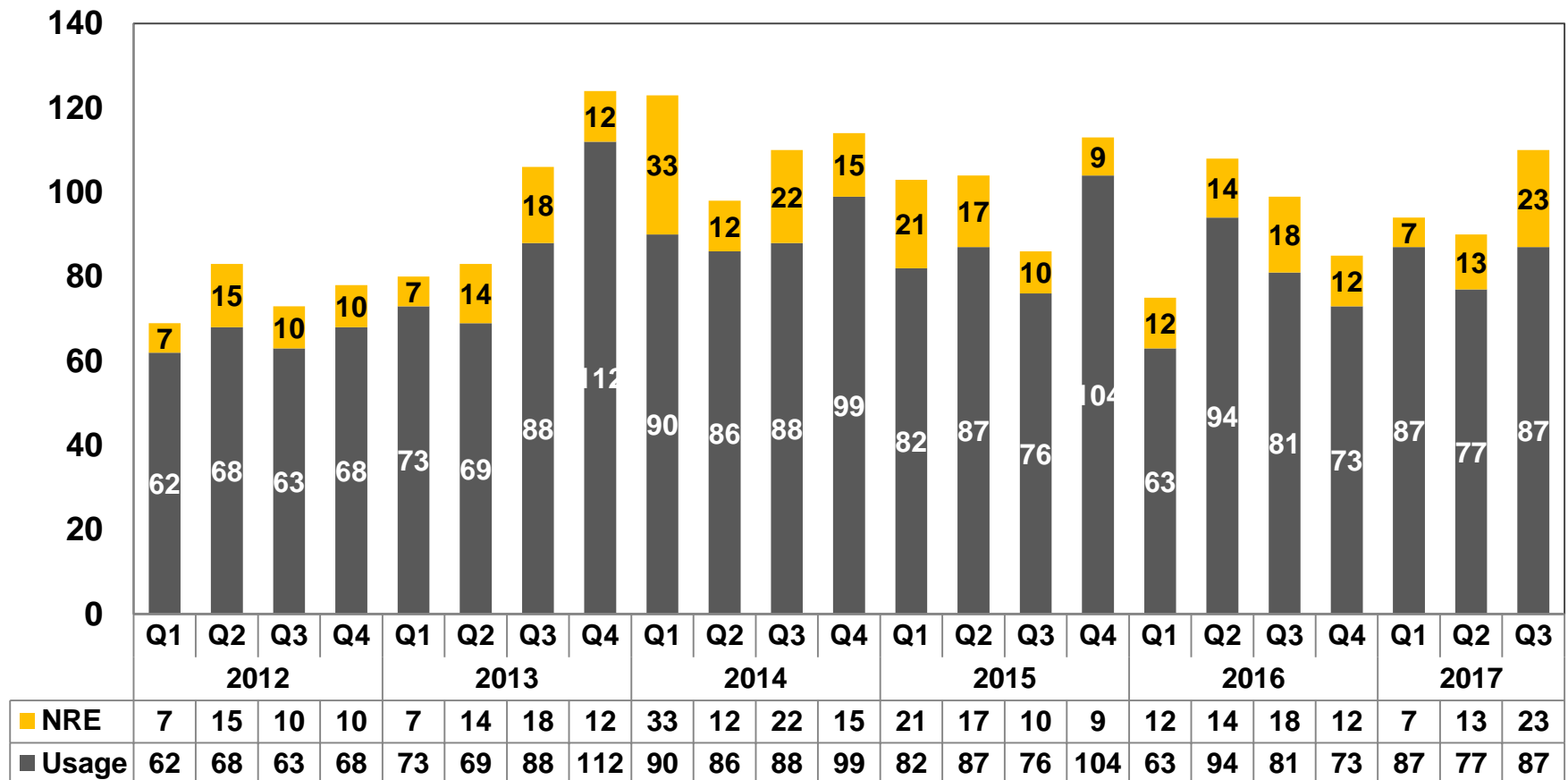
Year	2014	2015	2016	Q1- Q3 2017
License	21	28	43	17

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.



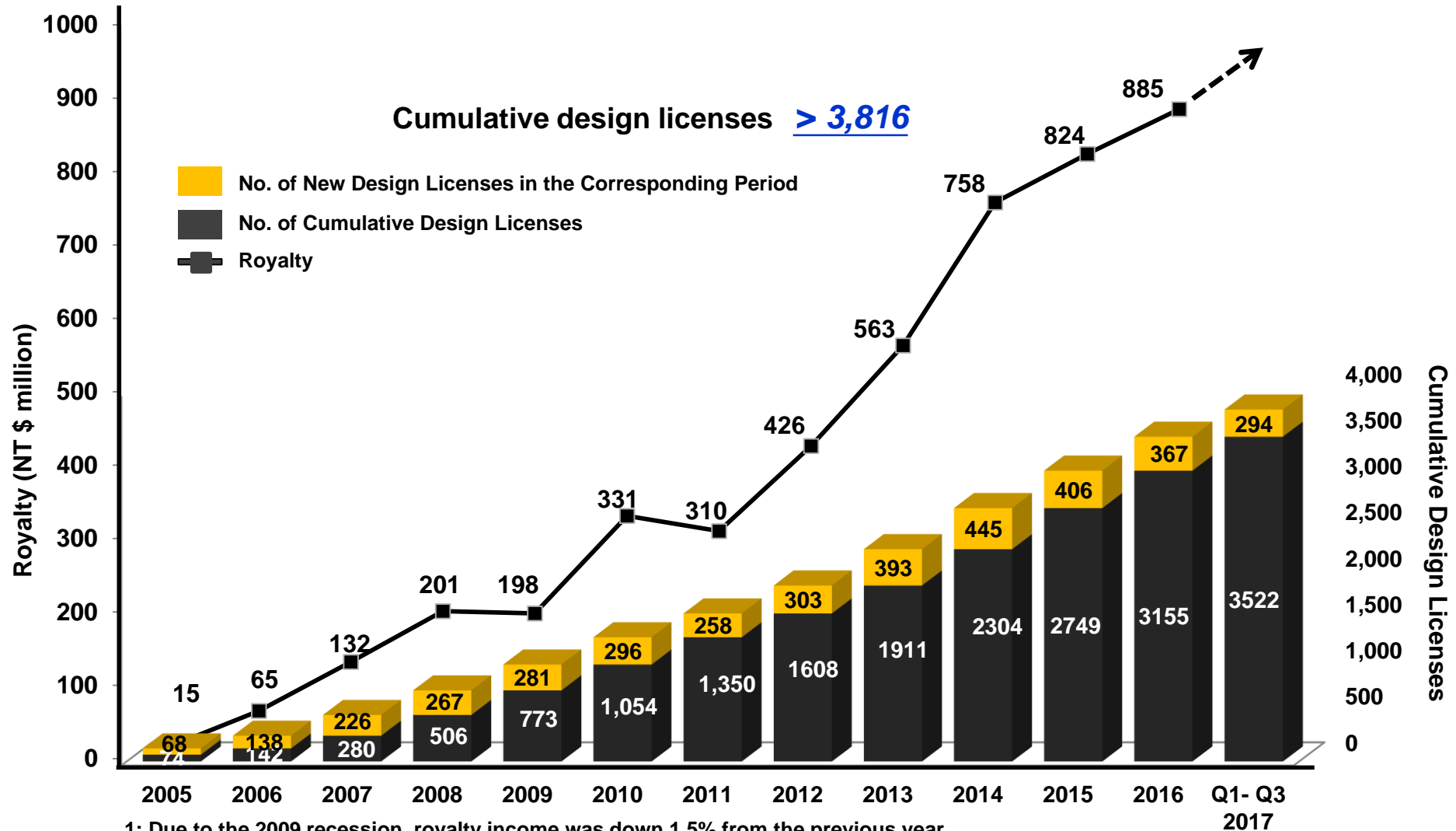
# Design Licensing

- A total **294** NTO in Q1-Q3 2017 (**367**@2016, **406**@2015, **445**@2014, **393**@2013)



Note\*: As the applications of MCU at several foundries have gradually entered mass production, and the business model of the main foundry partner which provides green process has shifted to — eMemory licenses IP cell to the foundry for it to provide direct design service to customers — as the result, the new tape out number of MCU has been affected, but the royalty coming from IP cell usage continues to roll in. In summary, even the new tape out number of MCU is lower than before; the corresponding wafer output and royalty continue to grow.

# Cumulative Licenses Drive Future Royalties



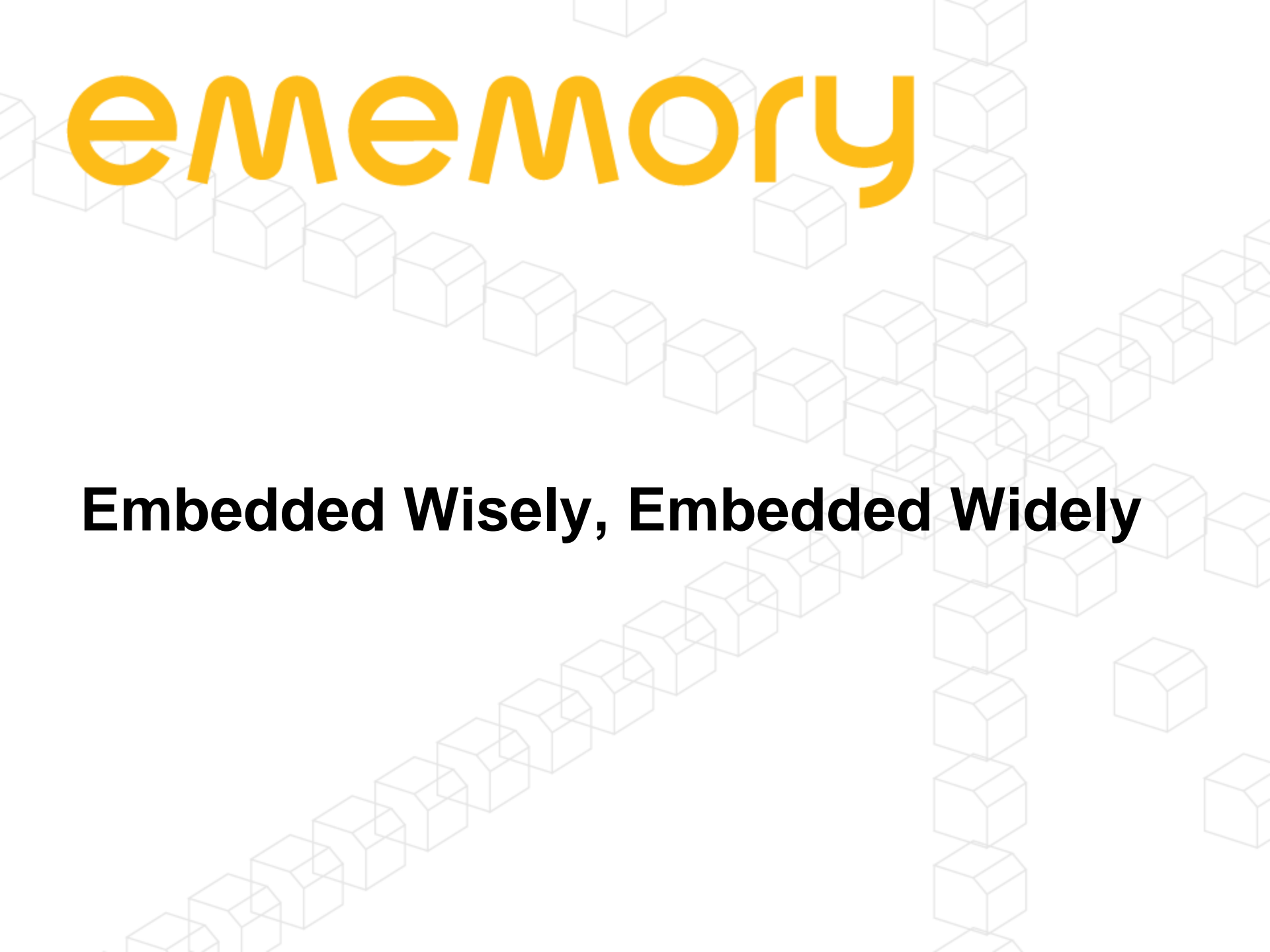
1: Due to the 2009 recession, royalty income was down 1.5% from the previous year.

2: Prepaid royalty from a single customer contributed to 2010 annual growth of 67%, followed by a drop of 6.3% in 2011.

3: CAGR for 2009-2013 was 30%.

Confidential

Embedded Wisely, Embedded Widely



# ememory

**Embedded Wisely, Embedded Widely**