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力旺電子(3529)
A Leading Logic NVM Company
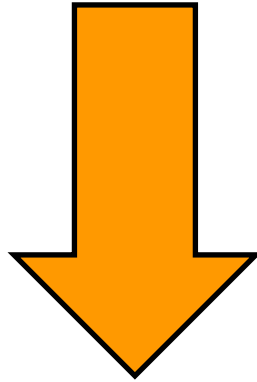
Charles Hsu

June 17, 2014

智慧財產權聲明

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eMemory, NeoBit, NeoFuse, NeoFlash, NeoEE與 NeoMTP皆為力旺電子在台灣或其他國家之註冊商標或服務標章。

何謂 Logic Non-Volatile Memory

Embedded NVM = LOGIC + 10 Masks

>30%
cost reduction

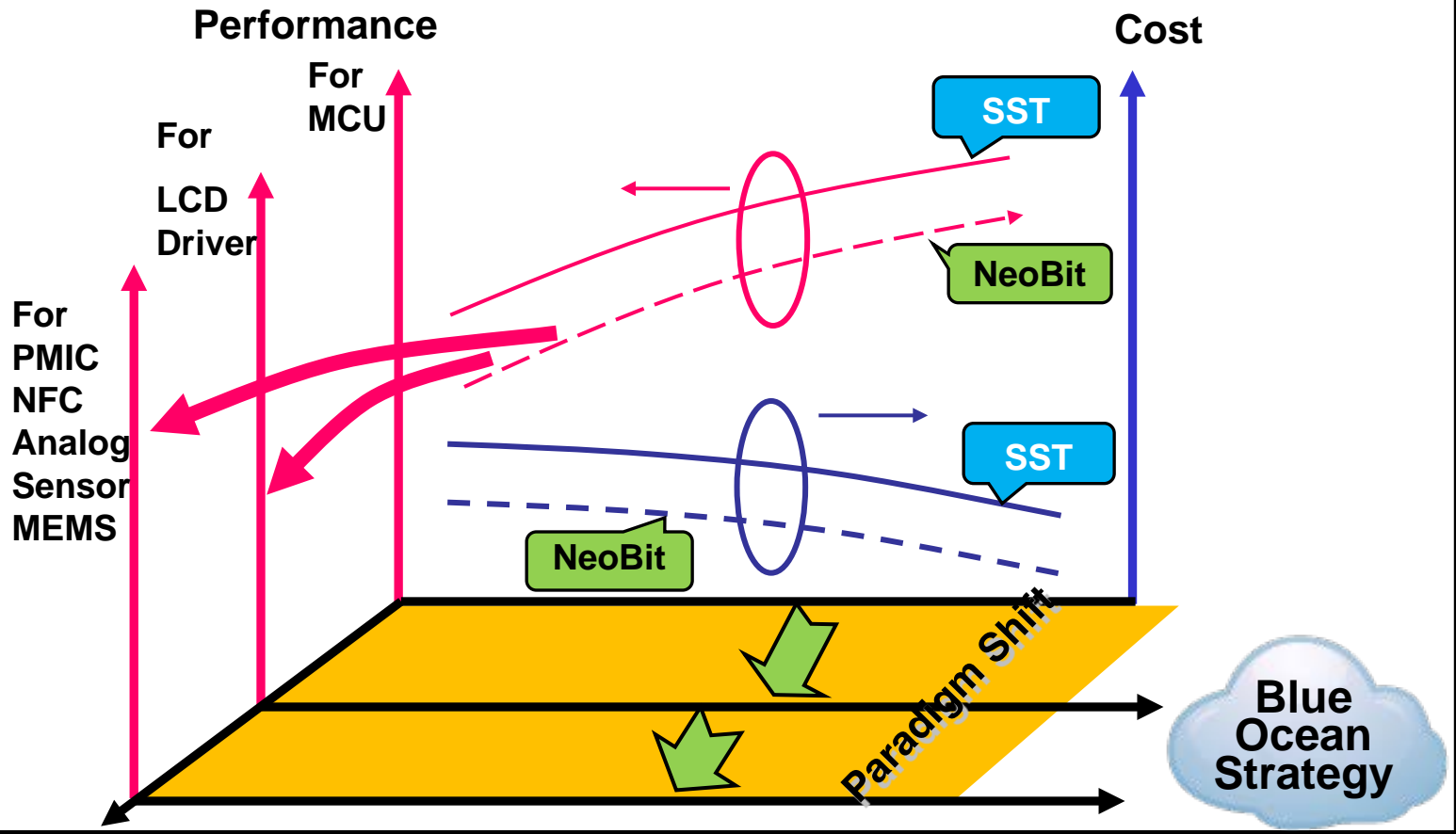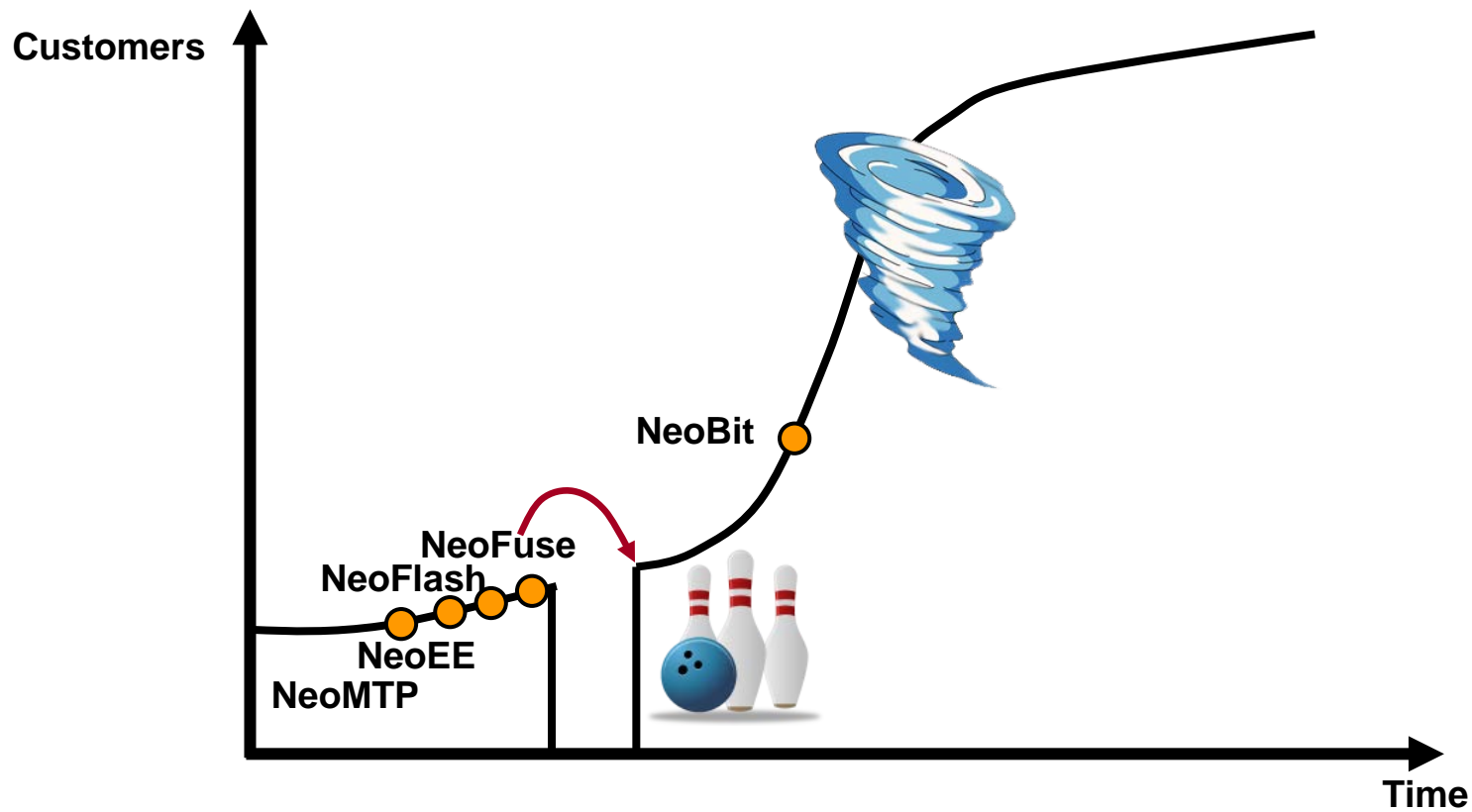## Embedded LOGIC NVM = LOGIC

破壞性創新

Innovation, Innovation, and Innovation！

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跨越鴻溝

Customers

NeoBit

NeoFuse

NeoFlash

NeoEE

NeoMTP

Time

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我們的定位

- **Global leader of logic non-volatile memory (NVM) Technology**
- **Received TSMC's best IP partner award for 4 consecutive years (2009-2013), on par with ARM and Synopsys**
- **Innovative business model leads to high profit margin**
  - › **Upfront license fee + Running royalties**

1-2 years	1-2 years	3+ years
eMemory & foundry development	Fabless product development	Multiple application & sales
Technology License Revenue	**Design License Revenue**	**Royalty Revenue Continues**

- **Over 2500 technology & design licenses**
  - › **Growing by 400+ every year**
- **700+ potential royalty payers**
- **Industry's largest talent pool**
  - › **More than 70% of employees on R&D teams**

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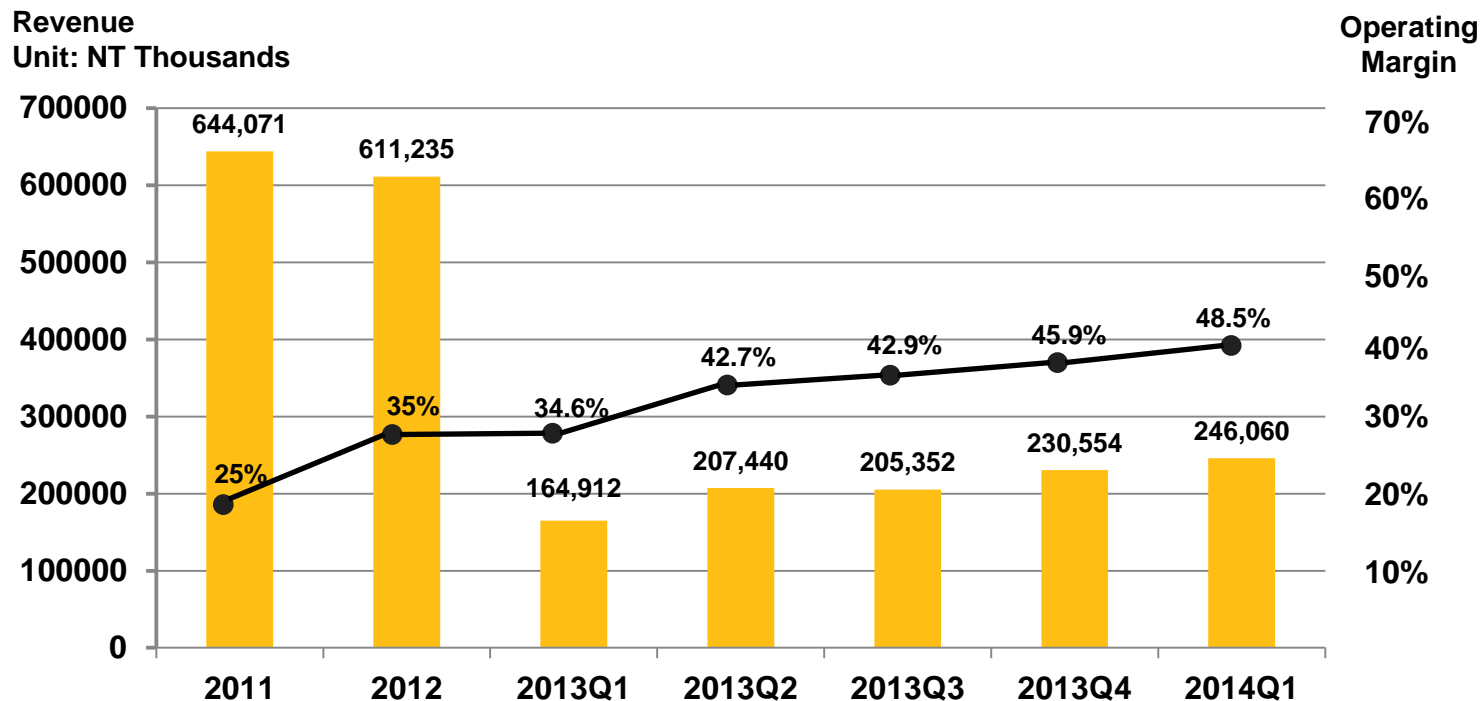
獨特的營運模式

No capex needed to drive organic growth

- **Only investment is R&D personnel. Dedicated team moves from fab to fab to finish process development and qualification. All costs (mask, QD) incurred are absorbed by foundry.**

Competitive upfront fee structure and accumulated royalty backlog, hard for new comer to catch up

Able to enter the right technology node at the right time to maximize ROI .

Returns 100% cash to shareholder

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高營運槓桿

Revenue
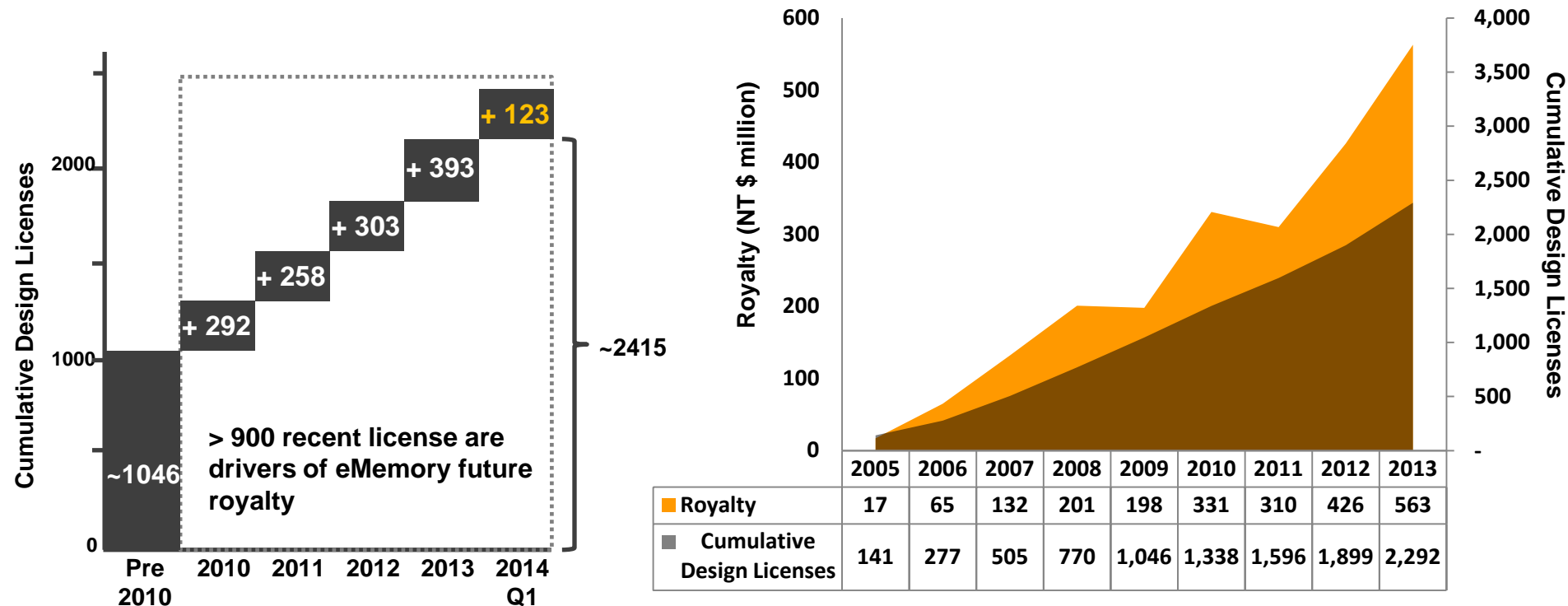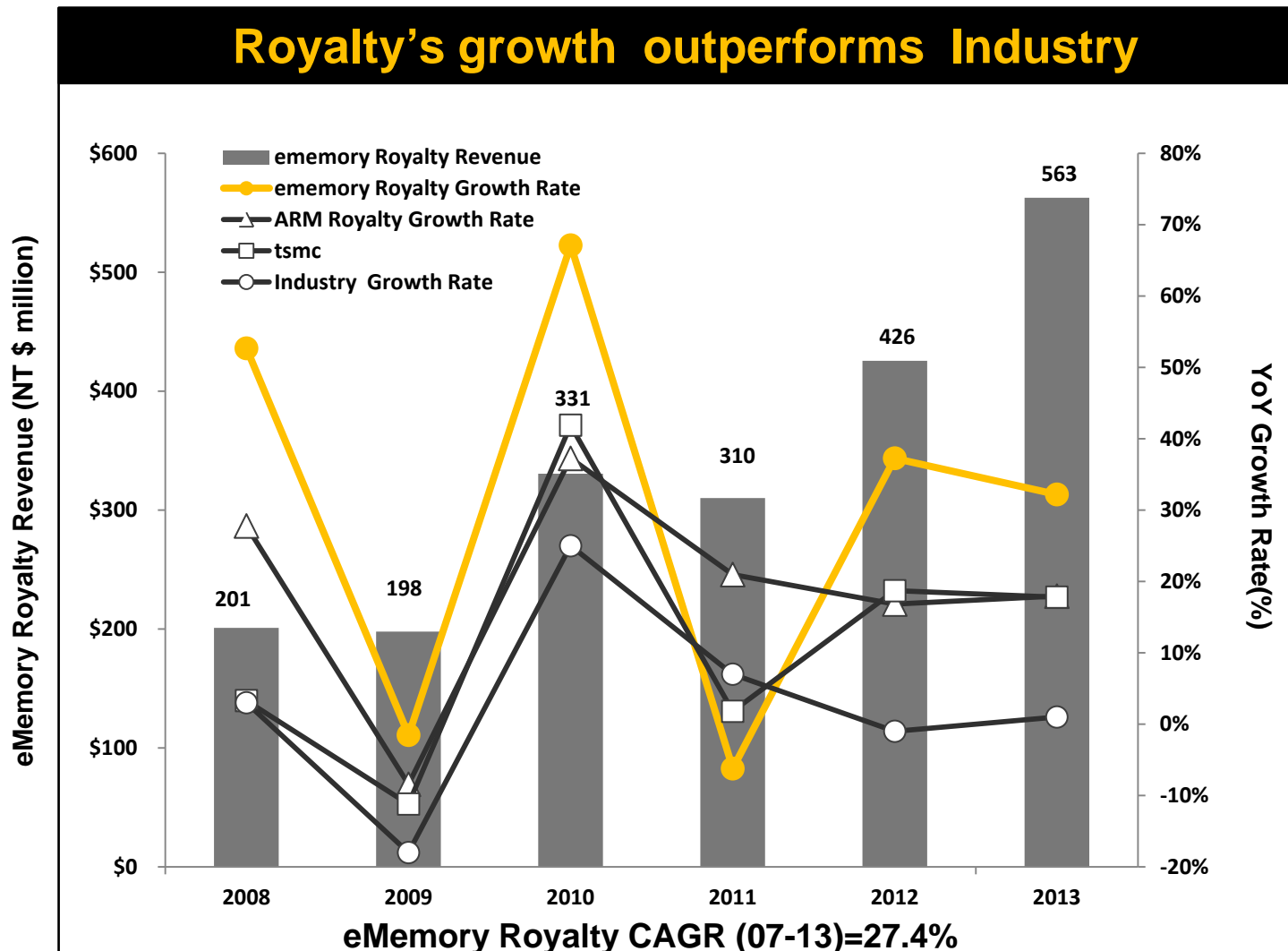Unit: NT Thousands

Operating Margin

- **Upfront fee (Licensing) covers most of operating expense.**

- **Royalty payments contribute to bottom line earnings.**

- **2013 revenue grows 32.23%(YoY), EPS up 80% (YoY)**

- **2014Q1 revenue grows 49.21%(YoY), EPS up 108.57% (YoY)**

持續的授權案驅動權利金成長

- **20 technology and 393 design licenses were signed in 2013**
- **5 technology and 123 design licenses were signed in 2014Q1**
- **Current royalty revenues are derived from design licenses signed many years ago**
- **Growing license base leads to royalty revenues over long period**

	2005	2006	2007	2008	2009	2010	2011	2012	2013
Royalty	17	65	132	201	198	331	310	426	563
Cumulative Design Licenses	141	277	505	770	1,046	1,338	1,596	1,899	2,292

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力旺表現優於產業

Royalty's growth outperforms Industry

Legend:
- emenory Royalty Revenue
- emenory Royalty Growth Rate
- ARM Royalty Growth Rate
- tsmc
- Industry Growth Rate

eMemory Royalty Revenue (NT $ million)

Year	Revenue
2008	201
2009	198
2010	331
2011	310
2012	426
2013	563

YoY Growth Rate(%)

eMemory Royalty CAGR (07-13)=27.4%

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持續增加滲透率

We believe TAM is equal to total world-wide foundry shipment.

In 2013, the numbers of wafers embedded with eMemory IP totaled 2.2 mil. Total world wide foundry shipment is 43 mil 8" equiv. wafers. Our current penetration share is only around 5%.
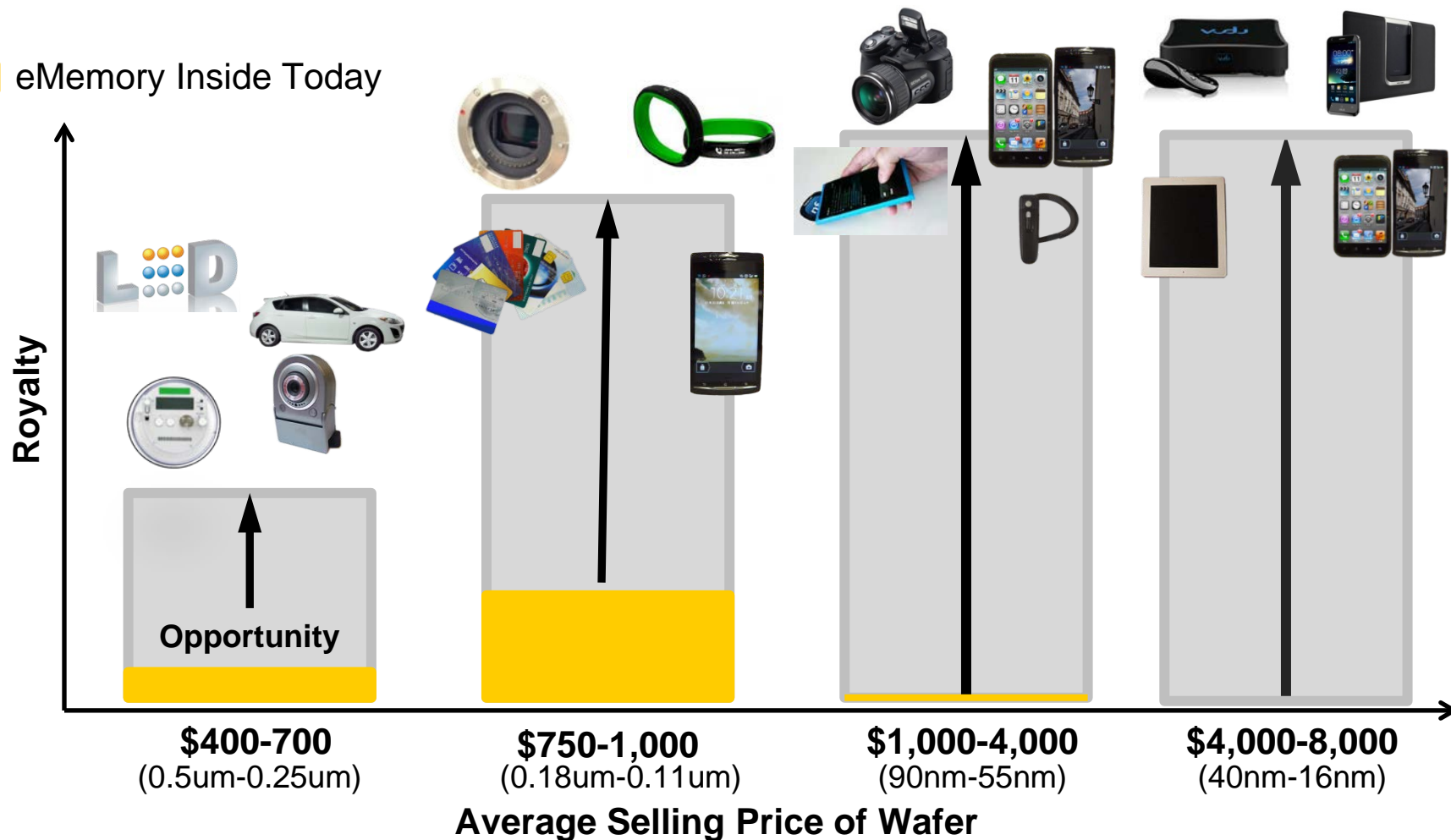
TSMC was the main driving force for the last 3 yrs. Our penetration rate in TSMC increased from 3% in 2010 Q4 to 10% in 2013 Q4, and quarterly royalty revenue from TSMC increased 385% accordingly.

Apple products related chip suppliers' contribution went from less than 15% of total royalty payments in 2013 to 25% in Q1 2014 . Expect the number to further increase in H2 of 2014.

Penetrates into PMIC chip suppliers among Chinese smart phone vendors (used to dominate mainly on DDI chip solution) .

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商機與潛力

eMemory Inside Today

Royalty (y-axis)

Opportunity

$400-700	$750-1,000	$1,000-4,000	$4,000-8,000
(0.5um-0.25um)	(0.18um-0.11um)	(90nm-55nm)	(40nm-16nm)

Average Selling Price of Wafer

Note: 2.2 million 8" equivalent wafers with eMemory IP were shipped in 2013. (~5% of WW foundry shipment)

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力旺IP的應用

	12"					8"		
16/20nm	28nm	40nm	55/65nm	80/90nm	110/130nm	160/180nm	250nm	350nm

NeoBit

NeoFuse

AP

NeoFlash

Bluetooth

NeoEE

NeoMTP

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智慧型手機中力旺 IP 的應用

Neo Flash

Neo MTP

Capacitive Touch Panel Controller

Neo Fuse

Neo EE

Neo Bit

-Ambient Sensor - Proximity sensor

Neo Bit

PMIC/PMU

- Accel.-sensor - Mag.-sensor - Gyro-sensor

Neo Bit

NFC

Neo EE

-Base Band

-Application Processor

Battery

Camera Module

LCD Driver

Connector

Neo Bit

Neo EE

Neo Fuse

Fuel Gauge

Neo Flash

Neo MTP

Neo Fuse

Neo MTP

Neo Bit
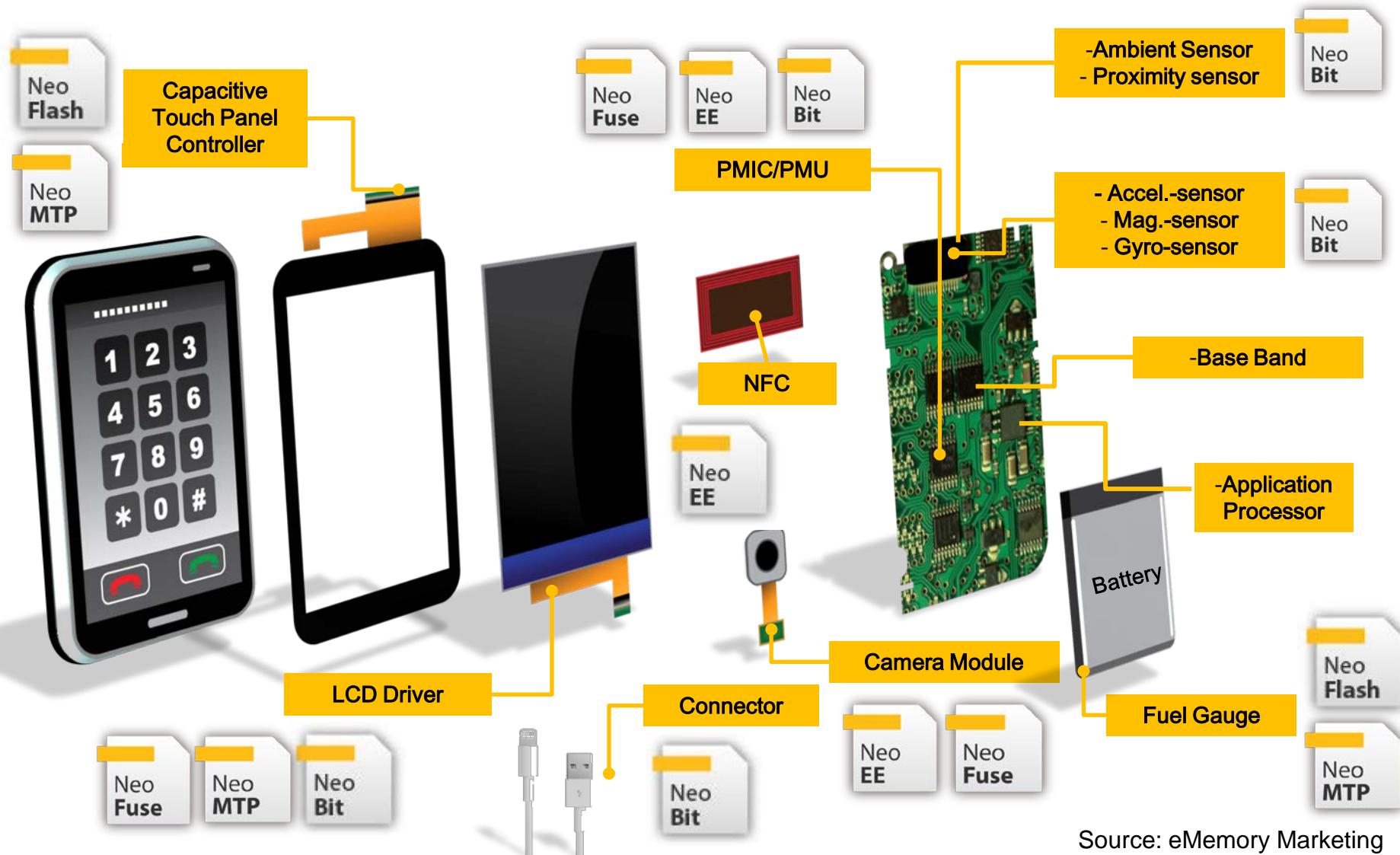
Source: eMemory Marketing

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MCU & NVM 於 IoT 之應用

eMemory
(Parameter Setting)

eMemory
(Trimming/Calibration)

eMemory
(Encryption/Security)

eMemory
(ID Setting)

eMemory
(Function Selection)

eMemory
(F/W code storage)

Smart Grid

Smart Lighting

Pedestrian Navigation

Remote Appliance Avoidance

Smart Cars

Smart Homes

M2M

MANY OTHER SERVICES

BLDG Automation

Smart Tags

Auto Safety

Smart Parking

Air Quality Control

Supply Chain Automation

Smart Health

Smart Energy

Applications

Software

Technology

Sensing

Embedded Processing

Connectivity

Accelerometer
Mognetometer
Gyroscope
Pressure
Altimeter
Temperature etc.

MCU
MPU
Hybrid MCU/MPU
Network Processor

NFC   GPS
6LoPAN   BT/BTLE
Sub-Gig   Wi-Fi®
ZigBee®   RFID
               Cellular

Source: Freescale/ARM Whit Paper 2013

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取代**Embedded Flash**之競爭優勢

MCU

product design & manufacturing by embedded Flash
Logic Process + 10 Masks
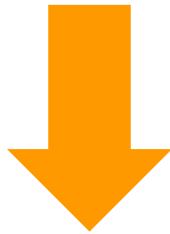
30% more cost reduction $\left(\begin{array}{c} \textit{wafer cost \&} \\ \textit{testing time} \end{array} \right)$

MCU

eMemory inside
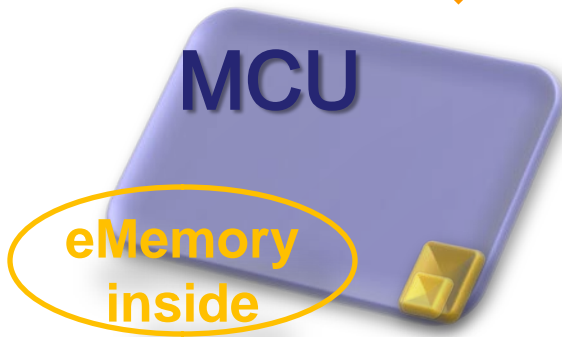
product design & manufacturing by Embedded Logic NVM (OTP/MTP) Logic Process

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安全 & 防護

Authorized Product

Fake Product

reverse copy

re-produce

without protection
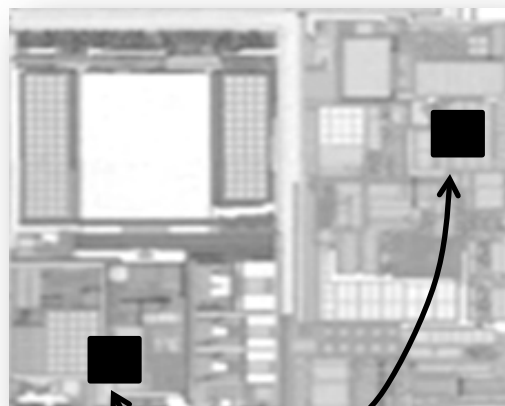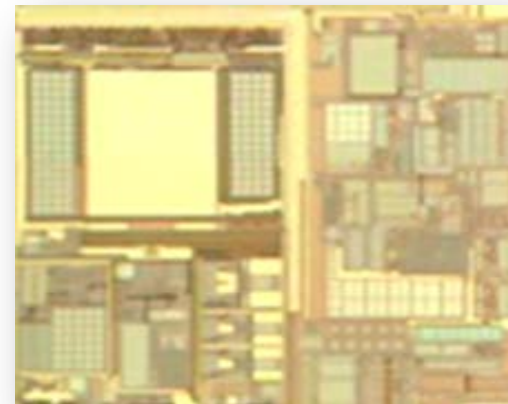
reverse copy

re-produce

with protection
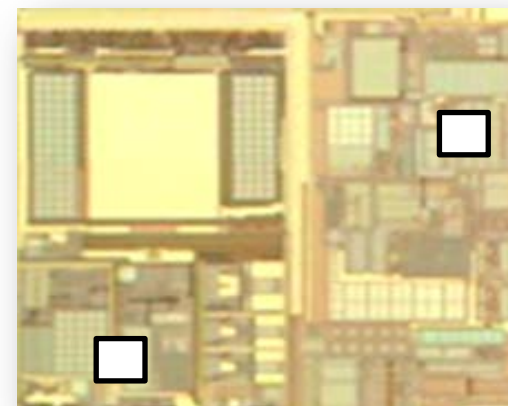
Security IP/Code by Authorized Use

Can NOT Work w/o Security IP/Code

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未來展望

over 30% CAGR for the next 5 yrs

Key growth drivers:

|	
Growth in value per mobile devices	• More chip applications per smartphone/tablet product
Growth into more markets	• From consumer electronics and mobile devices to wearable devices • Adding new NVM product lines further enable more product applications
Growth in more advanced technology	• Higher royalty per wafer is contributed from more advanced technology nodes.
IOT great era	• Embedded Logic NVM will be a must.

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現在與未來
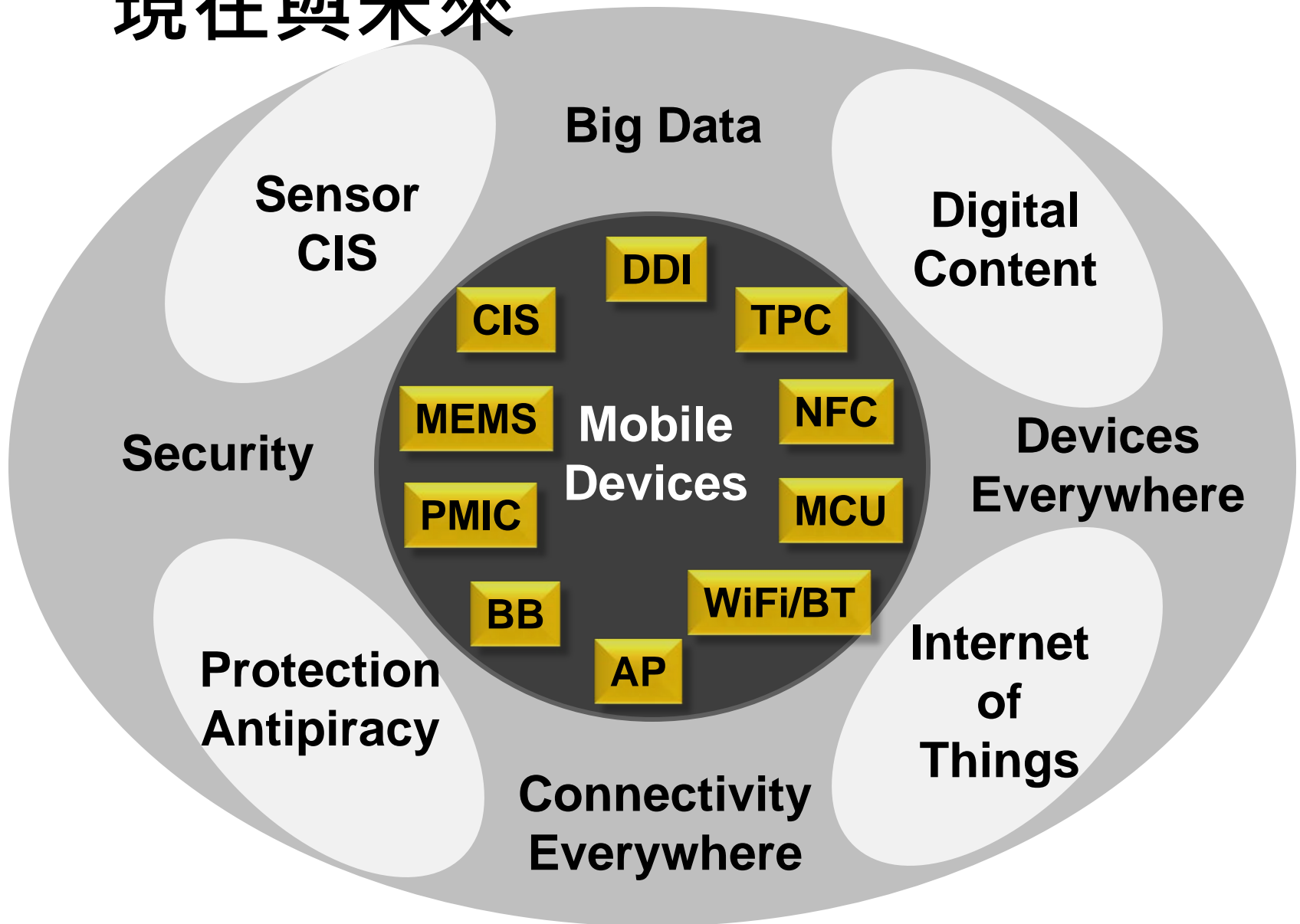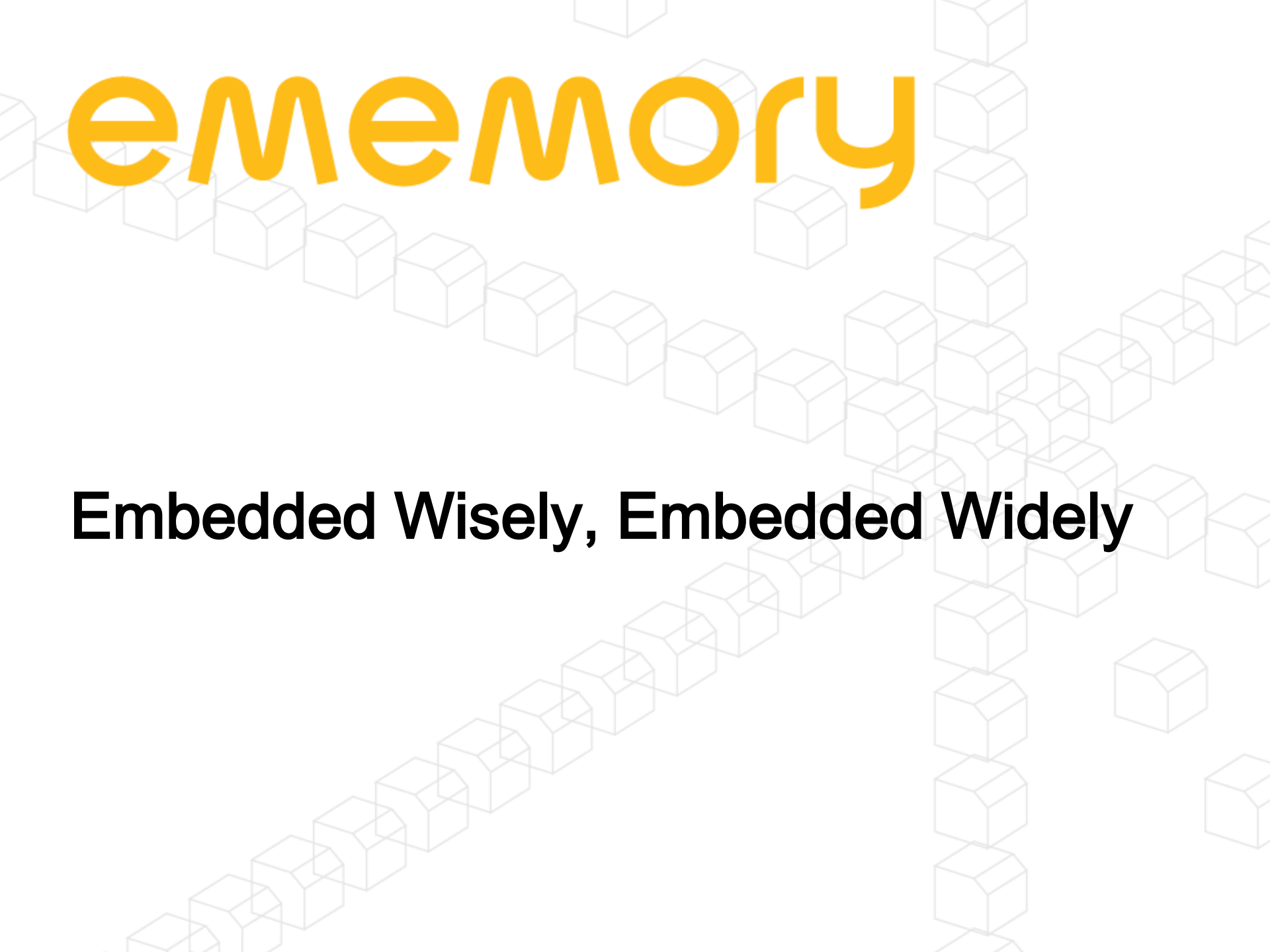
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