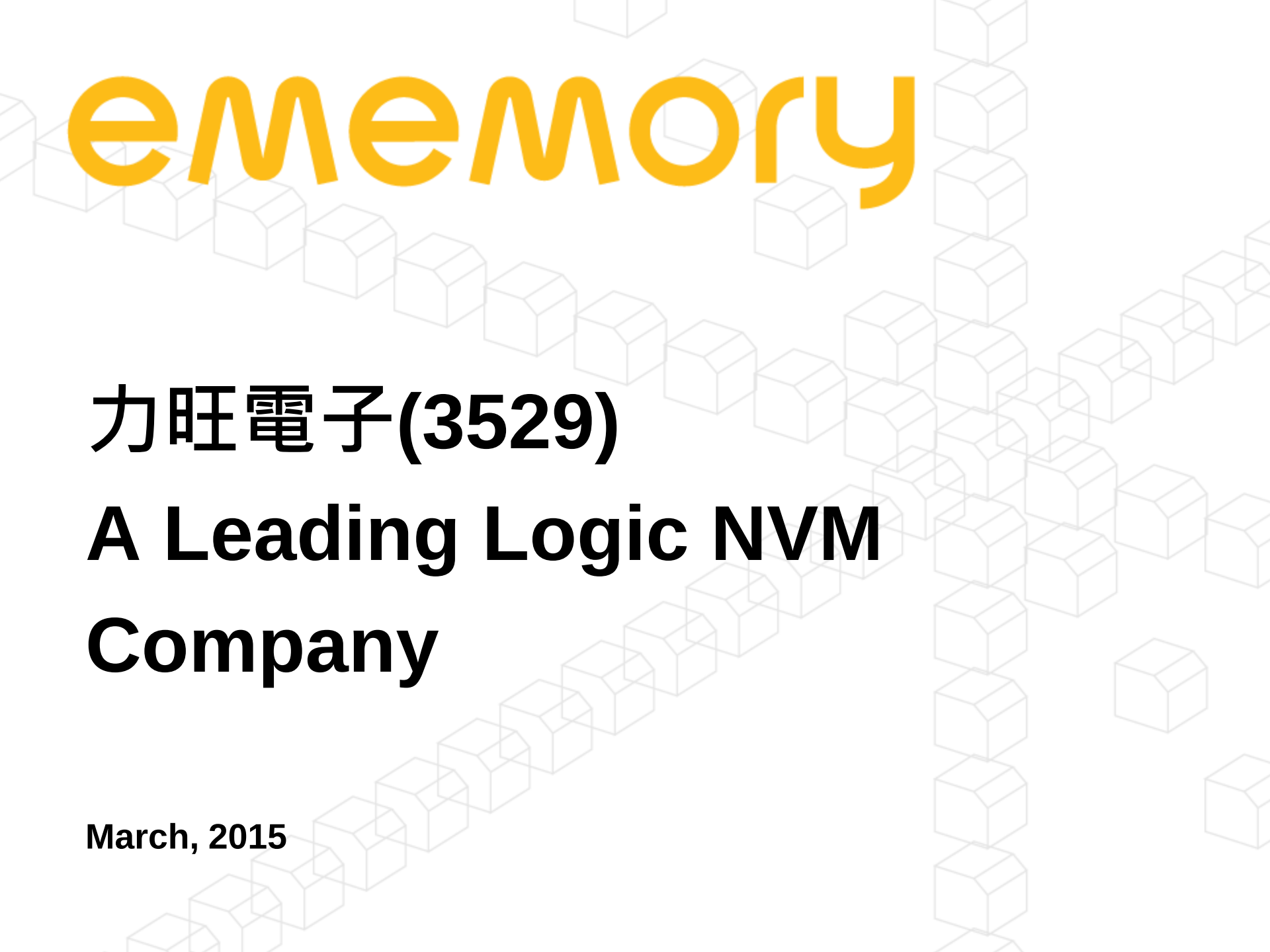




ememory

力旺電子(3529)

**A Leading Logic NVM
Company**

March, 2015

智慧財產權聲明

本文件內之資訊，包括文字、圖片、圖表、表格或其他檔案等，其所有權利或利益，包括但不限於所有權及智慧財產權，皆屬力旺電子所有，請尊重智慧財產權。本文件之內容包含力旺電子之機密資訊。部分內容可參見2014年出版之Logic Non-Volatile Memory (The NVM solutions from eMemory)一書。任何在此之資訊在未經力旺電子書面同意，不得影印、散佈、複製、使用本文件或將其揭露予第三人。

投資安全聲明

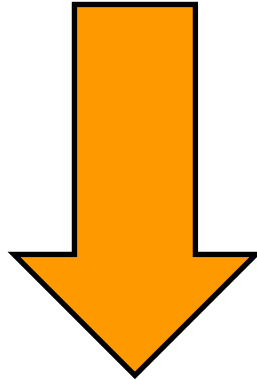
除簡報內所提供之歷史信息外，簡報事項係屬預測性陳述，受到風險及不確定性因素影響，可能造成實際結果與陳述內容發生不符，這些不確定性因素包括：技術平台是否順利導入利用、IP是否被客戶接受、客戶產品大量量產之能力及時間、產業及市場對半導體產品之供給及需求移轉、終端市場之穩定性及其他風險等。

大綱

- 公司營運模式
- 第4季營運回顧
- 成長機會與未來展望
- 問題與回答

何謂 Logic Non-Volatile Memory

Embedded NVM = LOGIC + 10 Masks

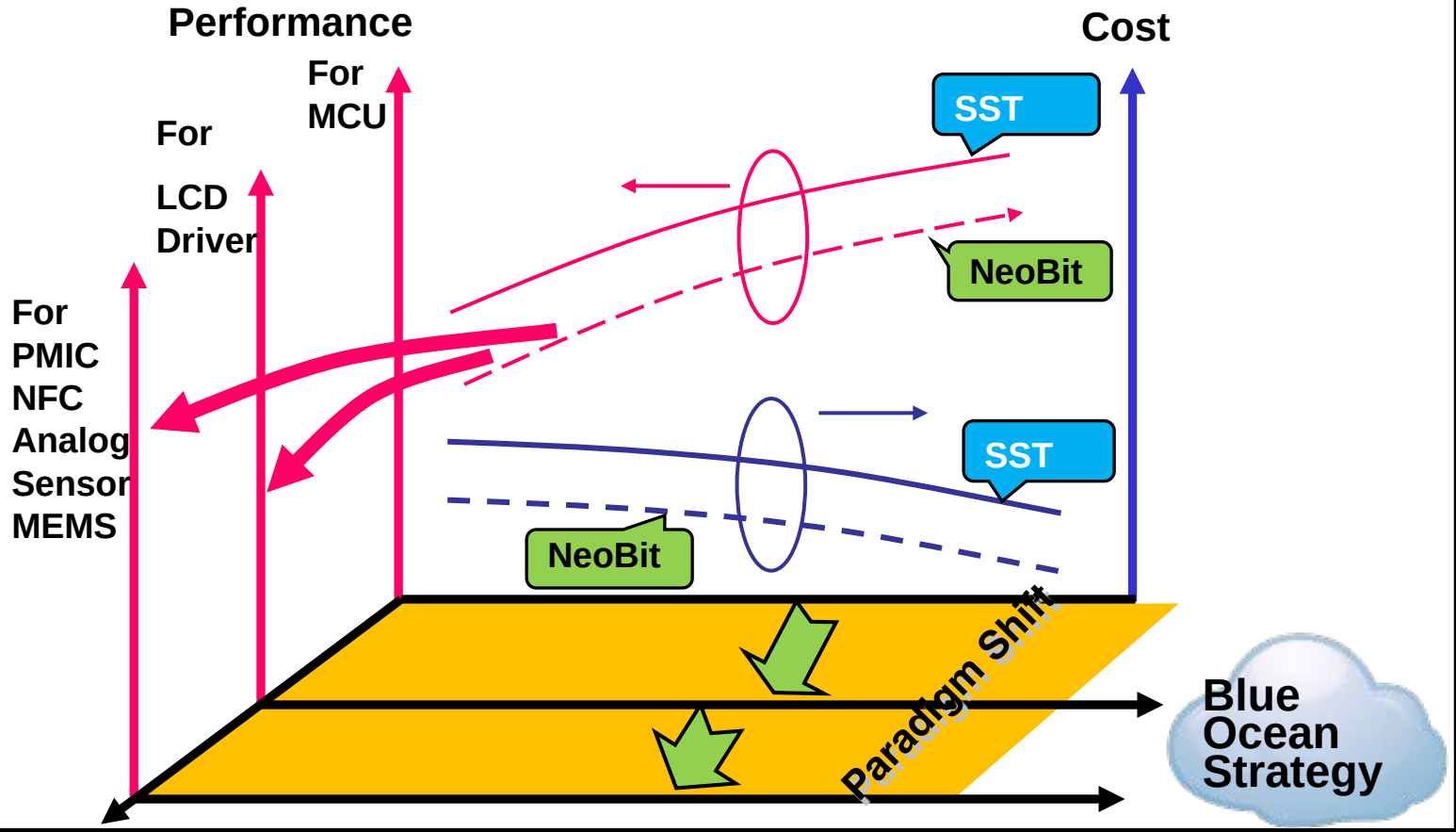


*30% more
cost reduction*

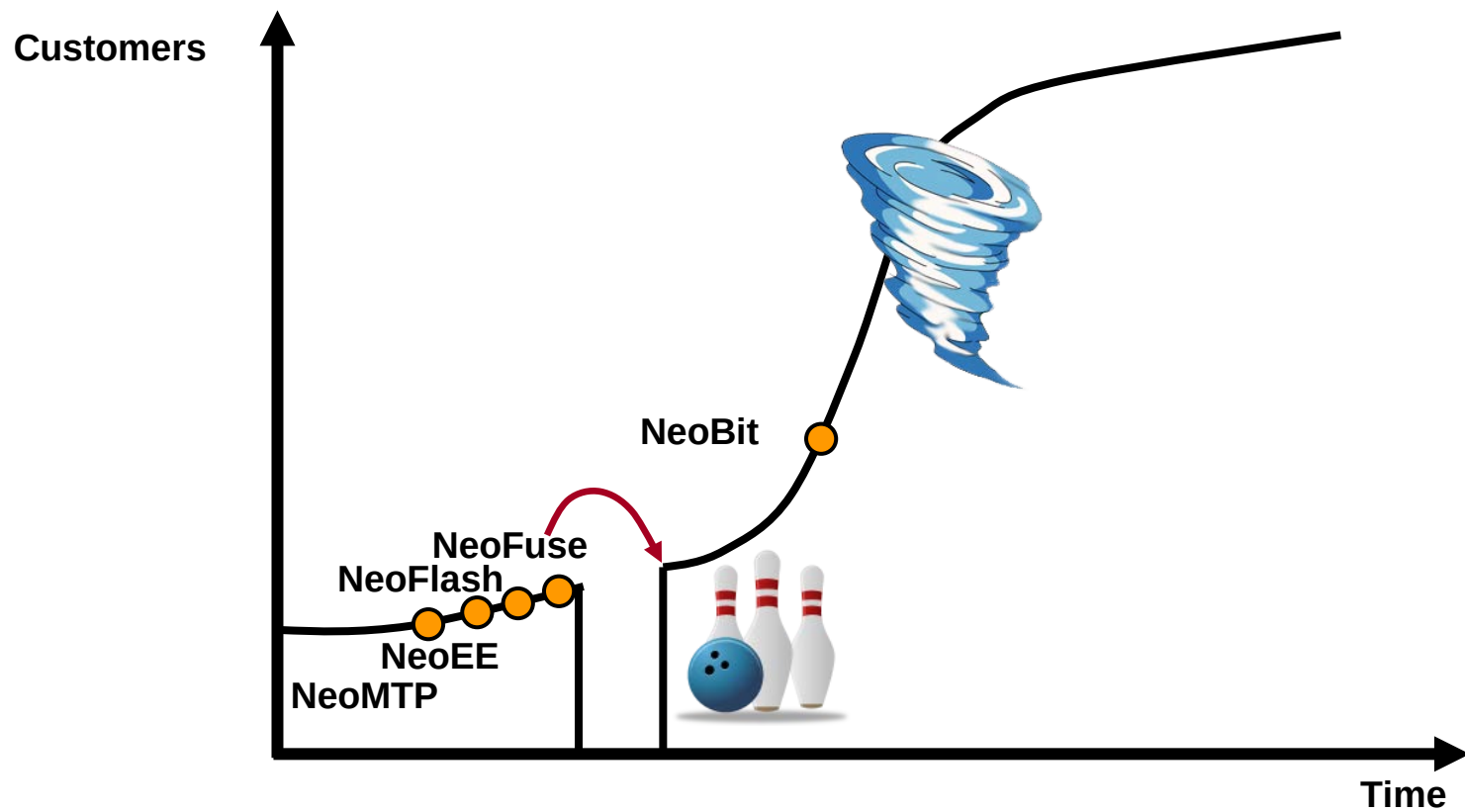
Embedded LOGIC NVM = LOGIC

破壞性創新

● *Innovation, Innovation, and Innovation !*

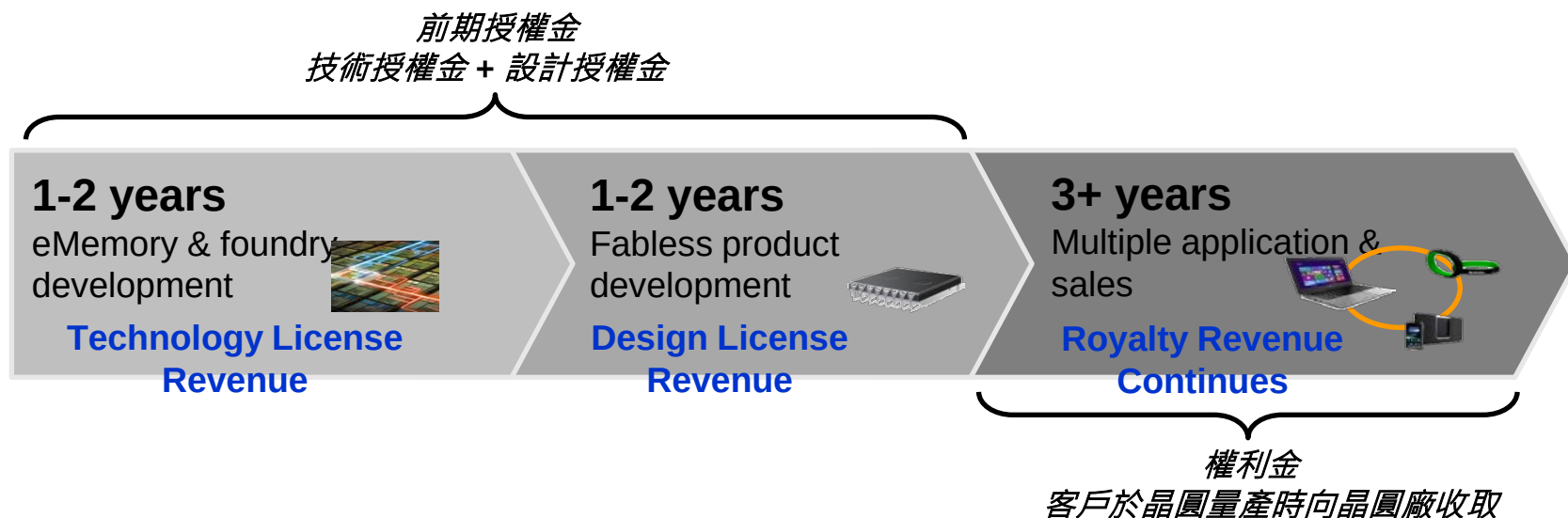


跨越鴻溝



營運模式

- 2000年成立，2002年第一個客戶，2005年開始獲利，2011年掛牌上市，掛牌以來，無市場籌資，無銀行借款，現金配股率超過100%。
- 全世界最大的logic non volatile Memory IP公司，217位員工，150位研發人員。
- 成長性指標: 1) 正在晶圓廠建構的製程平台數
2) 設計授權數
3) 權利金



全球客戶



晶圓代工廠



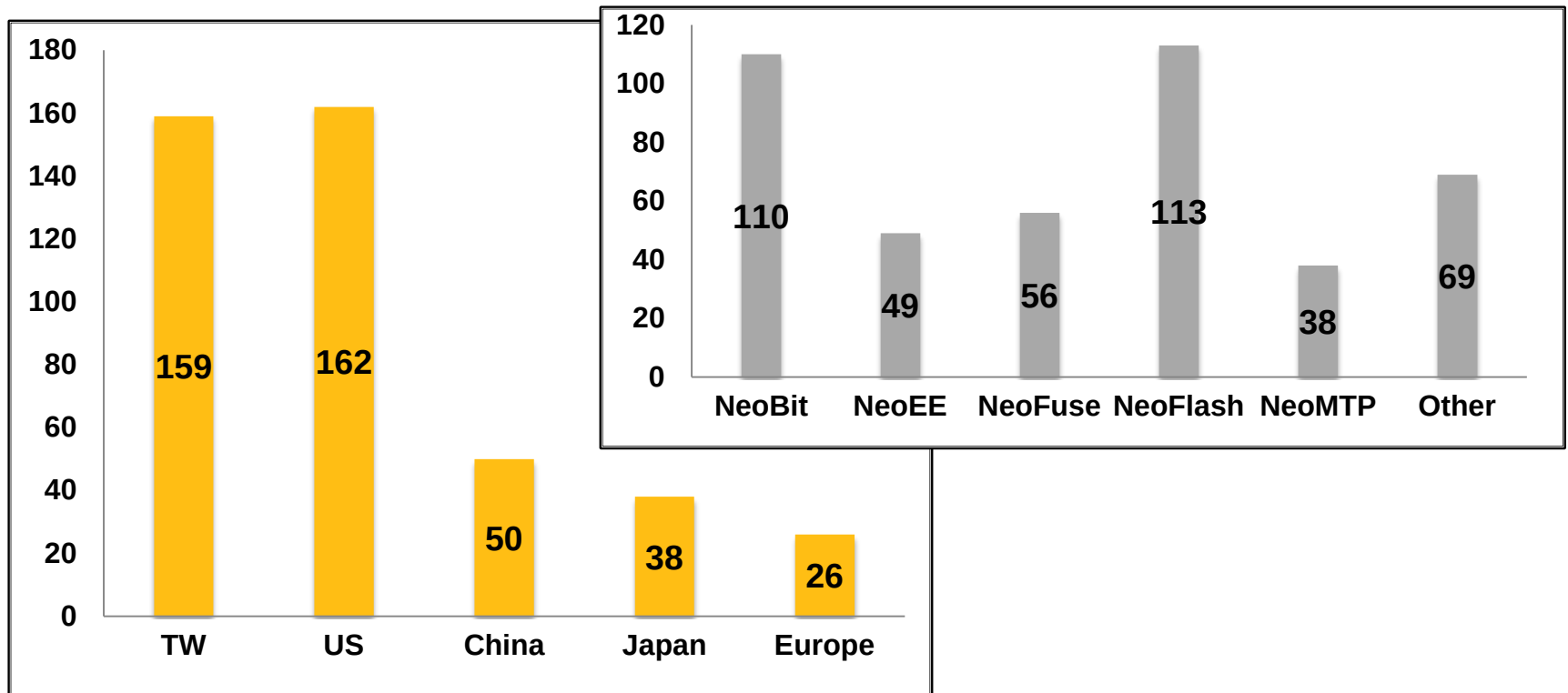
整合元件廠



	Taiwan	China	Korea	Japan	North America	Europe	Others
Foundry	5	6	3	2	1	0	1
IDM	0	0	0	8	2	1	0
Fabless	226	331	49	31	168	80	31

專利佈局

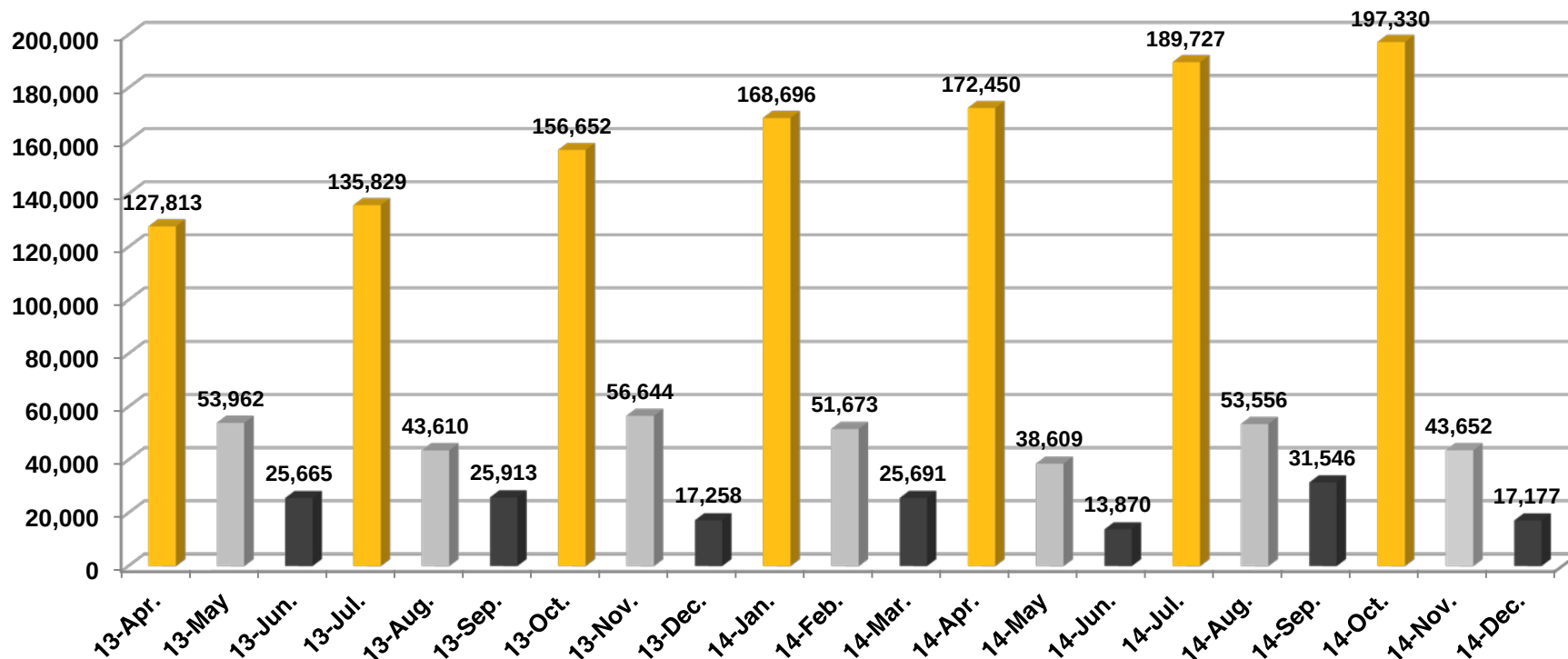
	3Q14	4Q14	Diff.
Pending	160	166	+6
Issued	255	269	+14
Total	415	435	+20



每季營收模式

- 每季第一個月認列絕大部份晶圓廠前一季使用本公司IP的出貨晶圓權利金及當月產生的技術授權金及設計授權金；第二個月則是少部份晶圓廠權利金及當月授權金；第三個月則無權利金收入，只有授權金。

Unit : NTD thousands



大綱

- 公司營運模式
- 第4季營運回顧
- 成長機會與未來展望
- 問題與回答

第四季各項營收

單位：新台幣仟元

	4Q14	3Q14	% change	4Q13	% change	2014	2013	% change
授權費	51,849	61,981	-16.35%	56,933	-8.93%	246,073	245,688	0.16%
權利金	206,310	212,848	-3.07%	173,621	18.83%	757,904	562,570	34.72%
合計	258,159	274,829	-6.07%	230,554	11.97%	1,003,977	808,258	24.21%

單位：合約數

		4Q14	3Q14	2014	2013
技術授權數		3	6	21	19
設計 授權數	NRE	15	22	82	51
	使用費	99	88	363	342

綜合損益表

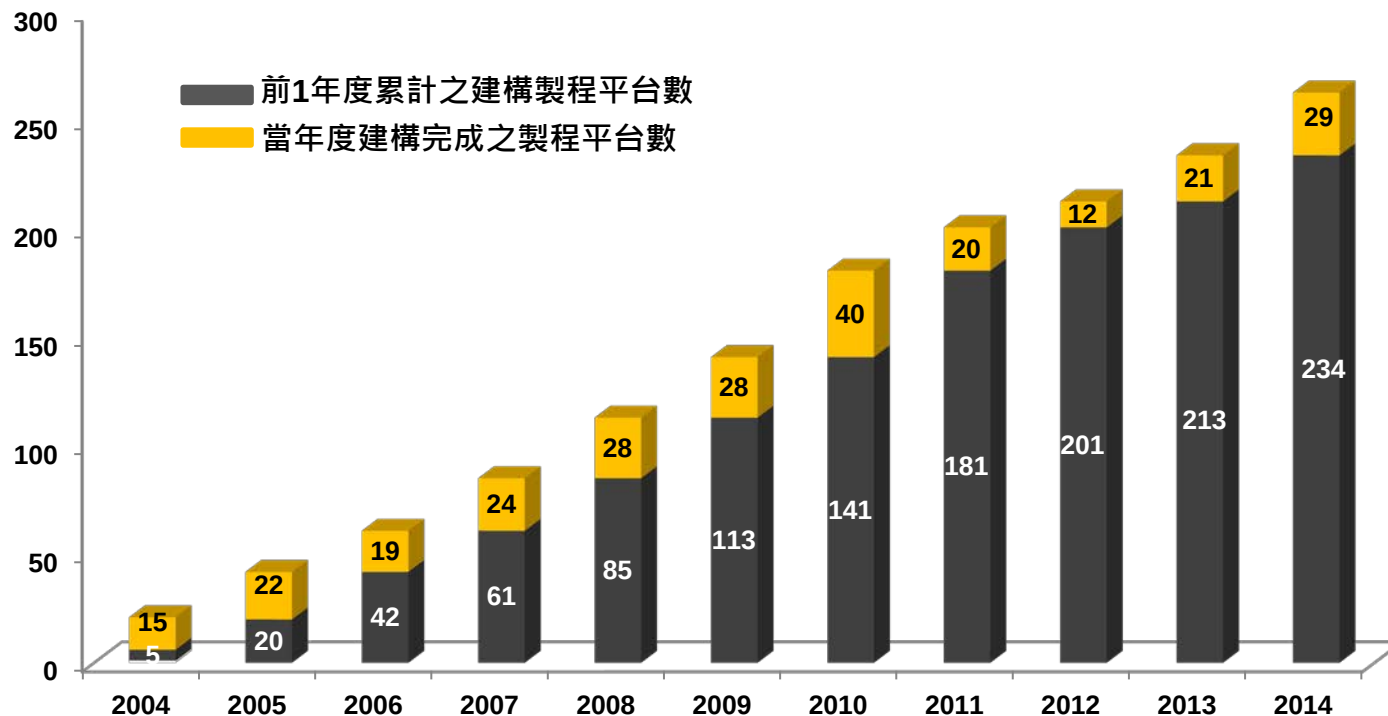
(單位:新台幣仟元)	4Q14	4Q13	% change	2014	2013	% change
營業收入淨額	258,159	230,554	12.0%	1,003,977	808,258	24.2%
營業毛利率	100%	100%	-	100%	100%	-
營業費用	148,501	124,761	19.0%	540,321	468,574	15.3%
營業淨利率	42.5%	45.9%	-3.4ppts	46.2%	42.0%	+4.2ppts
本期淨利	100,896	91,268	10.5%	418,569	290,640	44.0%
純益率	39.1%	39.6%	-0.5ppts	41.7%	36.0%	+5.7ppts
每股盈餘 (單位: 新台幣元)	1.33	1.21	9.9%	5.52	3.87	42.6%
權益報酬率	23.4%	22.9%	+0.5ppts	24.3%	18.2%	+6.1ppts

技術授權合約及累計平台數

單位：合約數

年度	2012	2013	2014
授權數	12	19	21

註：與晶圓廠簽訂的技術授權合約所含的技術製程及授權金視合約內容而定，無特別季節性因素。



目前正在建構的技術製程平台

- Total (As of Jan.) : **81***
- **27** for NeoBit, **29** for NeoFuse, **2** for NeoFlash, **15** for NeoEE, and **8** for NeoMTP.

	16nm	28nm	40nm	55/65nm	80/90nm	0.11~ 0.13um	0.15~ 0.18um	>0.25 um	Total
NeoBit	-	-	-	1	-	9	15	2	27
NeoFuse	1	7	4	9	1	5	2	-	29
NeoFlash	-	-	-	1	-	1	-	-	2
NeoEE	-	-	2	-	1	4	7	1	15
NeoMTP	-	-	-	1	2	2	3	-	8

Note*: 2 platforms qualified in Jan.

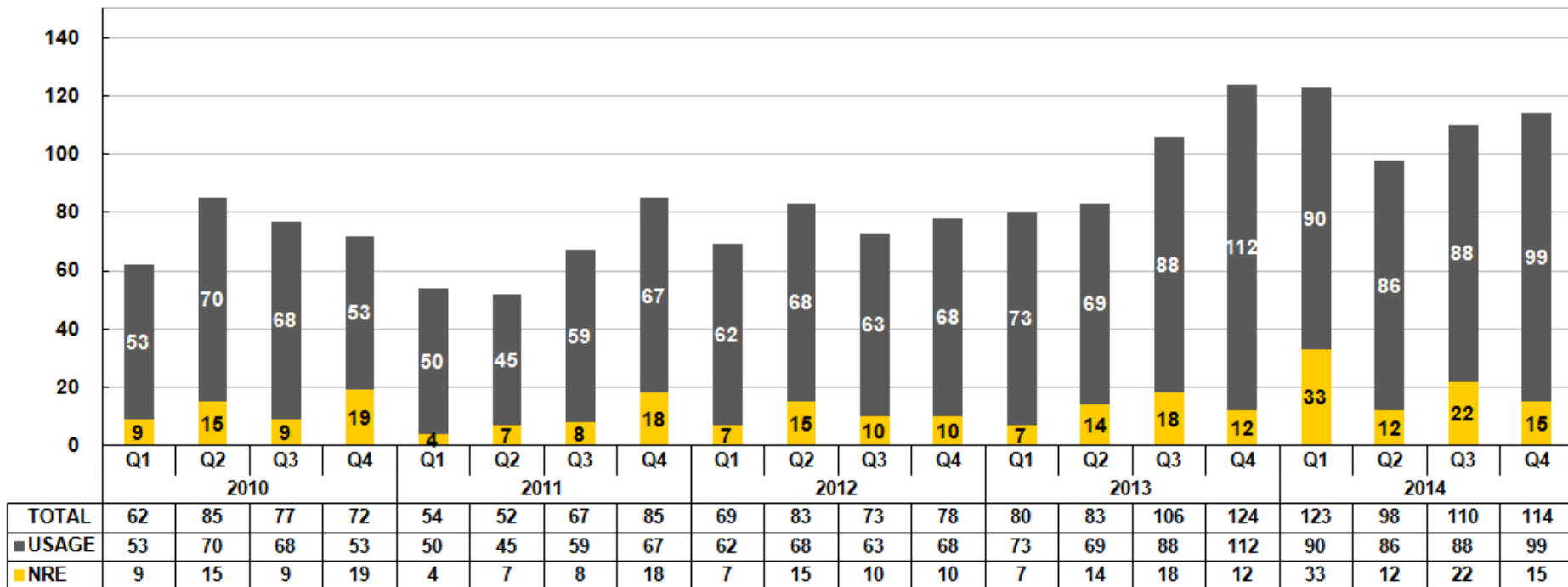
目前正在建構的技術製程平台

12" Fabs	Production	Development	NVM Type	Process Type
16nm	0	1	OTP	FF+
28nm	2	7	OTP	LP/HPM, HLP/HPM, LPS
40nm	1	6	OTP, MTP	HV-DDI, LP
55/65nm	7	12	OTP, MTP, Flash	LP, HV-DDI, HV-OLED, DRAM, CIS
80/90nm	5	4	OTP, MTP	HV-DDI, HV-OLED, LP
0.13/0.11um	4	5	OTP, Flash	HV-DDI, BCD, Generic
0.18um	1	0	OTP	BCD

8" Fabs	Development	NVM Type	Process Type
0.13/0.11um	16	OTP, MTP, Flash	HV-DDI, BCD, LP, RF, CIS, LL
0.18/0.16/0.152um	27	OTP, MTP	Generic, LP, LL, MR, HV, Green, BCD
0.25um	2	OTP, MTP	BCD
0.35um	1	OTP	UHV

每季設計授權數(New Tape Out)

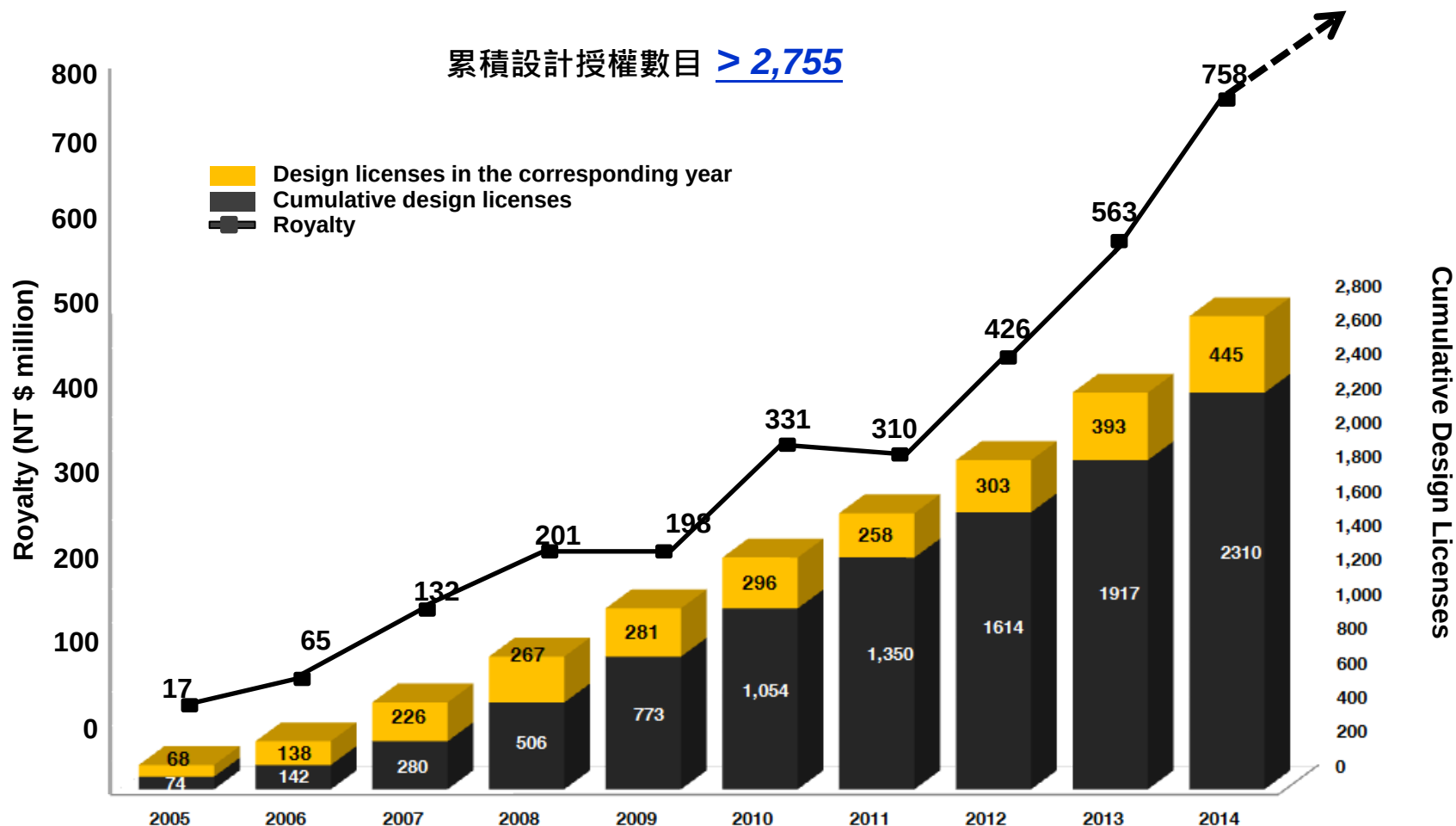
- Total **445** NTO as of 4Q 2014 (**393**@2013, **303**@2012, **258**@2011)



Usage：使用架上已認證及有量產經驗的IP，按年費(不計使用次數)或單次使用收費，設計導入到量產權利金貢獻時間約1年以內。

NRE：客製化的IP，需重新認證，導入到權利金貢獻約1-1.5年

權利金取決於過去累積的設計授權數目

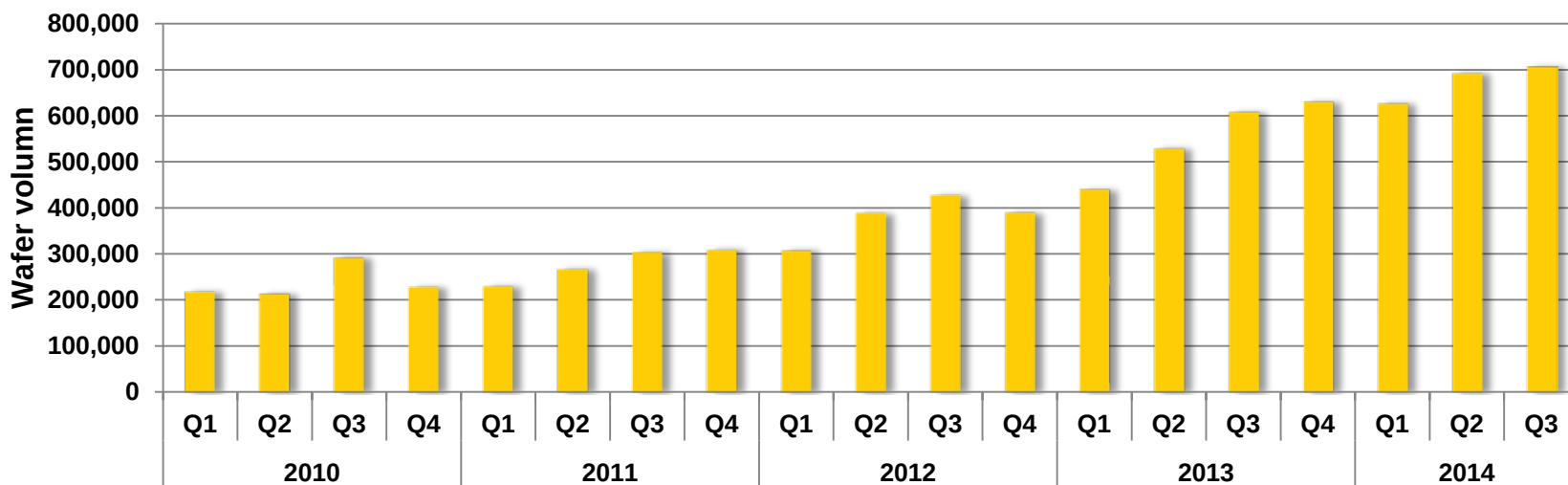


註1. 2009年因整體半導體景氣衰退，權利金年衰退1.5%。

註2. 2011年因2010年單一客戶預付權利金，導致2010年成長67%，2011年年衰退6.3%。

註3. 2009-2013年權利金年複合成長率為 30%。

每季量產晶圓片數



embedded eMemory IP in T Company (\$revenue); * % of Process node in T company total revenue in 4Q14

	Process node	*% of T	4Q14	3Q14	2014	2013
8"	0.5+	1%	0%	0%	0%	0%
	0.25/0.35	4%	30%	33.5%	30.5%	27.3%
	0.15/0.18	12%	8%	13%	11.9%	10.7%
	0.11/0.13	2%	28.9%	21%	20.8%	19.1%
12"	90nm	6%	18.2%	16.4%	16.3%	4.8%
	65nm	11%	0.1%	0%	0%	0%
	40/45nm	13%	0%	0%	0%	0%
	28nm	30%	0%	0%	0%	0%
	20nm	21%	0%	0%	0%	0%
8"		19%	14.2%	17%	15.6%	14.2%
12"		81%	1.4%	1.6%	1.4%	0.69%
Total		100%	4.3%	5.1%	4.5%	4.1%

大綱

- 公司營運模式
- 第4季營運回顧
- 成長機會與未來展望
- 問題與回答

力旺IP的應用

12"

8"

16/20nm

28nm

40nm

55/65nm

80/90nm

110/130nm

160/180nm

250nm

350nm

NeoBit

NeoFuse

NeoFlash

NeoEE

NeoMTP

力旺之 NVM 技術

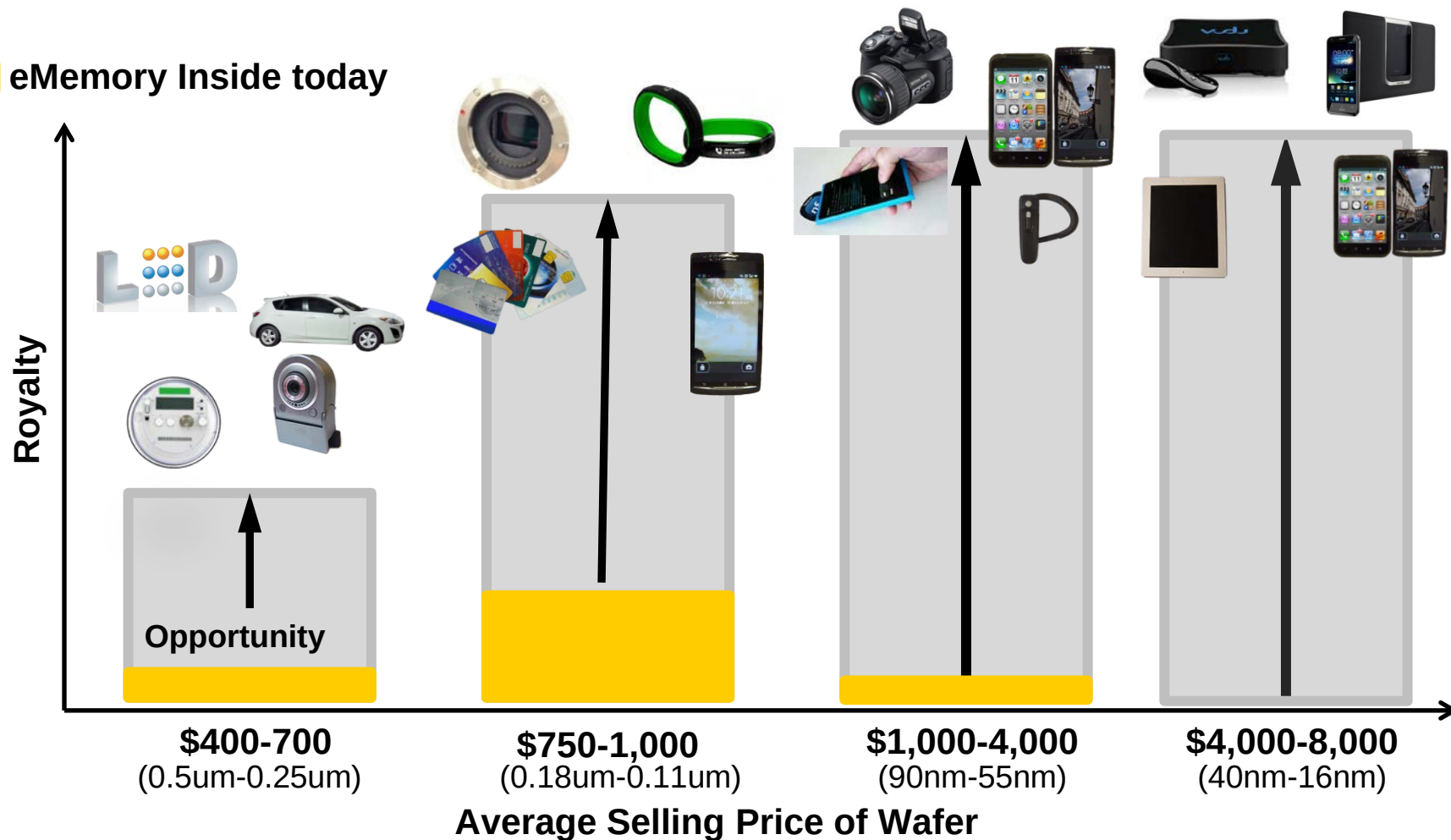
- **Logic NVM portfolio offers one-stop-shop solution.**

- › Compatible to any process
- › Robust structure
- › Low process cost
- › Competitive macro sizes
- › Easy integration
- › Easy porting

eMemory's NVM Technology	OTP			MTP	
	NeoBit	NeoFuse	NeoFlash	NeoEE	NeoMTP
Product Type	OTP	OTP	Flash	EEPROM	MTP
Endurance (Cycles)	10	10	1K~10K	10K~100K	1K~10K
Additional Mask Steps	0	0	2-3	0	0
Technology	Floating gate	Anti-Fuse	SONOS	Floating gate	Floating gate
Scalability	Simple	Simple	Simple	Simple	Simple
Memory Density	HD < 512Kb GHD < 16Mb	< 4Mb	< 2Mb	< 4Kb	< 512Kb

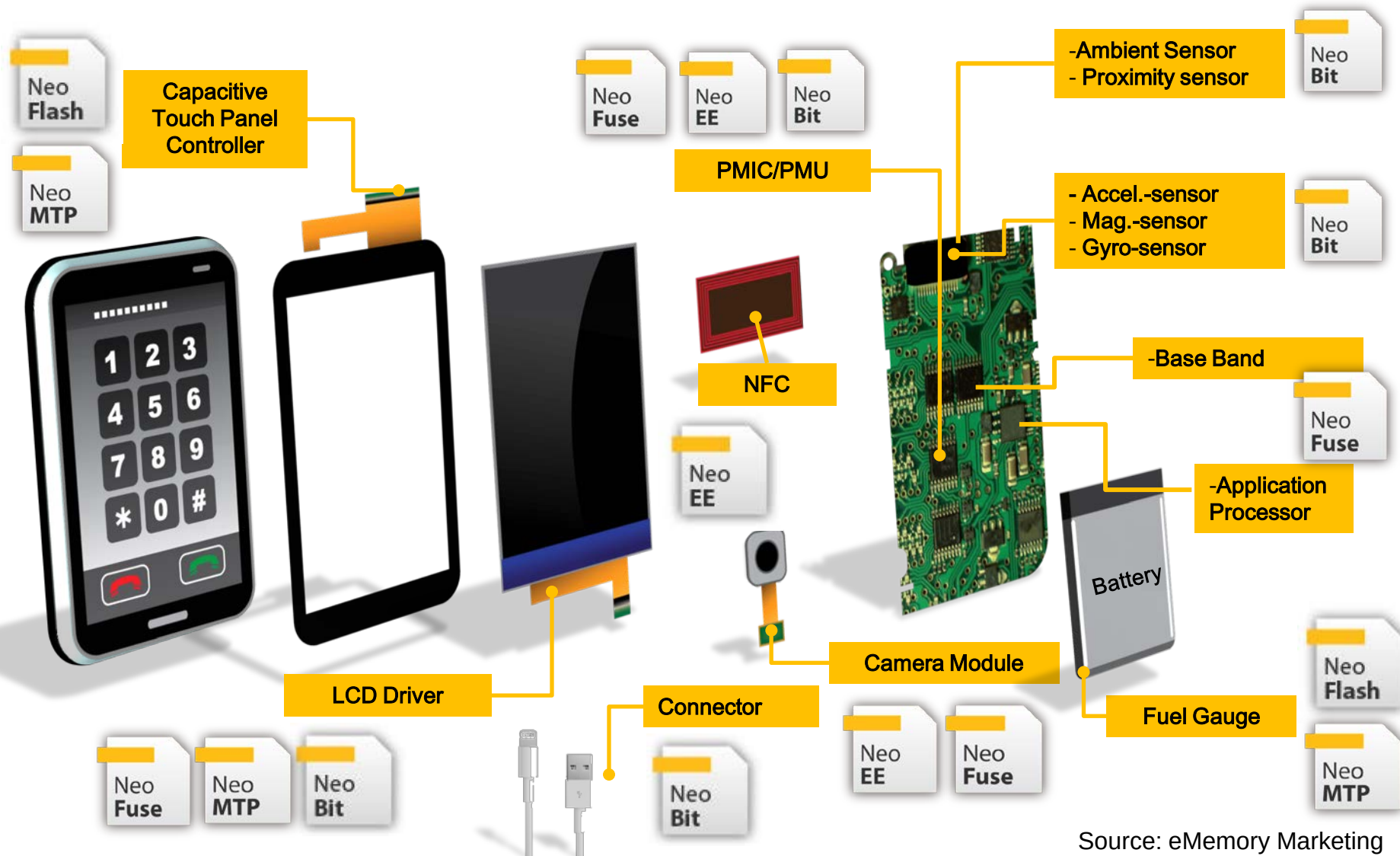
商機與潛力

 eMemory Inside today



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

智慧型手機中力旺 IP 的應用



Source: eMemory Marketing

3Q14 按IC種類之晶圓需求

IC Type	Equ. to 8-inch wafer (K)
AP	4964
PMU	4756
CIS sensor	4226
Fingerprint	4000
Smart card controller	3000
Base Band	2935
LCD driver (with TCON)	2013
Gauge IC	627
Touch panel controller (C)	556
Connectivity	395
STB controller	335
TV controller	327
Wifi controller	245
LED driver	243
DC-DC/AC-DC	176
Accelerator sensor controller	124
Light snesor	121
Bluetooth controller	121
Gyroscope sensor controller	104
TAG IC	76
DVD controller	67
MCU (8bits, LV/3.3V)	56
MCU (8bits, LV/3.3V)	56
P-Gamma	52
MCU (8bits, pure 5V)	51
NB CAM controller	42
Pressure sensor controller	20
Touch pad controller	18
PC CAM controller	15
Touch panel controller (R)	5
TCON (w/o driver)	4

2014.8.29 updated

先進液晶顯示驅動晶片

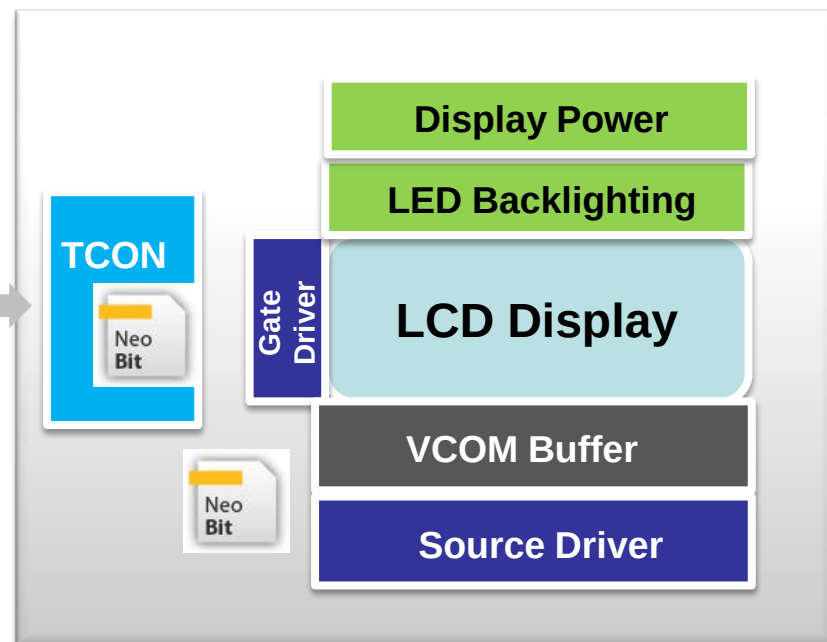
Process Technology : 0.11um HV/80nm HV/55nm HV



I/F
(LVDS, MIPI,...)



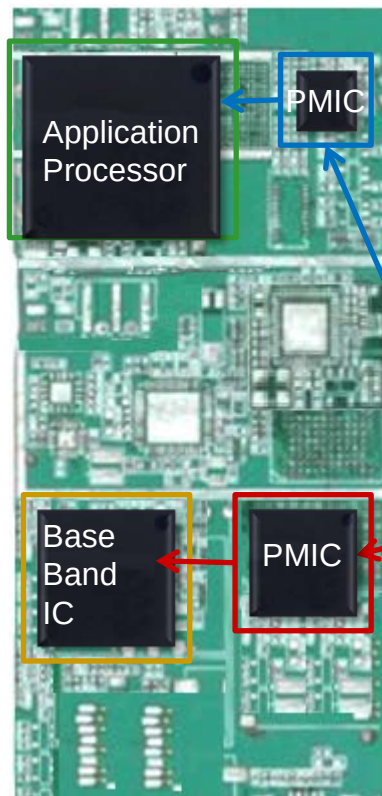
DDI



Density	Endurance	NVM Type	Purpose	NVM Usage
2K8~4K8	1	OTP	Trimming	1. Accuracy enhancement 2. Mismatch cancellation
			Code Storage	1. Gamma Correction Table 2. Timing Control Pattern 3. Color Engine Enhancement

應用於Baseband與Application Processor的電源管理晶片

Process Technology : Advanced 0.25um BCD/ 0.18um BCD/ 0.13um BCD
Mature 0.18um/0.16um/0.152um Logic

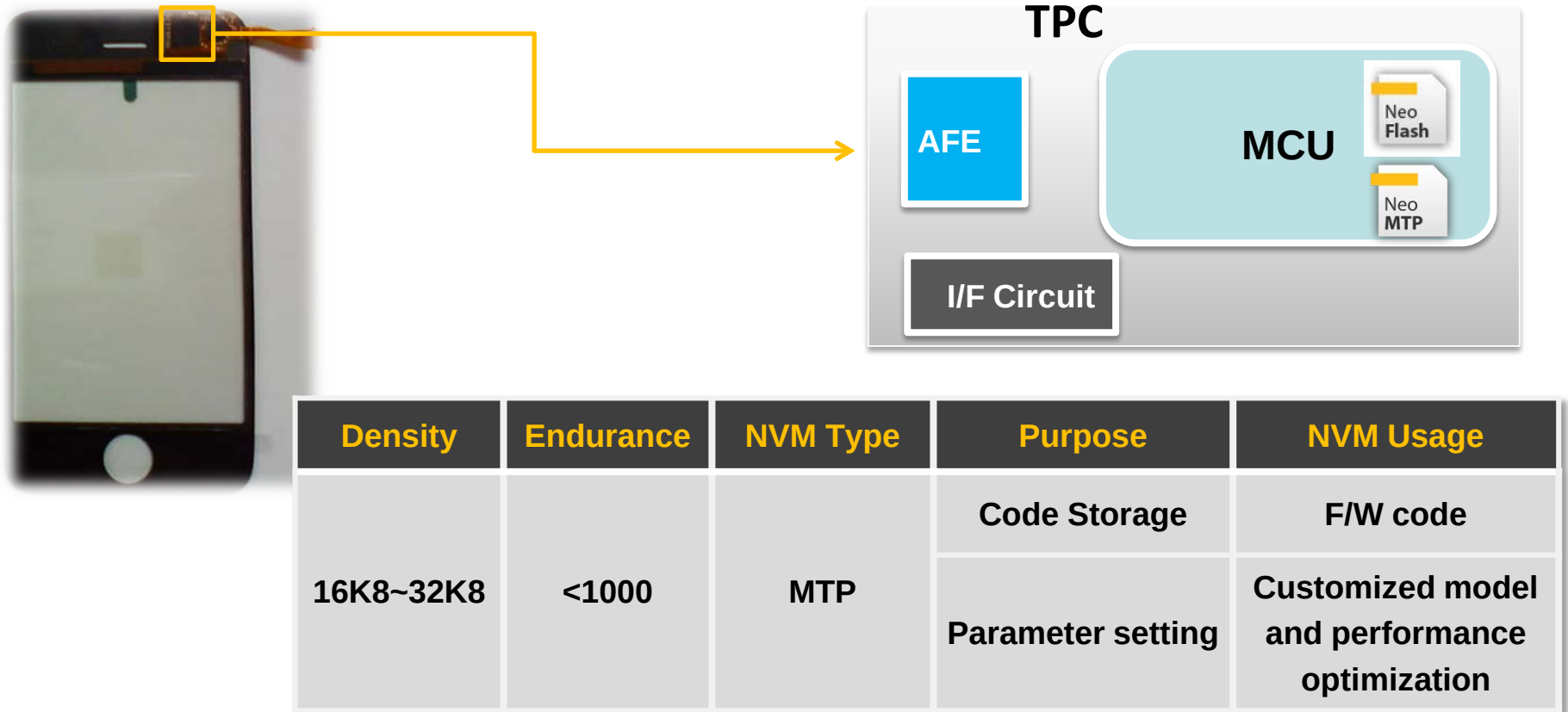


Density	NVM Type	Purpose	NVM Usage
2Kb~4Kb	OTP	Trimming	DC/DC, Bandgap
		Parameter Setting	Design flexibility & Performance optimization
		Code Storage	Start-up behavior & smart power saving algorithm



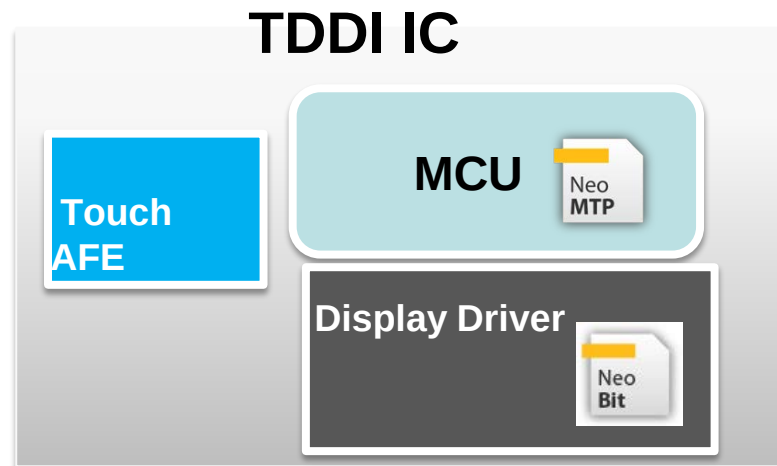
觸控面板控制器晶片

Process Technology : 0.16um HV/0.11um G



內嵌式觸控面板控制器晶片

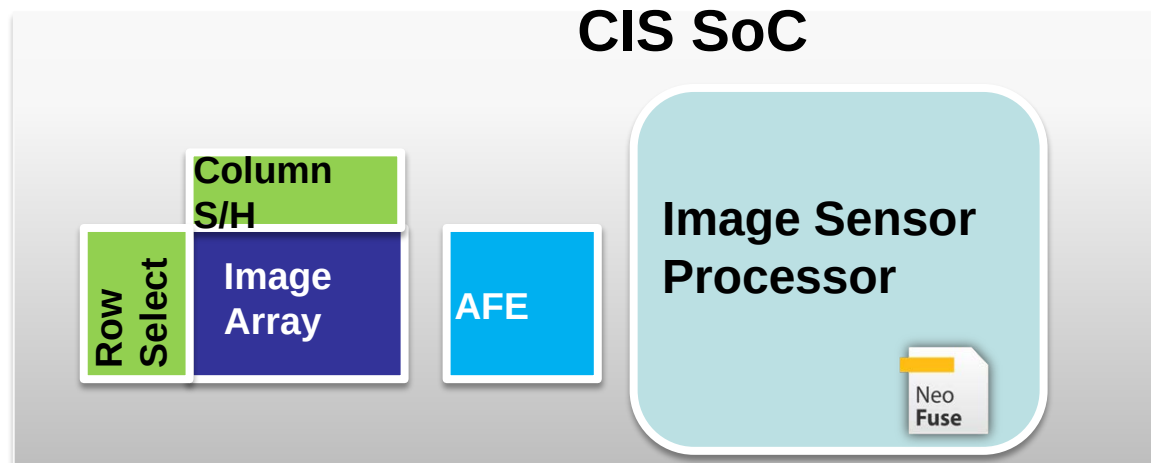
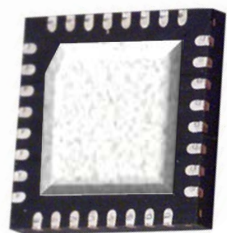
Process Technology : 0.11um HV/80nm HV/55nm HV



Density	Endurance	NVM Type	Purpose	NVM Usage
2K8~4K8	1	OTP	Trimming	Accuracy
			Code Storage	Gamma Table
16K8~32K8	<1000	MTP	Code Storage	Touch F/W Code
			Parameter setting	Performance Optimization

CMOS 影像感測器

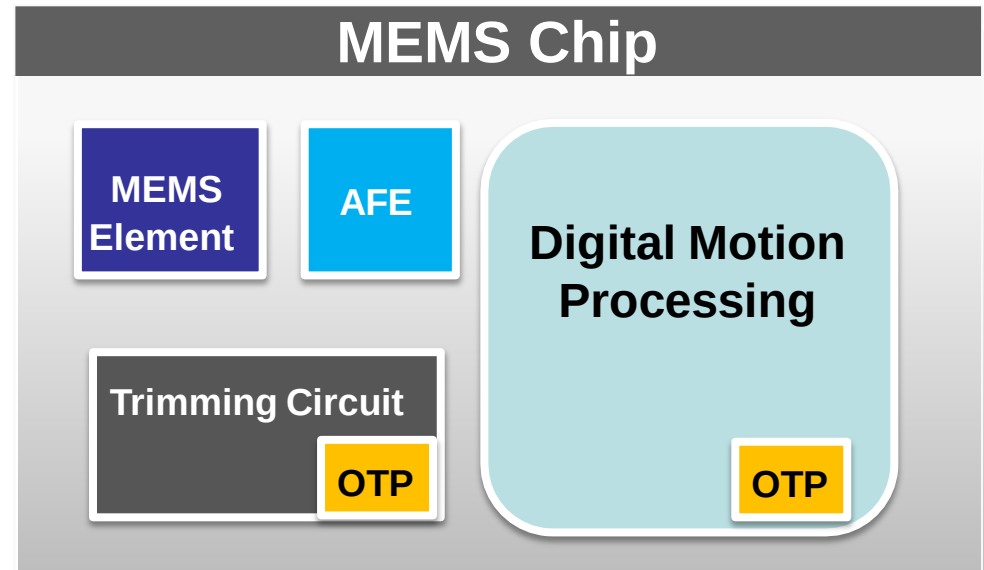
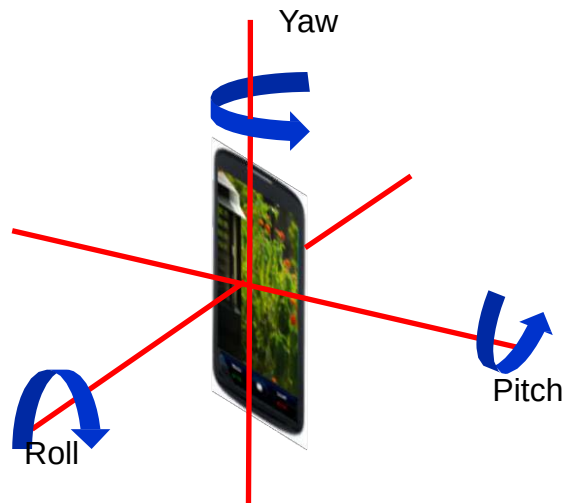
Process Technology : 0.11um CIS/90nm CIS/65nm CIS



Density	Endurance	NVM Type	Purpose	NVM Usage
2Kb~4Kb	1	OTP	Identification Setting	Product code
			Parameter Setting	Start-up initial setting
32K8	1	OTP/ROM	Code Storage	Boot load

微機電系統(MEMS)

180/160/15x nm HV/Logic for MEMS Controller



Density	NVM Type	Purpose	NVM Usage
2Kb~4Kb	OTP	Trimming	Factory trimming
		Parameter Setting	Signal filtering
		Code Storage	Geometric computation

資料防護

Authorized Product



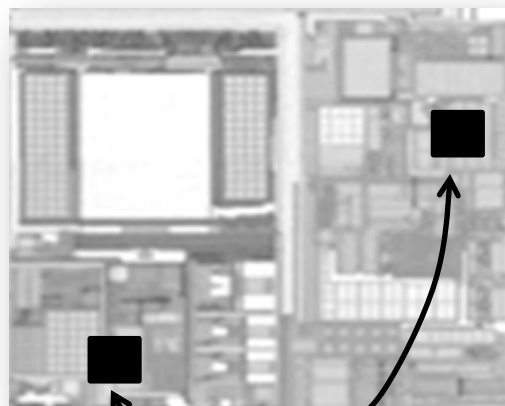
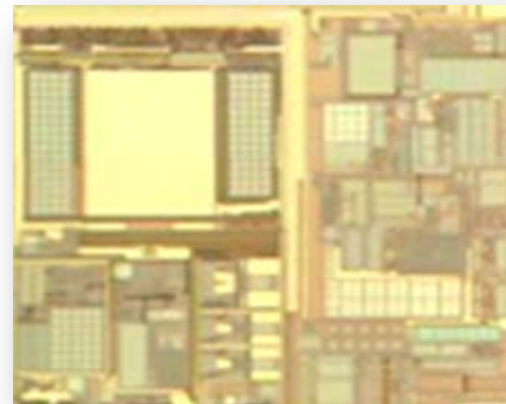
reverse
copy

re-produce



without protection

Fake Product

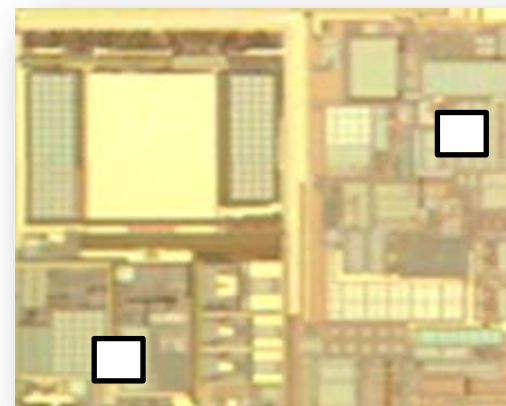


reverse
copy

re-produce



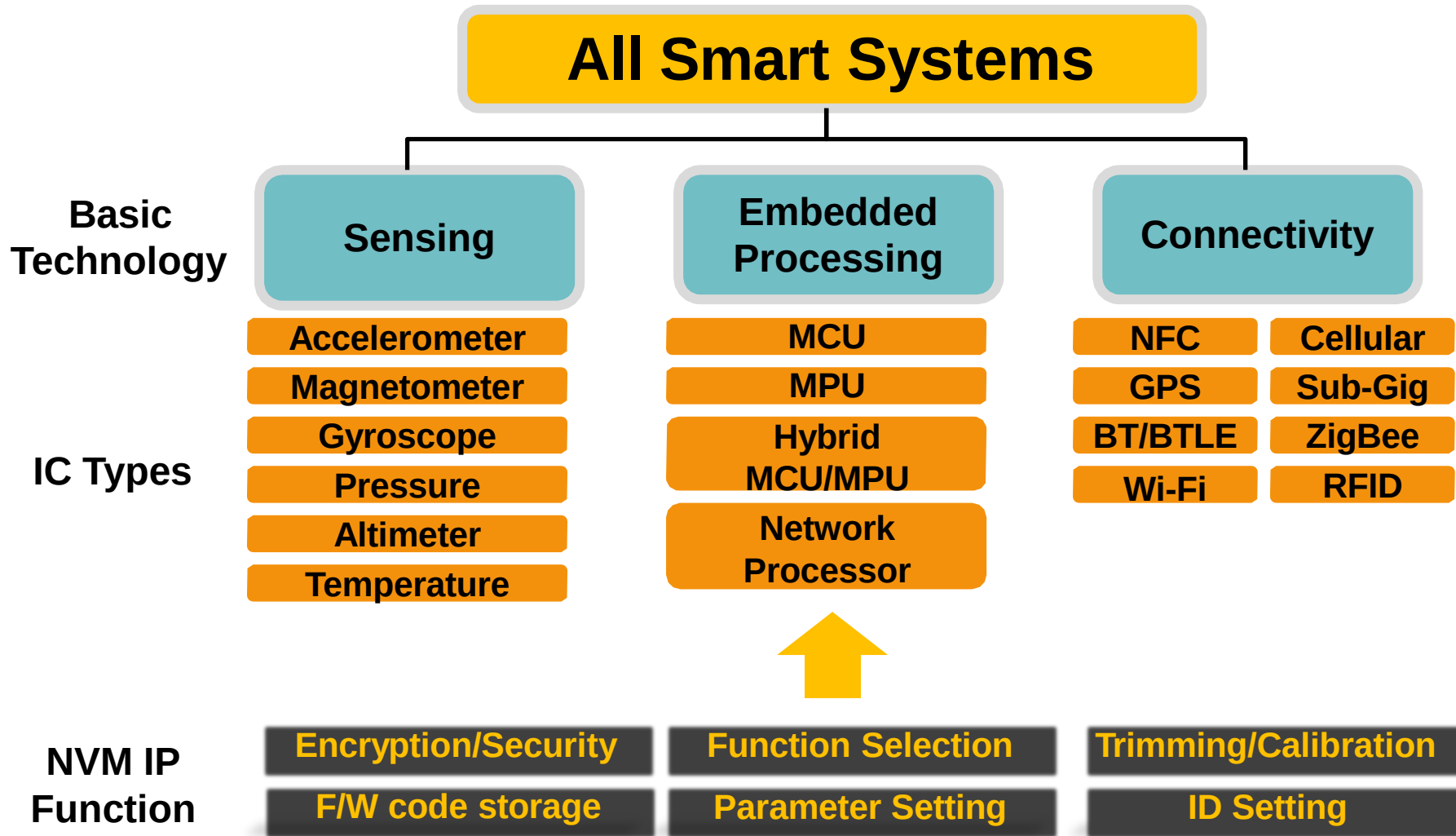
with protection



**Security IP/Code by
Authorized Use**

**Can NOT Work w/o
Security IP/Code**

在IoT中之NVM IP 需求



取代嵌入式快閃記憶體之競爭優勢

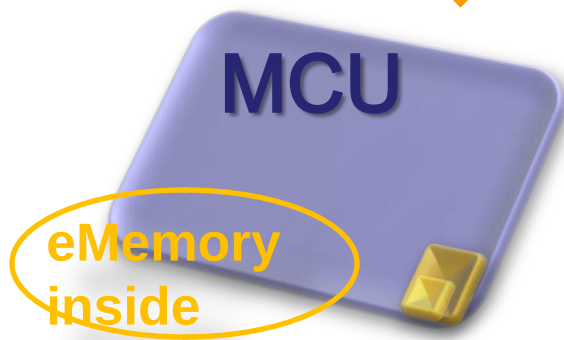


product design & manufacturing by
embedded Flash
Logic Process + 10 Masks



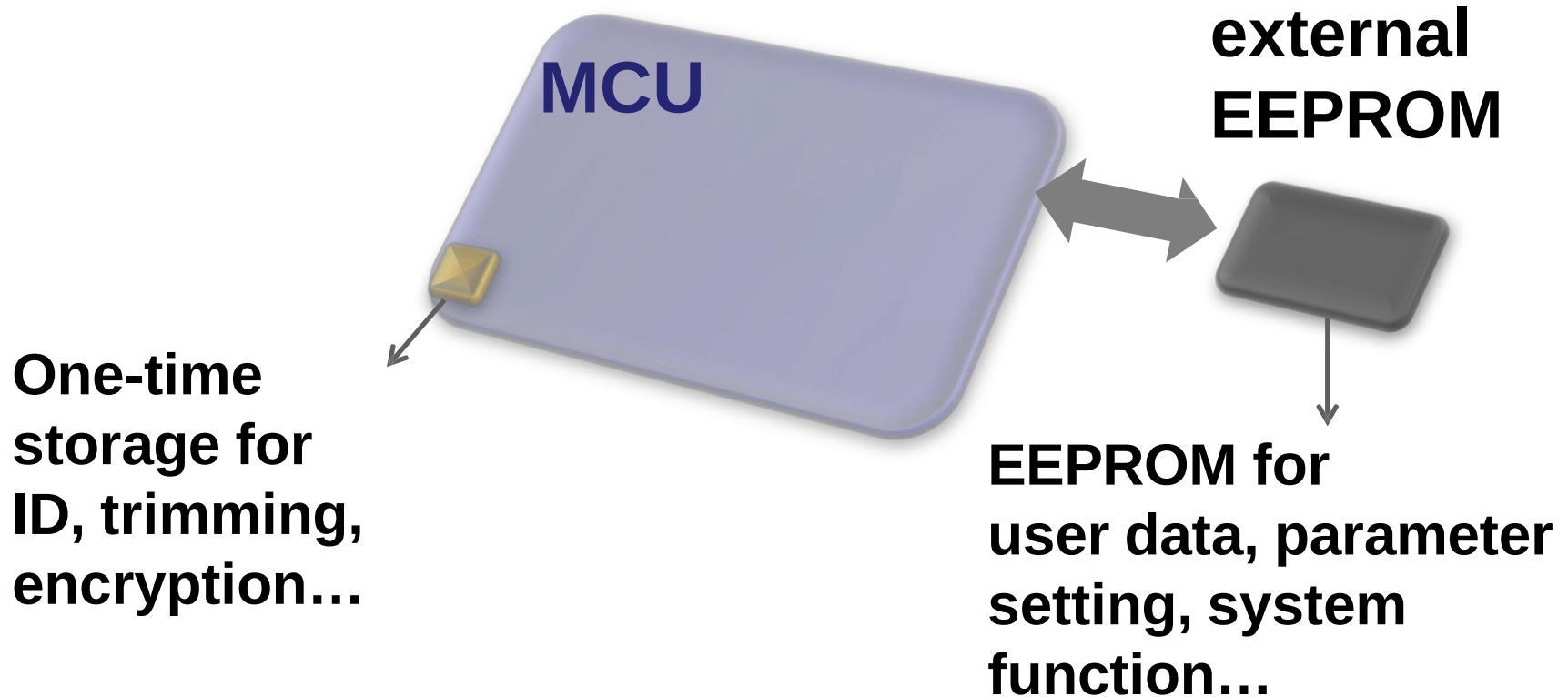
***30% more
cost reduction***

***wafer cost &
testing time***



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

EEPROM應用於MCU



NeoBit + NeoEE

Hybrid NVM solution (NeoBit + NeoEE) with customized SPEC & optimized size



- **One single IP by integration of NeoBit & NeoEE**
- **Help for system size reduction**

2015 展望

- 主要智慧型手機客戶的晶片應用持續成長，並擴展至穿戴式裝置。
- 電源管理晶片應用持續導入中國手機品牌且擴大量產，快速充電及無線充電應用導入。
- TDDI 與 55nm LCD Drivers 開始進入量產。
- Set up box, 指紋辨識及CIS預期下半年開始進入量產。

成長驅動力

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.

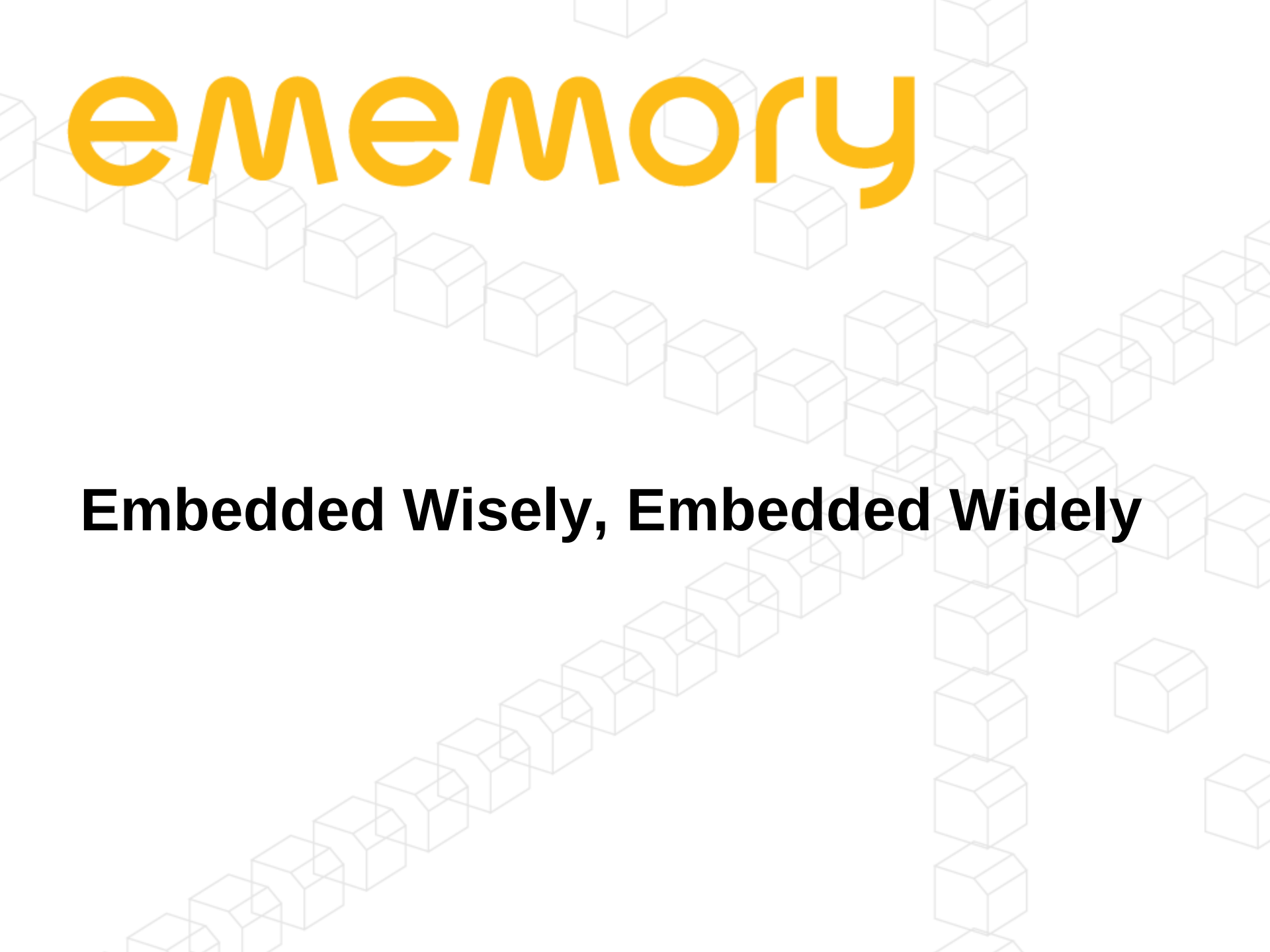
Growth in advanced technology

- Higher royalty per wafer is contributed from more advanced technology nodes.

Great IoT era

- Embedded Logic NVM will be a must.

Q & A

The background of the slide is filled with a pattern of white, 3D wireframe cubes. These cubes are arranged in a way that creates a sense of depth and perspective, with some cubes appearing closer and larger, while others are further away and smaller. The cubes are scattered across the entire slide, creating a textured, geometric background.

ememory

Embedded Wisely, Embedded Widely