力旺電子(3529)
A Leading Logic NVM Company

November, 2014

智慧財產權聲明

本文件內之資訊，包括文字、圖片或其他檔案等，其所有權及智慧財產權皆屬力旺電子所有，本文件之內容包含力旺電子之機密資訊。請尊重智慧財產權，並予以保密，在未取得力旺電子書面同意前，不得複製、使用本文件或將其揭露予第三人。

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。

投資安全聲明

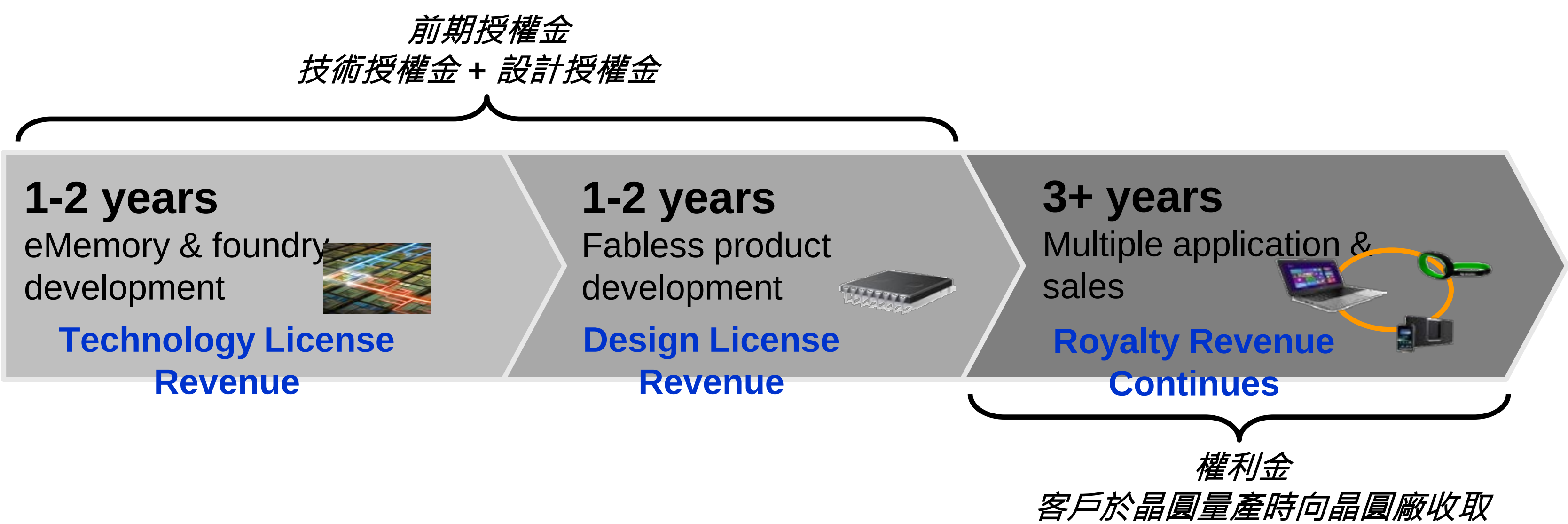
除簡報內所提供之歷史信息外，簡報事項係屬預測性陳述，受到風險及不確定性因素影響，可能造成實際結果與陳述內容發生不符，這些不確定性因素包括：技術平台是否順利導入利用、IP是否被客戶接受、客戶產品大量量產之能力及時間、產業及市場對半導體產品之供給及需求移轉、終端市場之穩定性及其他風險等。

大綱

- 公司營運模式
- 第三季營運回顧
- 成長機會與未來展望
- 問題與回答

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，216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) Usage 設計授權數
  3) 權利金



全球客戶

	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	202	280	49	30	118	60	28

晶圓代工廠

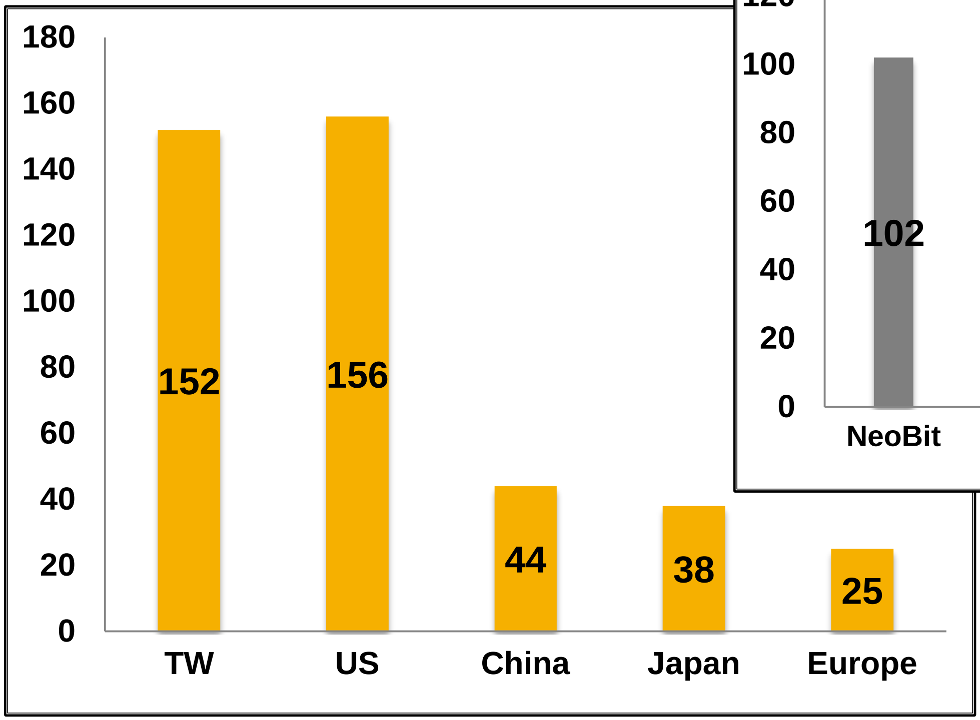
tsmc, UMC, VIS, SILTERRA, 宏力 GRACE SEMICONDUCTOR MANUFACTURING CORPORATION, GLOBALFOUNDRIES, ROHM SEMICONDUCTOR, SK hynix, MagnaChip, Maxchip 鉅晶電子 Maxchip Electronics Corp., Dongbu HiTek, HEJIAN, FUJITSU, Powerchip 力晶科技, SMIC, CSMC A LEADING ANALOG FOUNDRY, HLMC, asmc Advanced Semiconductor Manufacturing Corporation Limited

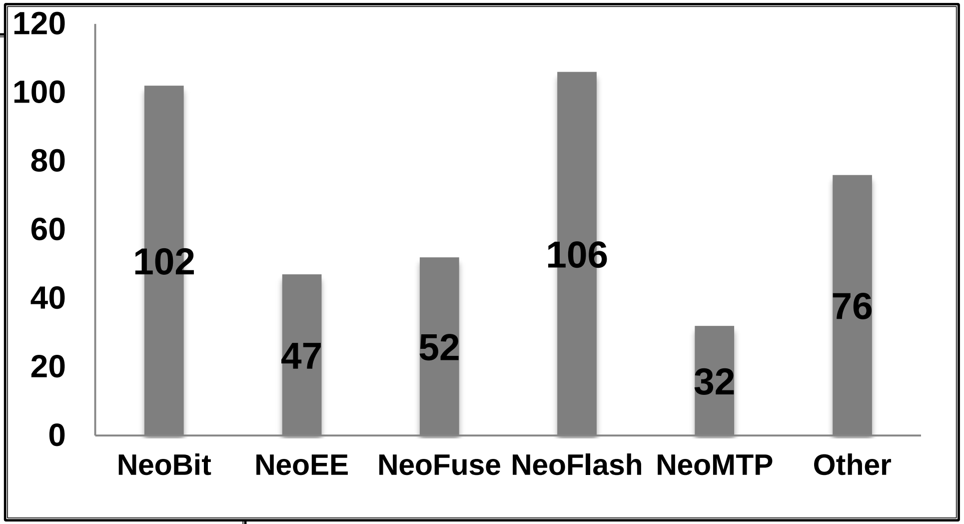
整合元件廠

FUJITSU, OKI, MITSUMI, MITSUBISHI ELECTRIC Changes for the Better, JRC, MAXIM, RICOH, RENESAS, SII, TOSHIBA, ON Semiconductor, ON, NXP

專利佈局

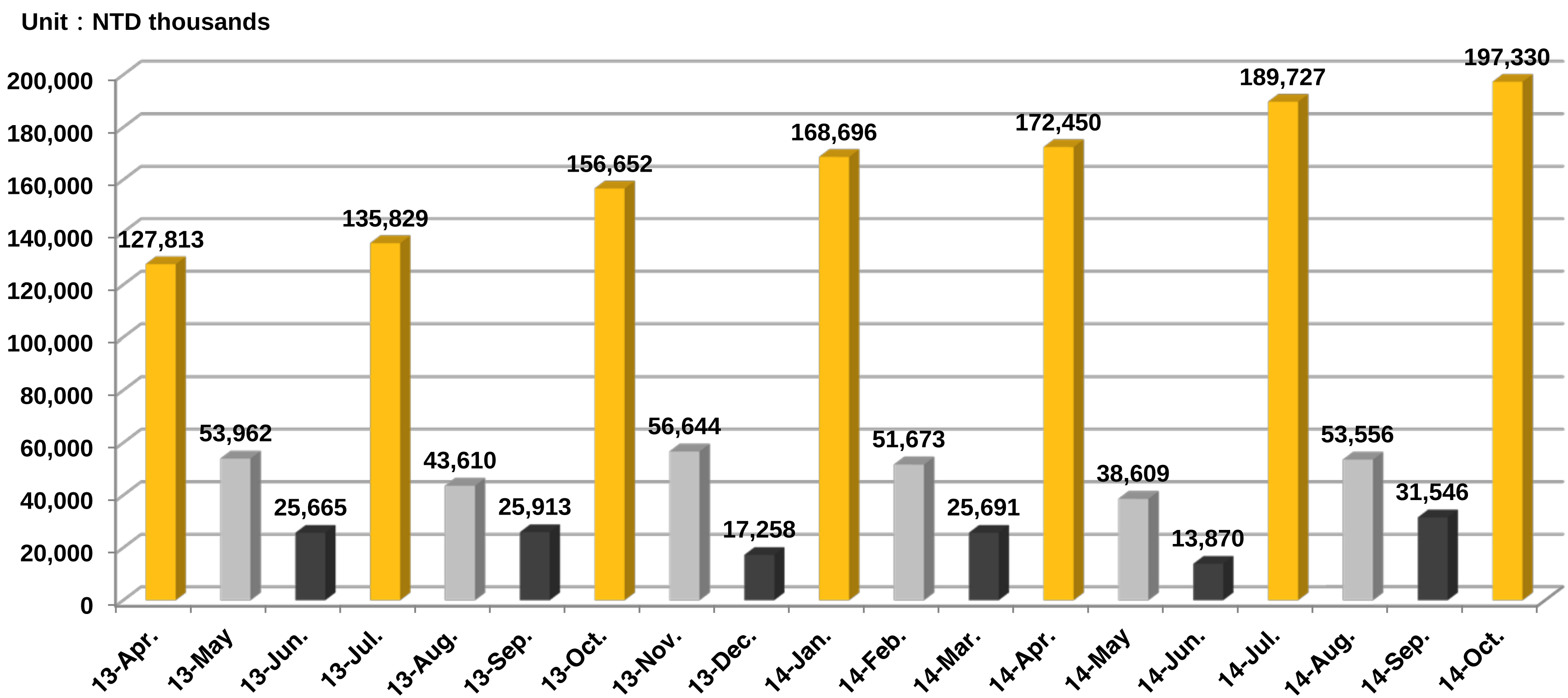
	2Q14	3Q14	Diff.
Pending	136	160	+24
Issued	236	255	+19
Total	**372**	**415**	**+43**





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。



大綱

- 公司營運模式
- 第三季營運回顧
- 成長機會與未來展望
- 問題與回答

第三季各項營收

單位：新台幣仟元

	3Q14	2Q14	QoQ Growth Rate	3Q13	YoY Growth Rate	1Q-3Q14	1Q-3Q13	YoY Growth Rate
權利金	212,848	167,731	26.90%	148,297	43.53%	551,594	388,949	41.82%
授權金	61,981	57,198	8.36%	57,055	8.63%	194,224	188,755	2.90%
合計	274,829	224,929	22.18%	205,352	33.83%	745,818	577,704	29.10%

單位：合約數

		3Q14	2Q14	1Q-3Q14	1Q-3Q13
技術授權數		5	6	17	14
設計授權數	NRE	22	12	67	39
	使用費	88	86	264	230

綜合損益表

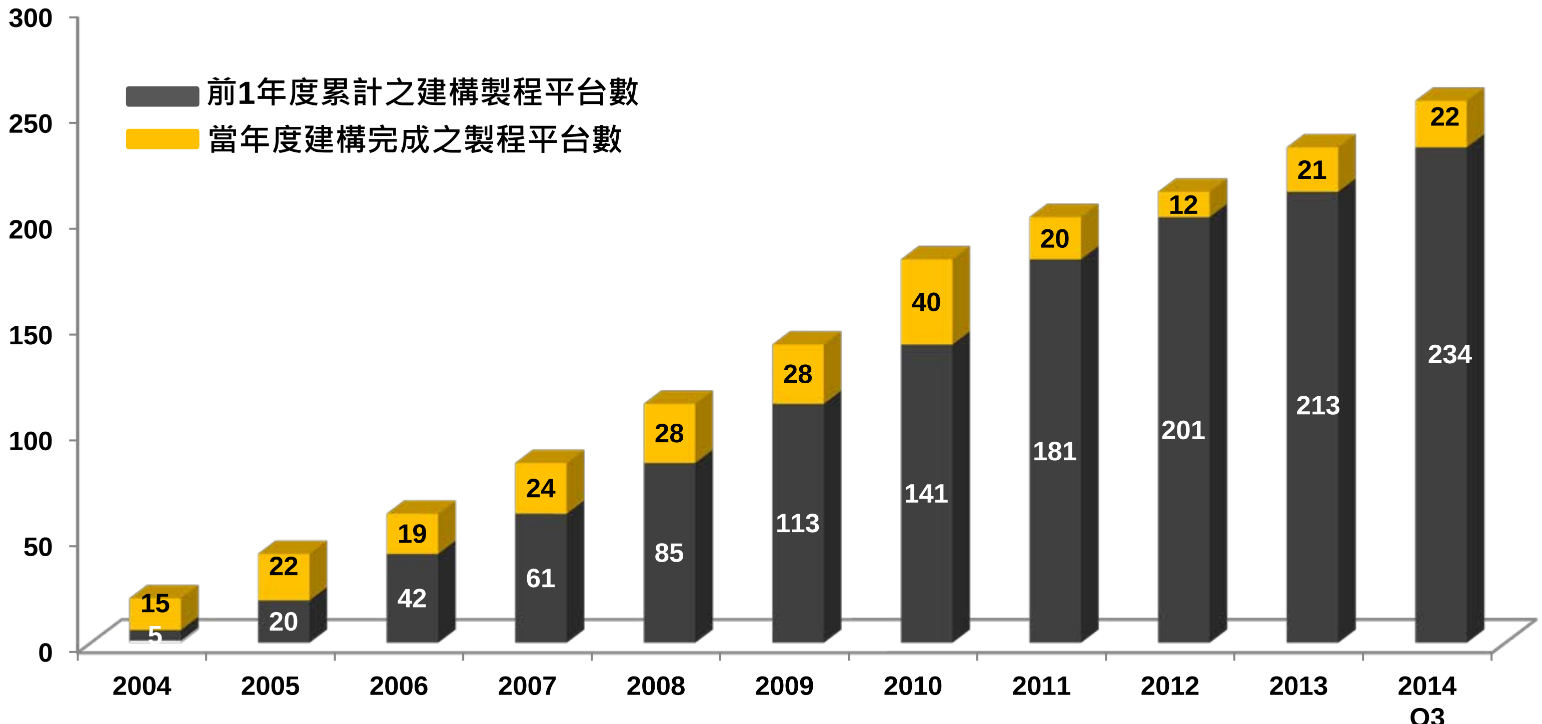
(單位:新台幣仟元)	3Q14	1Q-3Q14	1Q-3Q13	YoY
營業收入淨額	274,829	745,818	577,704	29.1%
營業毛利率	100%	100%	100%	-
營業費用	135,695	391,820	343,813	14.0%
營業淨利率	50.6%	47.5%	40.5%	+7.0ppts
營業外收入及支出	1,852	6,943	654	961.6%
本期淨利	124,352	317,673	199,372	59.3%
純益率	45.2%	42.6%	34.5%	+8.1ppts
每股盈餘 (單位: 新台幣元)	1.64	4.19	2.66	57.5%
權益報酬率	29.7%	25.3%	17.2%	+8.1ppts

技術授權合約及累計平台數

單位：合約數

年度	2012	2013	1Q-3Q2014
授權數	12	19	17

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 October) : 78
- 31 for NeoBit, 25 for NeoFuse, 2 for NeoFlash, 13 for NeoEE, and 7 for NeoMTP.

	16nm	28nm	40nm	55/65nm	80/90nm	0.11~ 0.13um	0.15~ 0.18um	>0.25 um	Total
NeoBit	-	-	-	1	1	10	17	2	31
NeoFuse	1	7	4	8	1	3	1	-	25
NeoFlash	-	-	-	1	-	1	-	-	2
NeoEE	-	-	2	-	1	4	5	1	13
NeoMTP	-	-	-	1	2	2	2	-	7

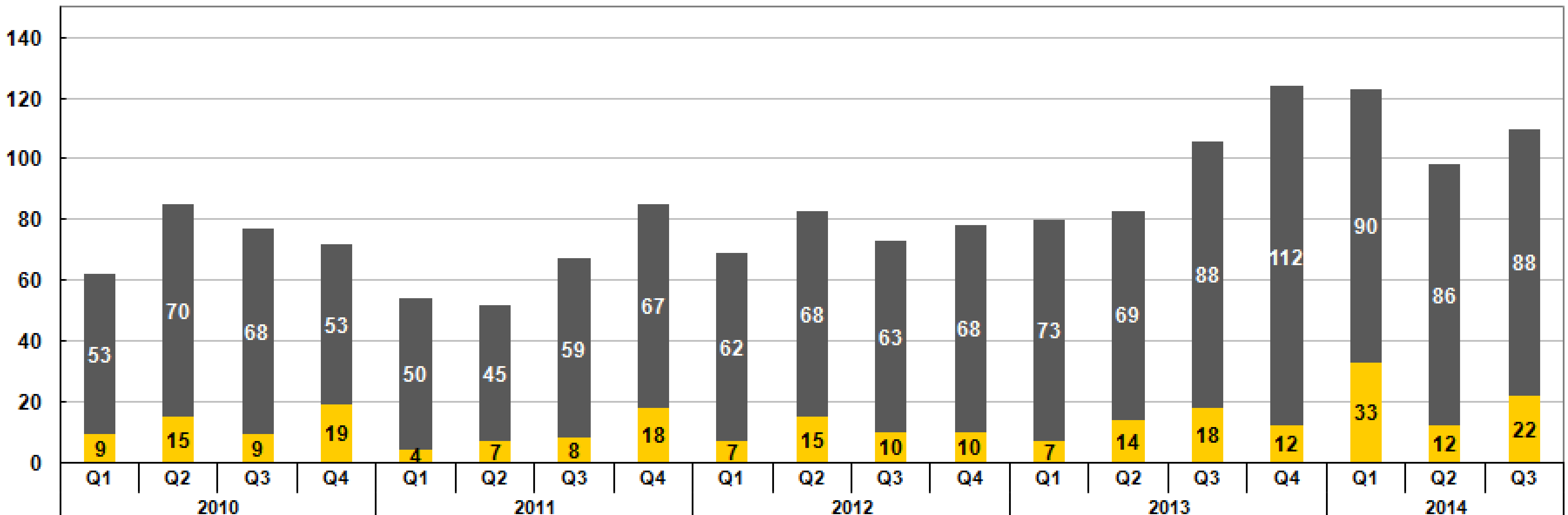
目前正在建構的技術製程平台

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	11	OTP, MTP, Flash	LP, HV-DDI, HV-OLED, DRAM, CIS
80/90nm	7	5	OTP, MTP	HV-DDI, HV-OLED, LP
0.13/0.11um	1	5	OTP, Flash	HV-DDI, BCD, Generic
0.18um	0	1	OTP	BCD

8" Fabs	Development	NVM Type	Process Type
0.13/0.11um	15	OTP, MTP, Flash	HV-DDI, BCD, LP, RF, CIS, LL
0.18/0.16/0.152um	24	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 331 NTO as of 3Q 2014 (393@2013, 303@2012, 258@2011)

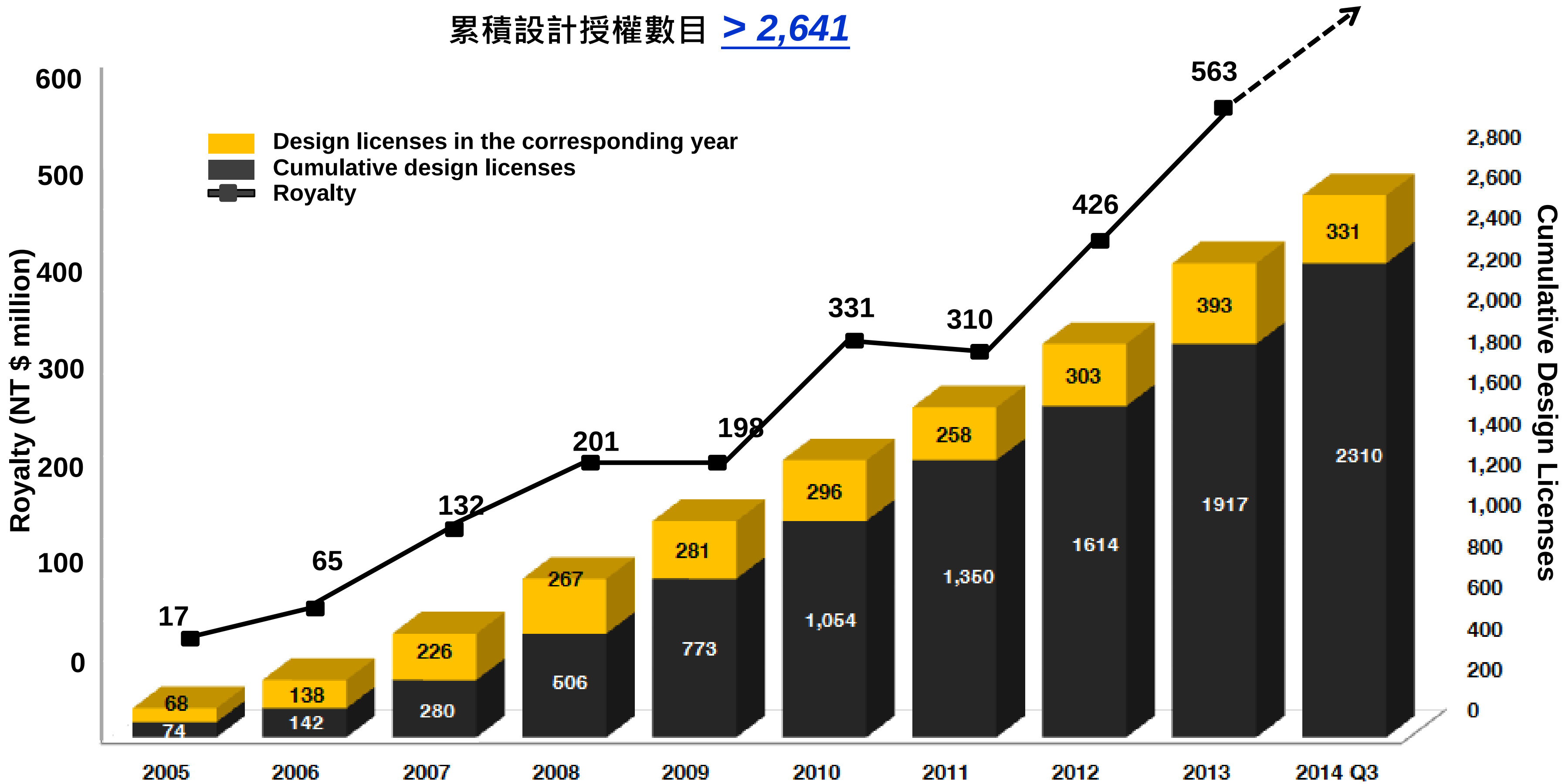


	2010 Q1	2010 Q2	2010 Q3	2010 Q4	2011 Q1	2011 Q2	2011 Q3	2011 Q4	2012 Q1	2012 Q2	2012 Q3	2012 Q4	2013 Q1	2013 Q2	2013 Q3	2013 Q4	2014 Q1	2014 Q2	2014 Q3
TOTAL	62	85	77	72	54	52	67	85	69	83	73	78	80	83	106	124	123	98	110
USAGE	53	70	68	53	50	45	59	67	62	68	63	68	73	69	88	112	90	86	88
NRE	9	15	9	19	4	7	8	18	7	15	10	10	7	14	18	12	33	12	22

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

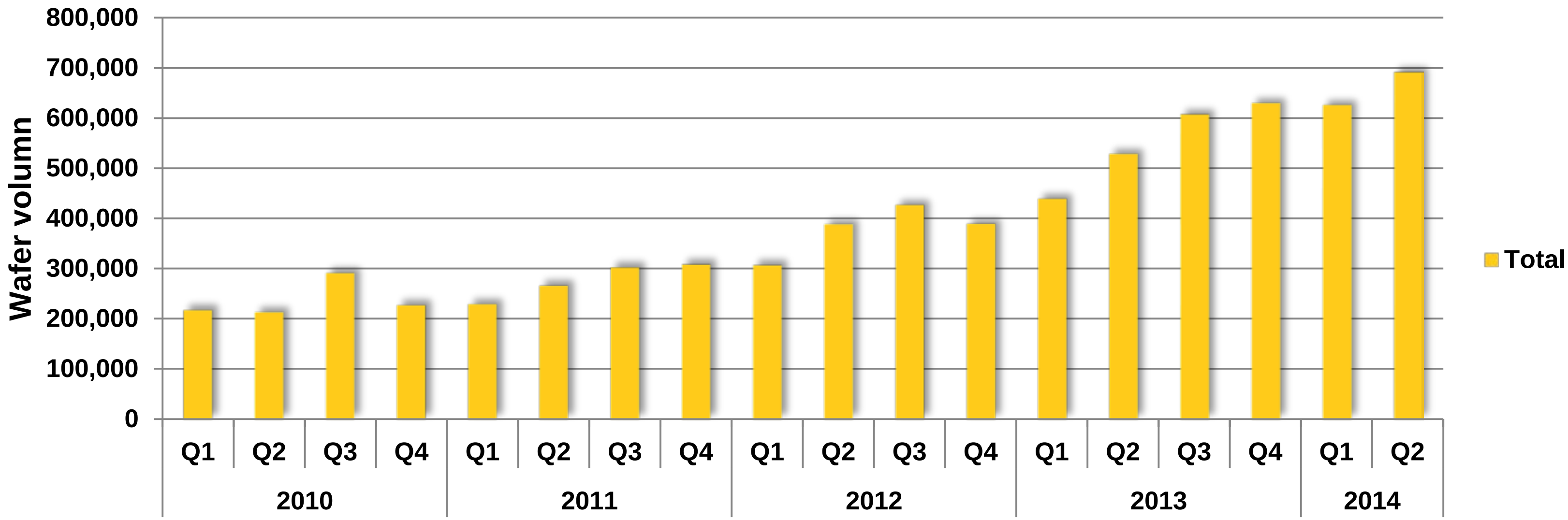


註1. 2009年因整體半導體景氣衰退，權利金年衰退1.5%。

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 3Q14

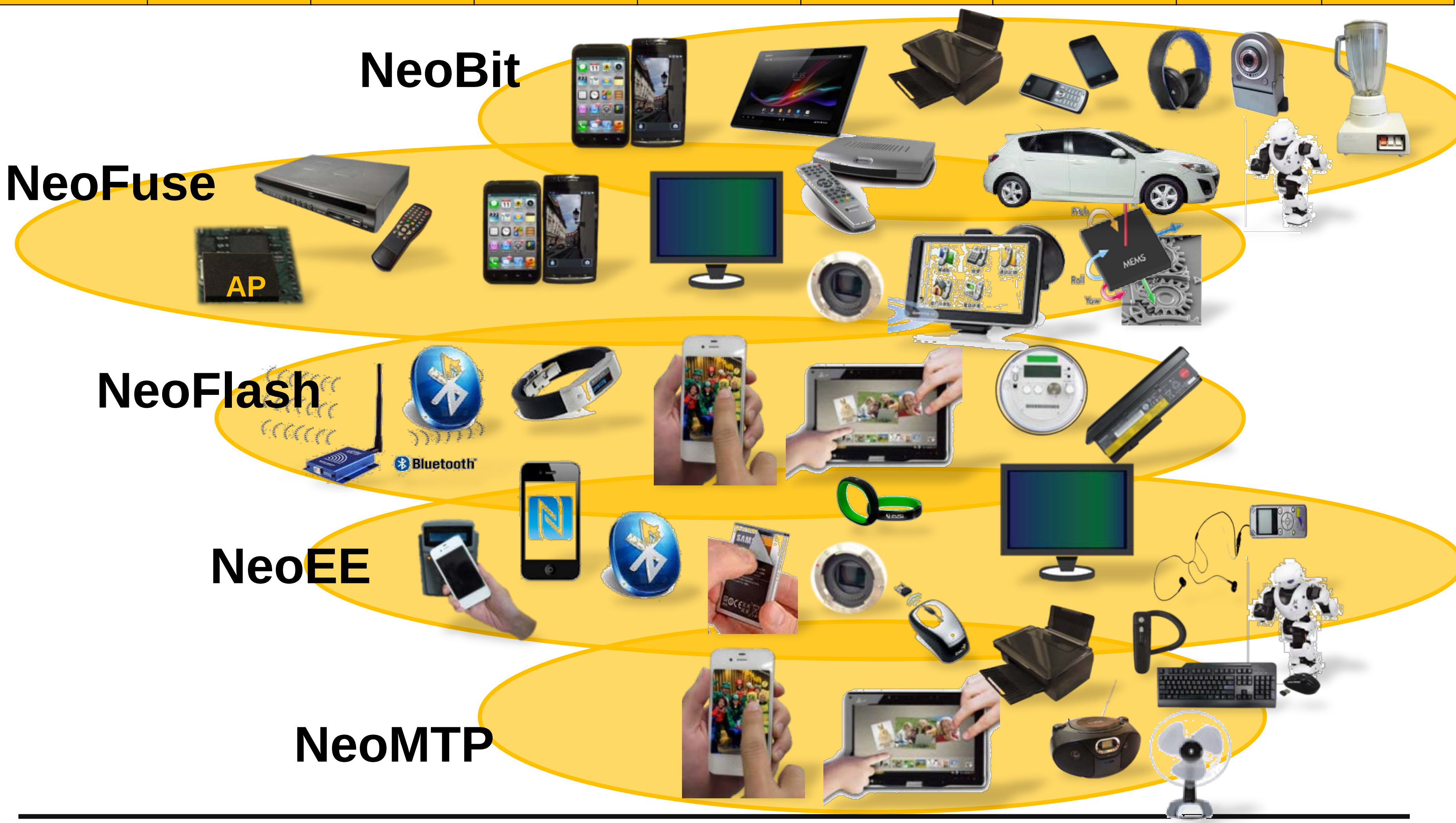
	Process node	*% of T	3Q14	2Q14	1Q-3Q14	1Q-3Q13
8”	0.5+	1%	0%	0%	0%	0%
	0.25/0.35	4%	33.5%	34.2%	30.5%	25.6%
	0.15/0.18	13%	13%	13.3%	13.3%	9.4%
	0.11/0.13	3%	21%	20.4%	20.8%	20.2%
12”	90nm	6%	16.4%	18.3%	16.3%	3.9%
	65nm	13%	0%	0%	0%	0%
	40/45nm	17%	0%	0%	0%	0%
	28nm	34%	0%	0%	0%	0%
	20nm	9%	0%	0%	0%	0%
8”		21%	16.5%	17%	16.1%	13.2%
12”		79%	1.4%	1.6%	1.4%	0.65%
Total		100%	4.5%	5.1%	4.5%	3.7%

大綱

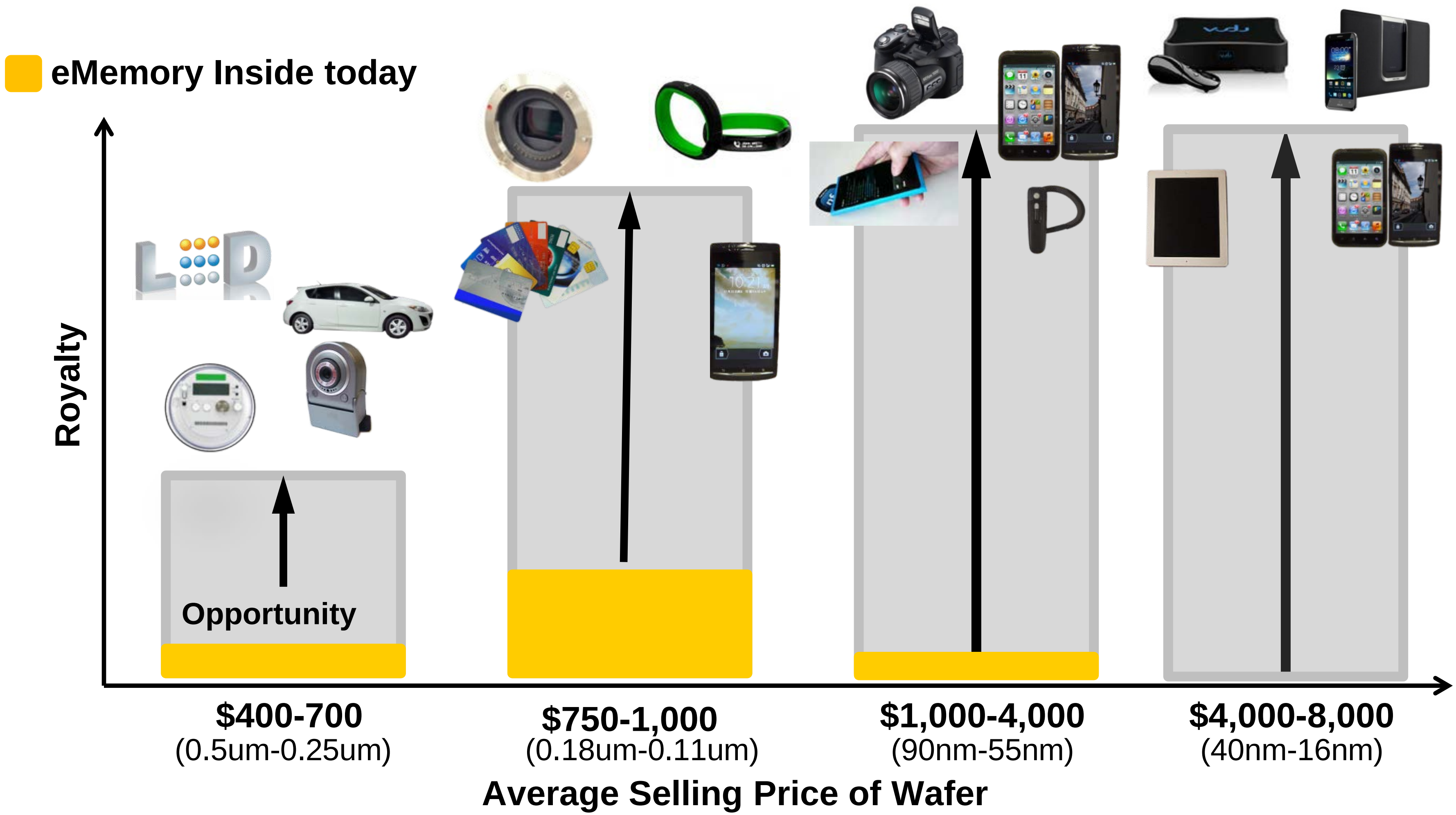
- 公司營運模式
- 第三季營運回顧
- 成長機會與未來展望
- 問題與回答

力旺IP的應用

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

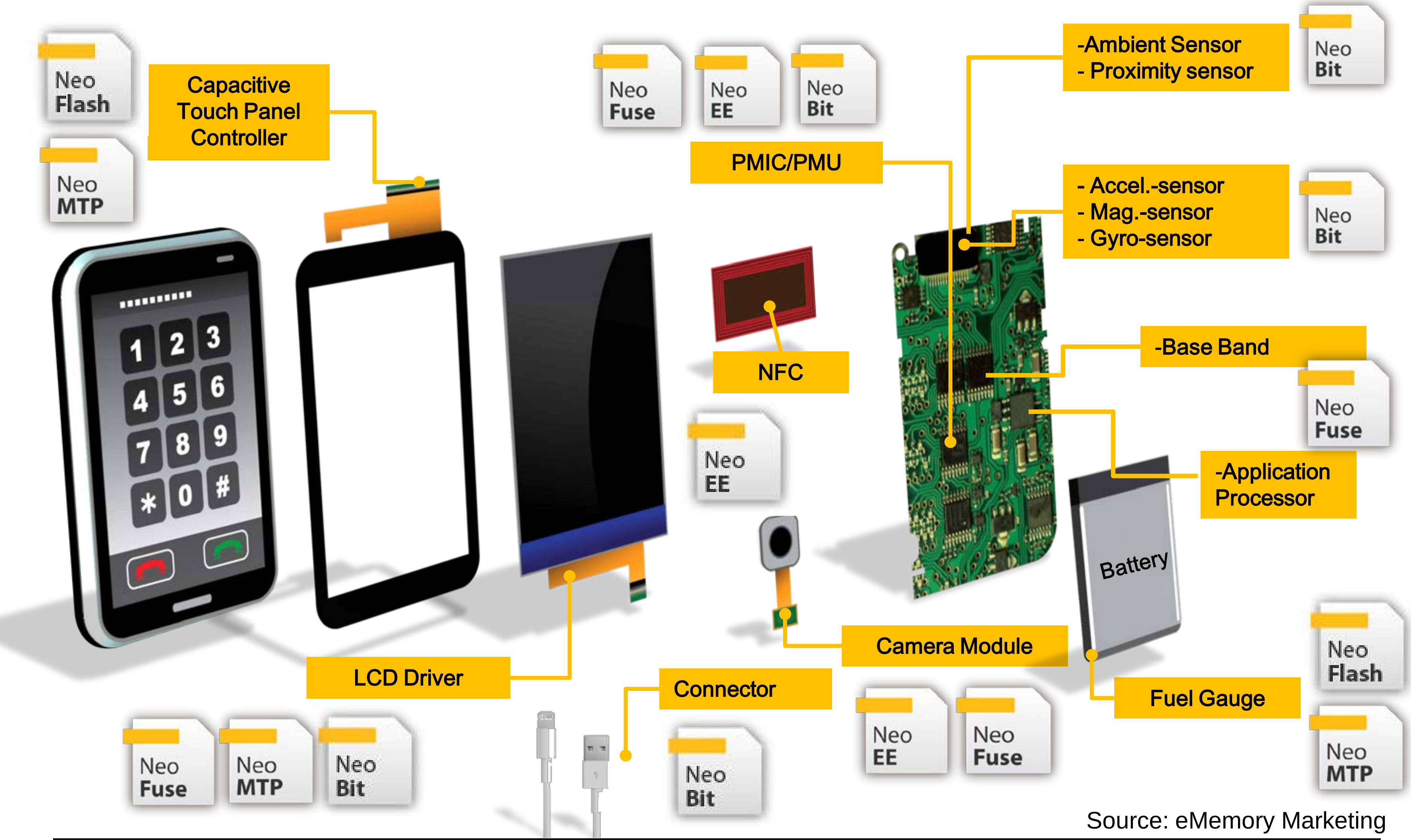


商機與潛力



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

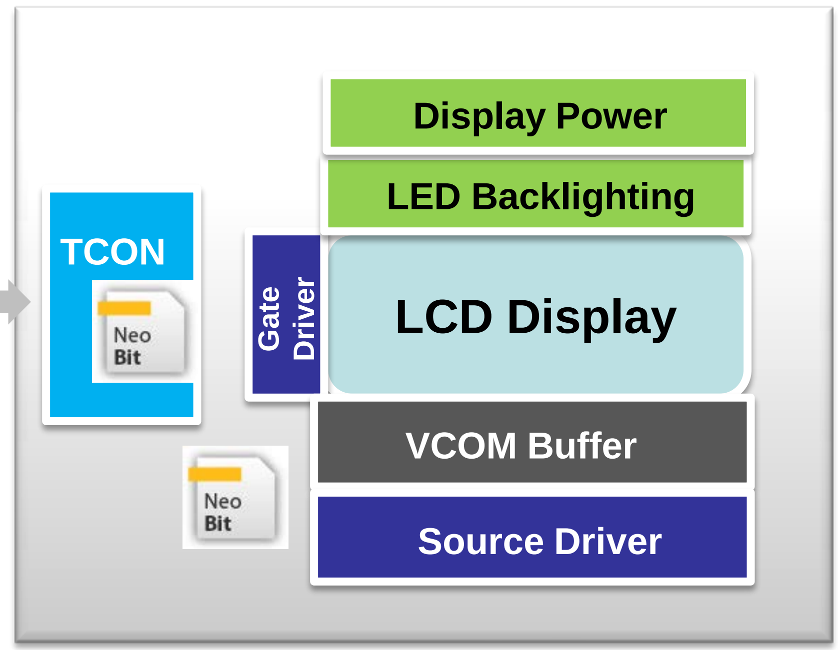
2014.8.29 updated

先進液晶顯示驅動晶片

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

I/F
(LVDS, MIPI,…)

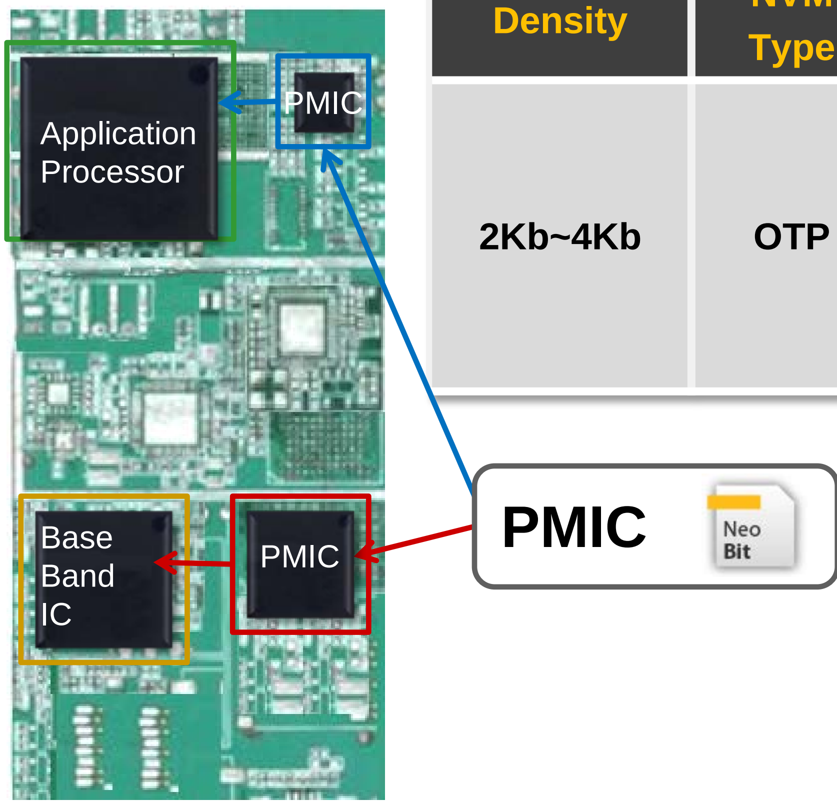
DDI



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

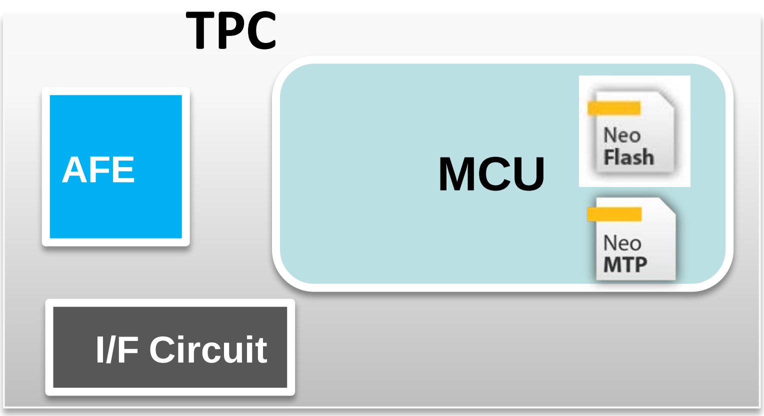
Process Technology : Advanced 0.25um BCD/ 0.18um BCD/ 0.13um BCD
Mature 0.18um/0.16um/0.152um Logic



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

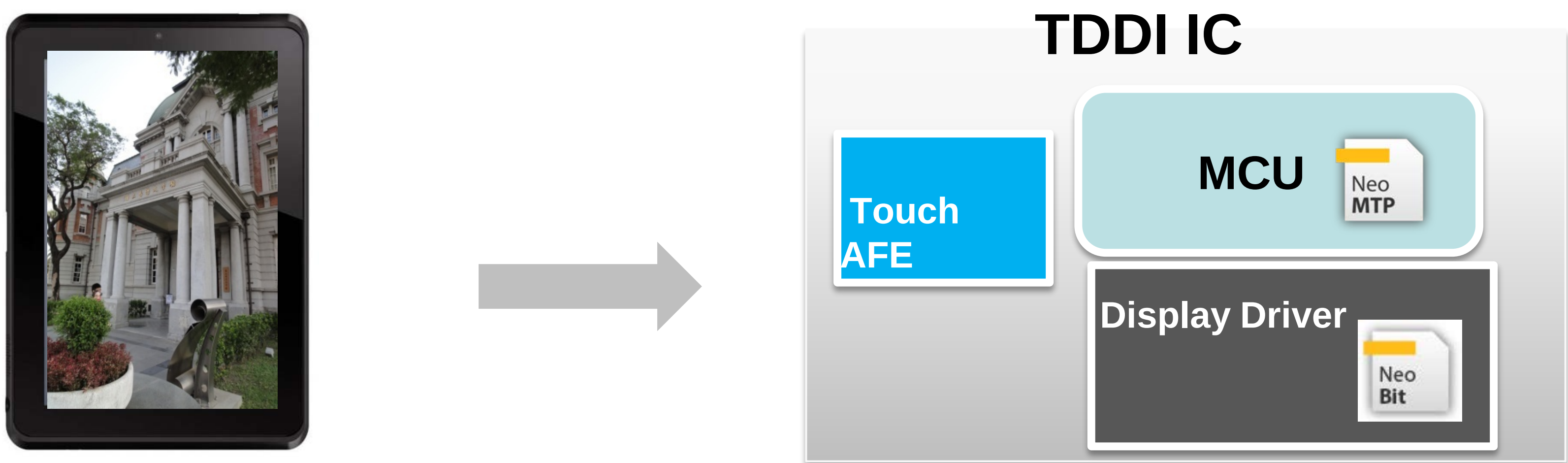
Process Technology : 0.16um HV/0.11um G



Density	Endurance	NVM Type	Purpose	NVM Usage
16K8~32K8	<1000	MTP	Code Storage	F/W code
			Parameter setting	Customized model and performance optimization

內嵌式觸控面板控制器晶片

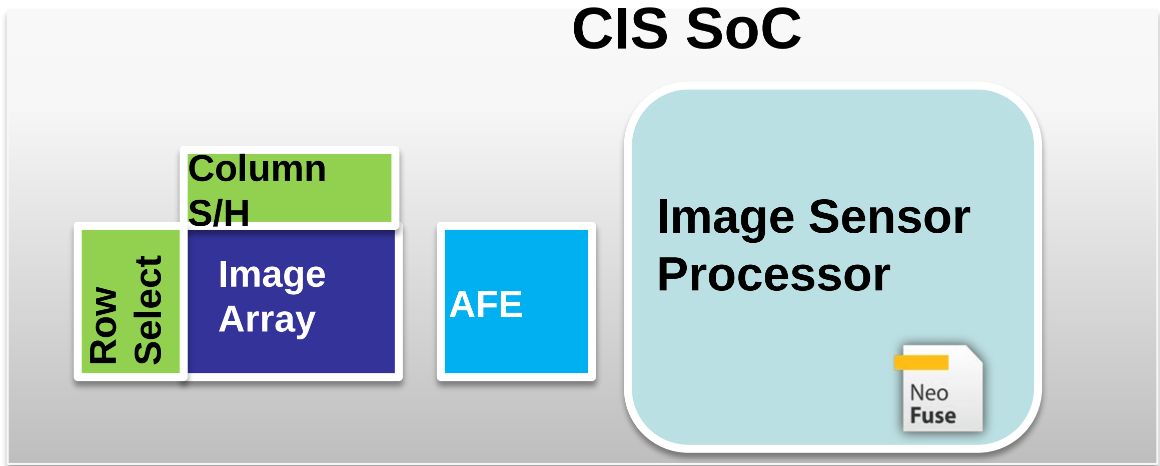
Process Technology : 0.11um HV/80nm HV/55nm HV

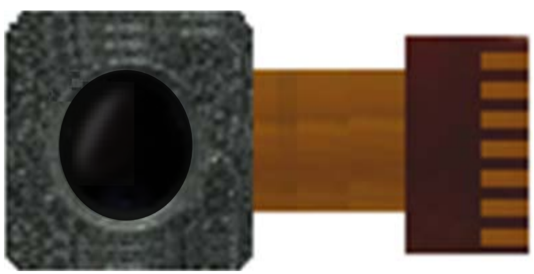


Density	Endurance	NVM Type	Purpose	NVM Usage
2K8~4K8	1	OTP	Trimming	Accuracy
			Code Storage	Gamma Table
16K8~32K8	<1000	MTP	Code Storage	Touch F/W Code
			Parameter setting	Performance Optimization

CMOS 影像感測器

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

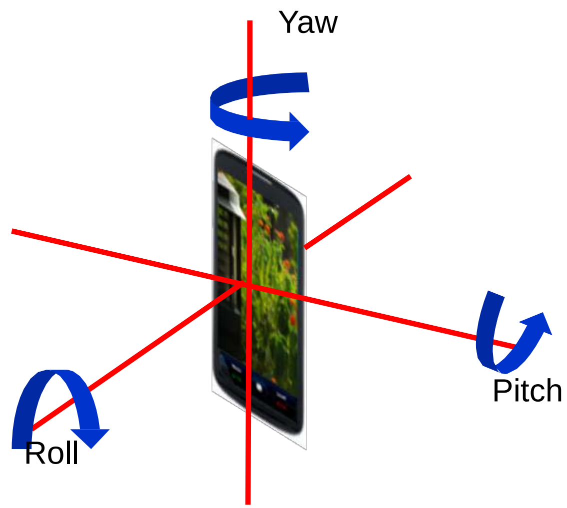


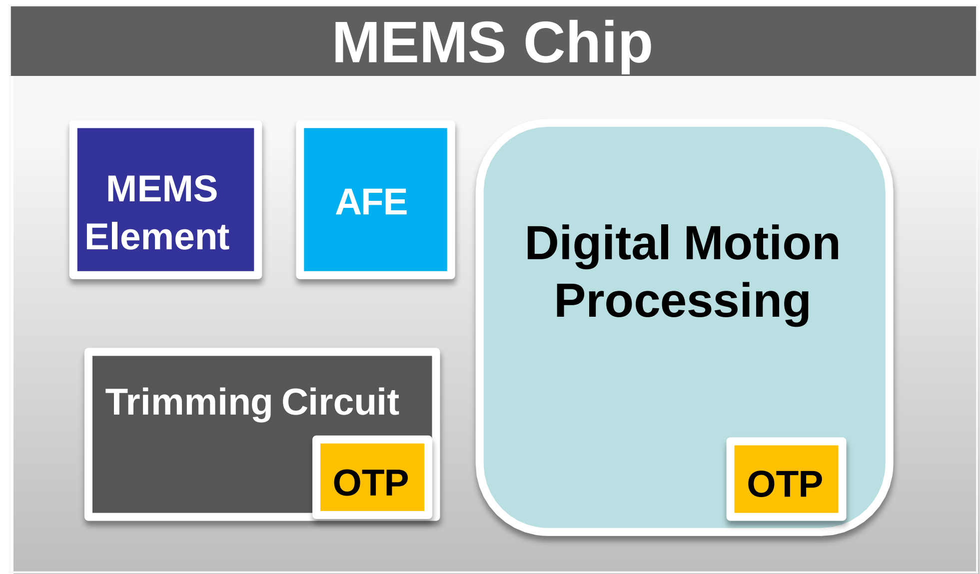


Density	Endurance	NVM Type	Purpose	NVM Usage
2Kb~4Kb	1	OTP	Identification Setting	Product code
			Parameter Setting	Start-up initial setting
32K8	1	OTP/ROM	Code Storage	Boot load

微機電系統(MEMS)

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





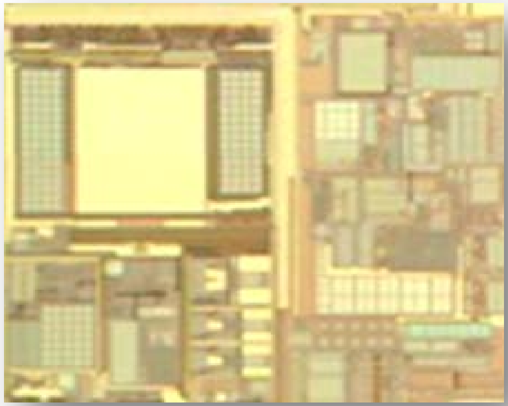
Density	NVM Type	Purpose	NVM Usage
2Kb~4Kb	OTP	Trimming	Factory trimming
		Parameter Setting	Signal filtering
		Code Storage	Geometric computation

資料防護

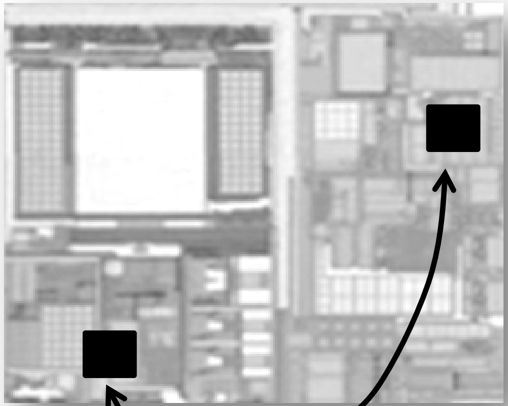
Authorized Product | **Fake Product**

reverse copy

re-produce

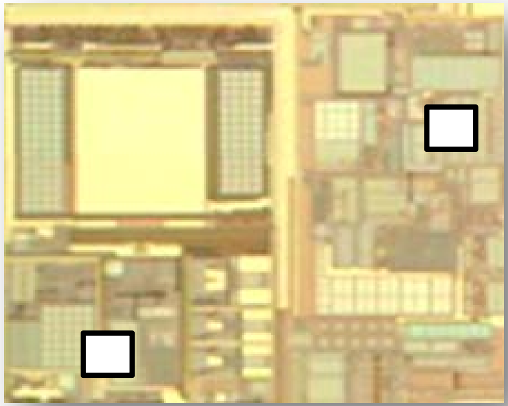


without protection



reverse copy

re-produce

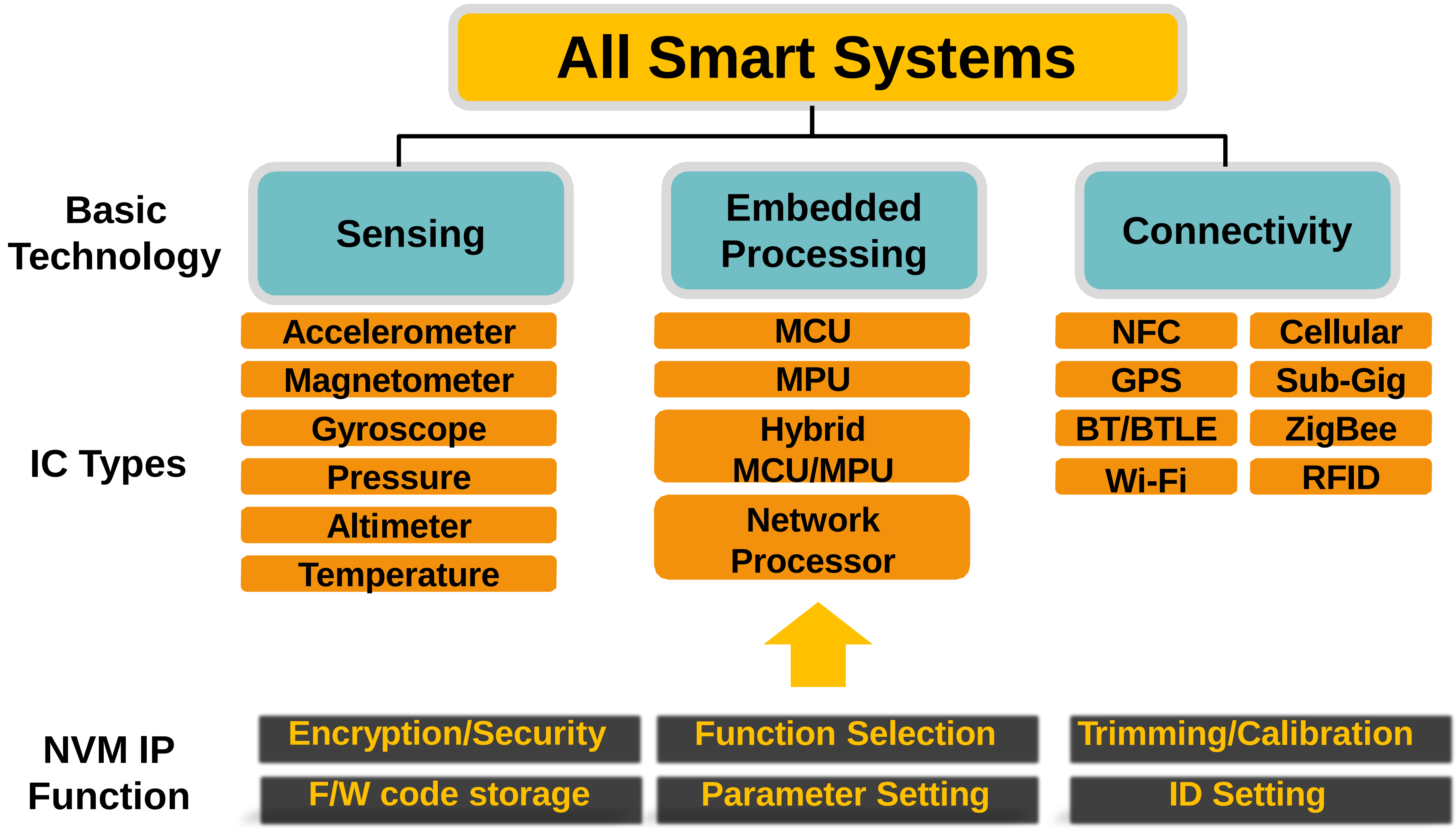


with protection

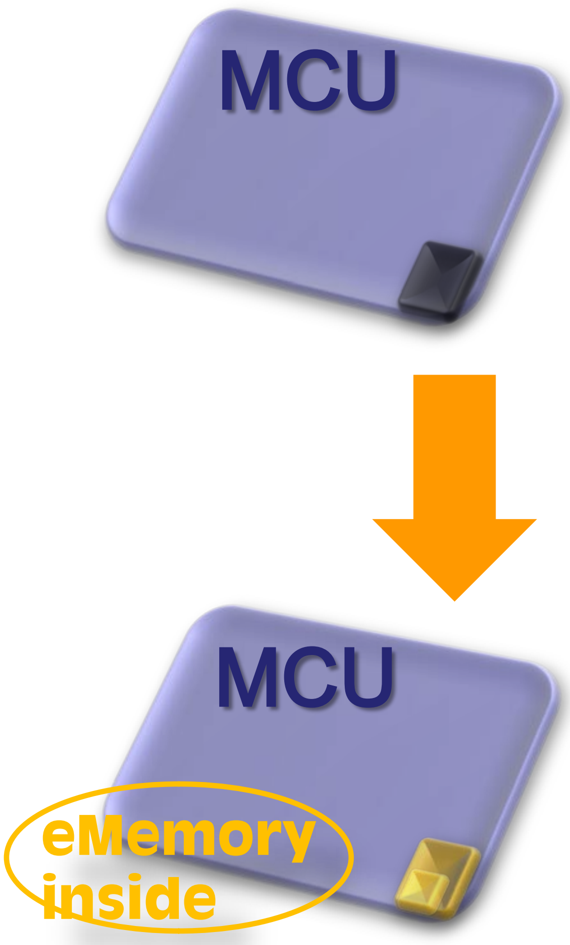
Security IP/Code by Authorized Use

Can NOT Work w/o Security IP/Code

在IoT中之NVM IP 需求



取代嵌入式快閃記憶體之競爭優勢



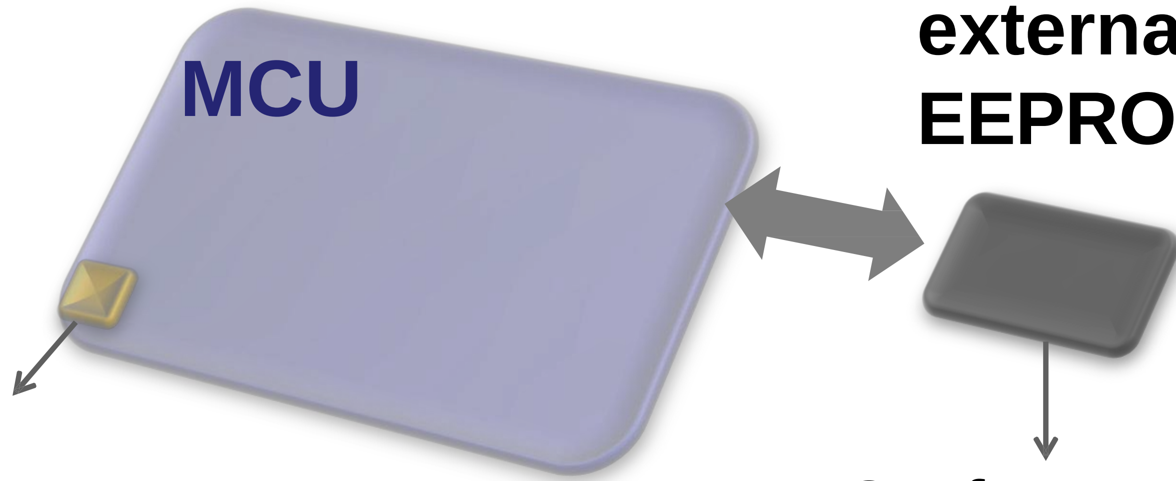
product design & manufacturing by embedded Flash
Logic Process + 10 Masks

30% more cost reduction ***(wafer cost & testing time)***

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

EEPROM應用於MCU

external
EEPROM

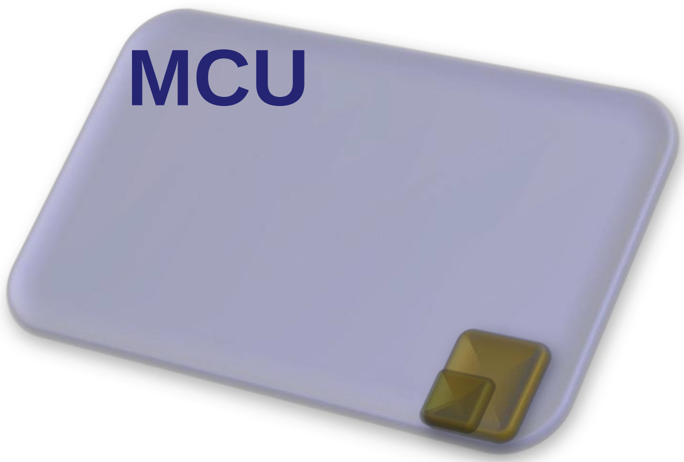


One-time storage for ID, trimming, encryption…

EEPROM for user data, parameter setting, system function…

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

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 more advanced technology	• Higher royalty per wafer is contributed from more advanced technology nodes.
IoT great era	• Embedded Logic NVM will be a must.

未來展望

- 既有客戶晶片需求仍然強勁，新客戶晶片順利導入量產，營運成長動能可望持續。
- 隨著先進製程技術平台陸續建構完成，新設計案加速導入，來自先進製程的授權案與權利金貢獻可望明顯成長。
- 隨著行動裝置普及，帶動相關穿載式與物聯網應用，對低功耗、低成本及安全考量需求增加，加速嵌入式非揮發性邏輯記憶體IP的導入設計應用。

Q & A

ememory

Embedded Wisely, Embedded Widely