ememory

A Leading Logic NVM Company

January, 2015

IPR Notice

Cautionary Statement

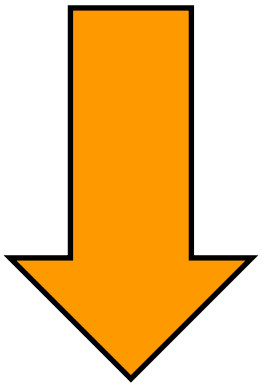
This presentation contains forward-looking statements, which are subject to risk factors associated with semiconductor and intellectual property business. It is believed that the expectations reflected in these statements are reasonable. But they may be affected by a variety of variables, many of which are beyond our control. These variables could cause actual results or trends to differ materially and 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.

Outline

- **Business Model**
- **Review of Operations for 4Q**
- **Growth Opportunity and Future Outlook**
- **Q & A**

What's Logic Non-Volatile Memory (NVM)

Embedded NVM = LOGIC + 10 Masks

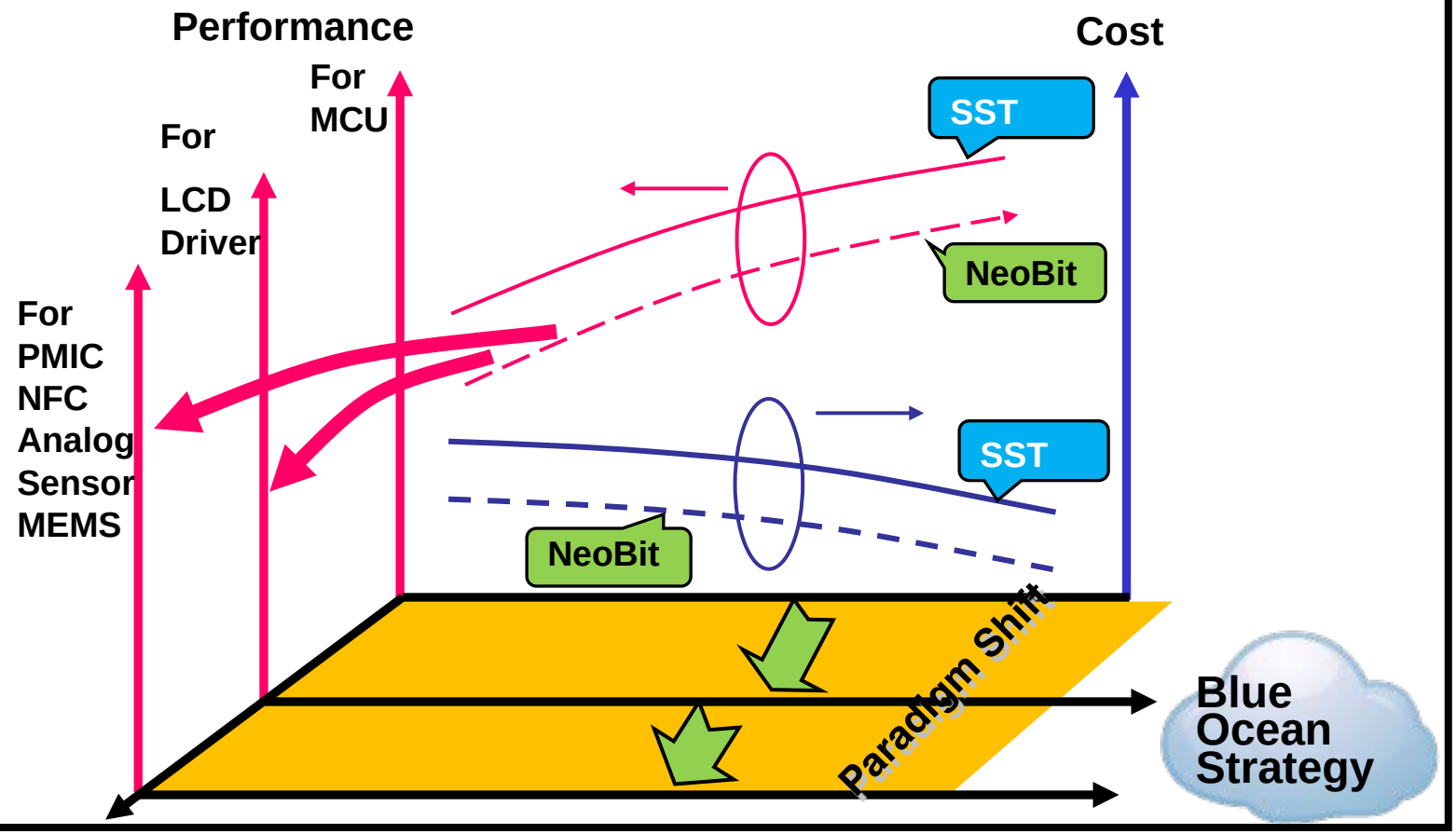


30% more cost reduction

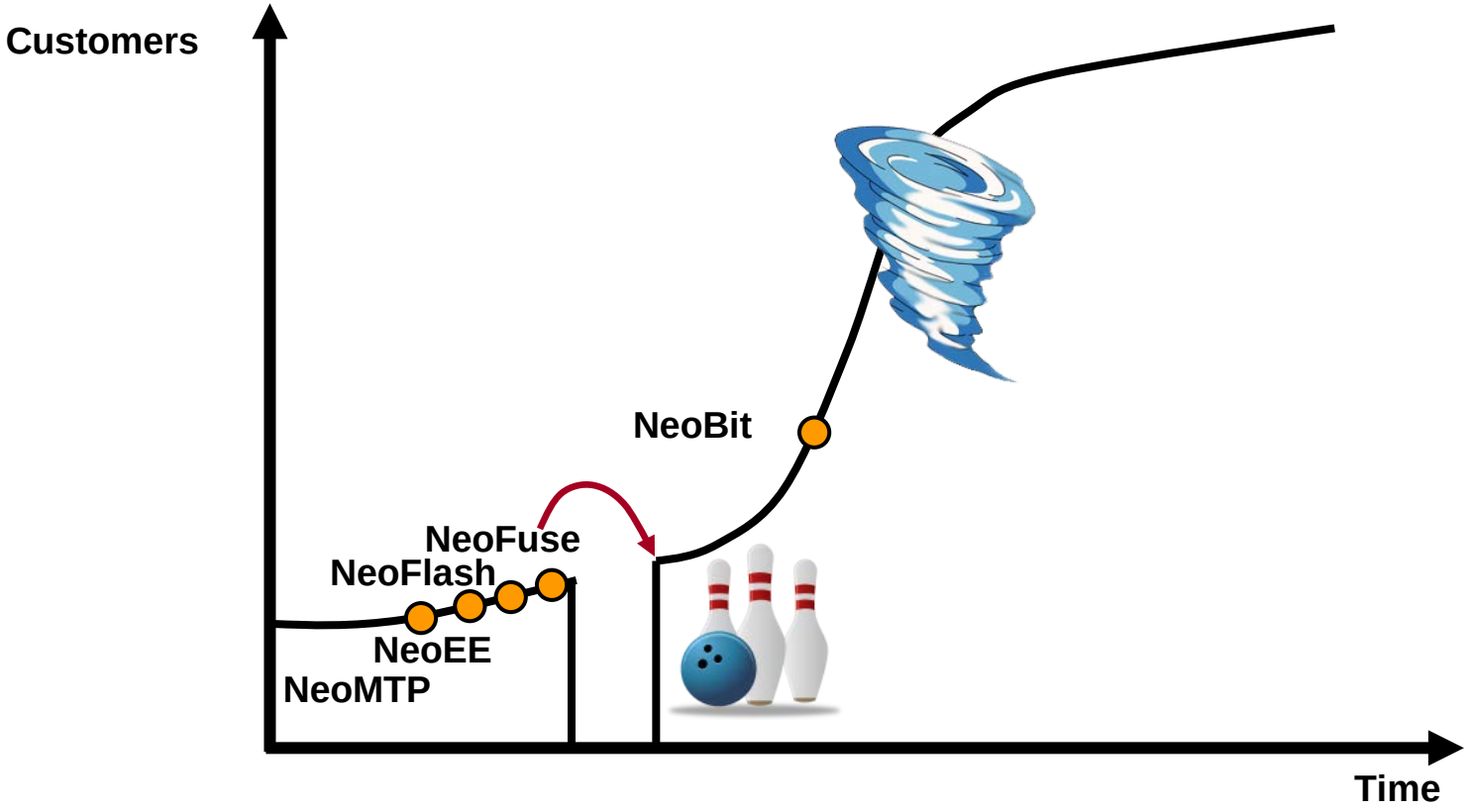
Embedded LOGIC NVM = LOGIC

What We Have Done

- *Innovation, Innovation, and Innovation !*

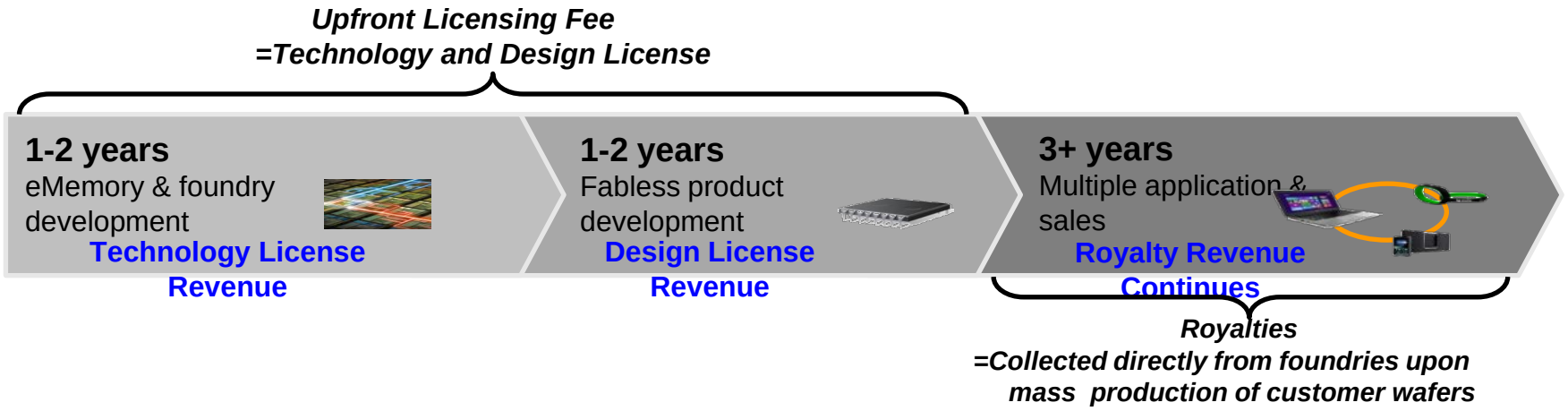


Crossing the Chasm

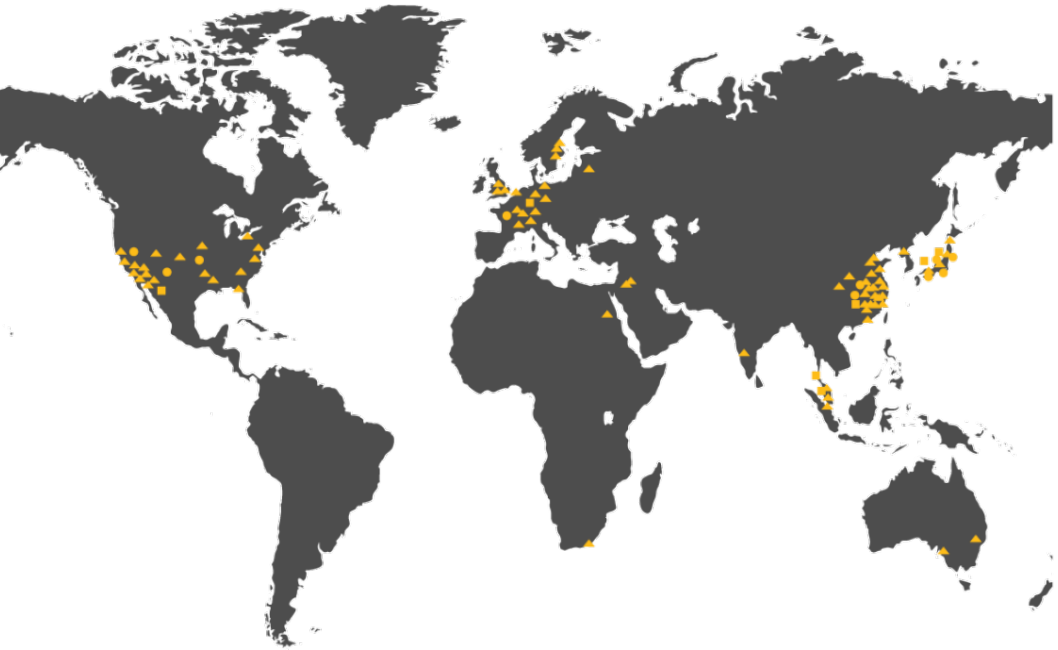


Business Model

- **Founded in 2000. First customer engaged in 2002. Achieved profitability in 2005 and IPO in 2011. The largest logic non-volatile memory IP company, 217 employees (150 R&D).**
- **Since its IPO, the company initiated no new fund raising or bank debt, and has distributed in excess of 100% of earnings in cash dividends.**
- **Growth Indices: 1) No. of on-going technology platforms**
  2) No. of design licenses
  3) Royalty



Worldwide Customers



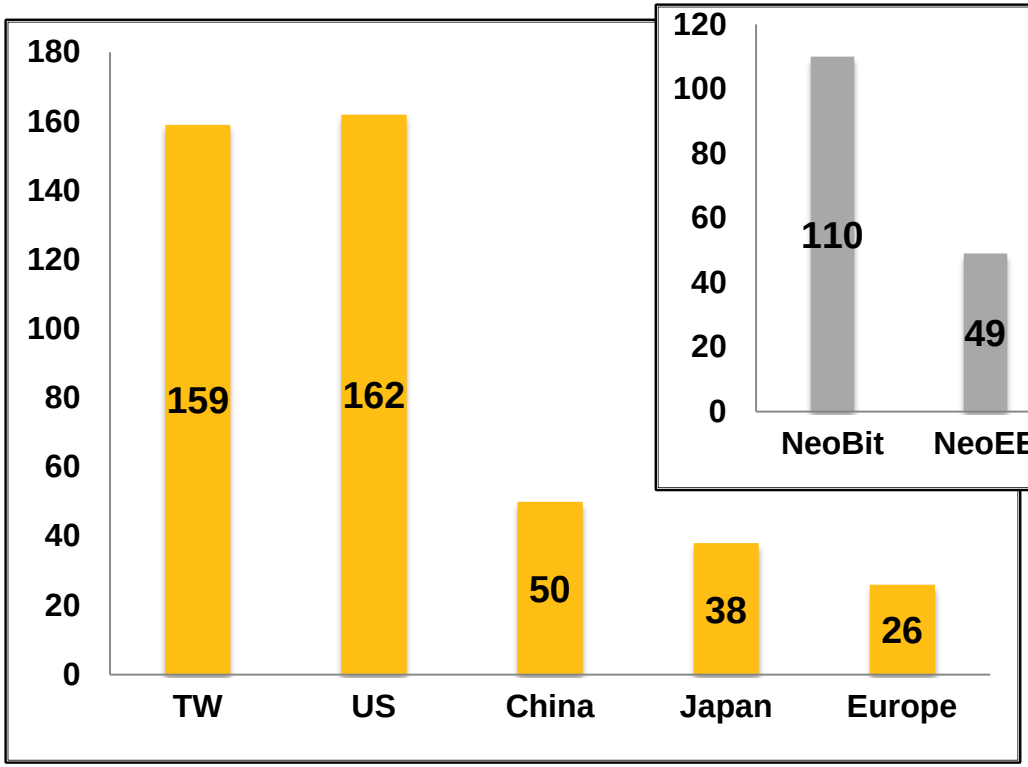
	Taiwan	China	Korea	Japan	North America	Europe	Others
Foundry	5	6	3	2	1	0	1
IDM	0	0	0	8	2	1	0
Fabless	226	331	49	31	168	80	31

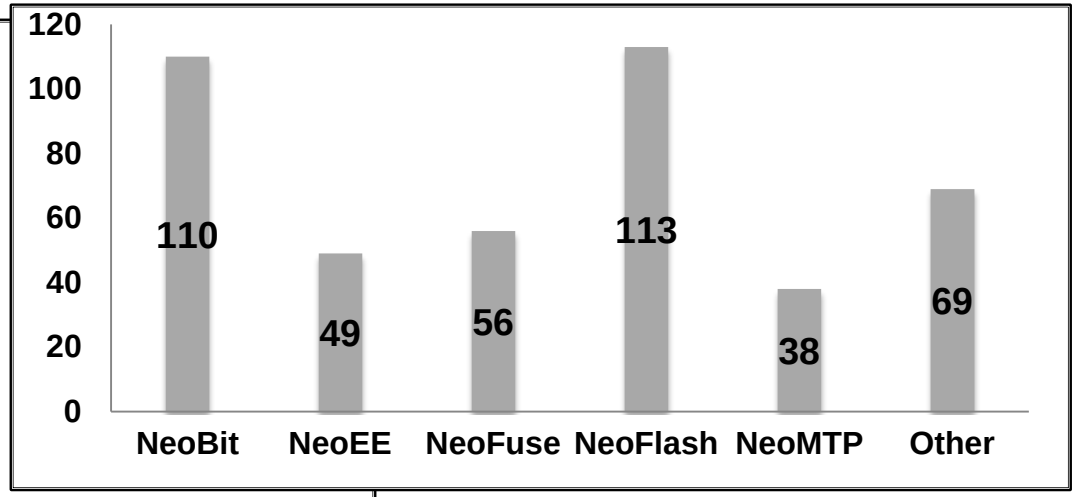
Foundry

IDM

Patent Portfolio

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

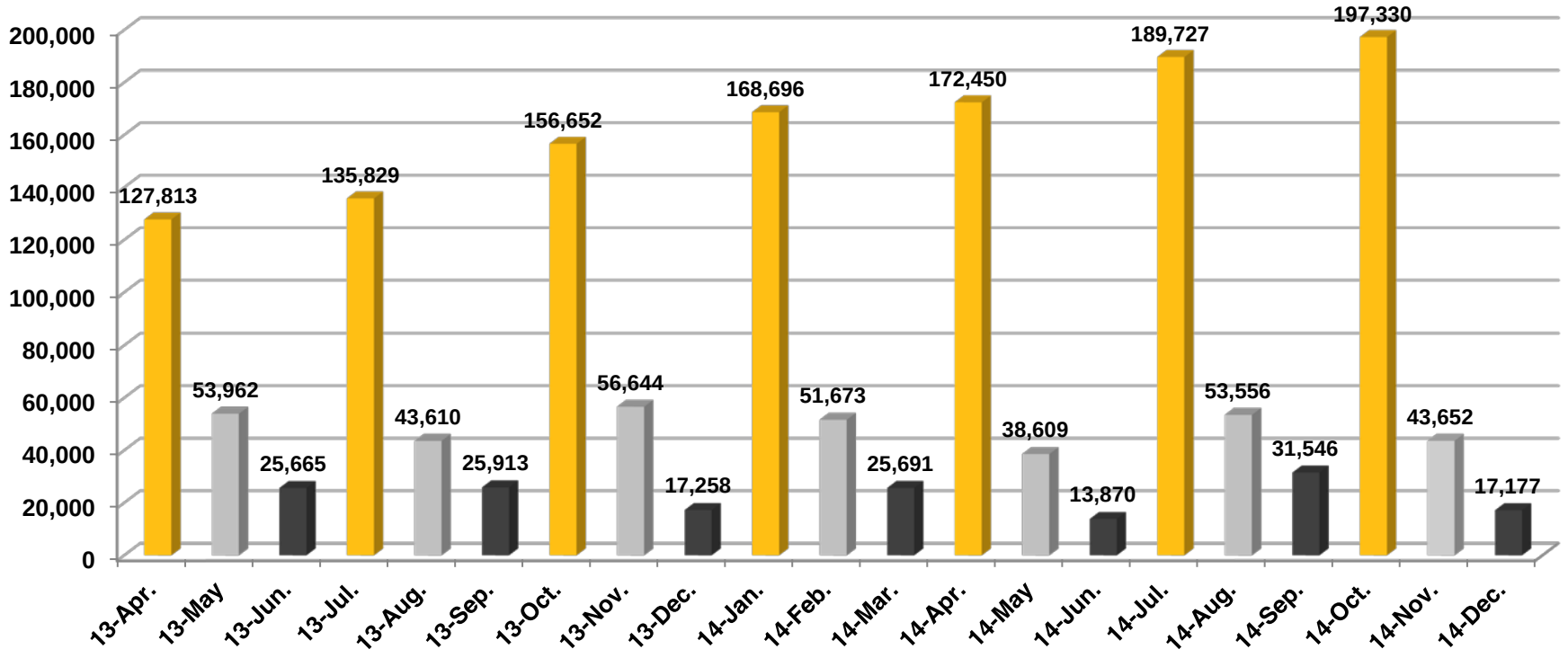




Quarterly Revenue Pattern

- **The quarterly royalty from most of foundries are collected at first month of each quarter and from some other foundries are collected at second month, and none at third month.**

Unit：NTD Thousands



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4Q Revenue Breakdown

Unit: NTD thousands

	4Q14	3Q14	QoQ Growth Rate	4Q13	YoY Growth Rate	1Q-4Q14	1Q-4Q13	YoY Growth Rate
Licensing	51,849	61,981	-16.35%	56,933	-8.93%	246,073	245,688	0.16%
Royalty	206,310	212,848	-3.07%	173,621	18.83%	757,904	562,570	34.72%
Total	258,159	274,829	-6.07%	230,554	11.97%	1,003,977	808,258	24.21%

Unit: Number of contract

		4Q14	3Q14	1Q-4Q14	1Q-4Q13
Technology License		3	6	21	19
Design License	NRE	15	22	82	51
	Usage	99	88	363	342

Financial Income Statement

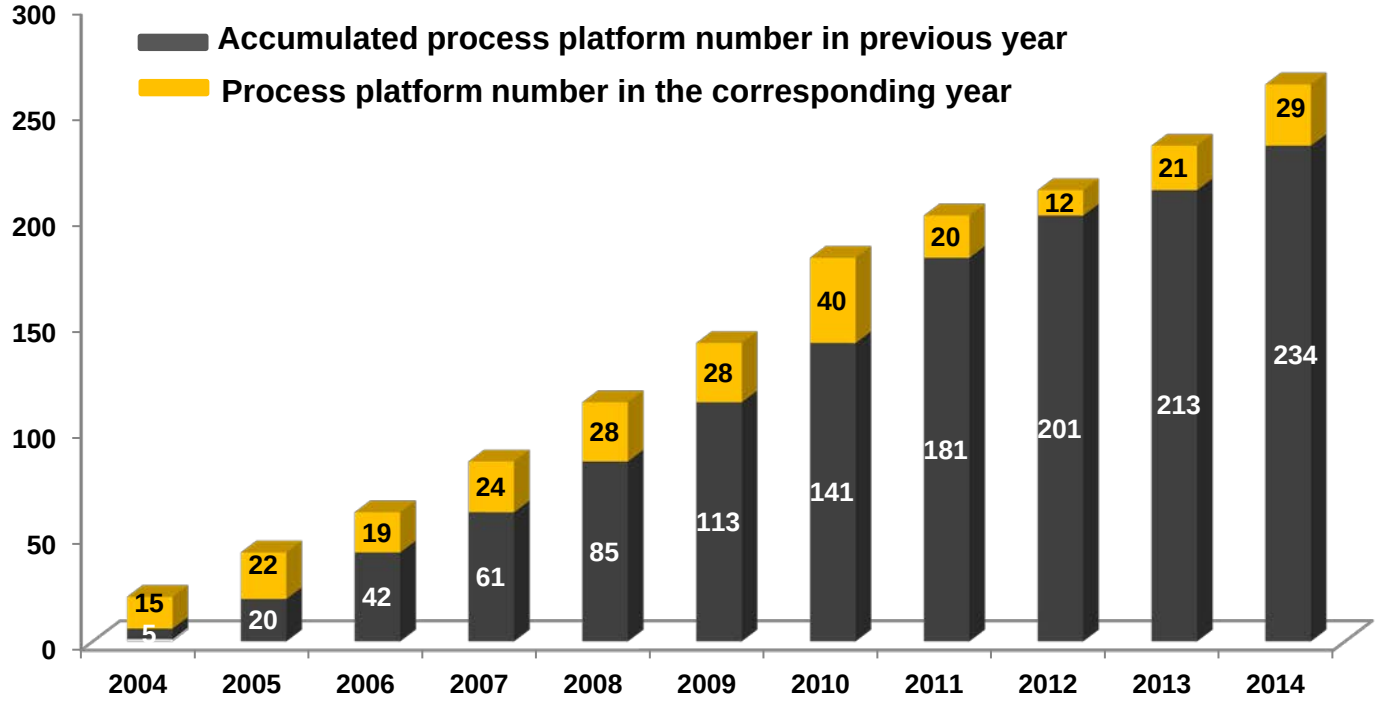
Unit: NTD thousands	3Q14	1Q-3Q14	1Q-3Q13	YoY
Revenue	274,829	745,818	577,704	29.1%
Gross Margin	100%	100%	100%	-
Operating Expenses	135,695	391,820	343,813	14.0%
Operating Margin	50.6%	47.5%	40.5%	+7.0ppts
Non Operating Income	1,852	6,943	654	961.6%
Net Income	124,352	317,673	199,372	59.3%
Net Margin	45.2%	42.6%	34.5%	+8.1ppts
EPS (Unit: NTD)	1.64	4.19	2.66	57.5%
ROE	29.7%	25.3%	17.2%	+8.1ppts

Technology License Statistics

Unit: Number of contract

Year	2012	2013	2014
License number	12	19	21

Note: The 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.



Current Technology Development Platform

- Total (As of 4Q14) : 83
- 32 for NeoBit, 28 for NeoFuse, 2 for NeoFlash, 14 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	11	17	2	32
NeoFuse	1	7	4	9	1	4	2	-	28
NeoFlash	-	-	-	1	-	1	-	-	2
NeoEE	-	-	2	-	1	4	6	1	14
NeoMTP	-	-	-	1	2	2	2	-	7

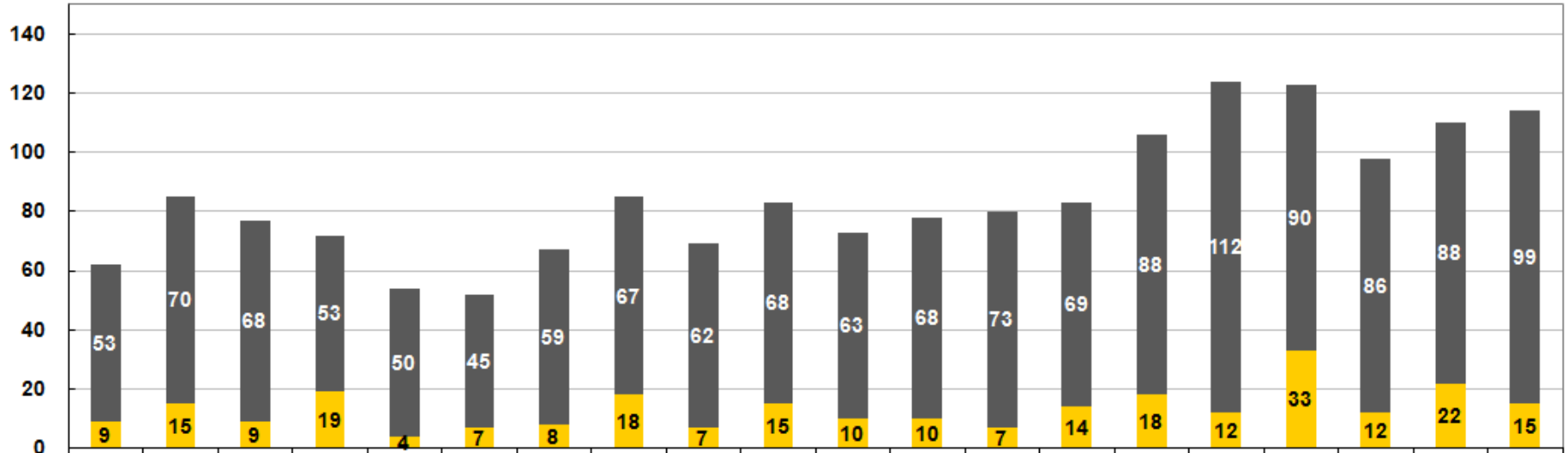
Current Technology Development Platform

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	4	5	OTP, MTP	HV-DDI, HV-OLED, LP
0.13/0.11um	3	6	OTP, Flash	HV-DDI, BCD, Generic
0.18um	0	1	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	26	OTP, MTP	Generic, LP, LL, MR, HV, Green, BCD
0.25um	2	OTP, MTP	BCD
0.35um	1	OTP	UHV

Quarterly Design Licensing (New Tape Out)

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

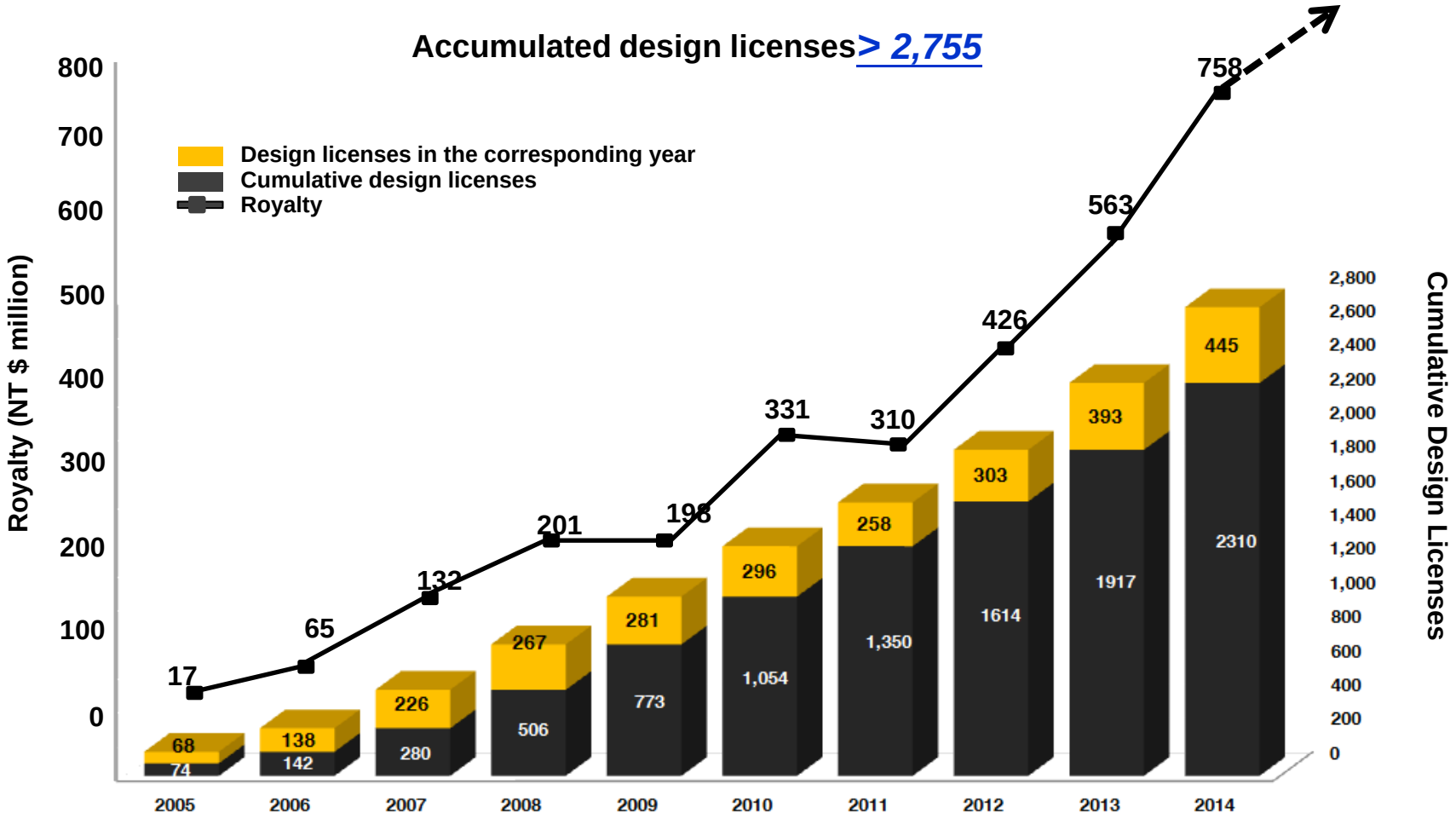


	2010				2011				2012				2013				2014			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
TOTAL	62	85	77	72	54	52	67	85	69	83	73	78	80	83	106	124	123	98	110	114
USAGE	53	70	68	53	50	45	59	67	62	68	63	68	73	69	88	112	90	86	88	99
NRE	9	15	9	19	4	7	8	18	7	15	10	10	7	14	18	12	33	12	22	15

Usage：**Usage of pre-qualified and verified IP (charged by per product tape out or annual package), the cycle time from design implementation to royalty payments for mass production is faster, typically less than one year.**

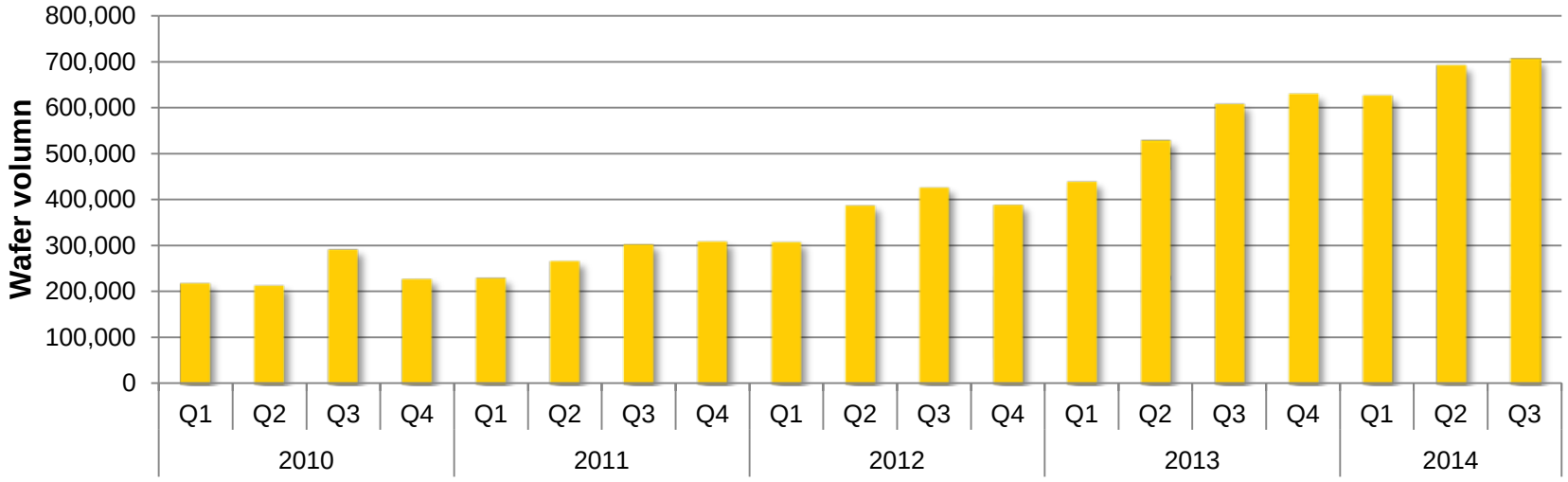
NRE: NRE covers the customization of IP that must undergo new verification or qualification. It typically requires 1 to 1.5 years before resulting in royalty revenue.

Accumulated Licenses Drive Future Royalties



note 1: Due to the 2009 recession, royalty income was down annually 1.5%.
note 2: Pre-payment of royalty fees by a single customer contributed to 2010 annual growth of 67%, causing a drop of 6.3% in the following year, 2011.
note 3: CAGR for 2009-2013 was 30%.

Wafer Production Volume



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%

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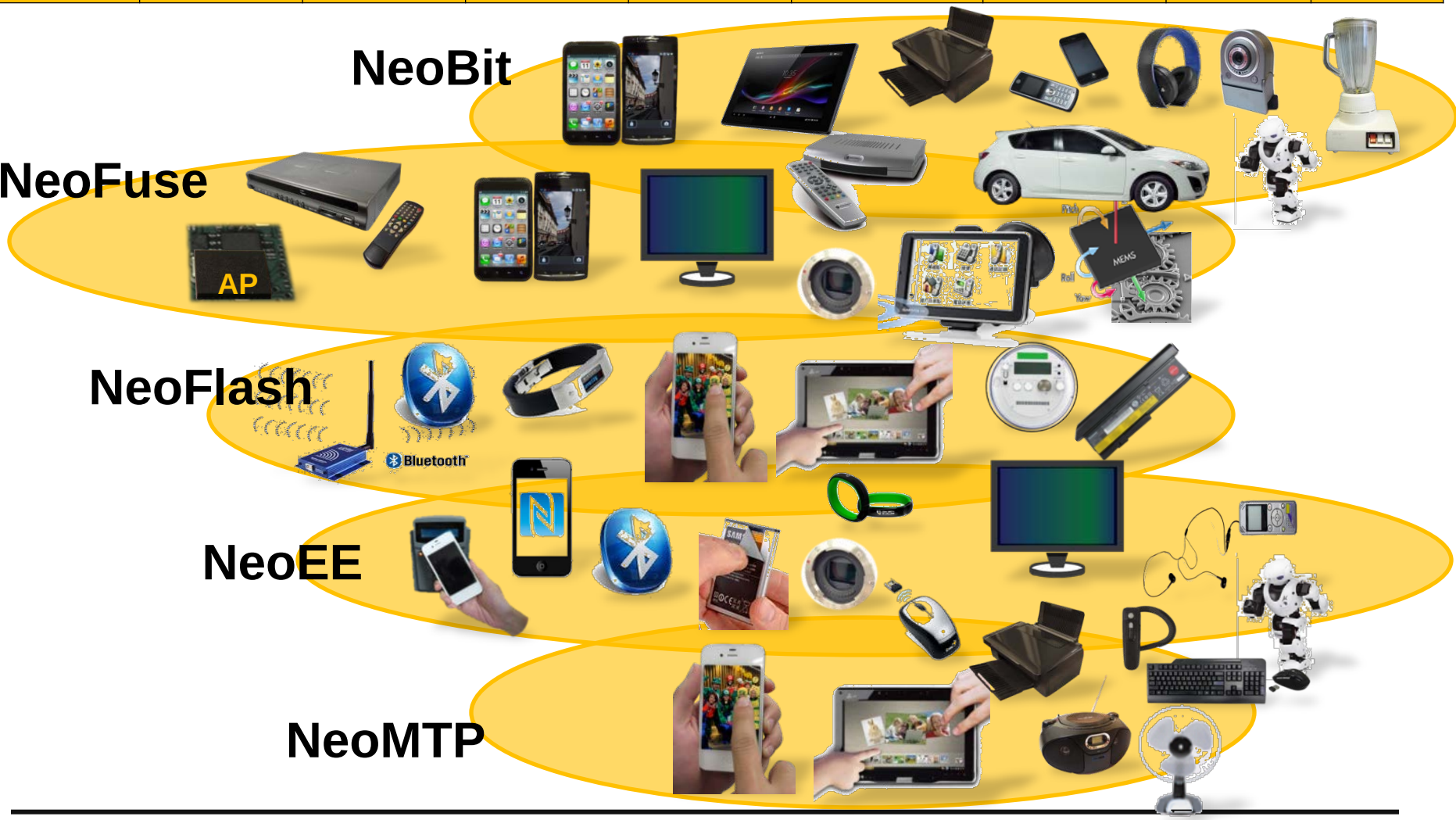
Applications by Technology

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

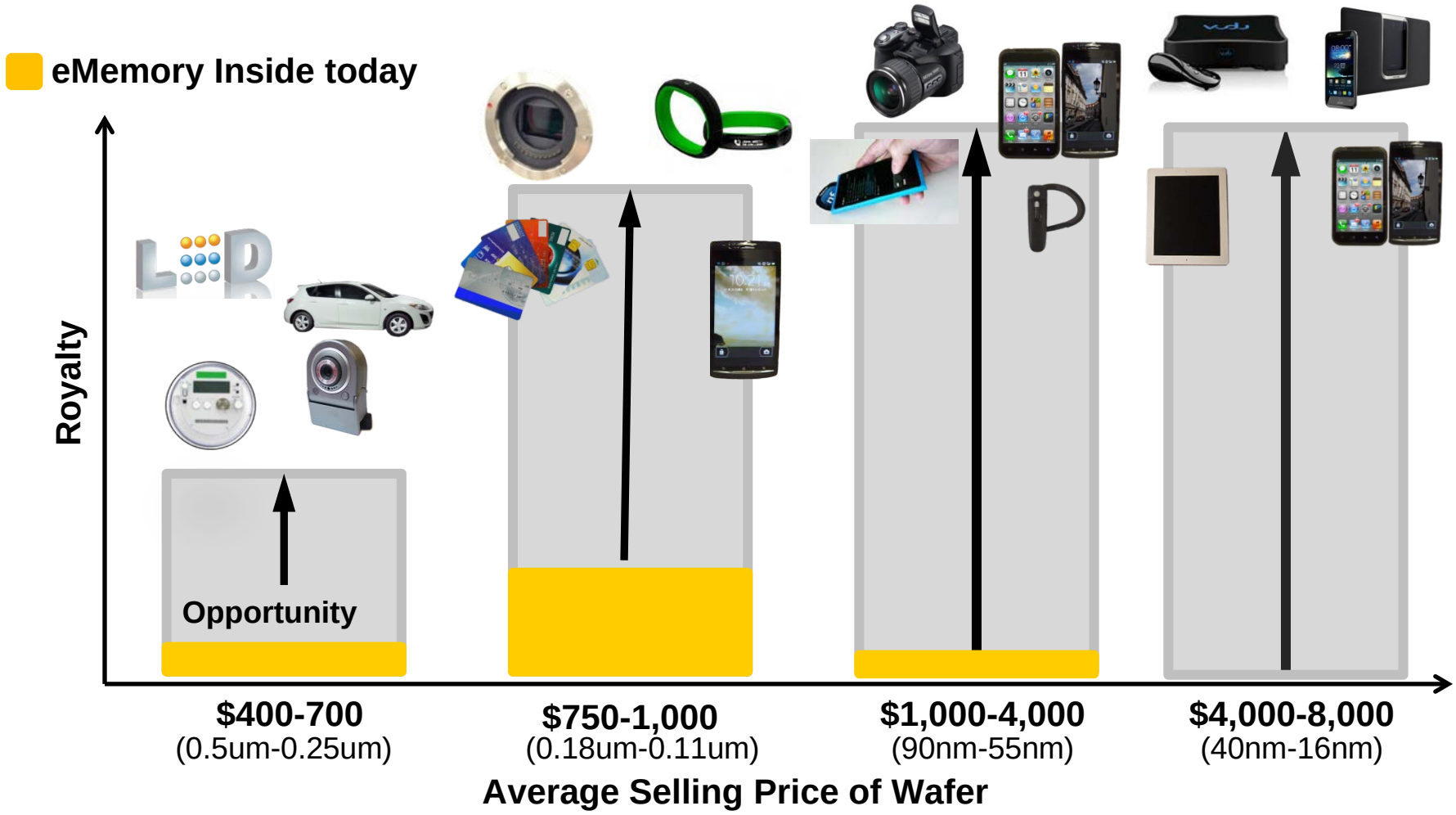


eMemory's NVM Technologies

- **Logic NVM portfolio offers one-stop-shop solution.**
  - › Compatible to any process
  - › Robust structure
  - › Low process cost
  - › Competitive macro sizes
  - › Easy integration
  - › Easy porting

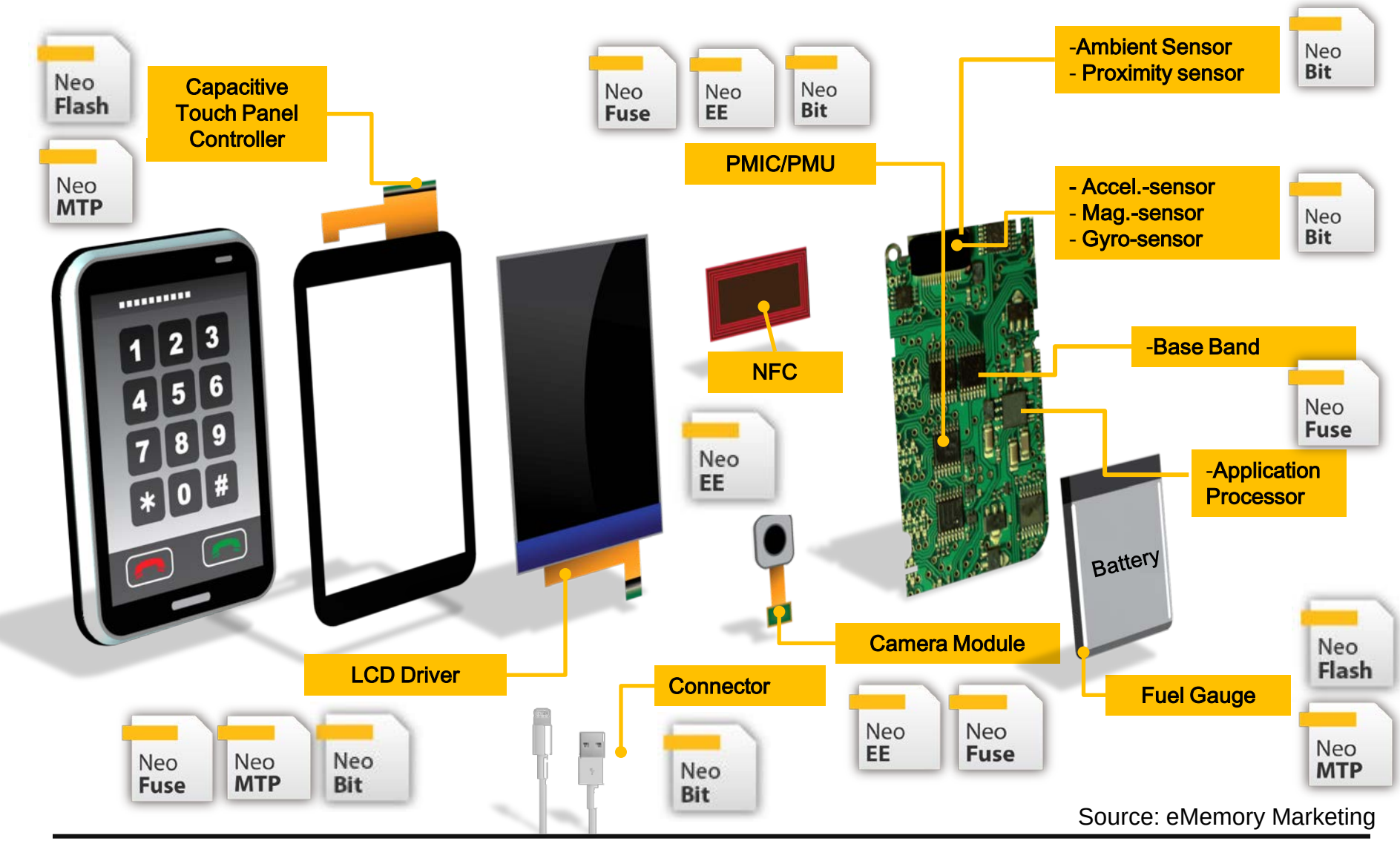
eMemory's NVM Technology	OTP		MTP		
	NeoBit	NeoFuse	NeoFlash	NeoEE	NeoMTP
Product Type	OTP	OTP	Flash	EEPROM	MTP
Endurance (Cycles)	10	10	1K~10K	10K~100K	1K~10K
Additional Mask Steps	0	0	2-3	0	0
Technology	Floating gate	Anti-Fuse	SONOS	Floating gate	Floating gate
Scalability	Simple	Simple	Simple	Simple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

Opportunity at all Price Points



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

eMemory IP in Smart Phone



Source: eMemory Marketing

3Q14 Wafer Demand by IC Type

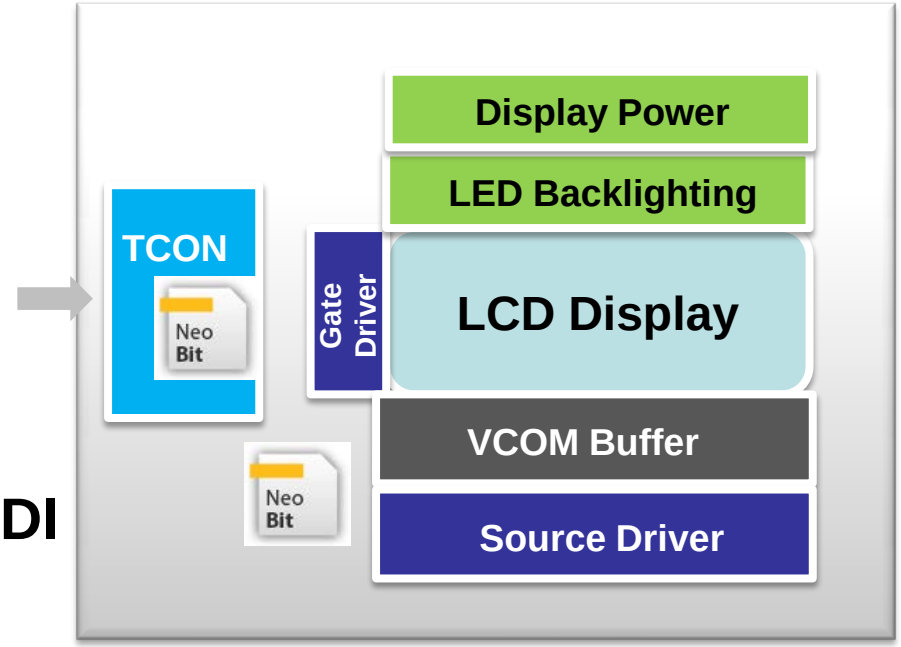
IC Type	Equ. to 8-inch wafer (K)
AP	4964
PMU	4756
CIS sensor	4226
Fingerprint	4000
Smart card controller	3000
Base Band	2935
LCD driver (with TCON)	2013
Gauge IC	627
Touch panel controller (C)	556
Connectivity	395
STB controller	335
TV controller	327
Wifi controller	245
LED driver	243
DC-DC/AC-DC	176
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

Advanced LCD Driver ICs

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

I/F
(LVDS, MIPI,…)

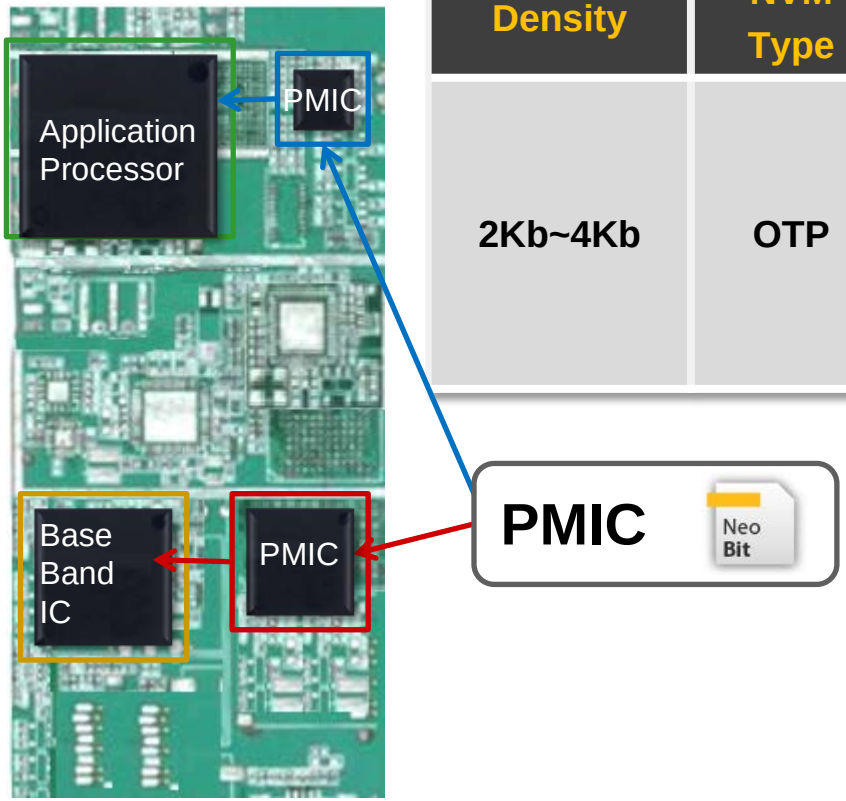


DDI

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

Power Management ICs for Baseband and Application Processor

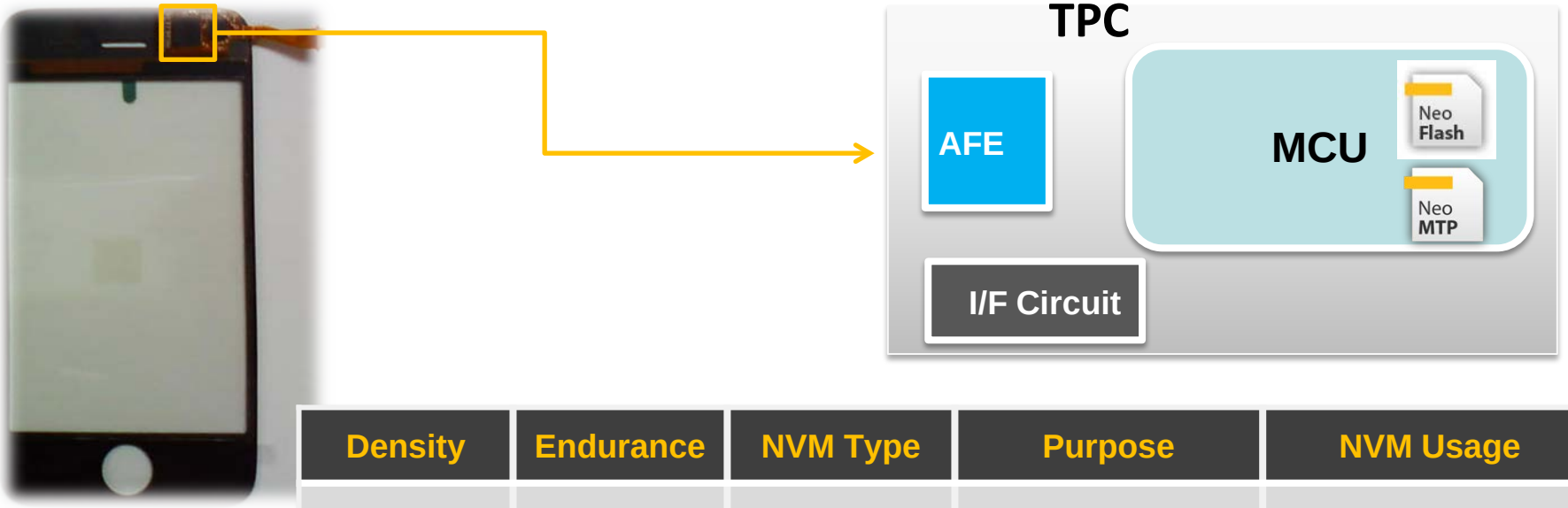
Process Technology : Advanced 0.25um BCD/ 0.18um BCD/ 0.13um BCD
Mature 0.18um/0.16um/0.152um Logic



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

Touch Panel Controller ICs

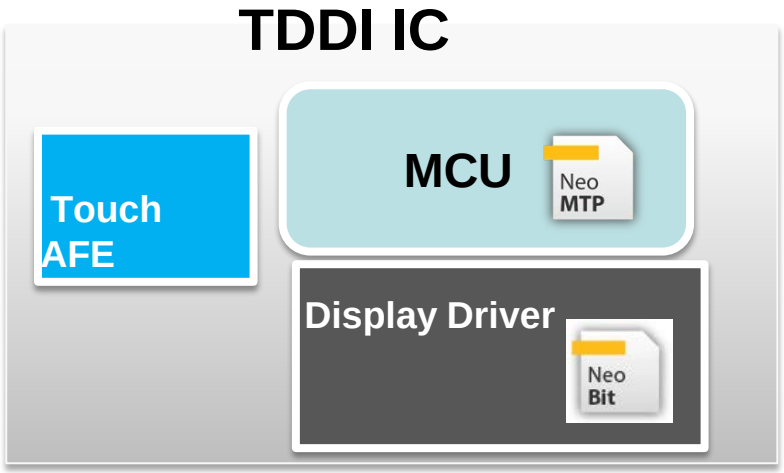
Process Technology : 0.16um HV/0.11um G



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

In-Cell Touch Panel Controllers ICs

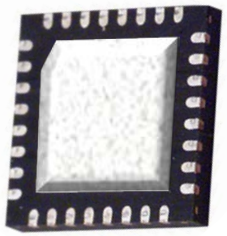
Process Technology : 0.11um HV/80nm HV/55nm HV

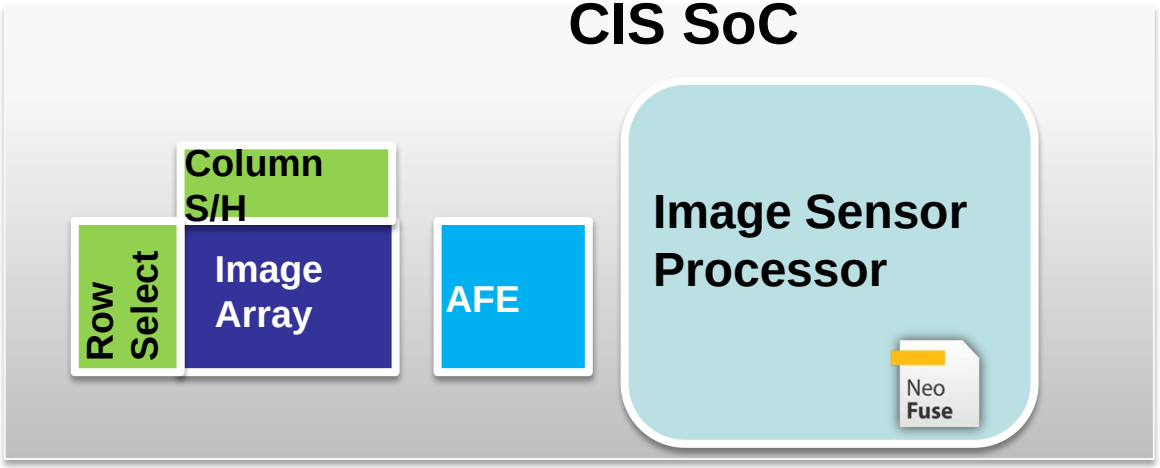


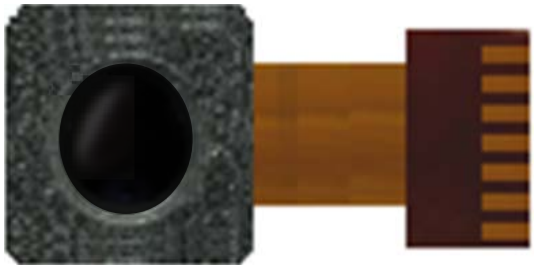
Density	Endurance	NVM Type	Purpose	NVM Usage
2K8~4K8	1	OTP	Trimming	Accuracy
			Code Storage	Gamma Table
16K8~32K8	<1000	MTP	Code Storage	Touch F/W Code
			Parameter setting	Performance Optimization

CMOS Image Sensor

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



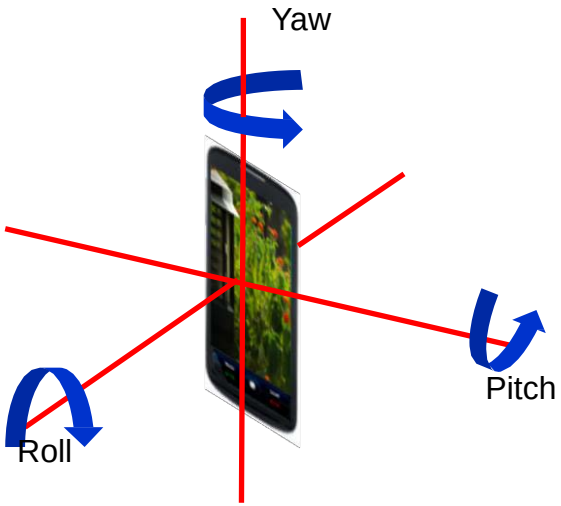


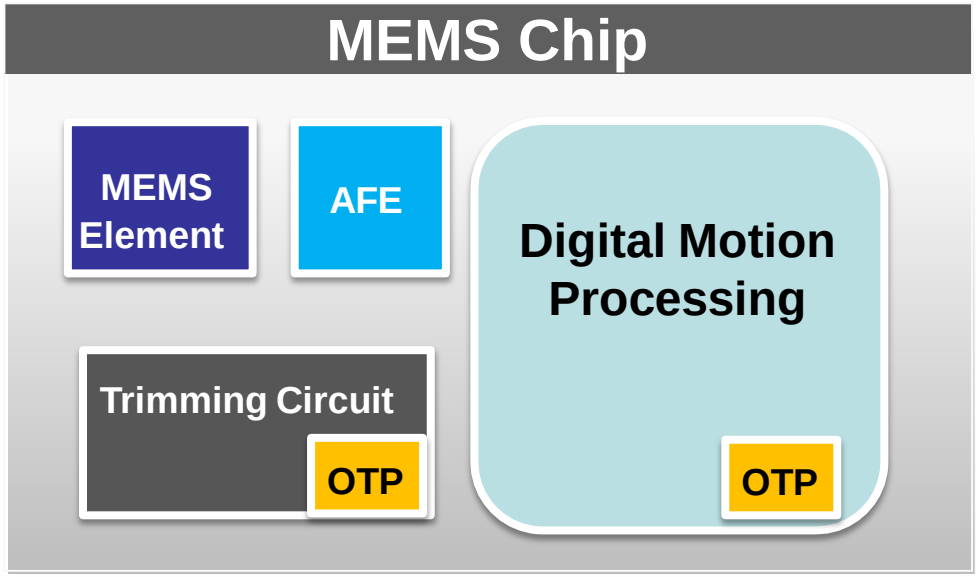


Density	Endurance	NVM Type	Purpose	NVM Usage
2Kb~4Kb	1	OTP	Identification Setting	Product Code
			Parameter Setting	Start-up Initial Setting
32K8	1	OTP/ROM	Code Storage	Boot Load

MEMS

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





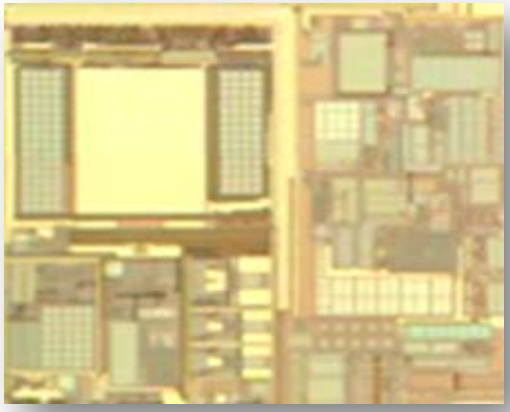
Density	NVM Type	Purpose	NVM Usage
2Kb~4Kb	OTP	Trimming	Factory trimming
		Parameter Setting	Signal filtering
		Code Storage	Geometric computation

Security & Protection

Authorized Product

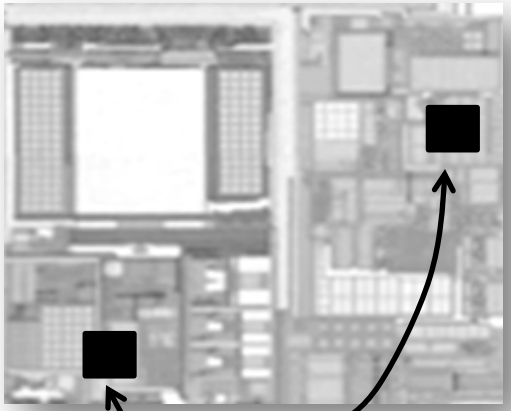
reverse copy

re-produce



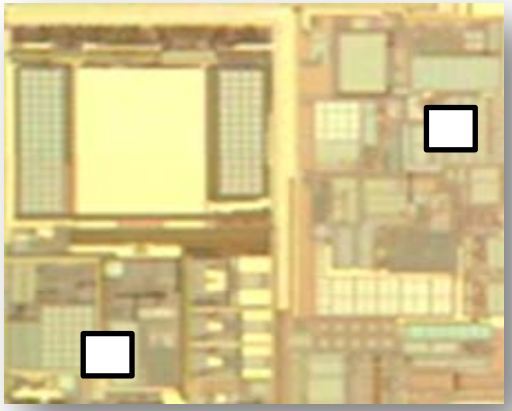
Fake Product

without protection



reverse copy

re-produce

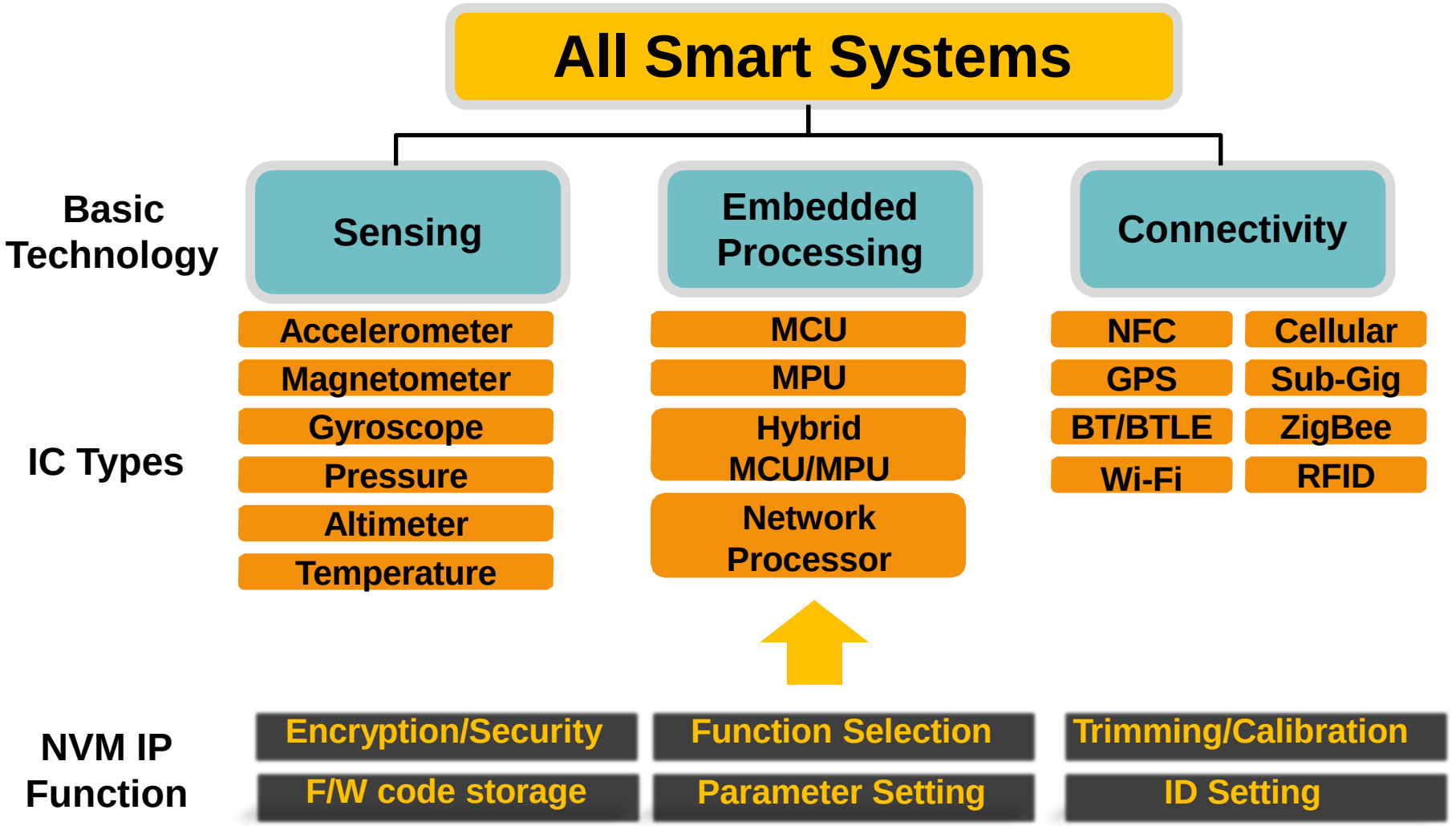


with protection

Security IP/Code by Authorized Use

Can NOT Work w/o Security IP/Code

NVM IP Demand in IoT

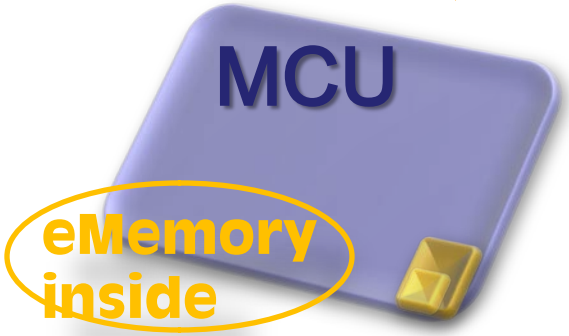


Replacement of Embedded Flash for Competitiveness Improvement

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

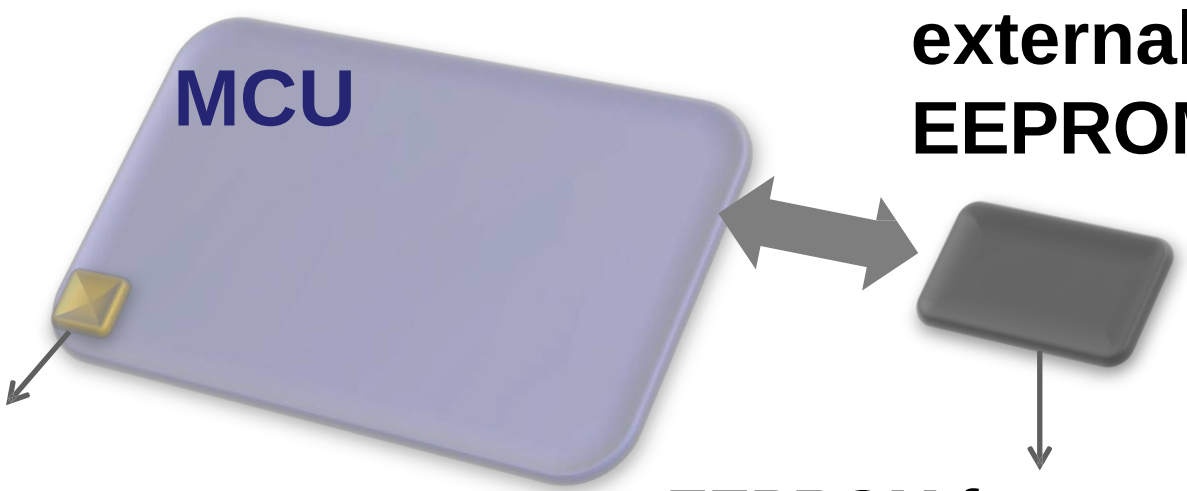
30% more cost reduction

wafer cost & testing time



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

MCU Applications with EEPROM

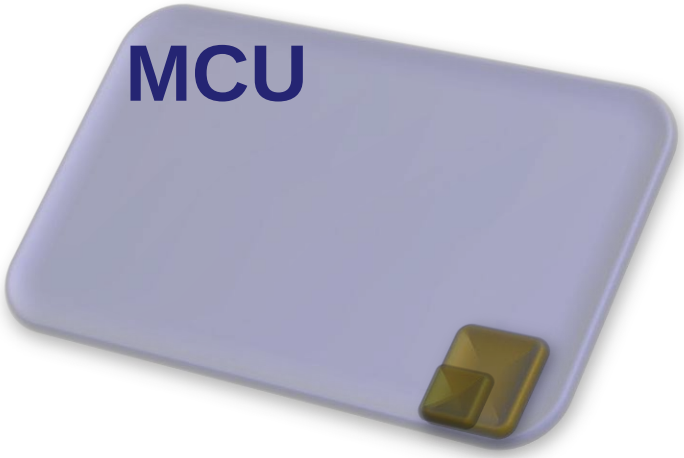


One-time storage for ID, trimming, encryption…

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**

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.

Future Outlook

- We foresee sustainable growth momentum in the coming quarters.
- Our penetration into advanced technology nodes is accelerating.
- The needs for low cost, low power and increased security are accelerating the adoption of eNVM in a diverse range of IoT-related applications.

Q & A

ememory

Embedded Wisely, Embedded Widely