

# 晶心科技股份有限公司 2018年第一季法人說明會

Driving Innovations™



股票代碼: 6533  
2018/05/29

# 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但不限於：天氣、競爭性產品及其定價的影響、產業及市場對半導體產品之供給及需求移轉、新產品大量量產之能力、技術急遽演進、半導體產業景氣以及整體經濟環境之變化。

# 簡報大綱

- 公司簡介
- 營運成果
- 產品應用
- 新產品及生態系統
- 近期獲獎
- 總結



# 公司簡介

## 晶心亮點

- 2005年3月設立於台灣新竹科學園區。
- 核心研發團隊來自於**AMD, DEC, Intel, MIPS, nVidia, and Sun**。
- 員工人數達150人；80%為工程師。
- **EETimes**評為全球60家最具潛力半導體新創公司。**(2012)**
- 獲得**TSMC 2015年新的 IP OIP Award**。
- **RISC-V基金會**創始成員。**(2016)**
- 股票於台灣交易所掛牌上市。**(2017年 3月)**

## 晶心任務

- 創新架構高效能/低功耗嵌入式處理器。

## 晶心利基

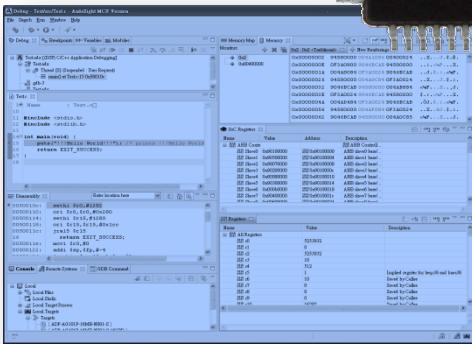
- 智能及環保之電子設備
- 雲端應用, 人工智慧及物聯網

# 營運成果

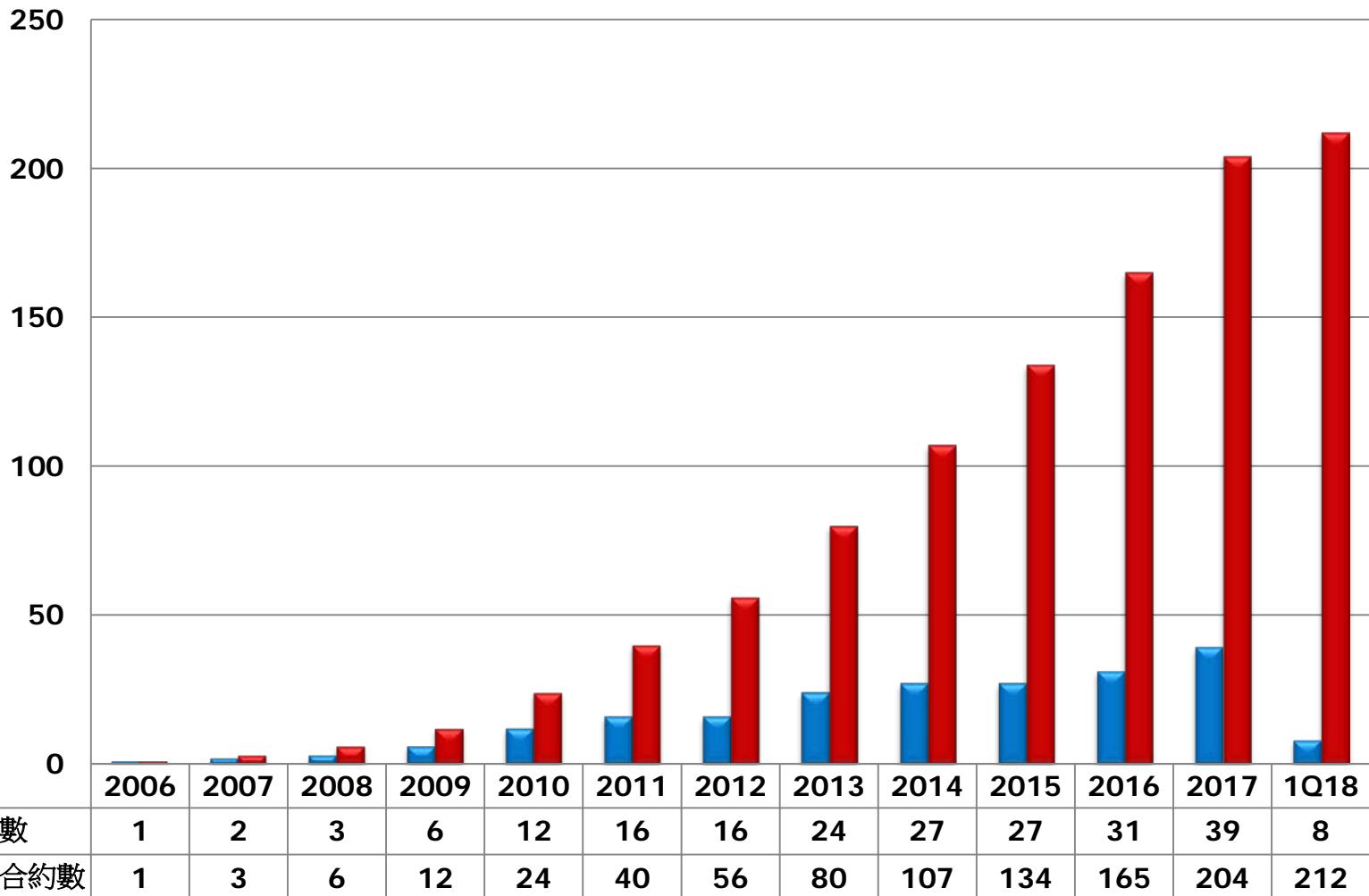
# 重要里程碑



- 全球授權客戶超過 **148家**
  - 台灣, 大陸, 韓國, 日本, 歐洲, 及美國
  - 授權合約超過**212份**
- AndeSight™ IDE:
  - 安裝次數超過 **13,800次**
- 生態系統:
  - 合作夥伴超過 **122 家**
- 嵌入晶心處理器之系統晶片累計出貨量
  - 達 **26億顆** (截至2018年第一季)



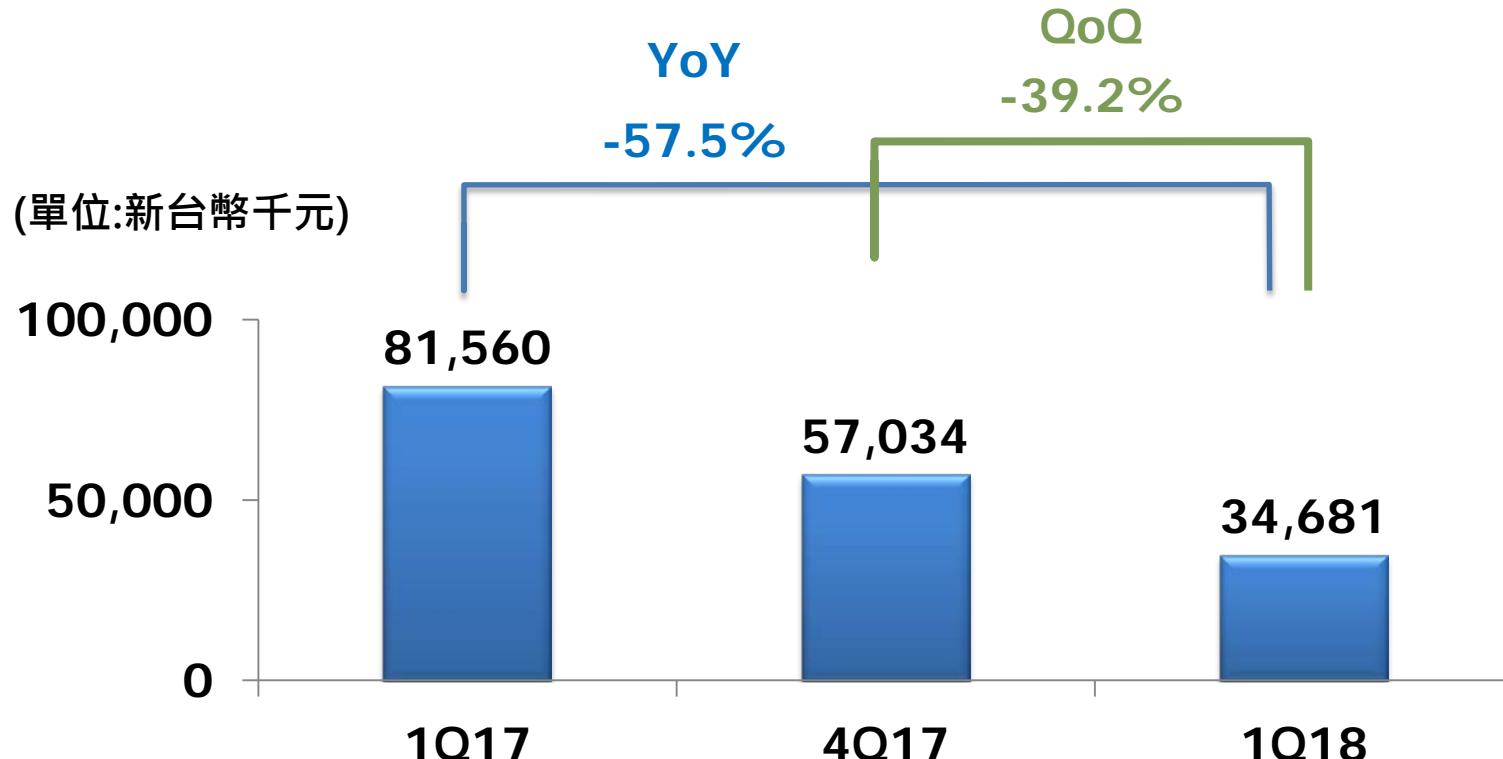
# IP 授權合約數穩健成長(截至1Q18)





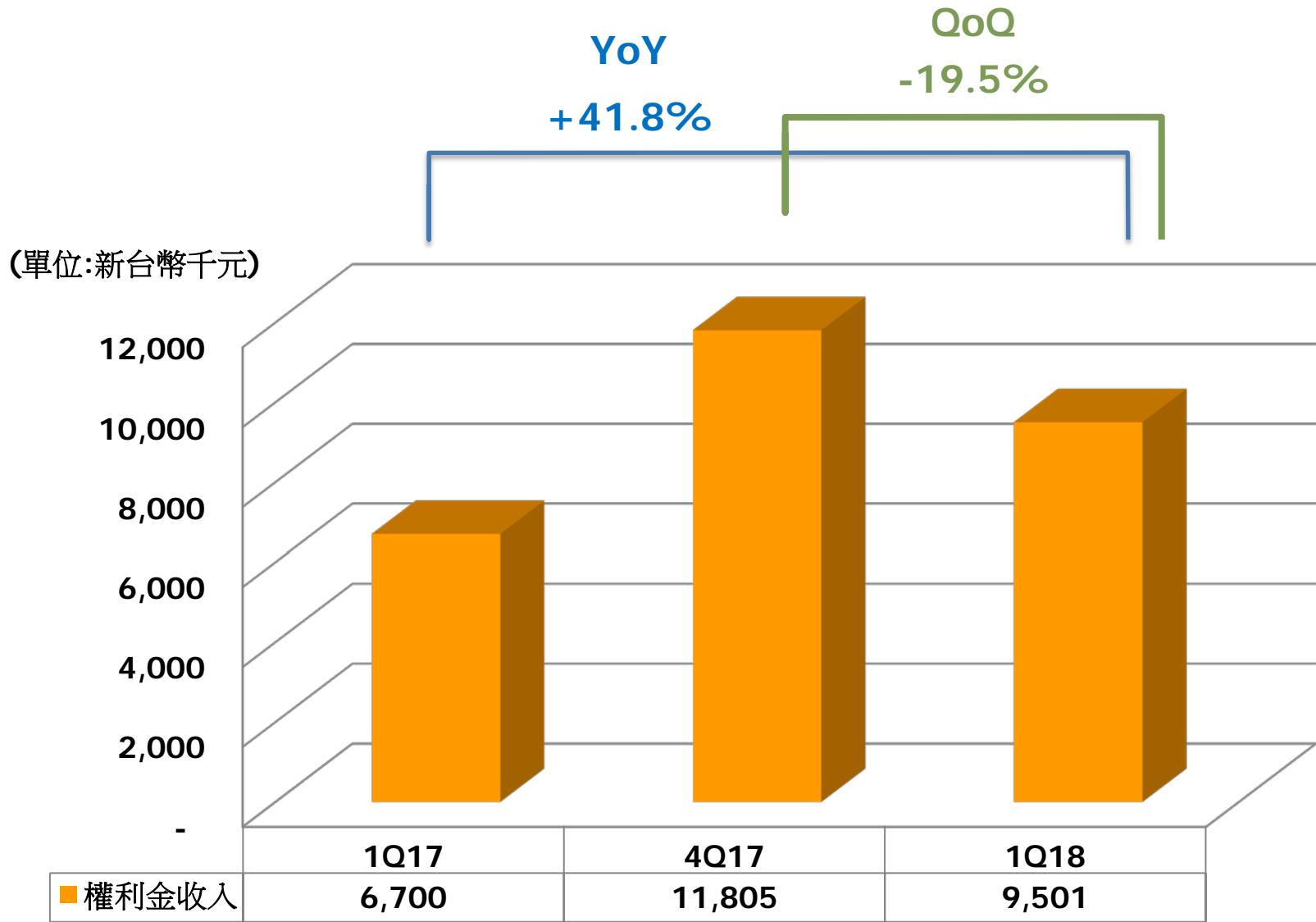
# 2018年第一季營運績效

- 2018第一季合併營收: NT\$34.68百萬元
- 年營收成長率(YoY): 減少57.5%
- 季營收成長率(QoQ): 減少39.2%





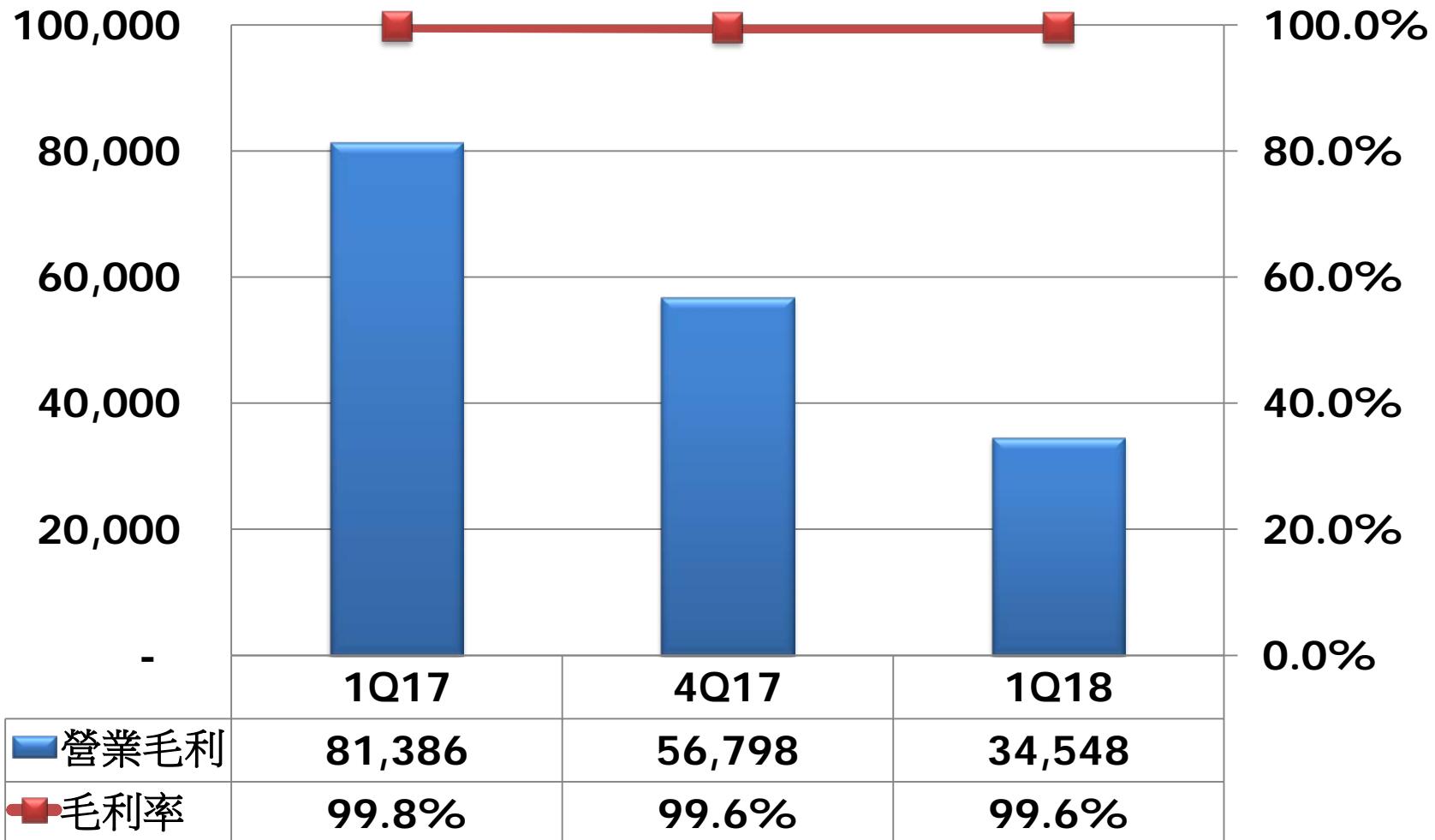
# 2018年第一季權利金收入



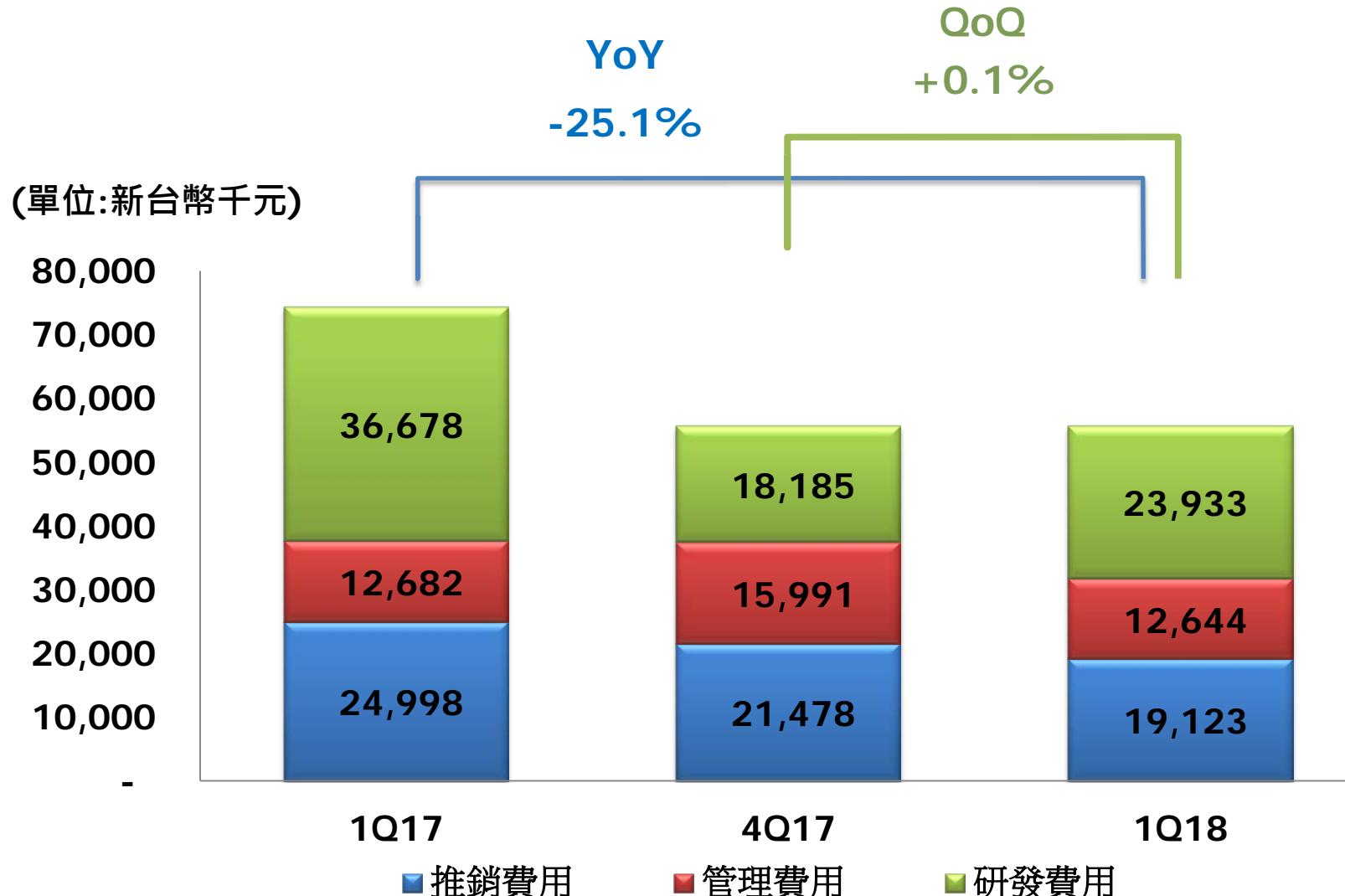
# 營業毛利與毛利率



(單位:新台幣千元)

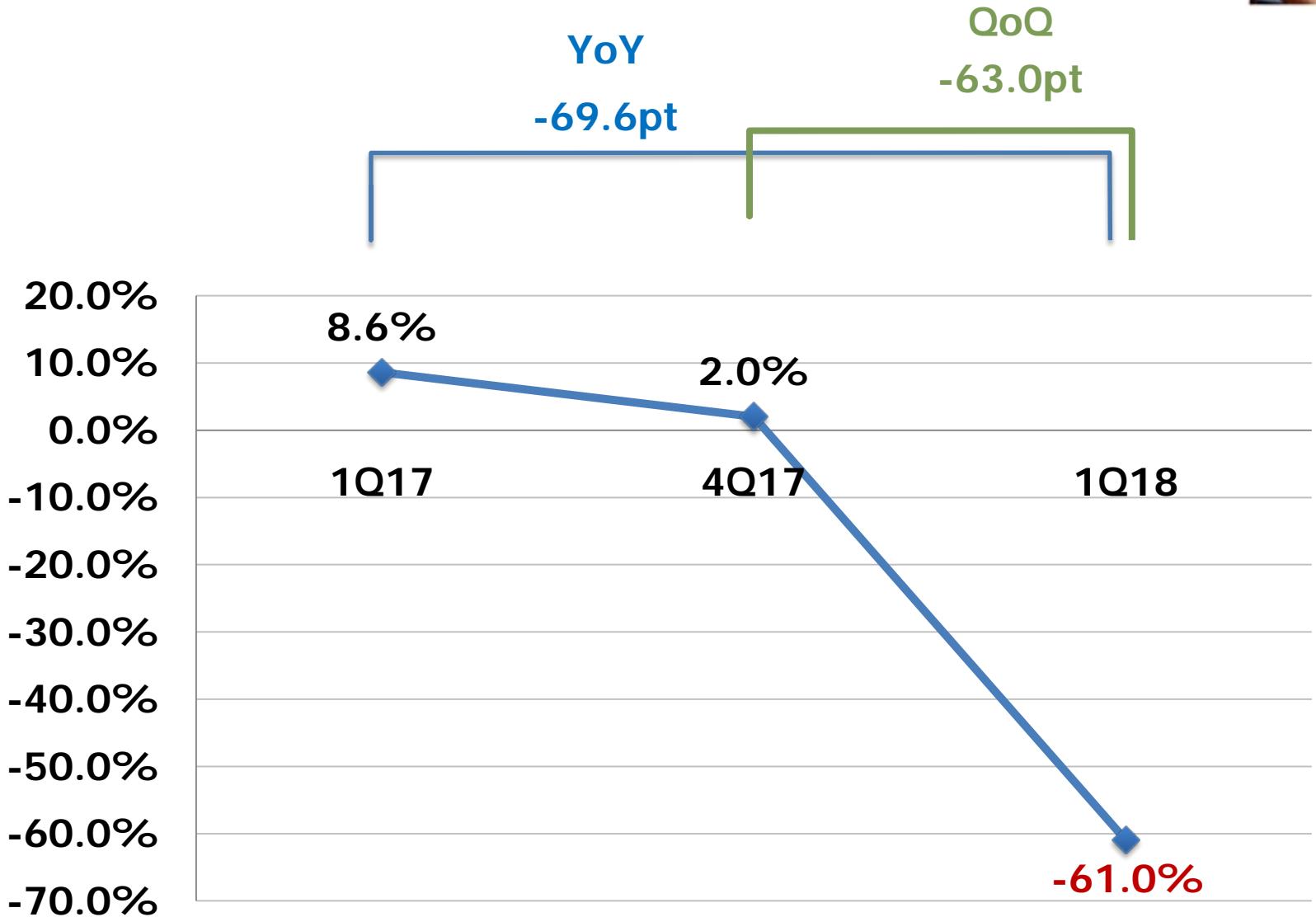


# 營業費用



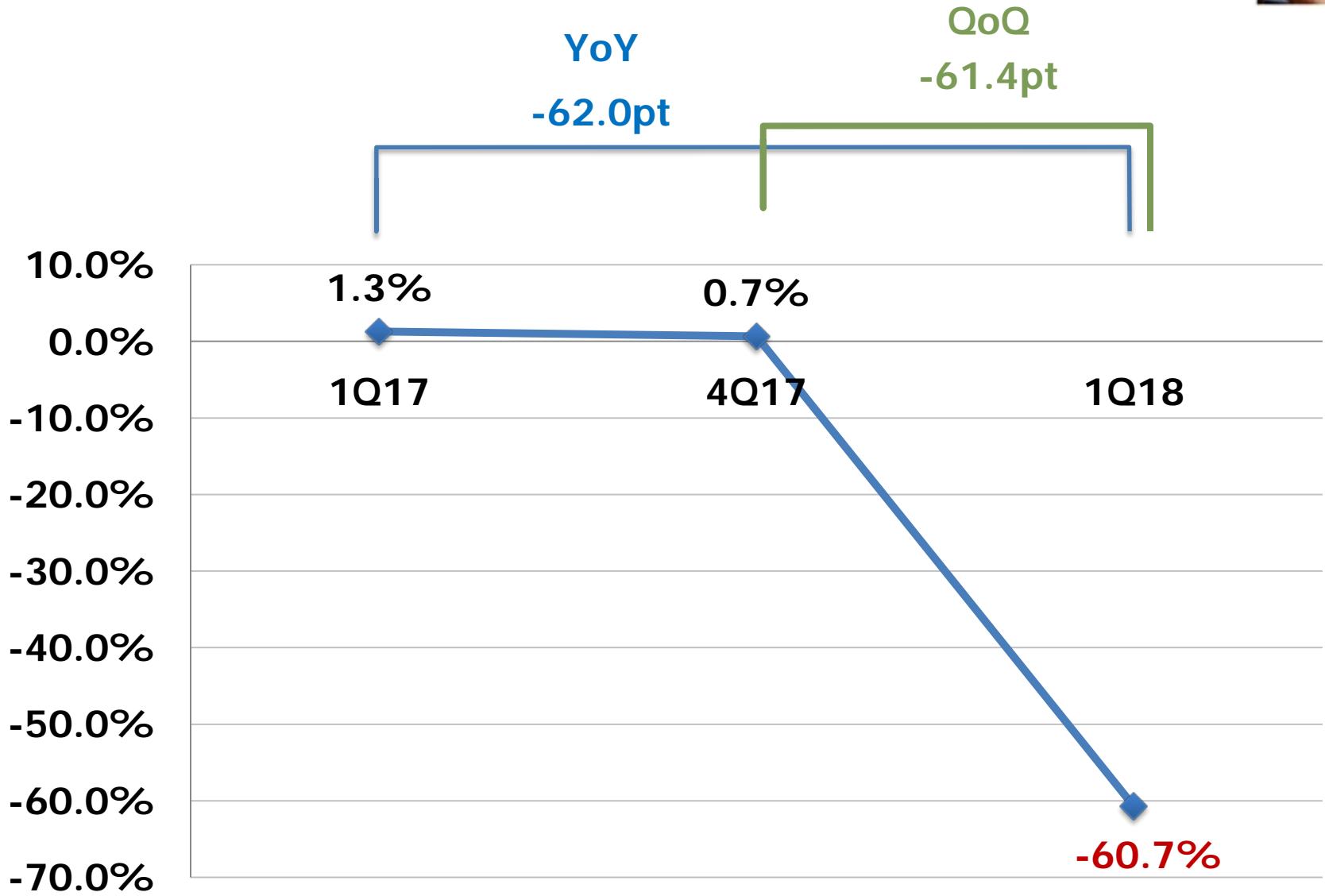


# 營業利益率



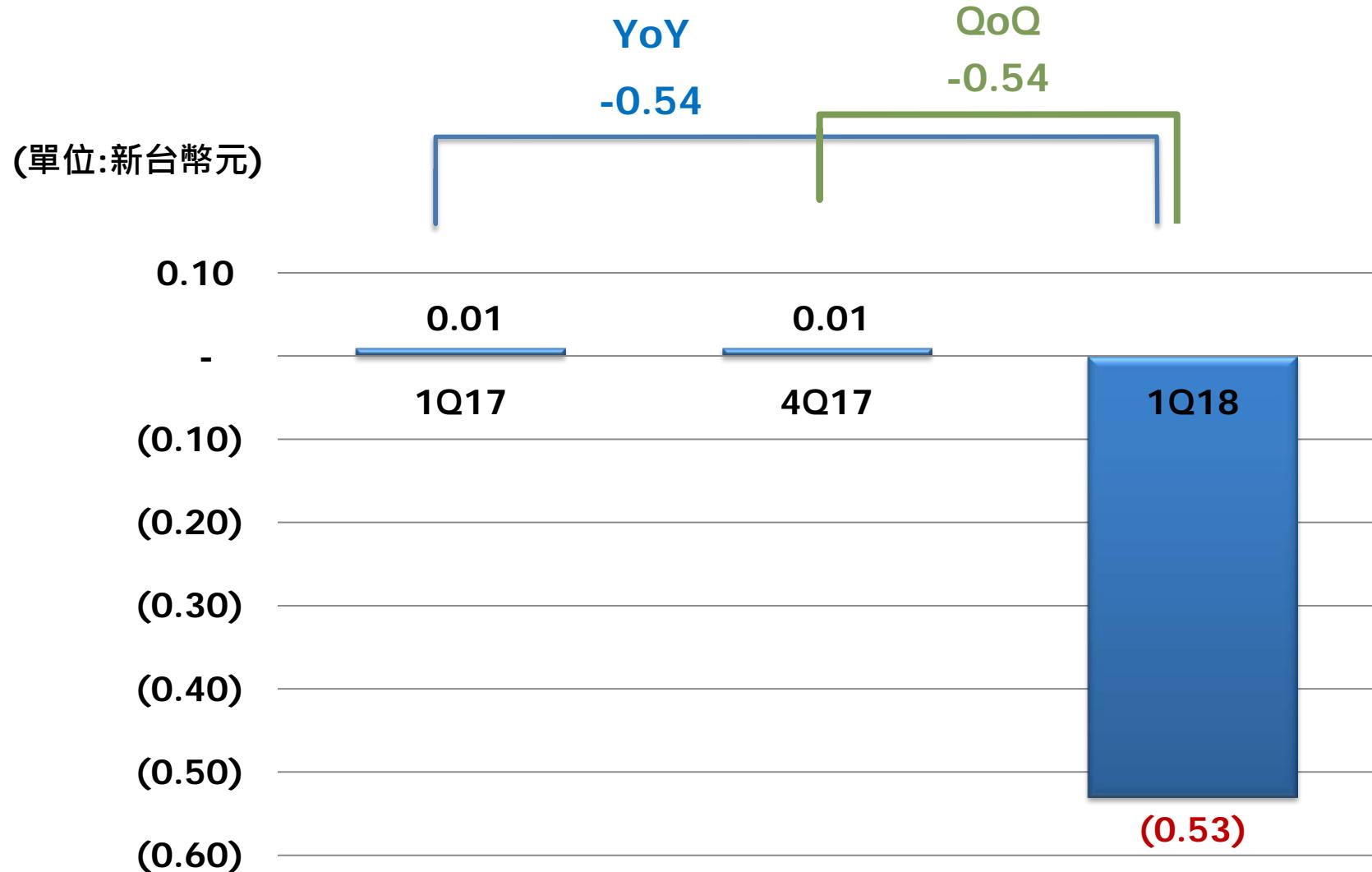


# 合併淨利(損)率





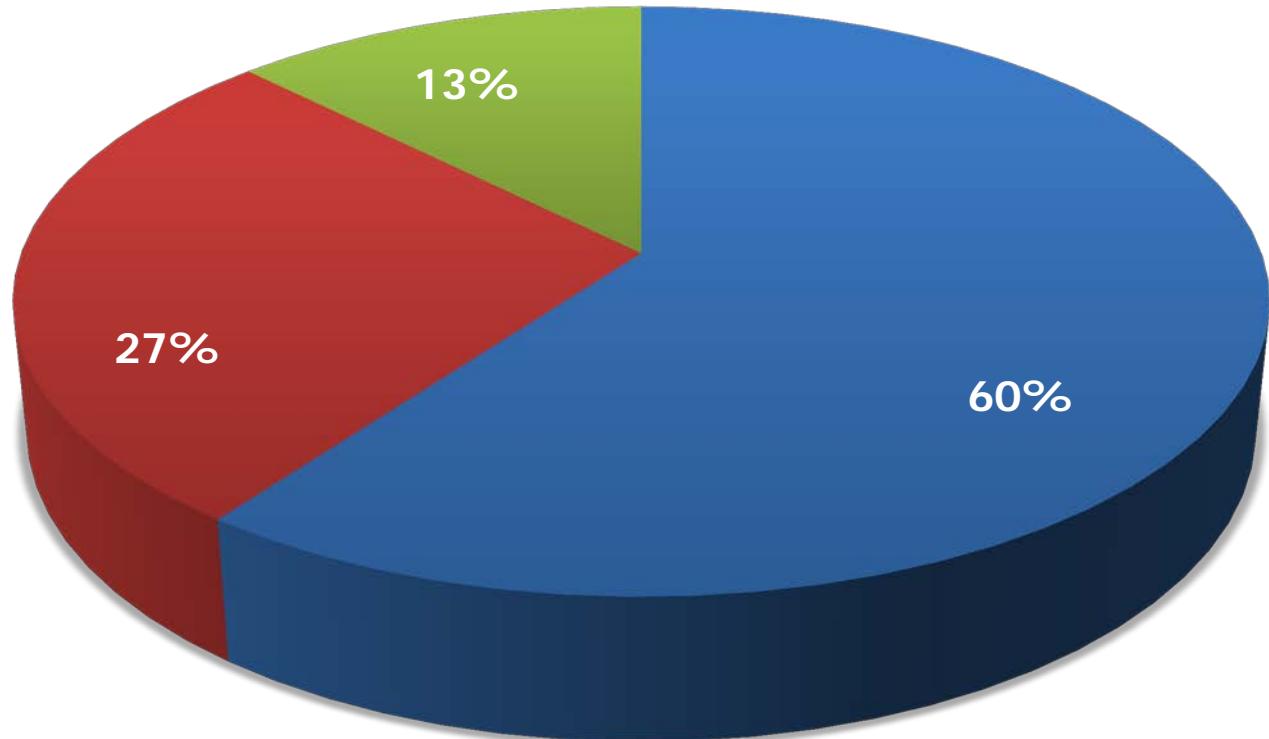
# 每股盈餘



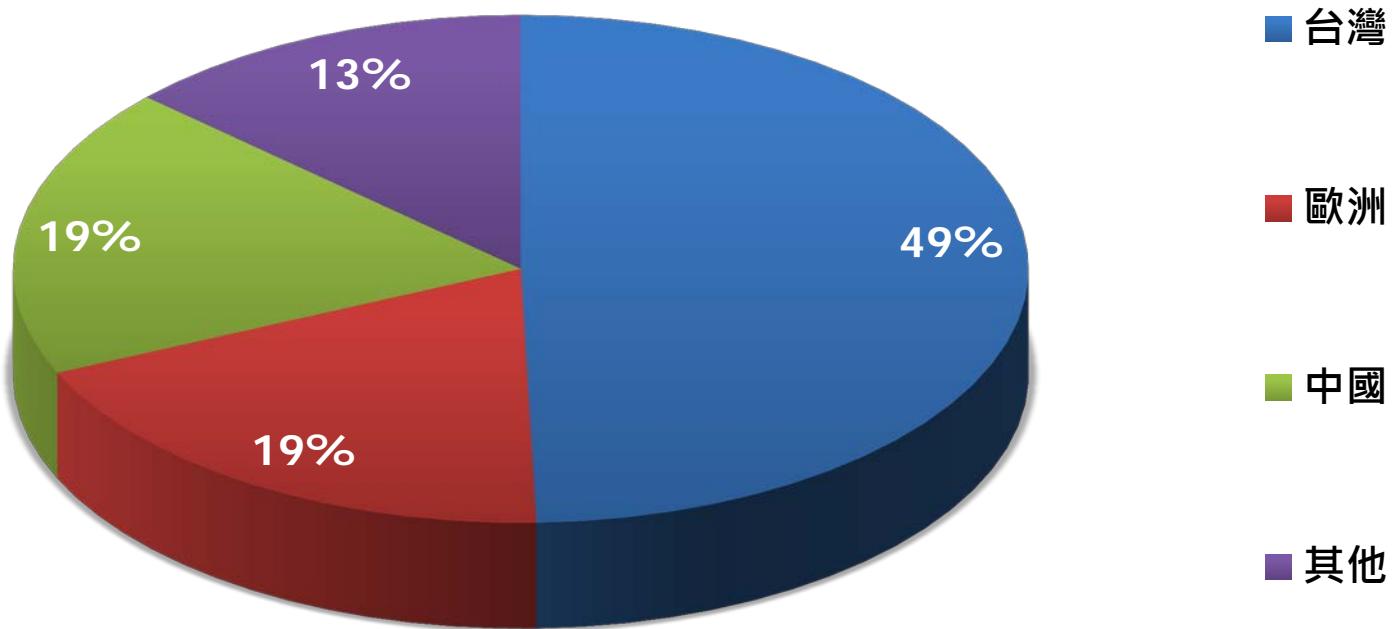
# 2018年第一季銷售分析-收入模式



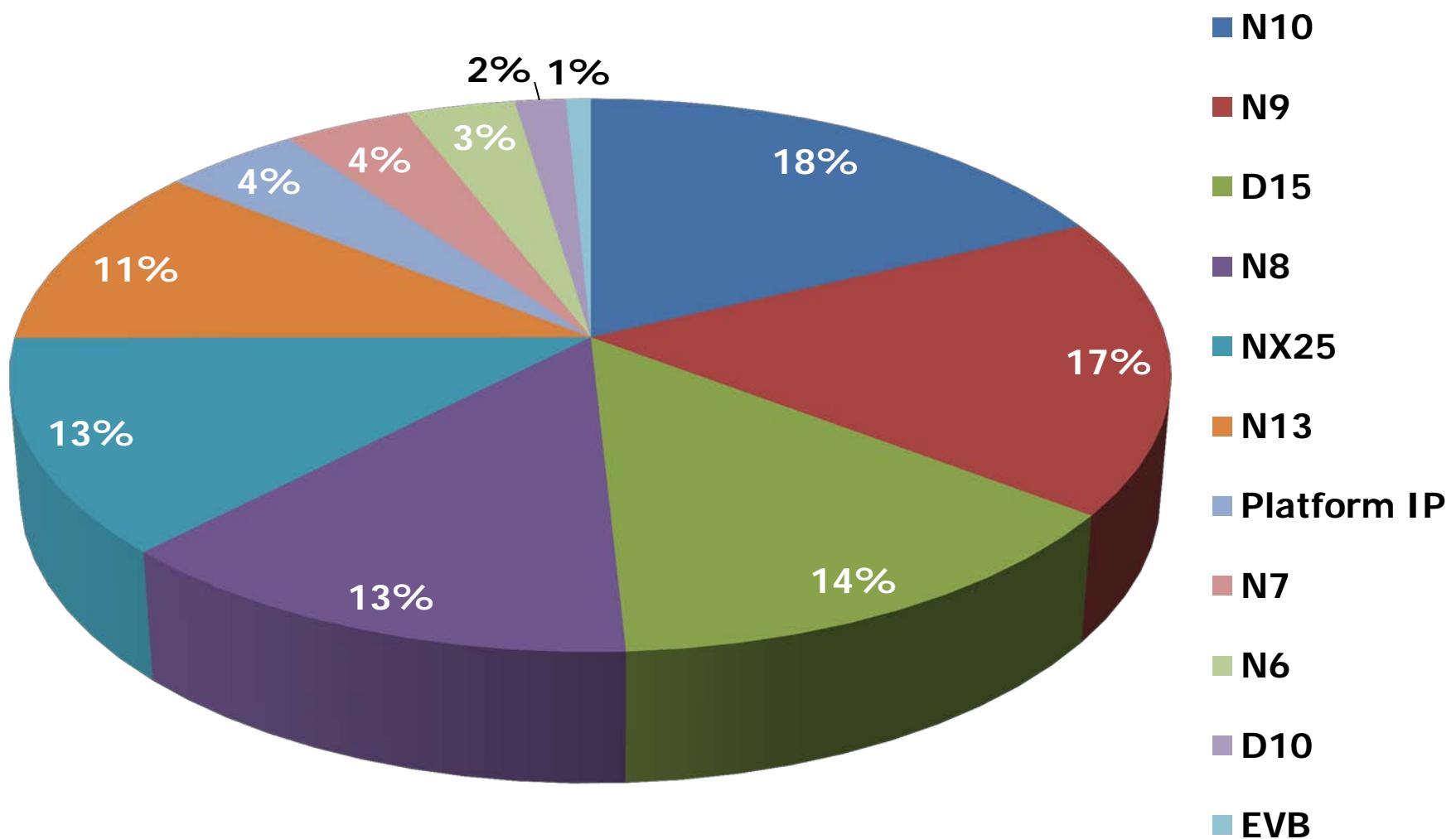
■ 矽智財授權收入 ■ 權利金收入 ■ 矽智財維護服務收入及其他



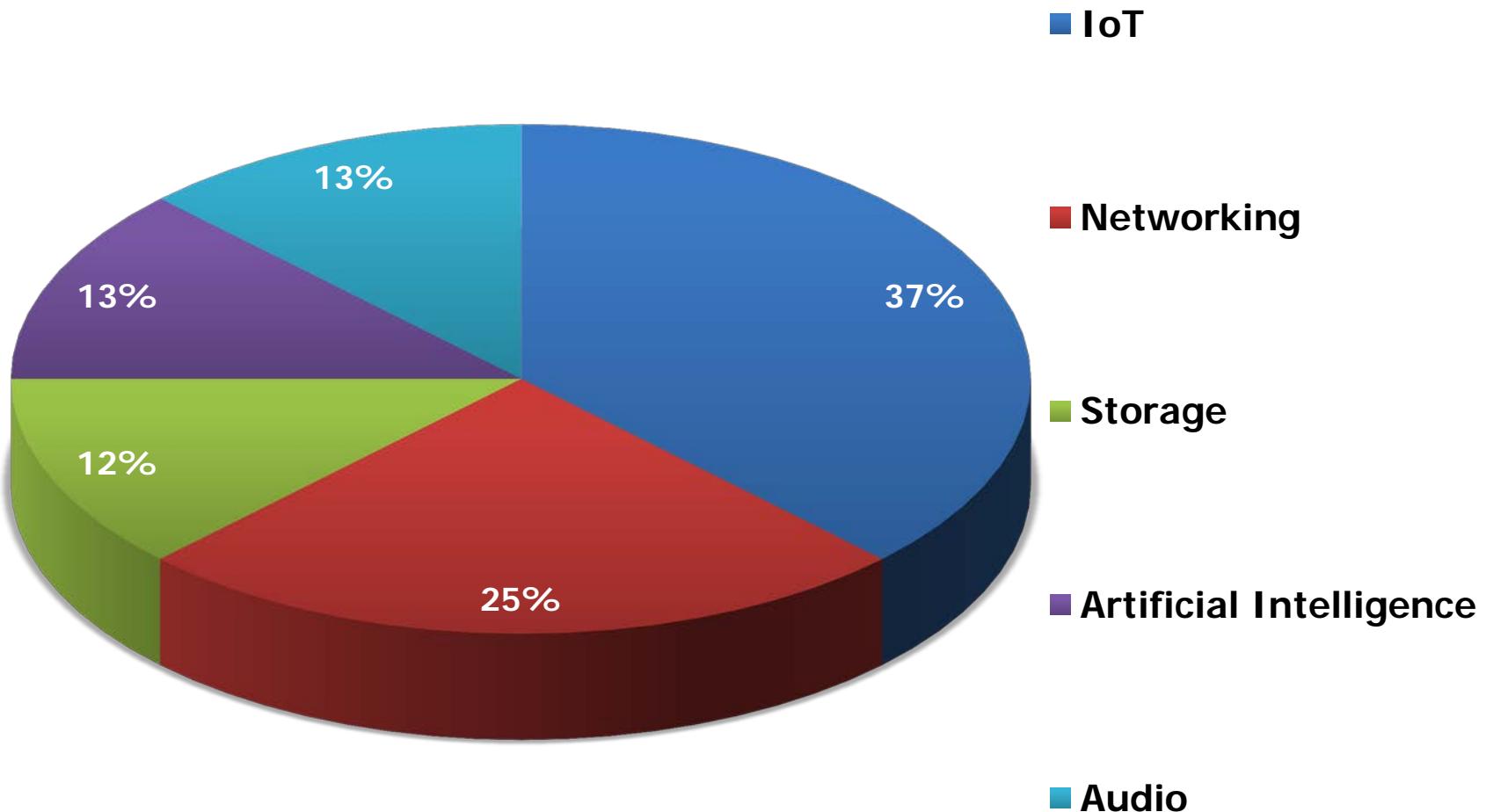
# 2018年第一季銷售分析-地區別



# 2018年第一季銷售分析-產品別



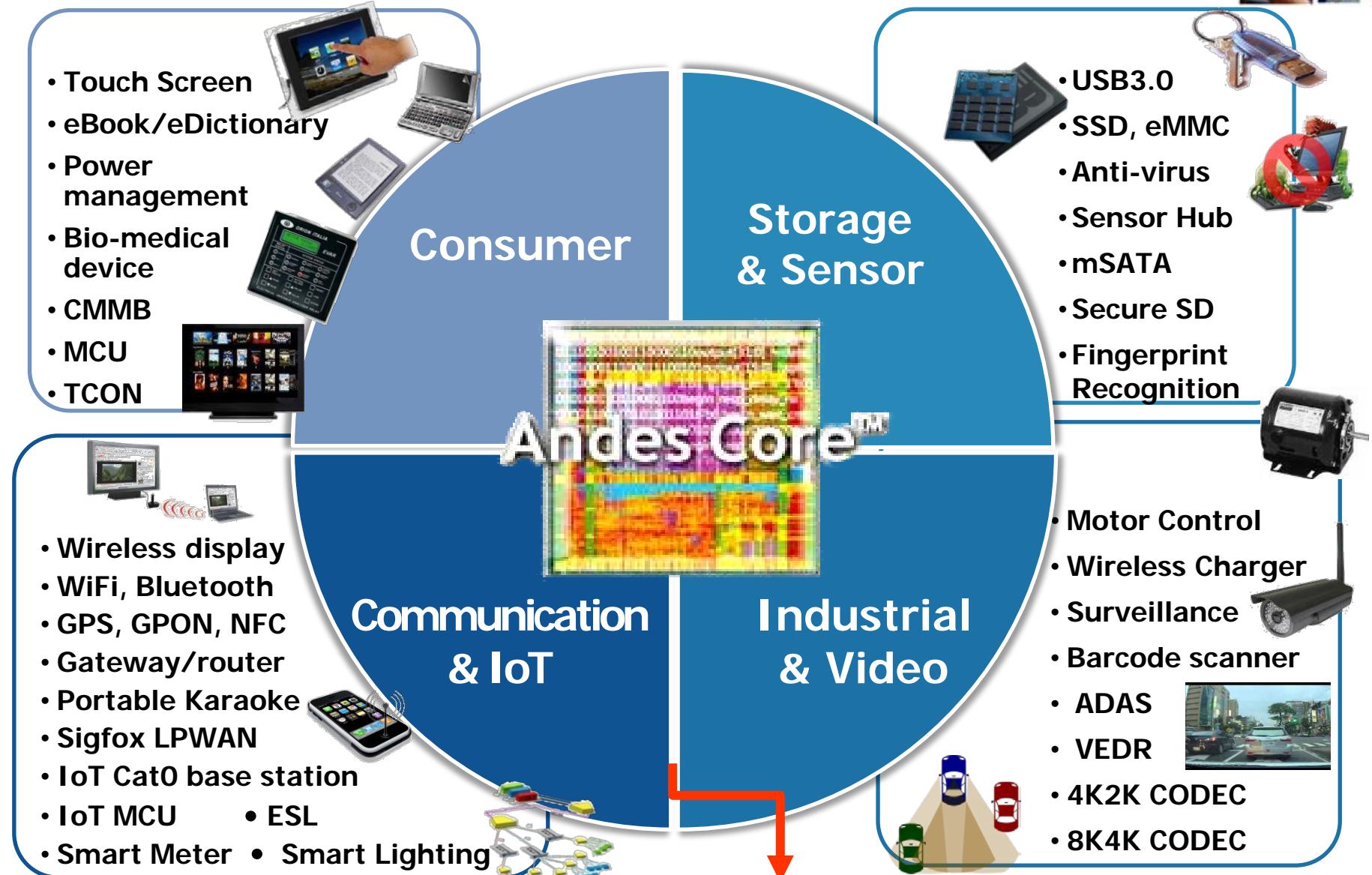
# 2018年第一季銷售分析-應用別



\*Based on agreement number

# 產品應用

# 豐富多樣的客戶應用



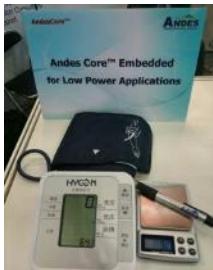
# 物聯網應用 - 1



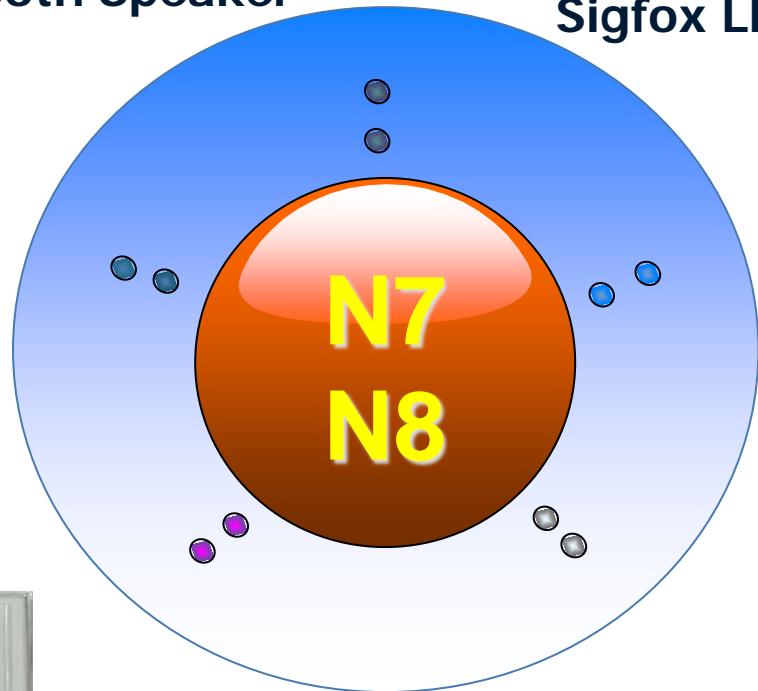
Bluetooth Speaker



Sigfox LPWAN



Healthcare device



Wearable device



Electronic price tags



Sensor Hub

# 物聯網應用 - 2



Wearable devices



Drone



Portable Karaoke

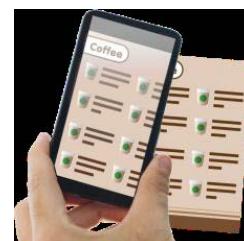
N9  
D10



WiFi/GPS/FM/Bluetooth  
combo



GPS/Beido in shared bikes



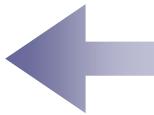
Contactless payment  
(NFC)

# 汽車電子應用



◆ N13

- ◆ 汽車環車監控系統 (AVM)  
in NISSAN New X-Trial



Andes Core™

◆ N10

- ◆ 行車紀錄器
- ◆ 先進駕駛輔助系統(ADAS)



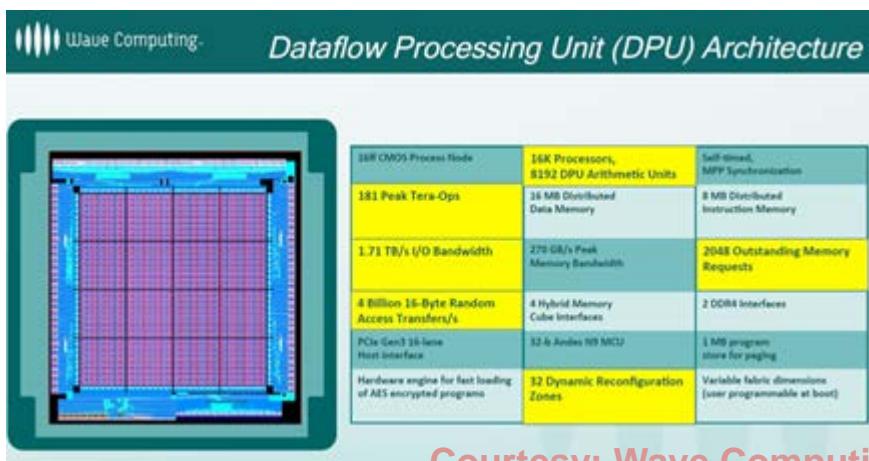
◆ D10

- ◆ ADAS





# AI人工智慧應用



◆ N9  
Dataflow Processing



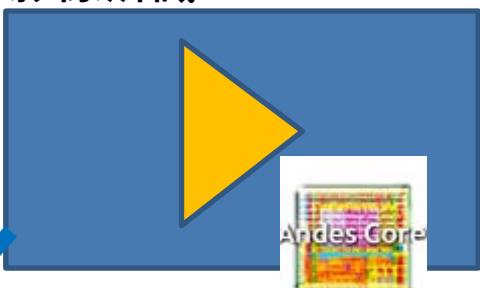
◆ D10  
語音辨識

Andes  
Embedded™

Yes, boss, I  
understand...



◆ D15F  
影像辨識



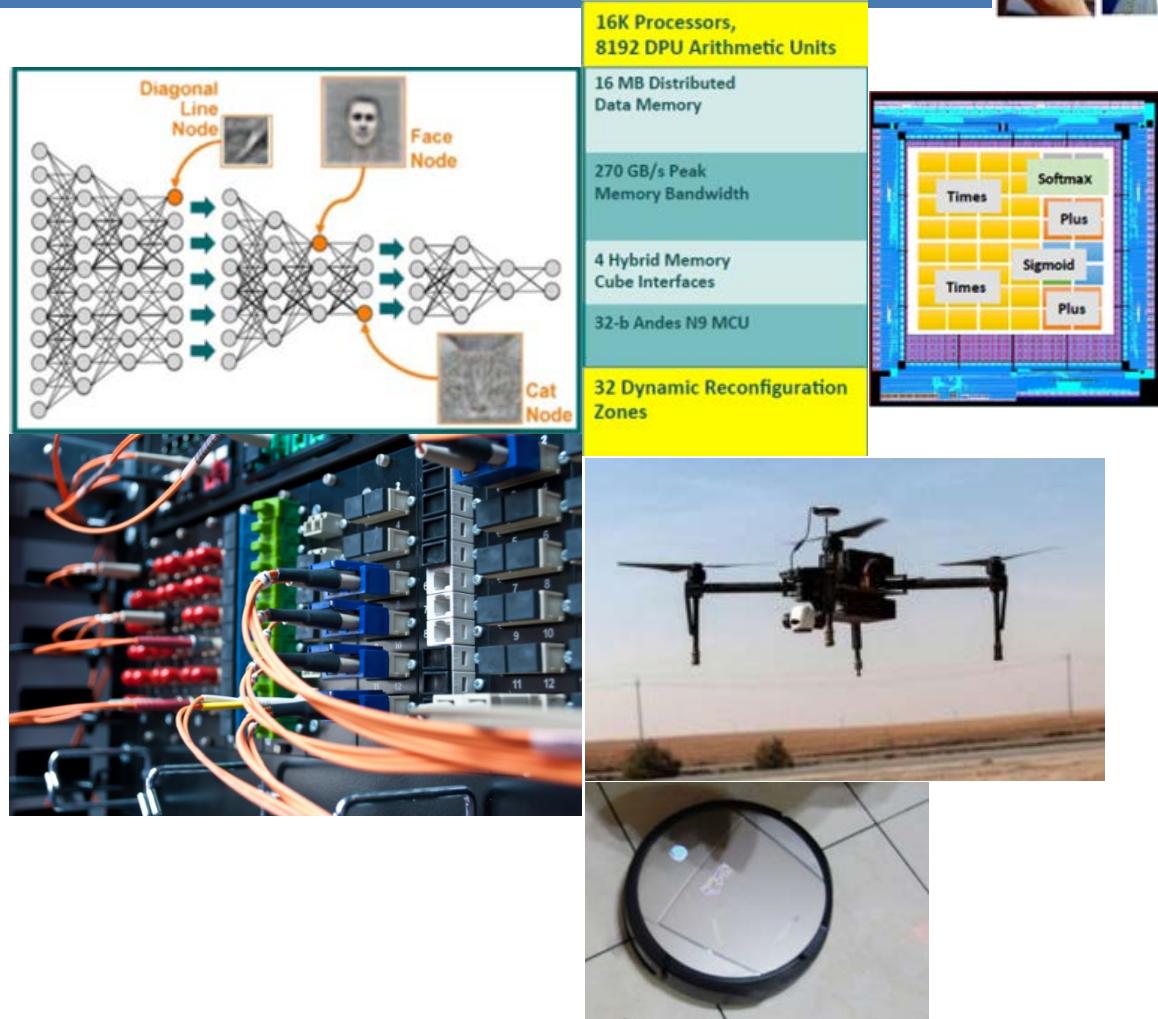
◆ N9  
AI companion



# 更多、更新的應用正在發生



- ❖ 人工智慧
  - 深度學習
- ❖ 下世代電視
- ❖ 下世代網路引擎
  - 路由器
- ❖ 無人機飛控
- ❖ 機器人
- ❖ ...
- ❖ 由百種應用邁向千種應用的歷程

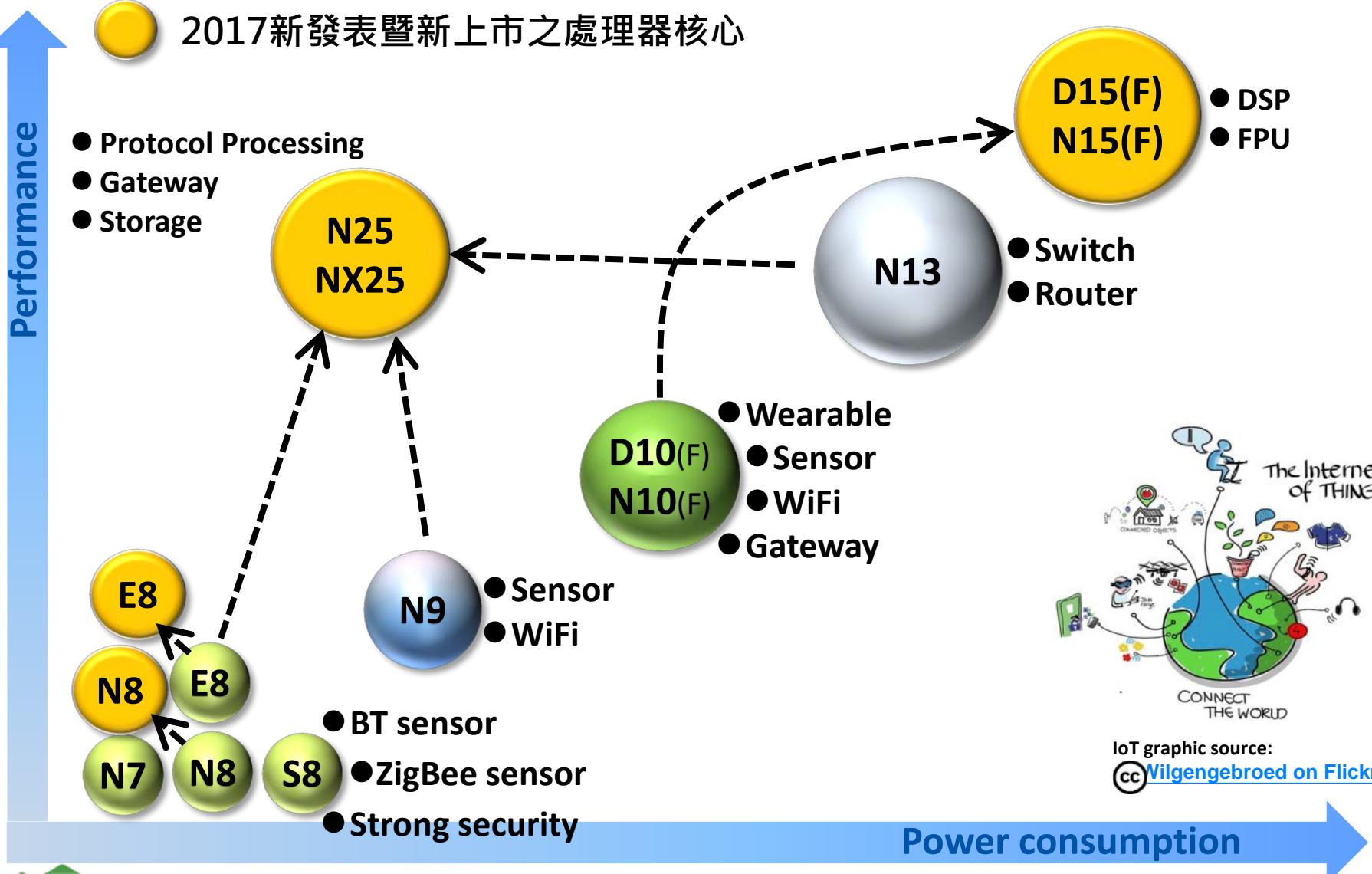


# 新產品及生態系統

# 新上市之AndesCore™



2017新發表暨新上市之處理器核心





# 完整產品線

- ◆ 此次晶心嵌入式科技研討會推出  
晶心A系列微處理器核心

A N D E S





# V5 AndesCore™ Processors

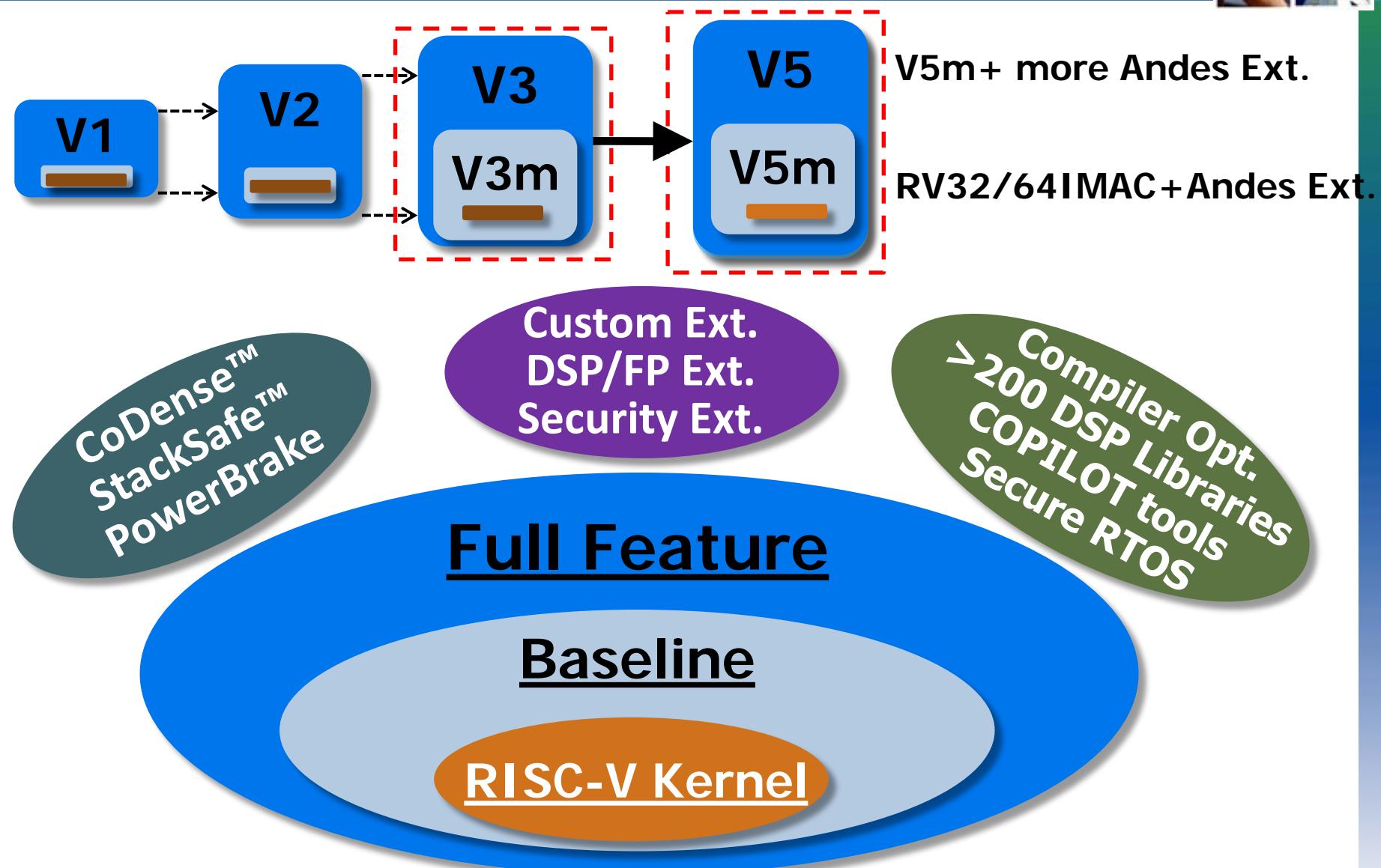
N25/NX25

N25F/NX25F

A25/AX25



# AndeStar™ V5: New Generation of ISA Kernel



# AndesCore™ V5 家族



Ultra  
Performance

StackSafe™  
CoDense™  
PowerBrake

Next  
Generation  
V5 (V5m with  
adv. features)

Enhanced  
Features

N25(F)\*  
V5m, 32-bit  
5-stage, 1GHz  
PMP, FPU, ACE...

NX25(F)\*  
V5m, 64-bit  
5-stage, 1GHz  
PMP, FPU, ACE...

Modern  
Architecture

N25  
V5m, 32-bit  
5-stage, 1GHz  
Compact

NX25  
V5m, 64-bit,  
5-stage, 1GHz  
Compact

I/D Local  
Memories

I/D Caches

Branch  
Prediction

64-bit  
AXI/AHB

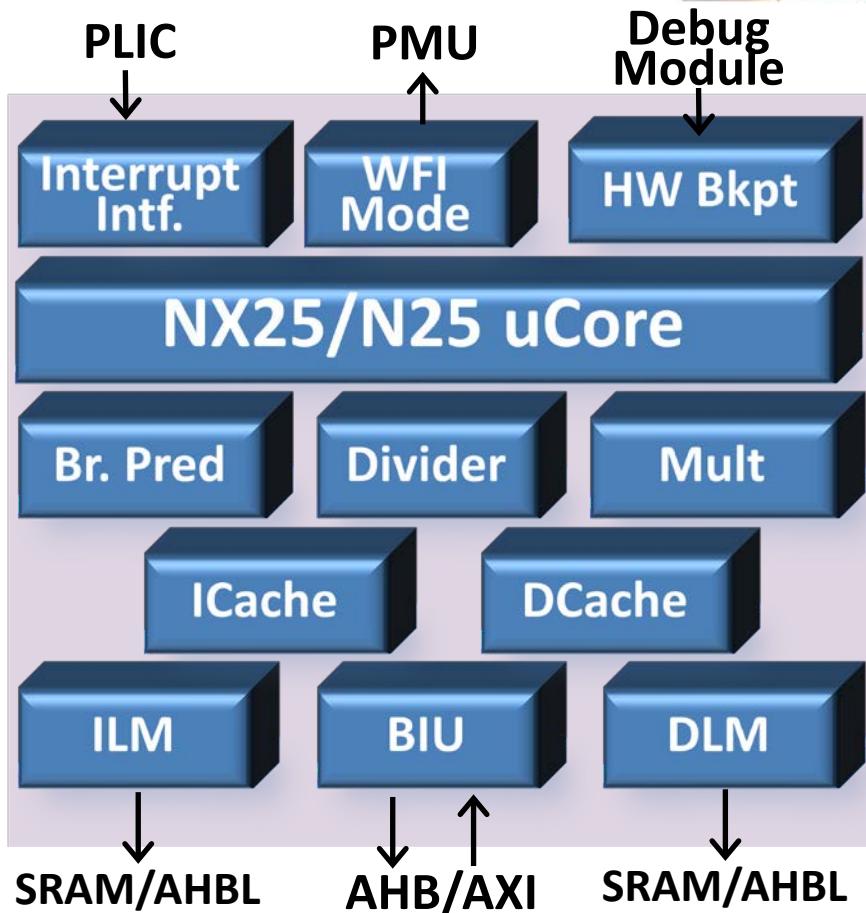
ECC

◆ 28HPC RVT, SS, 0.81V, 0C, with I/O constraints. \* Available H1 2018

# Baseline V5 AndesCore™: N25/NX25



- **Fast-n-small cores for control tasks in storage, networking, AI, and more.**
- ❖ **N25: 32-bit, NX25: 64-bit**
  - From scratch for the best PPA
- ❖ **AndeStar V5m ISA**
  - Superset of RV-IMAC
- ❖ **5-stage pipeline**
- ❖ **Configurable multiplier**
  - Sequential or parallel
- ❖ **Optional branch prediction**
- ❖ **Flexible memory subsystem**
  - I/D Local Memory (LM): to 16MB
  - I/D caches: to 64KB
  - Optional parity or ECC
- ❖ **Bus interface**
- ❖ **JTAG debug module**

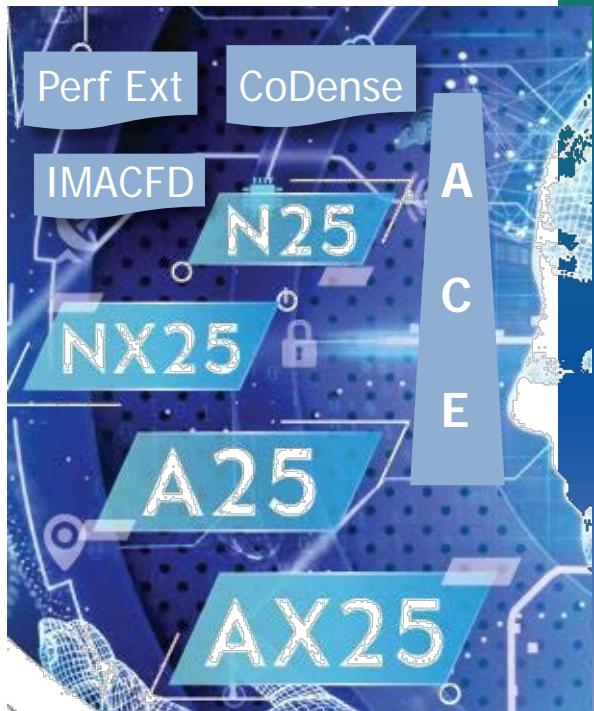


- ❖ **N25 sample config. @ 28HPC:**
  - Small: 37K gates, 1GHz (worst)
  - Large: 159K gates, 1.15GHz (worst)



# New V5 AndesCores Coming this Summer

- ❖ **4 New 25-series:** maintain the frequency
  - **N25F/NX25F:** N25/NX25 + FP support
  - **A25/AX25:** N25F/NX25F + MMU + S-mode
- ❖ **High-performance FP support:**
  - IEEE754-compliant single/double precisions
  - Multiply, add/sub, multiply-accumulate:
    - ◆ 1-cycle issue rate, 4-cycle latency
  - Divide/sqrt: 15 cycles for SP, 29 cycles for DP
    - ◆ Run in the background
  - **Half-precision** load/store for machine learning
- ❖ **MMU support:**
  - Supporting SV{32, 39, 48}
  - Page size: {Kilo, Mega, Giga, Tera} page
  - 4- or 8-entry microTLBs (ITLB,DTLB)
  - 4-way 32~128-entry Shared-TLB (STLB)



# Andes Position in RISC-V



**Complete product portfolio**

**Reliable RISC-V core IP business partner**

**RISC-V core that runs Linux\***

**Extreme low power consumption, high computing efficiency**

**World's only Customer-Extension Capable RISC-V Core**



\* Linux ported on core design, to release in Q3'18

# YTD RISC-V Design Win



- ❖ NX25: Enterprise SSD (Taiwan)
- ❖ N25, AX25: FPGA (US)
- ❖ Three design service joint promotion licenses: US, Korea, China



# AndesCore™ 競爭優勢



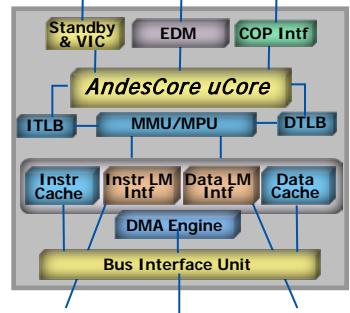
AndesCore™	AndesCore/ Competitor	Competitors
	Power Efficiency <sup>1</sup> (DMIPS/mW)	
<u>N7</u>	+42%	Cortex-M0+
<u>N8</u>	+43%	Cortex-M3
<u>N9</u>	+43%	Cortex-M3
<u>D10</u>	+48%	Cortex-M4
<u>N13</u>	+185%	Cortex-A5
<u>N13</u>	+45%	Cortex-R4
<u>D15F</u>	+121%	Cortex-M7

1. Power Efficiency is DMIPS/MHz divided by power consumption (mW/MHz) when running Dhrystone.

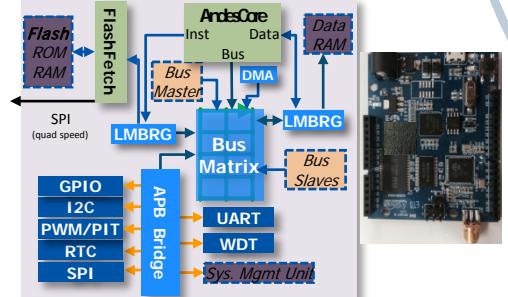


# 64位元架構及生態系統

Processor IP's  
**AndesCore™**  
NX25



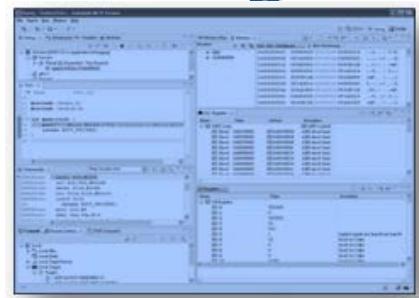
Development Platforms  
**AndeShape™**



Processor Architecture  
**AndeStar™**  
V5, V5m

```
smw.adm $r1,[&sp],$r5,0x0
smw.adm $sp,[&sp],$sp,0x2
addi   $sp,$sp,-8
sethi $r1,0x50a
lwi    $r1,[&r1+#0x98]
mov55 $r2,$r0
mov55 $r0,$r1
lwi    $r1,[&r1+#0x8]
addi   $r3,$sp,12
```

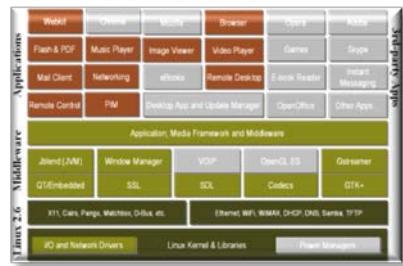
Development Tools  
**AndeSight™**



**Andes Embedded™**

37

SW Stacks  
**AndeSoft™**



# 生態系統: Andes 與 Knect.me



knectme™



# Knect.me 生態系統

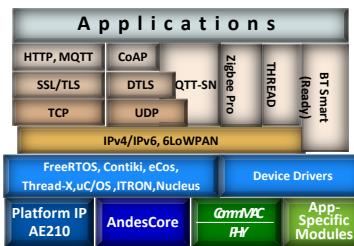
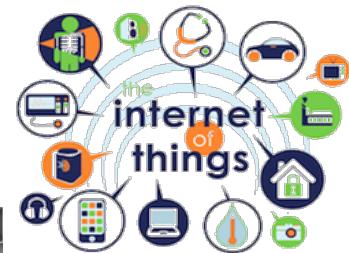
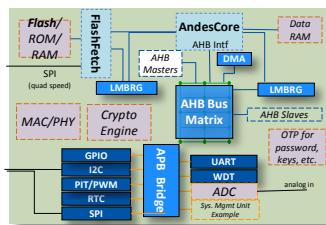


## ❖ 建立 knect.me 生態系統協助物聯網發展

- to knect solutions - Silicon IP's, SW stacks, tools, applications, systems and products

## ❖ Includes:

- SoC IP Platforms
- Software Stack
- Development Boards
- Development Tools



## ❖ To Form a IoT League

- to knect chip vendors, partners, application developers, system vendors





# 增加 A.I. 至 Knect.me 生態系統

ANDESknectme x knect.me/#a

knectme™ HOME FORUM SOC IP PLATFORMS SW STACK

Connectivity Security Library/Mix-signal/Memory Misc A.I./Machine Learning

Mindtree Ubuc L&T Technology Services SECURE ID INTRINSIC ID SECURE RF

Holy Stone ORCA SYSTEMS inside BarcoSilex winbond

M31 eMEMORY ASI Sidense CYPRESS UniSense SONICS

Performance-IP DOLPHIN INTEGRATION Dolphin Technology NORTHWEST LOGIC

matricus inc NSCore ANALOG BITS mobiveil DEEPhi

csem GRadio

The 'A.I./Machine Learning' and 'DEEPhi' company logos are circled in red.

What is "IoT League"? We invite Andes' customers to provide products information which contains AndesCore. IoT League can enhance exposure and reputation in IoT domain. Various applications can help Andes' customers to attract more and more users to adopt their IoT products.

Companies in alphabetical order

AIROHA

HYCON  
HYCON TECHNOLOGY

ITE  
ITE TECH. INC.

M<sup>2</sup>Communication

Weltrend

Wave Computing

# 近期獲獎

# 引領新興科技潮流



## ► “2018 Top25最佳新興科技解決方案提供公司” — CIO Advisor Magazine



# 總結

# 晶心科技擴大產品陣線,強化生態系統



- ❖ 晶心科技於五月份陸續在新竹、深圳及上海舉辦晶心嵌入式科技論壇，以RISC-V為講題，邀請嘉賓參與，獲得積極響應，例如：邀請SiFive共同推廣RISC-V。
- ❖ 晶心科技積極參與 RISC-V 基金會科技與社群發展，與RISC-V 生態系統互助(Imperas and UltraSoC等)，2018年5月於巴塞隆納舉辦之RISC V Workshop，將DSP指令集捐贈給RISC-V Foundation，並在多個Committee中擔任要職，晶心已成為RISC-V陣營及產業中居於領先之位。
- ❖ 晶心科技陸續與Design Houses簽訂合約，授權N25/NX25的開發，創造晶心、Design House與產業共贏的局面。

# 謝謝指教



# Andes Core™

```
0001001001100100100input[31:0] hwdatal  
01110100100110000110output[31:0] hrdata;  
100100011100011100101output[15:0] hsplit;  
10100if ((retry_en = 1'b1 || split_en = 1'b1)  
010100110110001100begin resp_delay_nx =  
000011001001010011016'b0,brsp_wait_cnt);  
0100100011101011100100110100begin resp_delay_ny =  
000011001001010011016'b0,brsp_wait_cnt);
```

[www.andestech.com](http://www.andestech.com)

# 問與答