



晶心科技股份有限公司 2018年第二季法人說明會

Driving Innovations™



股票代碼: 6533
2018/08/09

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**。
- 員工人數略低於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

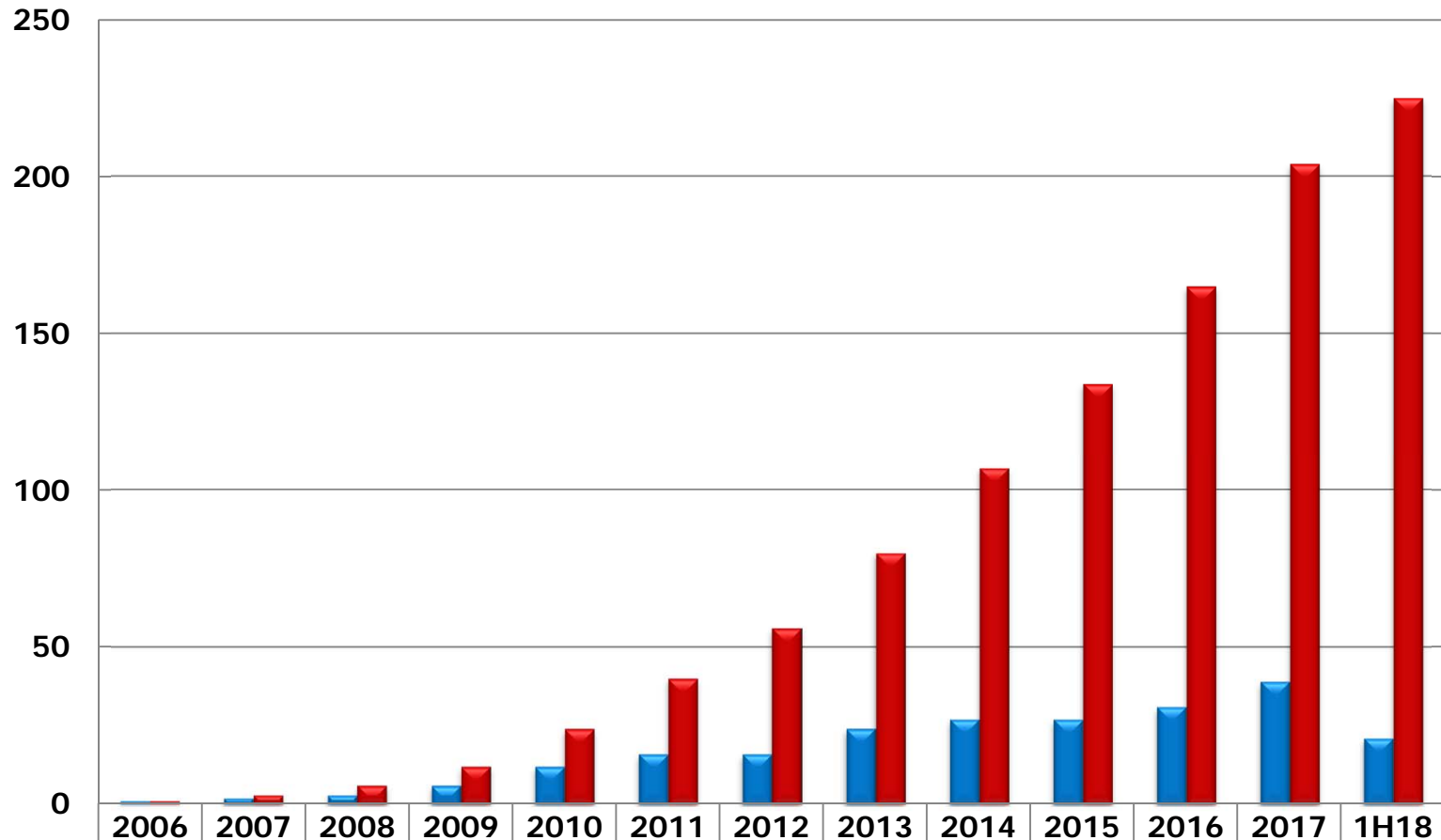
- 創新架構高效能/低功耗嵌入式處理器。

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

IP 授權合約數穩健成長(截至1H18)

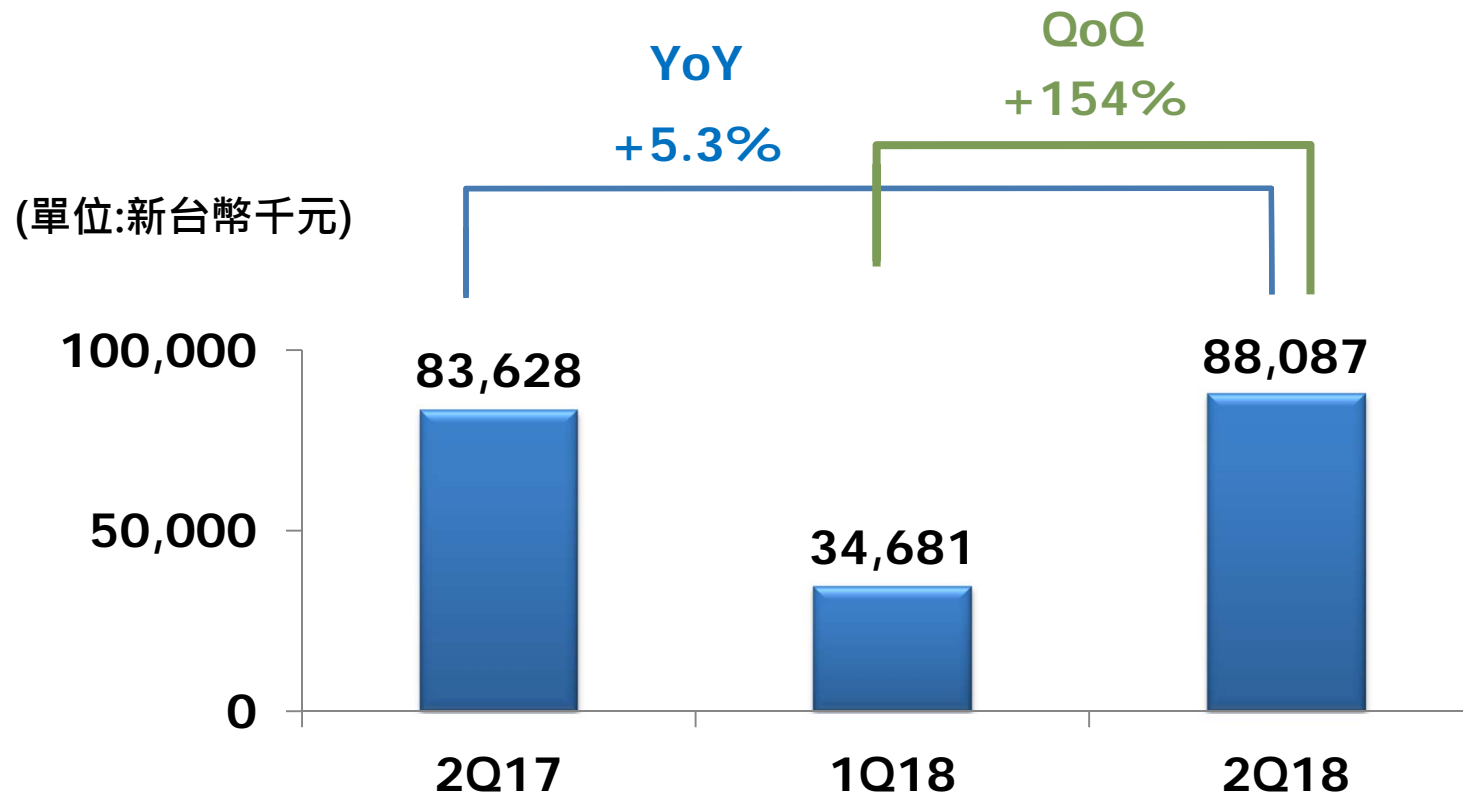


■ IP授權合約數	1	2	3	6	12	16	16	24	27	27	31	39	21
■ 累計IP授權合約數	1	3	6	12	24	40	56	80	107	134	165	204	225

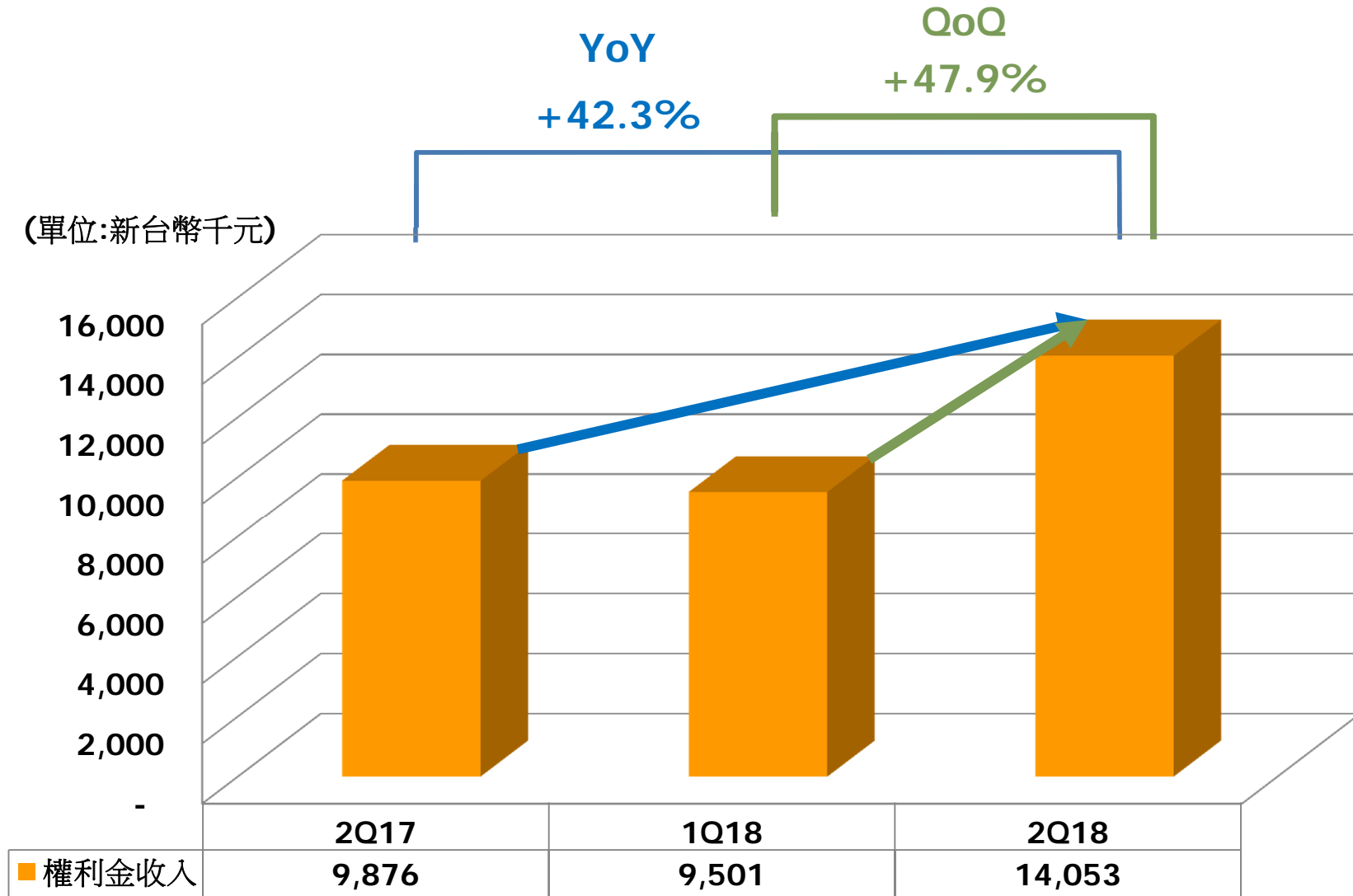
2018年第二季營運績效



- 2018第二季合併營收: NT\$88.08百萬元
- 年營收成長率(YoY): 成長5.3%
- 季營收成長率(QoQ): 成長154%



2018年第二季權利金收入

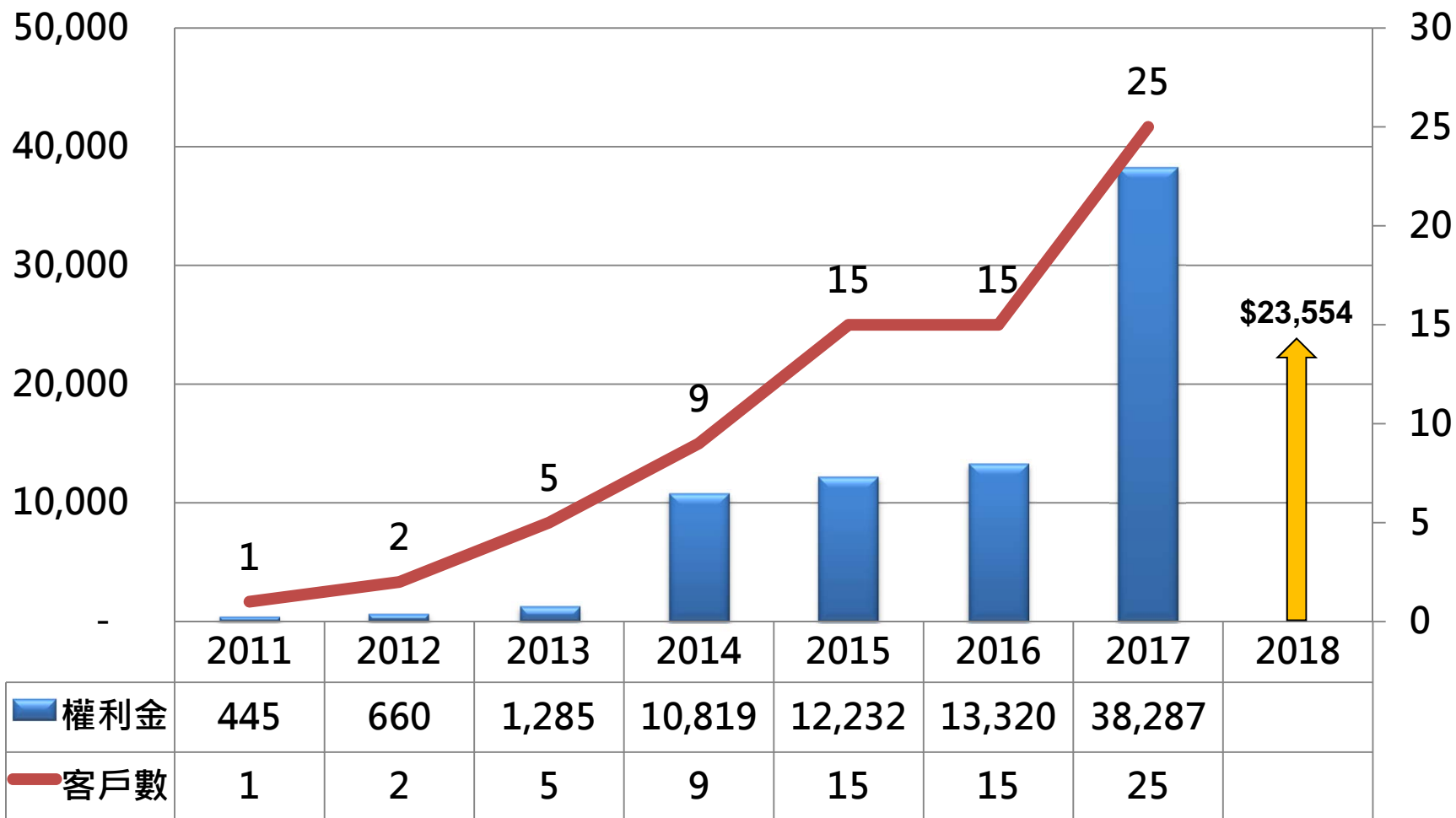


權利金貢獻分析



(單位:新台幣千元)

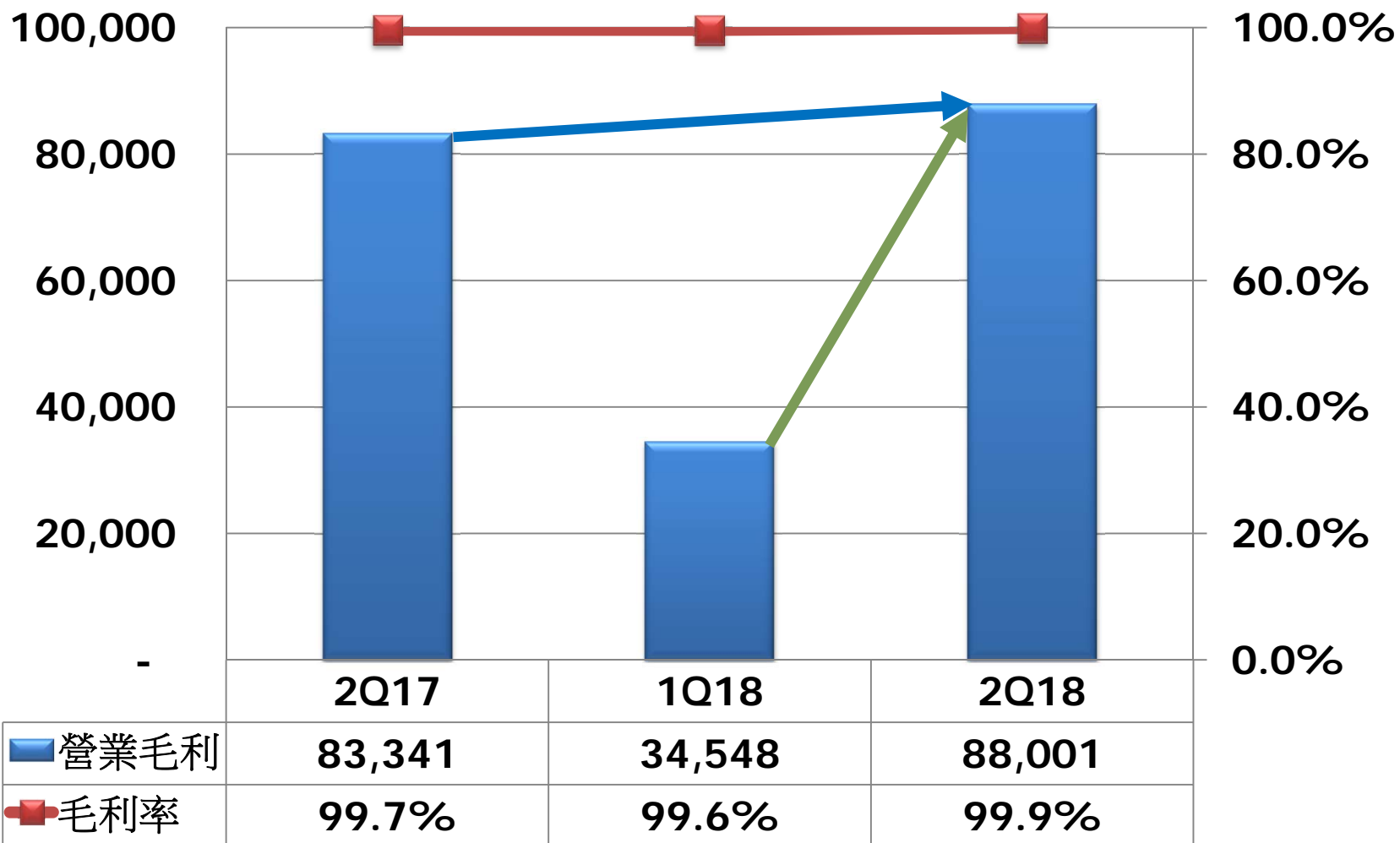
↑: 2018 H1 royalty collected



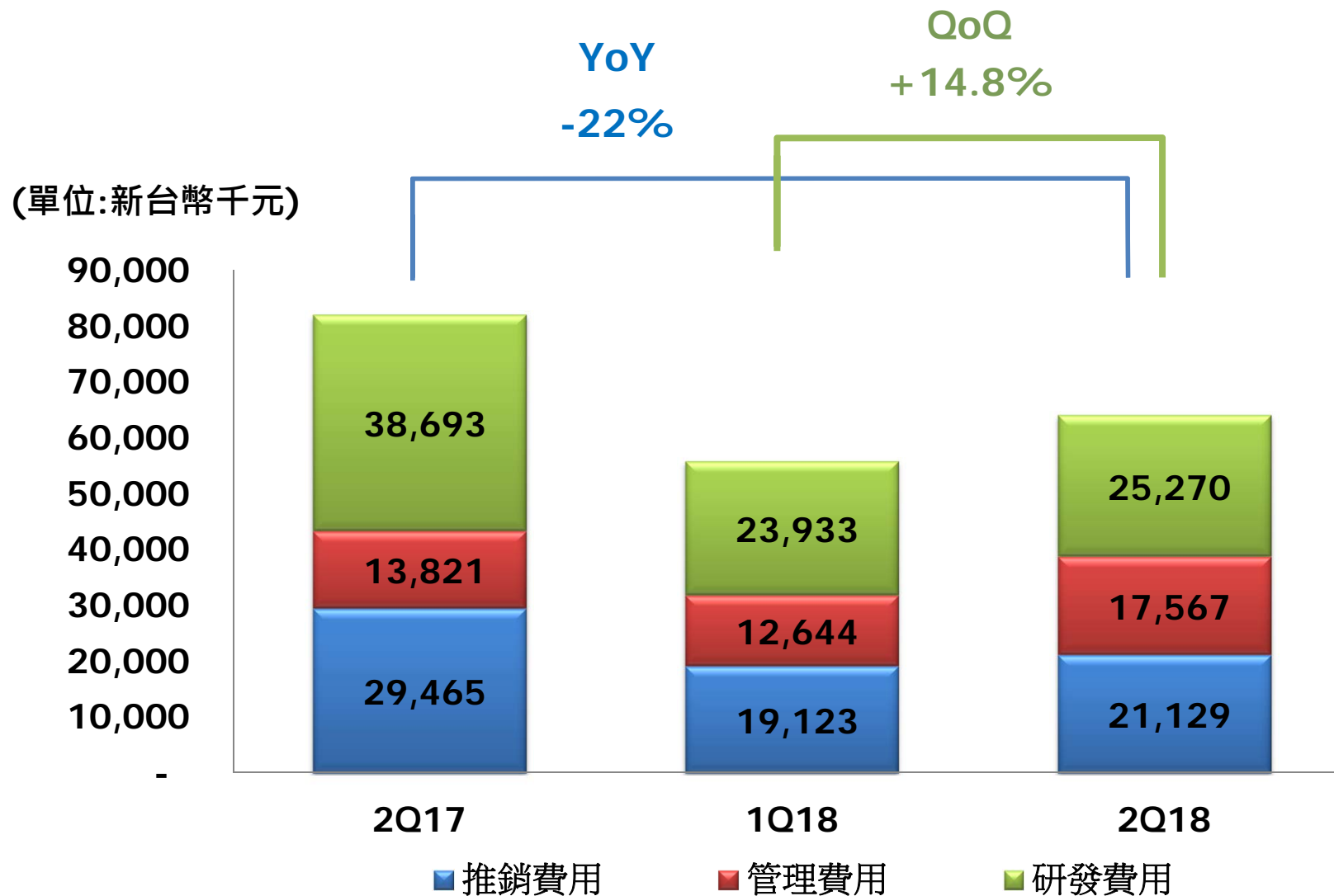
營業毛利與毛利率



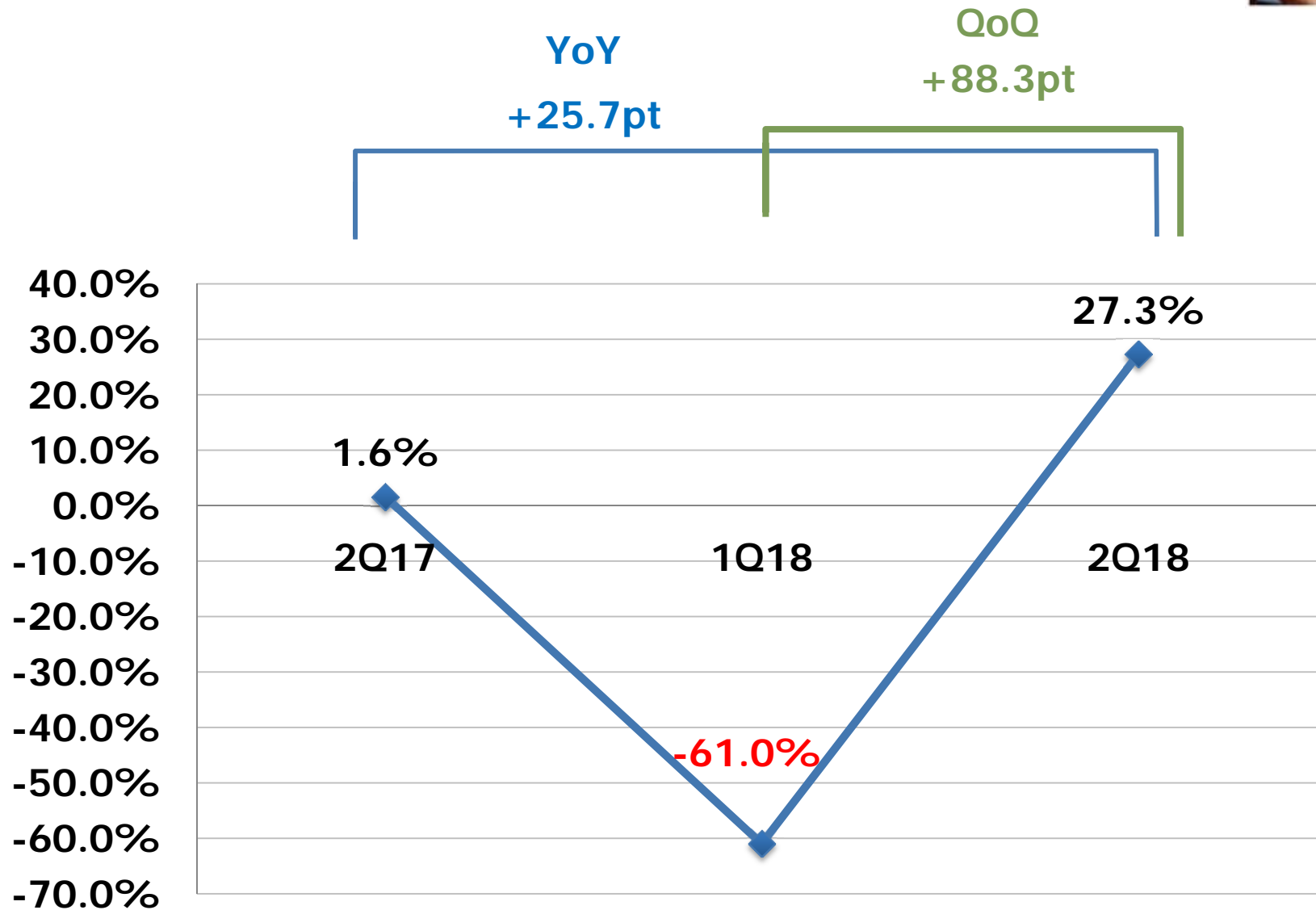
(單位:新台幣千元)



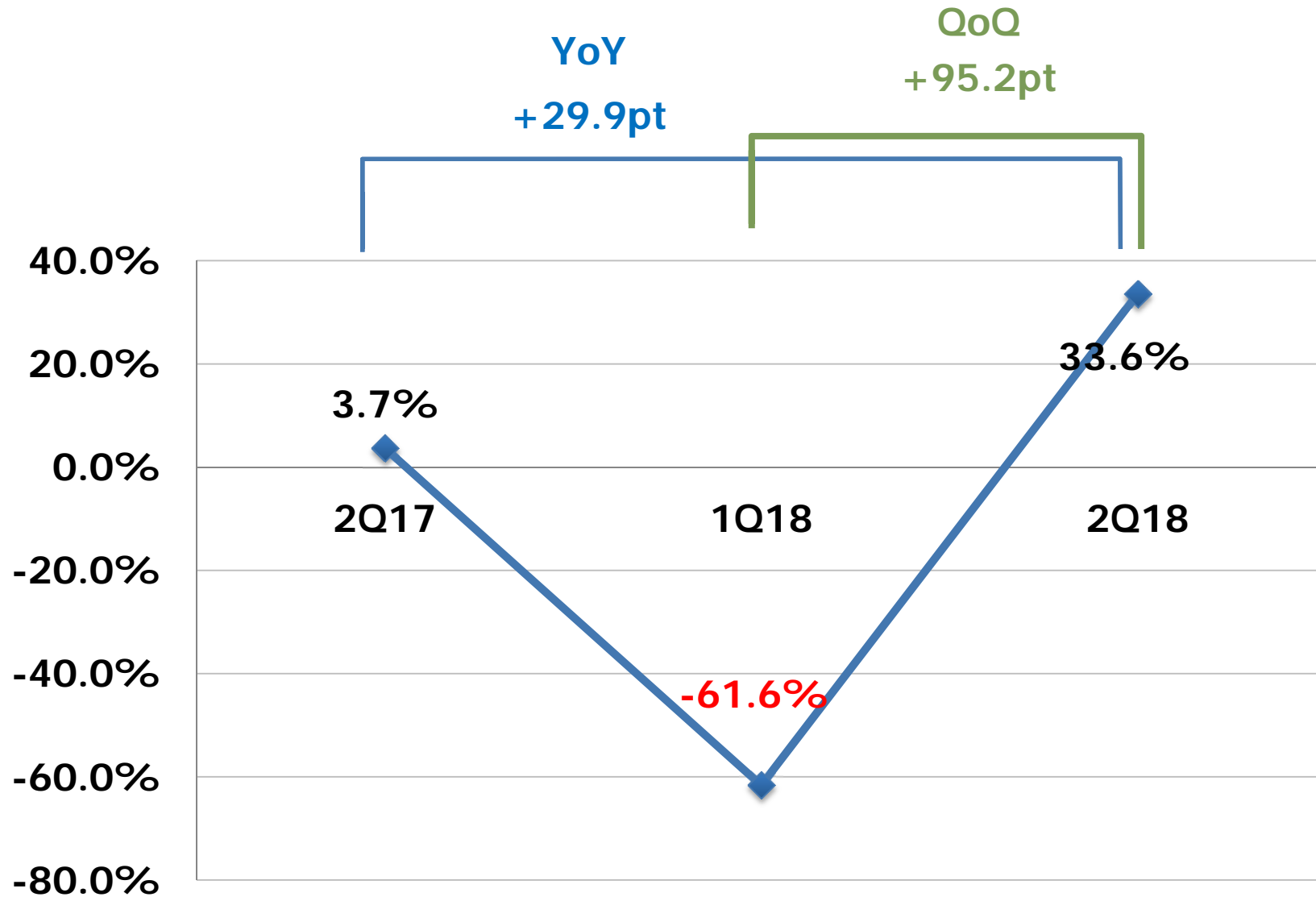
營業費用



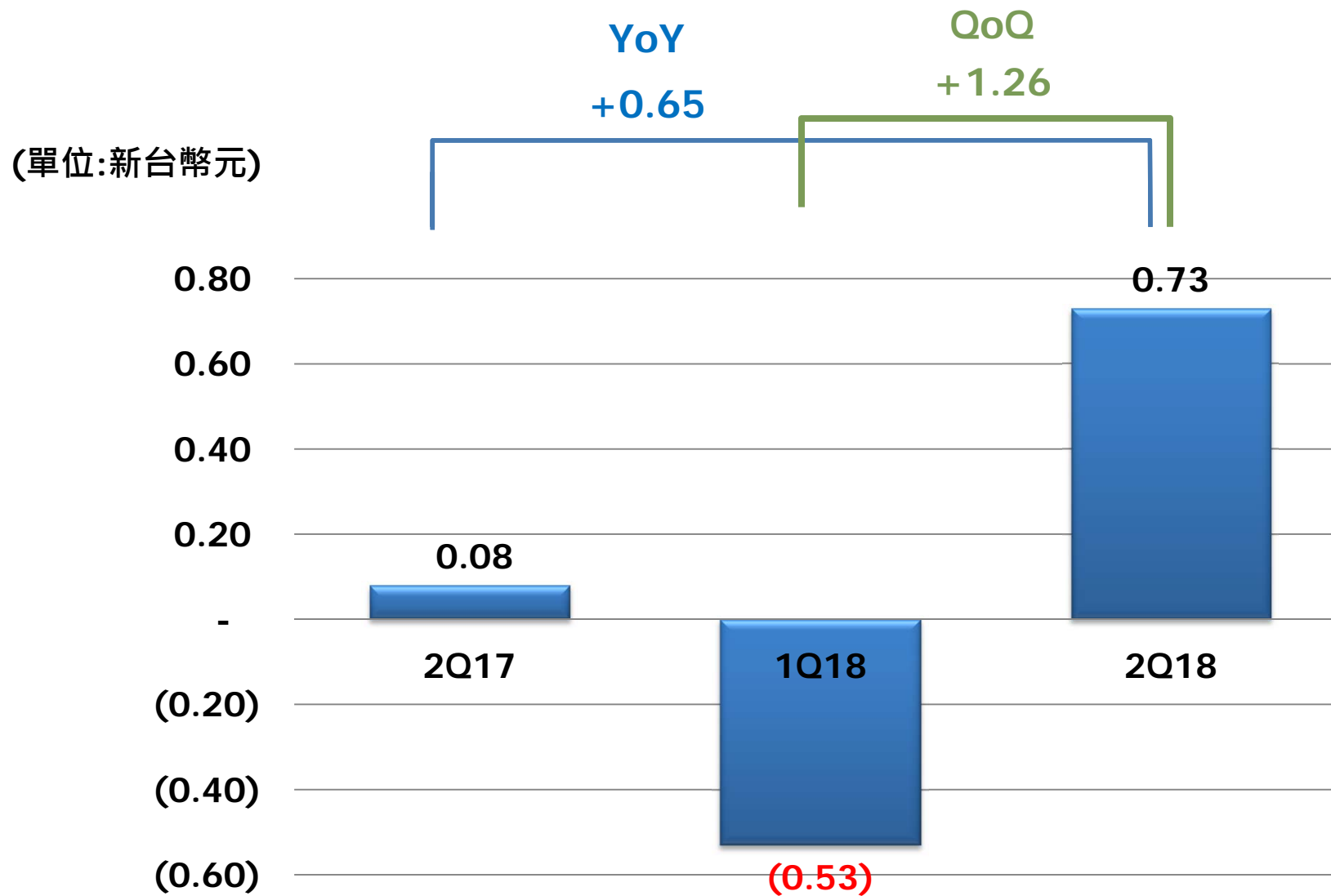
營業利益率



合併淨利(損)率



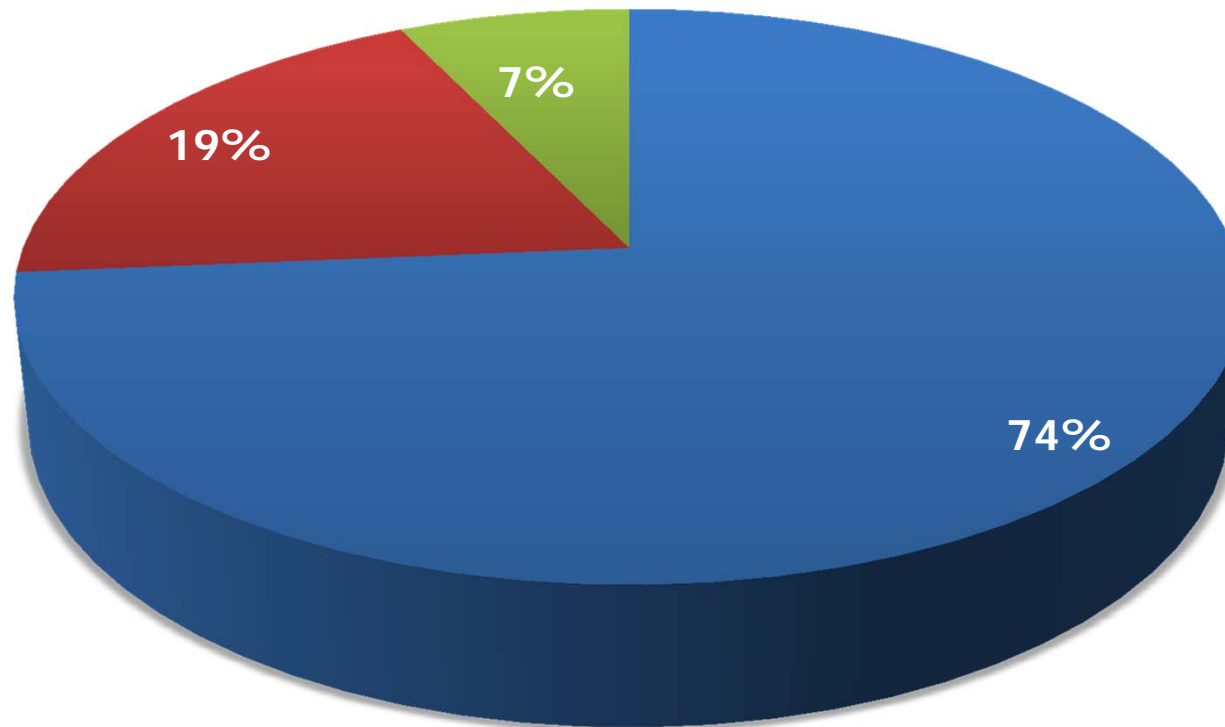
每股盈餘



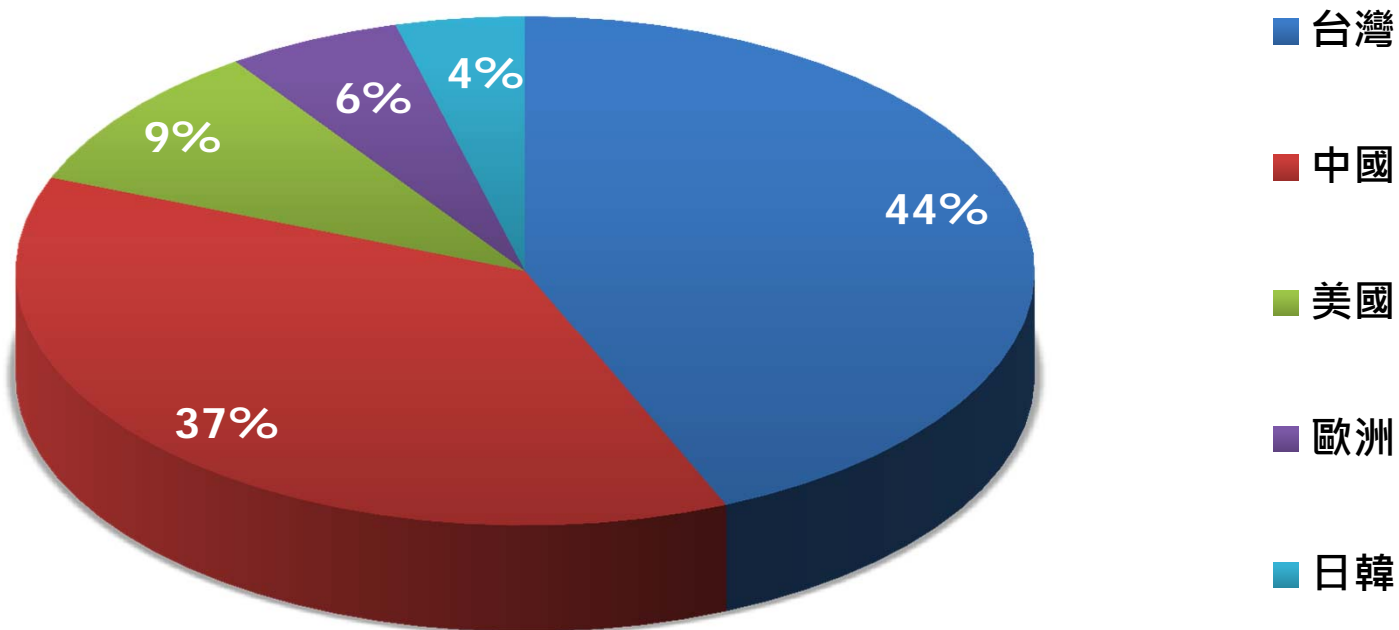
2018年上半年銷售分析-收入模式



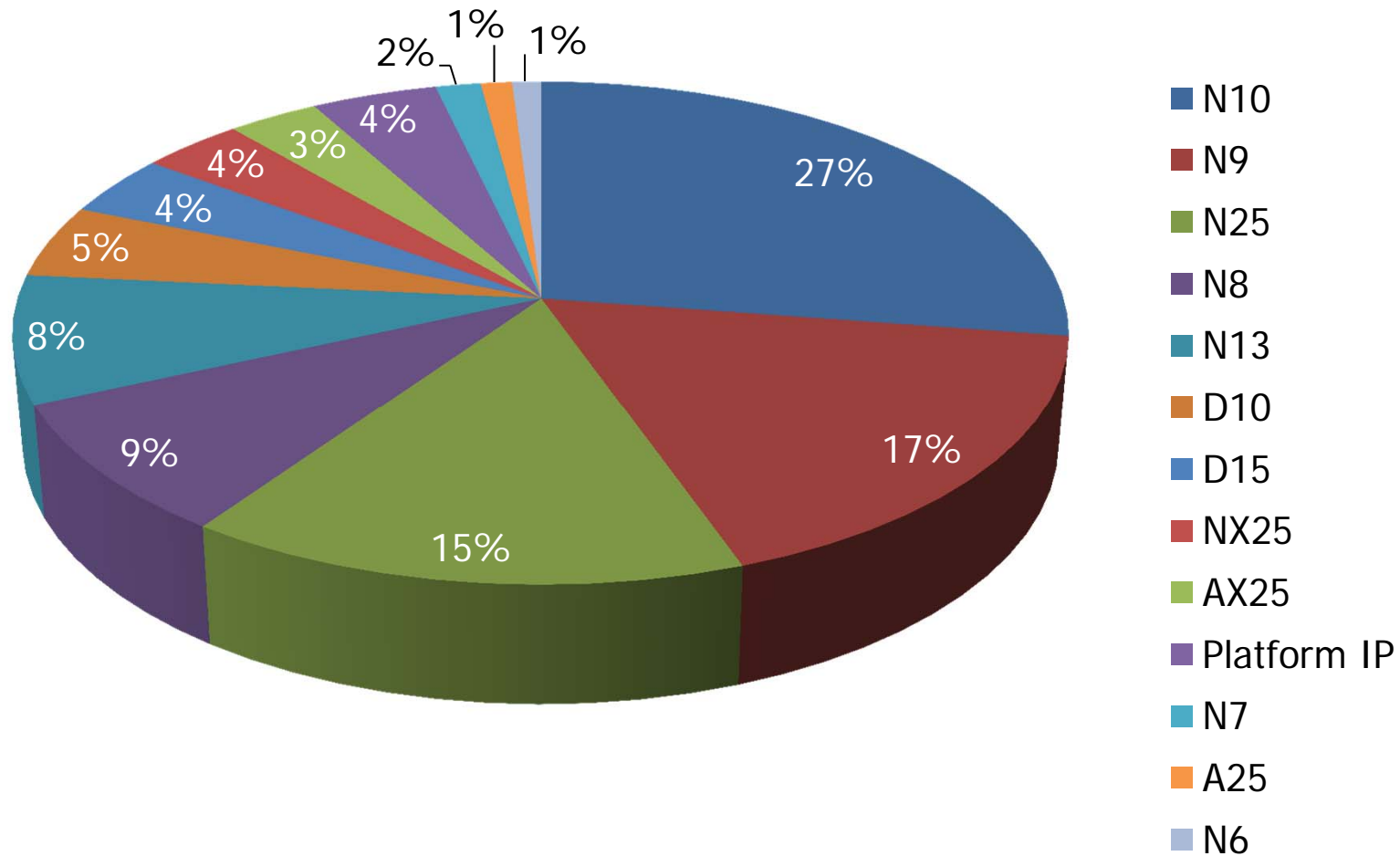
■ 矽智財授權收入 ■ 權利金收入 ■ 矽智財維護服務收入及其他



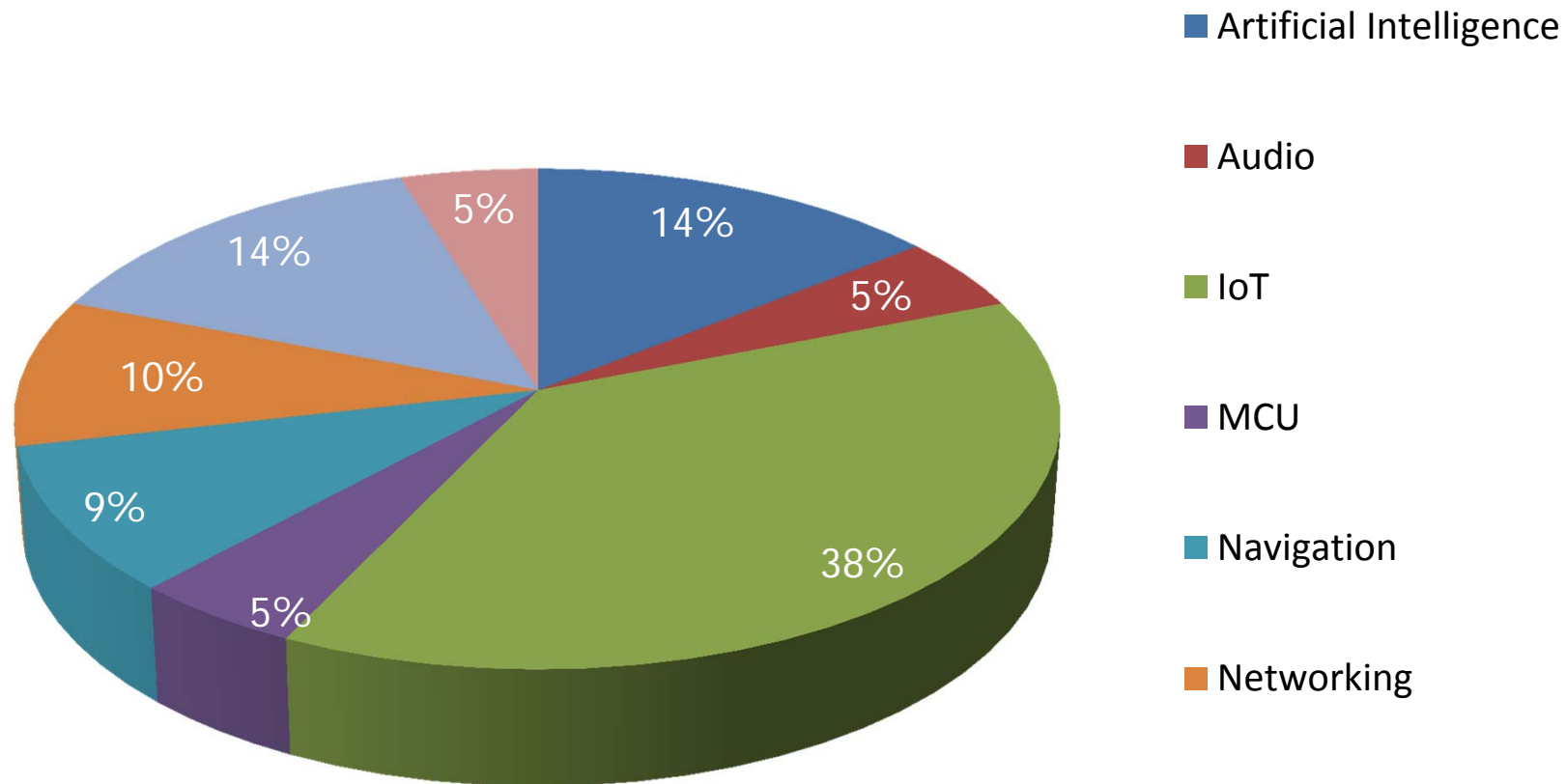
2018年上半年銷售分析-地區別



2018年上半年銷售分析-產品別



2018年上半年銷售分析-應用別



*Based on agreement numbers

2018年上半年簽約客戶分析



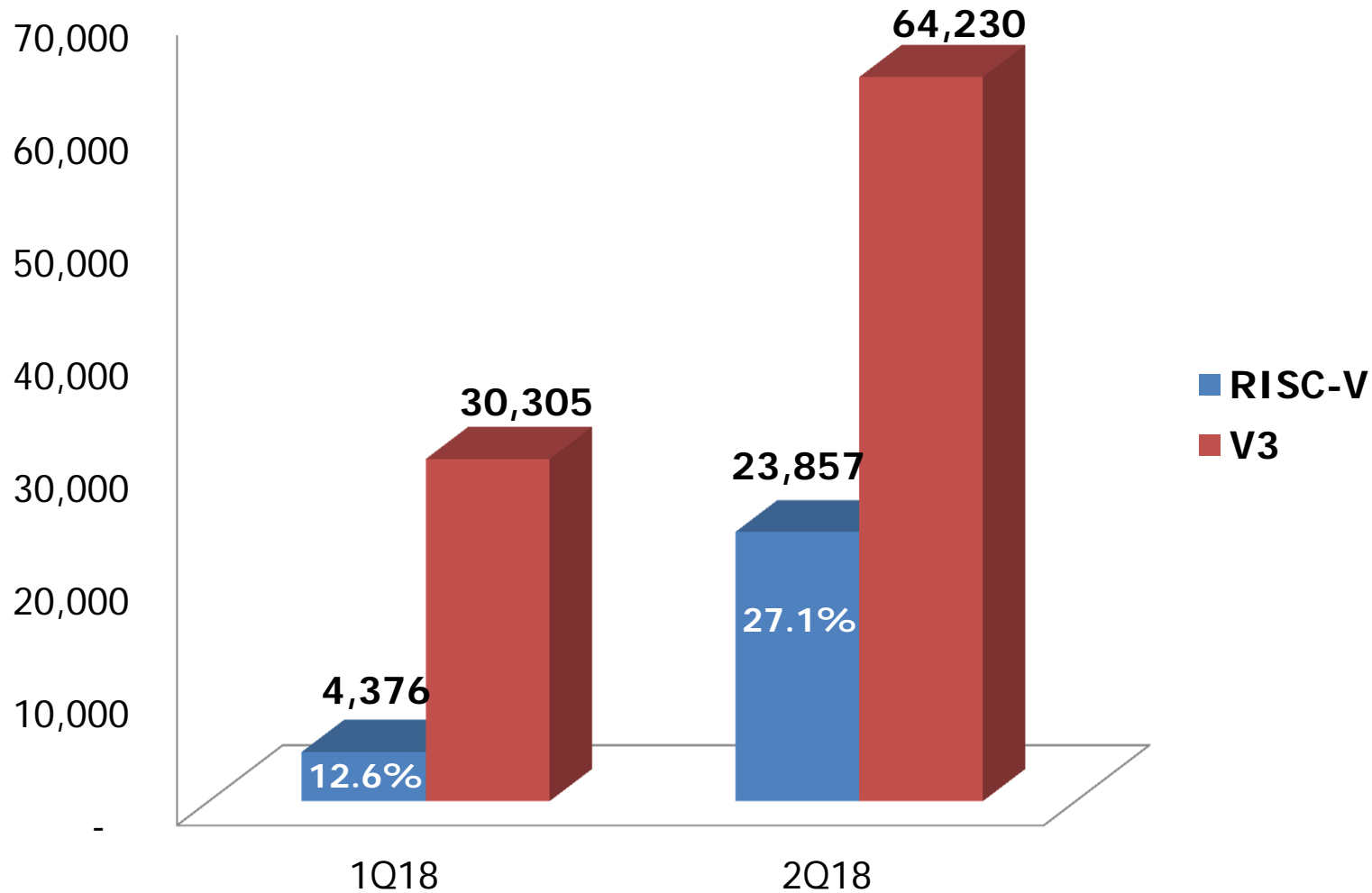
◆ Agreements may sign for H1: 20 ~ 23 reported, now 21

	1H18	簽約客戶數
N7, N8, N9	Mainland x 4, US x 2, Korea x 3, Taiwan x 1	10
N10, D10, N13	Mainland x 4, US x 1, Taiwan x 1	6
D15	Europe x 1	1
N25, NX25, AX25	Mainland x 2, US x 1, Taiwan x 1	4

2018年上半年銷售分析-RISC-V



(單位:新台幣千元)



產品應用

豐富多樣的客戶應用



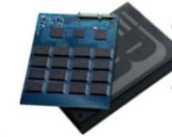
- Touch Screen
- eBook/eDictionary
- Power management
- Bio-medical device
- CMMB
- MCU
- TCON



Consumer

Storage & Sensor

- USB3.0
- SSD, eMMC
- Anti-virus
- Sensor Hub
- mSATA
- Secure SD
- Fingerprint Recognition



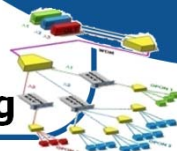
- Motor Control
- Wireless Charger
- Surveillance
- Barcode scanner
- ADAS
- VEDR
- 4K2K CODEC
- 8K4K CODEC



Communication & IoT

Industrial & Video

- Wireless display
- WiFi, Bluetooth
- GPS, GPON, NFC
- Gateway/router
- Portable Karaoke
- Sigfox LPWAN
- IoT Cat0 base station
- IoT MCU
- Smart Meter
- ESL
- Smart Lighting



Andes Core™



and more....

物聯網應用 - 1



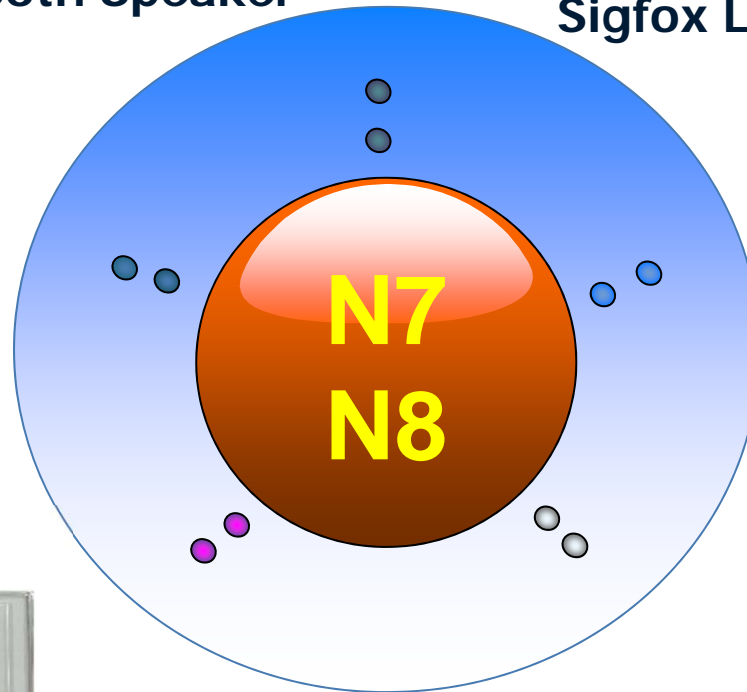
Bluetooth Speaker



Sigfox LPWAN



Healthcare device



Wearable device



Electronic price tags



Sensor Hub

物聯網應用 - 2



Wearable devices



Drone



Portable Karaoke



GPS/Beidou in shared bikes



WiFi/GPS/FM/Bluetooth
combo



Contactless payment
(NFC)

汽車電子應用



◆ N13

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



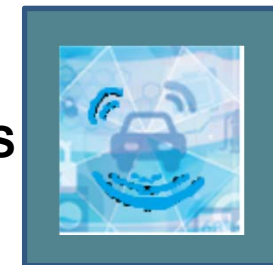
◆ N10

- ◆ 行車紀錄器
- ◆ 先進駕駛輔助系統 (ADAS)



◆ D10

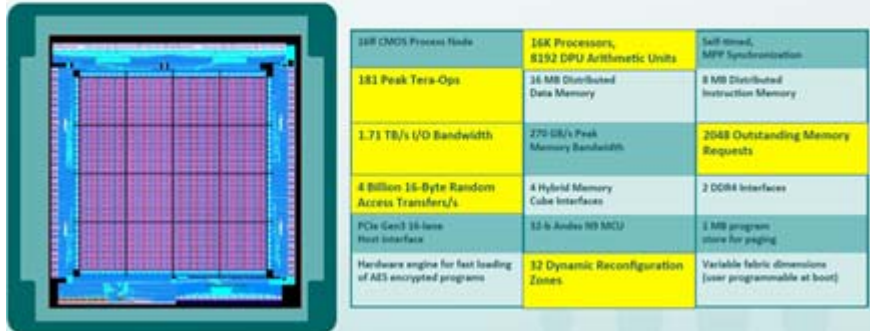
- ◆ ADAS



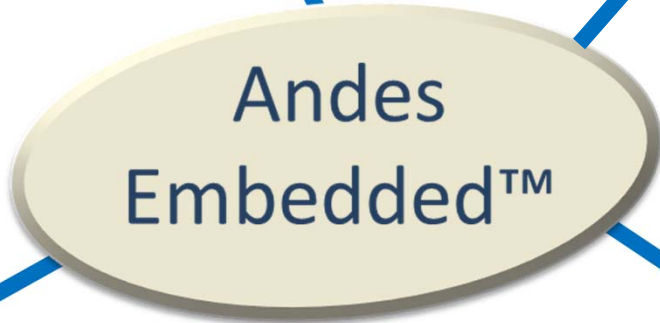
AI 人工智慧應用



Wave Computing - Dataflow Processing Unit (DPU) Architecture



Courtesy: Wave Computing



◆ N9
Dataflow Processing

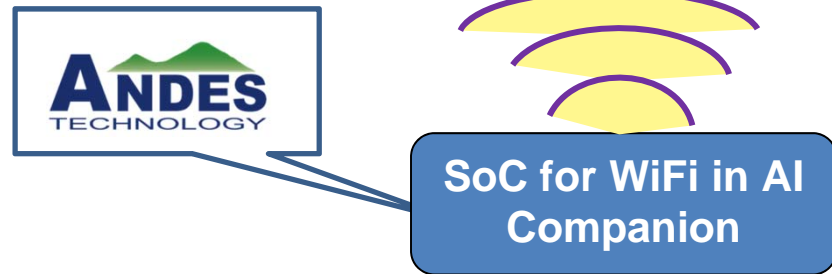
◆ D15F
影像辨識



◆ D10
語音辨識



◆ 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

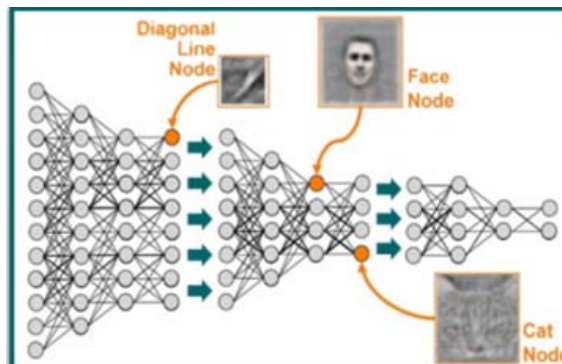
■ 路由器

❖ 無人機飛控

❖ 機器人

❖ ...

❖ 由百種應用邁向千種應用的歷程



16K Processors,
8192 DPU Arithmetic Units

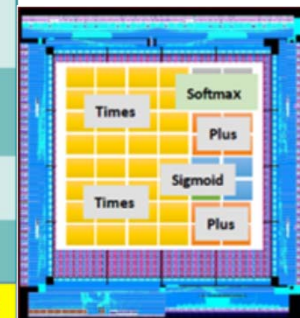
16 MB Distributed
Data Memory

270 GB/s Peak
Memory Bandwidth

4 Hybrid Memory
Cube Interfaces

32-b Andes N9 MCU

32 Dynamic Reconfiguration
Zones



新產品及生態系統

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**

 **RISC-V**



V5 AndesCore™ Processors

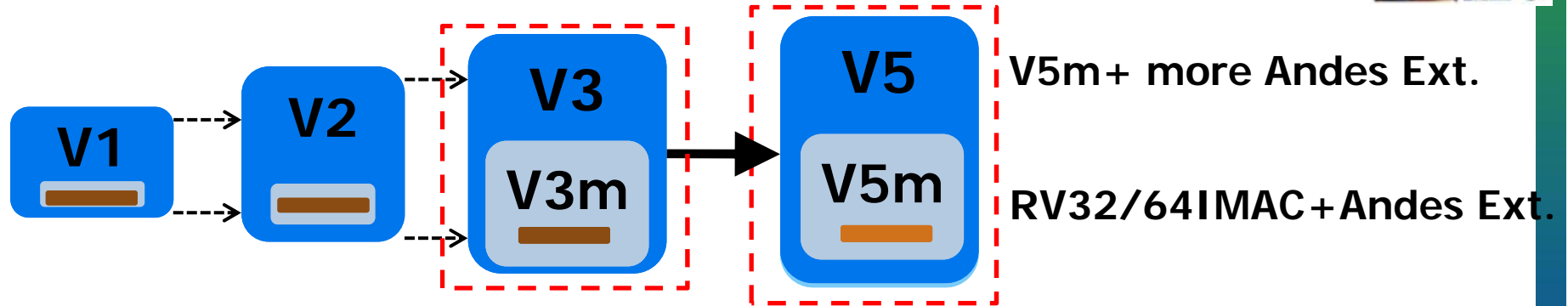
N25/NX25

N25F/NX25F

A25/AX25



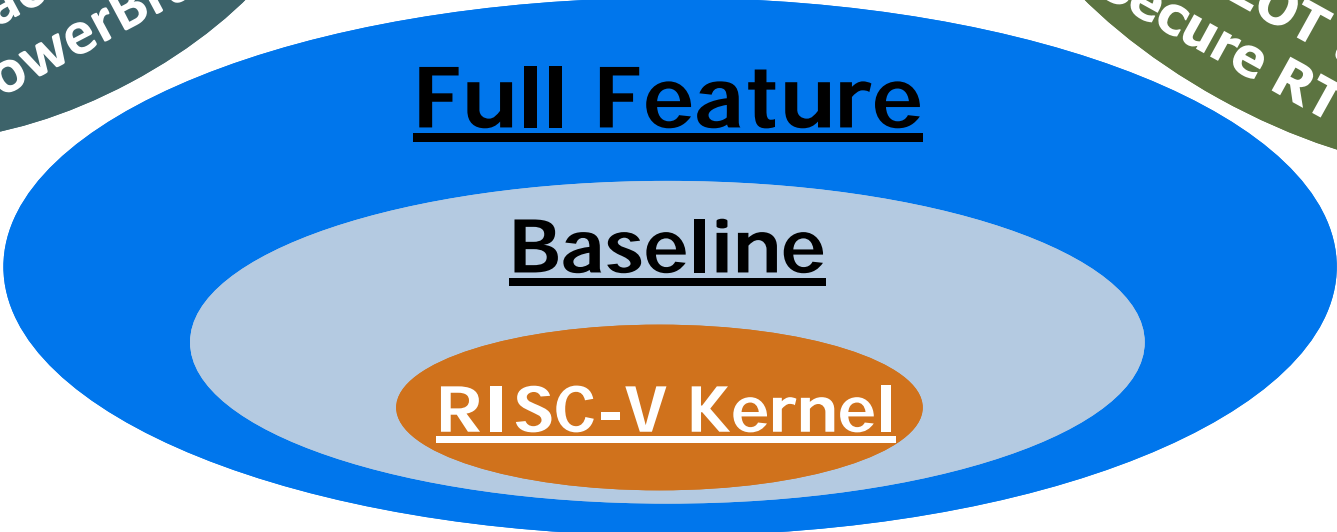
AndeStar™ V5: New Generation of ISA Kernel



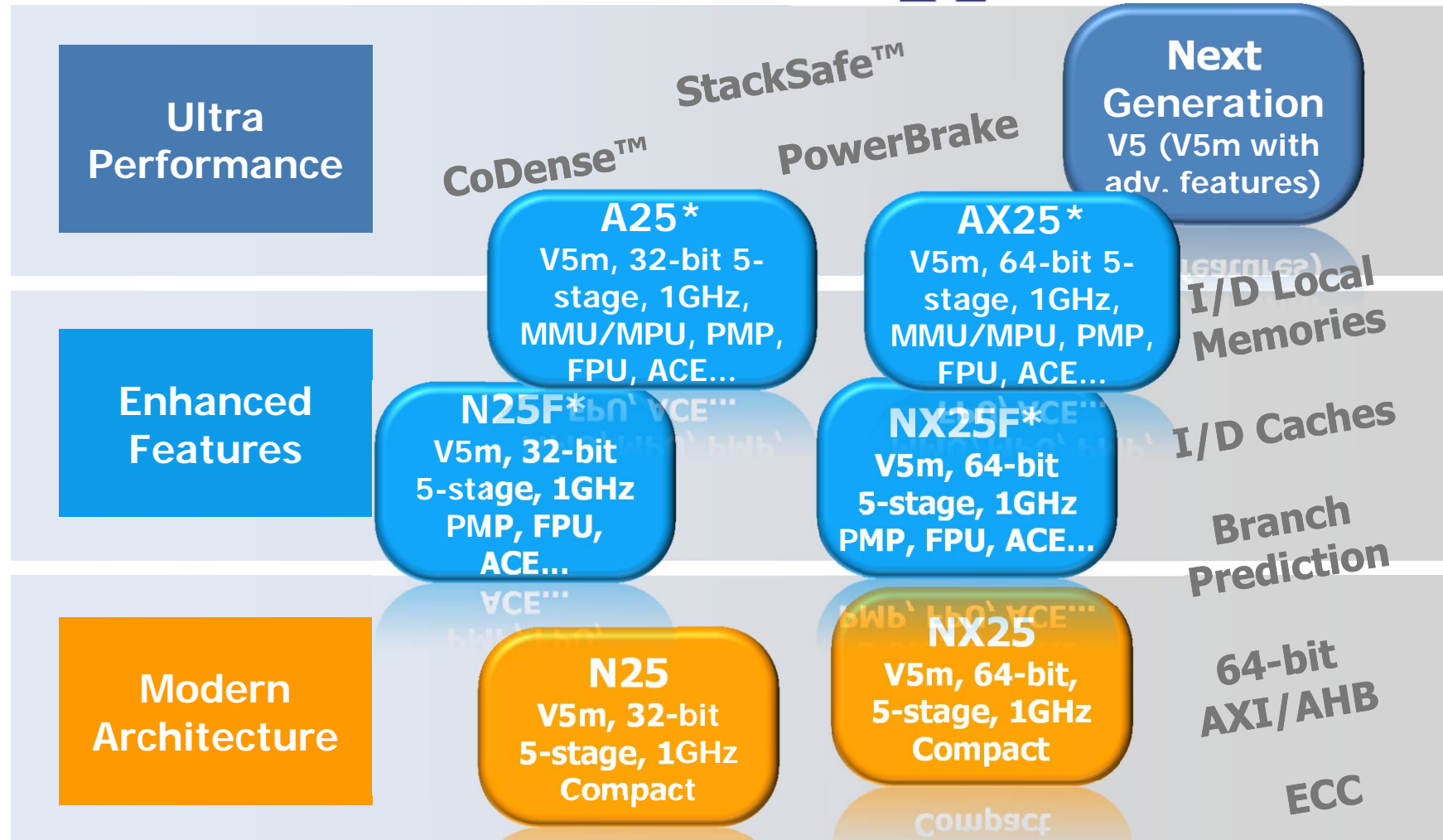
CoDense™
StackSafe™
PowerBrake

Custom Ext.
DSP/FP Ext.
Security Ext.

Compiler Opt.
>200 DSP Libraries
COPILOT tools
Secure RTOS



AndesCore™ V5 家族

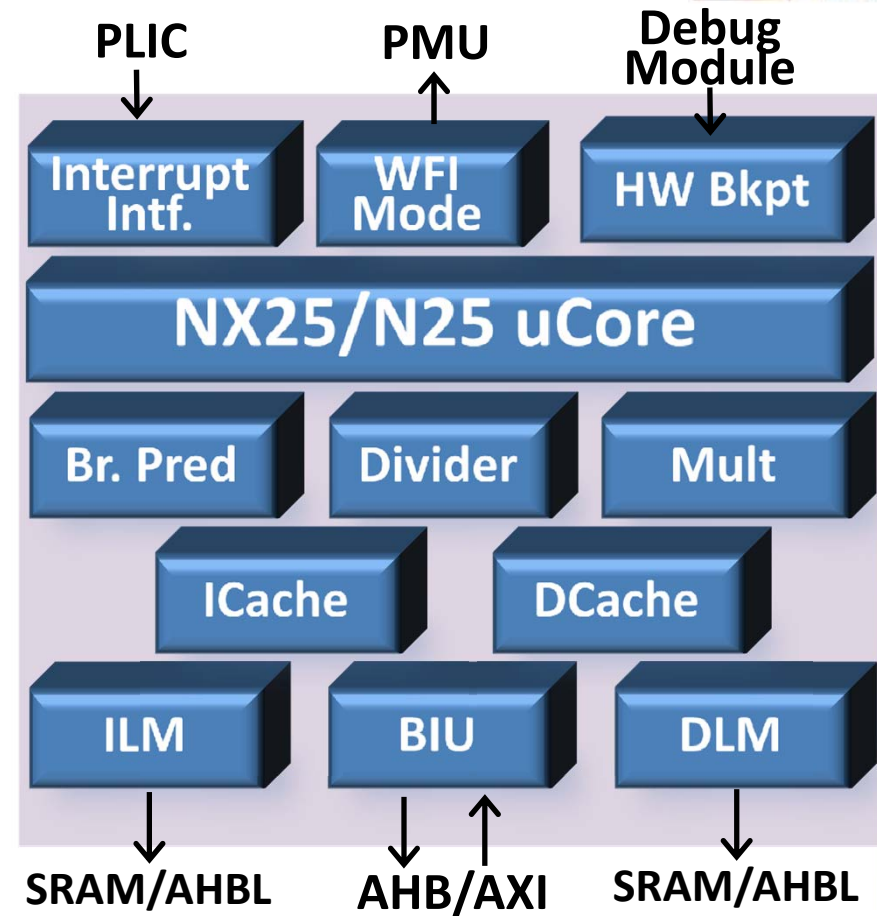


◆ 28HPC RVT, SS, 0.81V, 0C, with I/O constraints. * Available now

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**

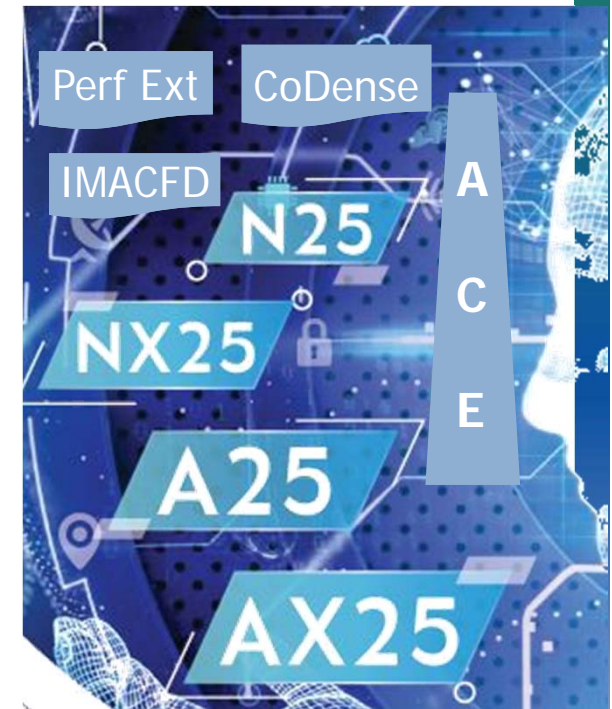


- ❖ **N25 sample config. @ 28HPC:**
 - Small: 37K gates, 1GHz (worst)
 - Large: 159K gates, 1.15GHz (worst)

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



YTD RISC-V Design Win



- ❖ **NX25: Enterprise SSD (Taiwan)**
- ❖ **N25, AX25: FPGA for AI (US)**
- ❖ **N25: AI (China)**
- ❖ **AX25: FPGA for AI (China)**
- ❖ **Six design service providers joined Andes RISC-V Easy Start Program: US x 2, Korea x 1, China x 1, Taiwan x 2**



AndesCore™ 競爭優勢



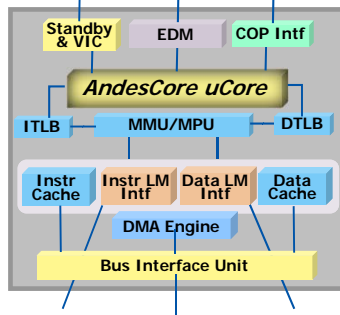
AndesCore™	AndesCore/ Competitor	Competitors
	Power Efficiency ¹ (DMIPS/mW)	
<u>N7</u>	+42%	Cortex-M0+
<u>N8</u>	+43%	Cortex-M3
<u>N9</u>	+43%	Cortex-M3
<u>D10</u>	+48%	Cortex-M4
<u>N13</u>	+185%	Cortex-A5
<u>N13</u>	+45%	Cortex-R4
<u>D15F</u>	+121%	Cortex-M7

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

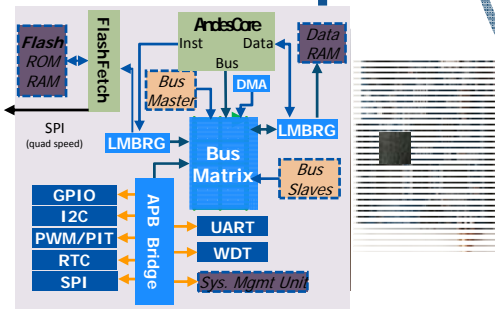
64位元架構及生態系統



Processor IP's AndeCore™ NX25



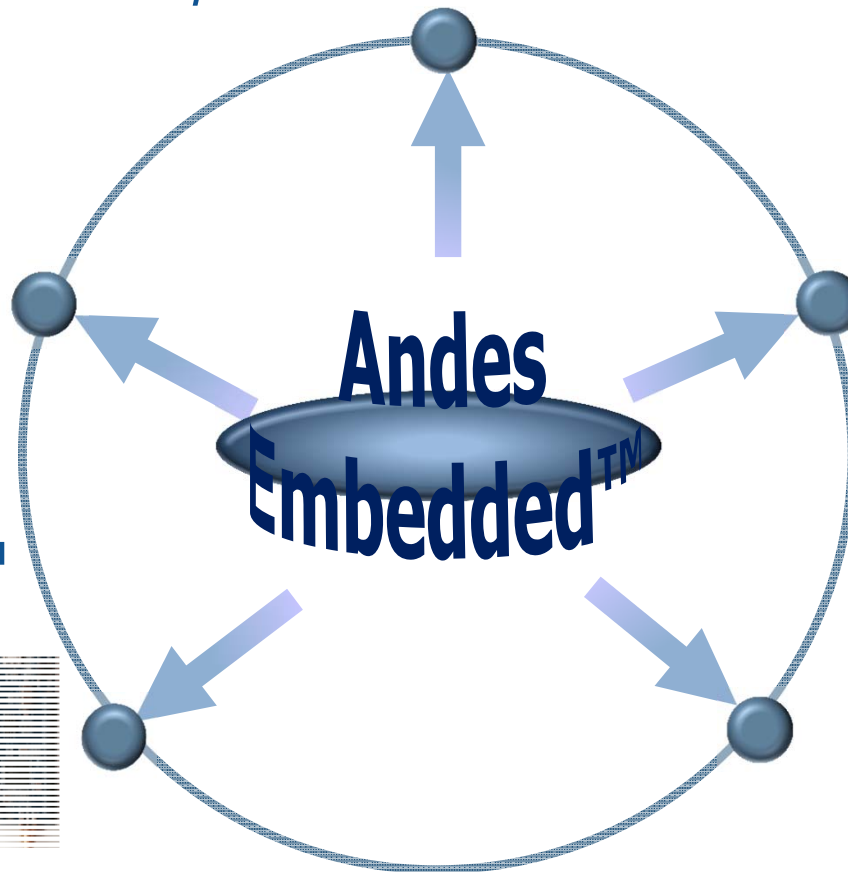
Development Platforms AndeShape™



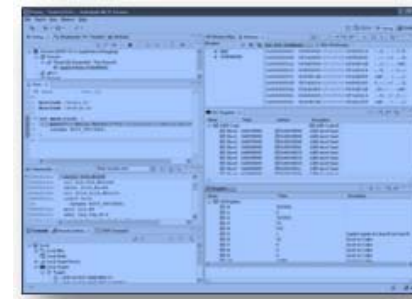
Processor Architecture AndeStar™ V5, V5m

```

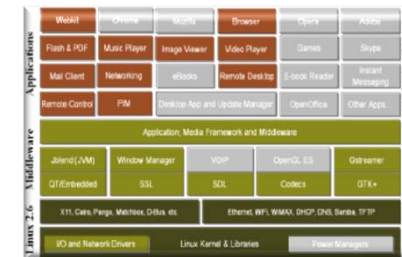
smw.adm $r1, [$sp], $r5, 0x0
smw.adm $sp, [$sp], $sp, 0x2
addi    $sp, $sp, -8
sethi   $r1, 0x50a
lwi     $r1, [$r1+#0x98]
mov55   $r2, $r0
mov55   $r0, $r1
lwi     $r1, [$r1+#0x8]
addi    $r3, $sp, 12
    
```



Development Tools AndeSight™



SW Stacks AndeSoft™



生態系統: Andes 與 Knect.me



Knect.me 生態系統

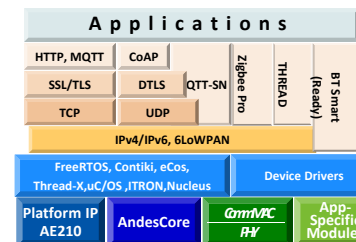
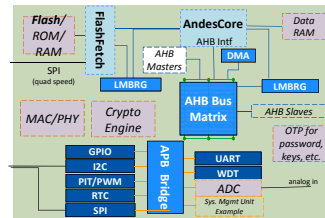


❖ 建立 *knect.me* 生態系統協助物聯網發展

- 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

knectme™



增加 A.I. 至 Knect.me 生態系統



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

Mindtree Welcome to possible Ubec L&T Technology Services SECURE IC INTRINSIC ID SECURE RF
Holy Stone ORCA SYSTEMS inside BarcoSilex winbond
M31 ememory ASI Sidense CYPRESS 聯興微系統科技 UniSense SONICS
Performance-IP IP to improve your SoC performance DELPHIN INTEGRATION Dolphin Technology NORTHWEST LOGIC
matricus inc NSCore ANALOG BITS mobiveil Investors in Innovation DCEPHi 深 鑒 科 技
csem GRadio

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 TECHNOLOGY ITE TECH. INC. M² Communication Neltrend 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，例如對GCC compiler、LLVM compiler、fast interrupt、vector instructions等技術多所貢獻。晶心科技目前領導著RISC-V 基金會之DSP指令集工作小組，執行RISC-V P-Extension的規格發展全球性討論，朝向未來的正式發表而努力中。
- ❖ 晶心科技已陸續與全球六家Design service houses簽訂合約，授權其協助客戶開發內嵌 Andes RISC-V core的ASIC (稱為Andes RISC-V Easy Start Program)，創造晶心、Design service house與產業共贏的局面。此一行動仍在持續中，預期在數月內完成與全球二十家Design service houses簽訂 Andes RISC-V Easy Start Program 合約，形成一個聯盟，強化 Andes RISC-V 生態系統。

謝謝指教



Andes Core™

www.andestech.com

問與答