



晶心科技股份有限公司 2019年第四季法人說明會

Driving Innovations™



股票代號: 6533
2020/03/10

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
- 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。
- 根基穩健的高科技上市公司。
- 員工人數達200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)
- 中國電子報 2018 MCU 設計創新獎。



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

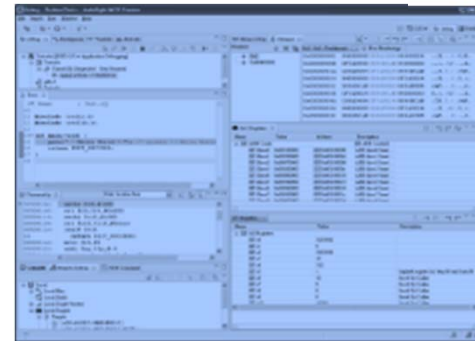
重要里程碑



- 全球授權客戶超過**180**家
 - 台灣, 大陸, 韓國, 日本, 歐洲, 及美國
 - 授權合約超過**300**份
 - 2019授權客戶**38+103**** (**: 網路授權)

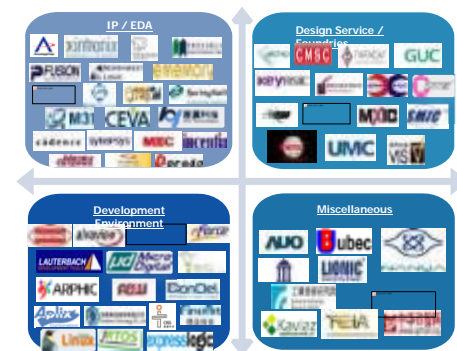


- AndeSight™ IDE:
 - 安裝次數超過**17,000** 次

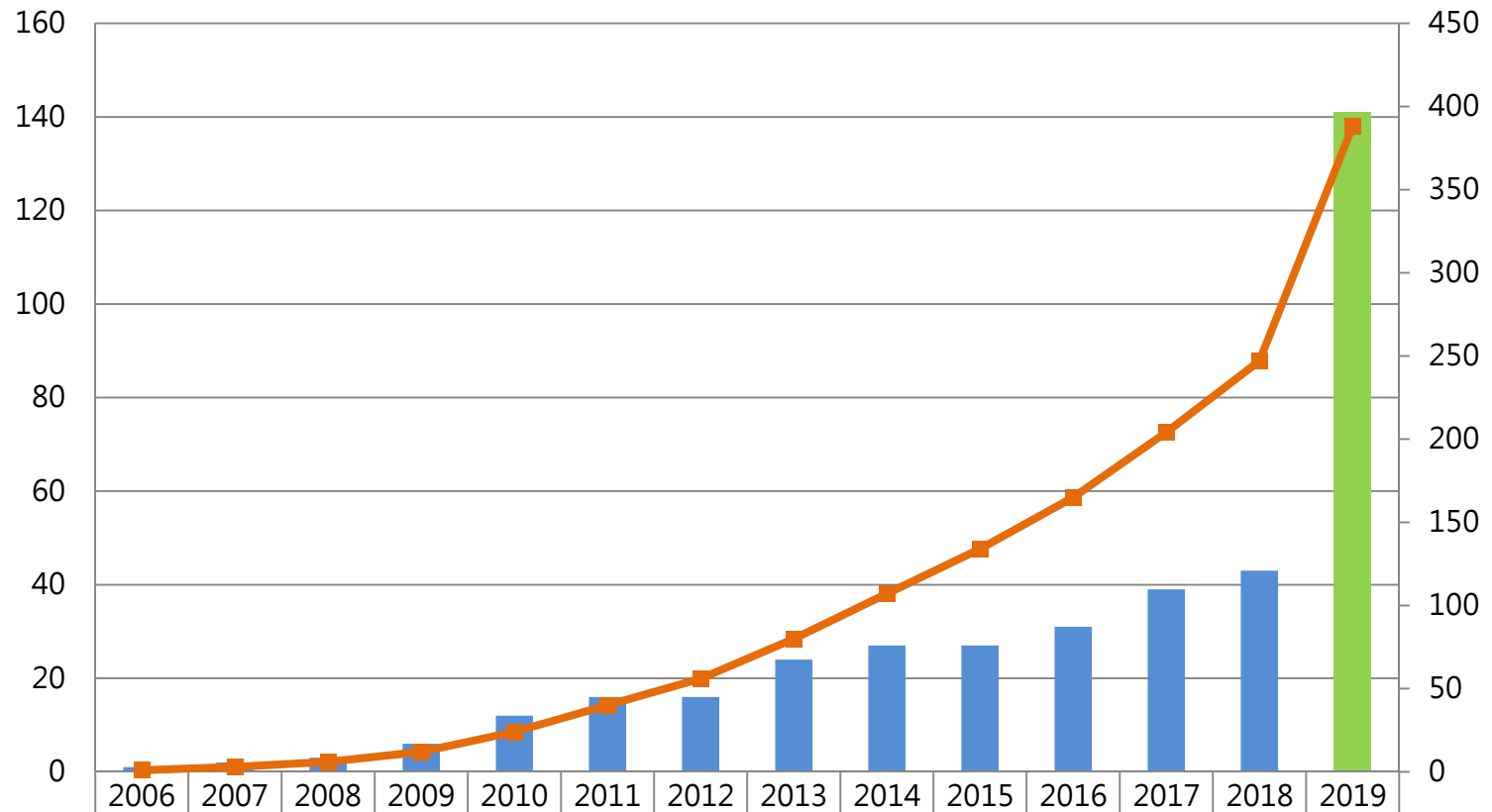


- 生態系統:
 - 合作夥伴超過**145** 家

- 嵌入晶心處理器之系統晶片累計出貨量
 - 超過**50**億顆



IP 授權合約數穩健成長

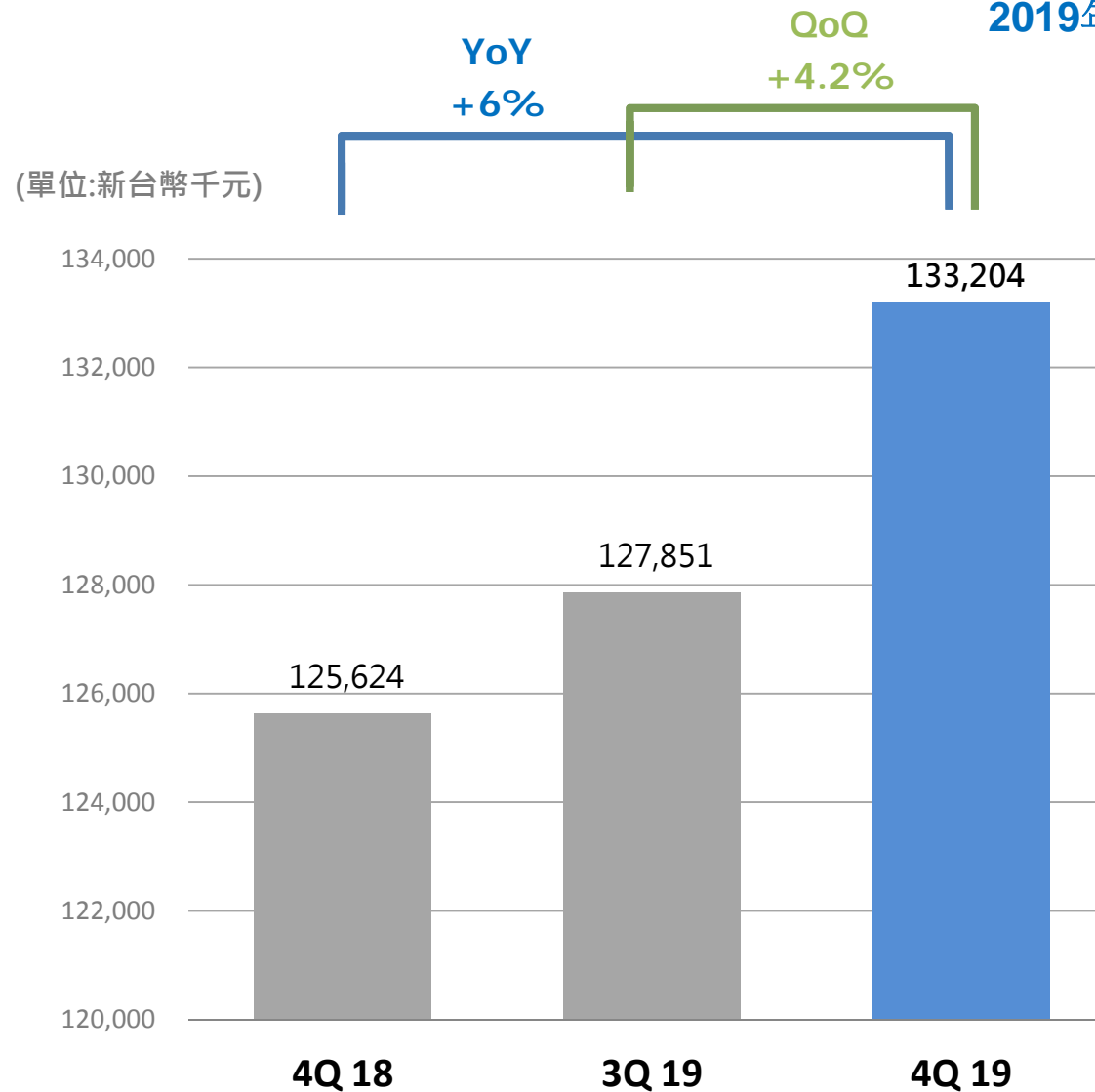


■ IP授權合約數	1	2	3	6	12	16	16	24	27	27	31	39	43	141
—■ 累計IP授權合約數	1	3	6	12	24	40	56	80	107	134	165	204	247	388

2019年第四季營業收入



2019年營業收入: 494,851

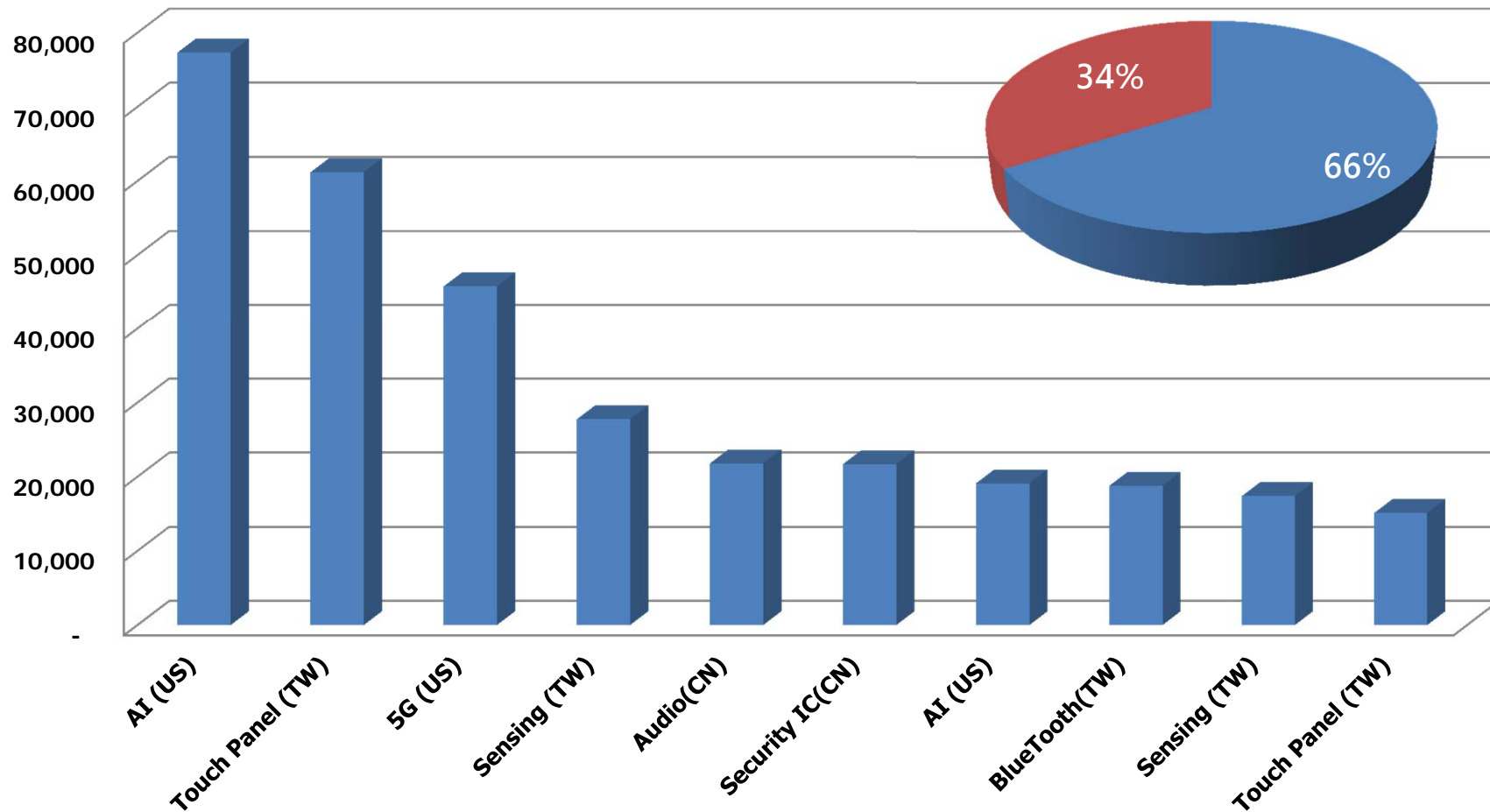


2019年度前十大客戶之應用分析

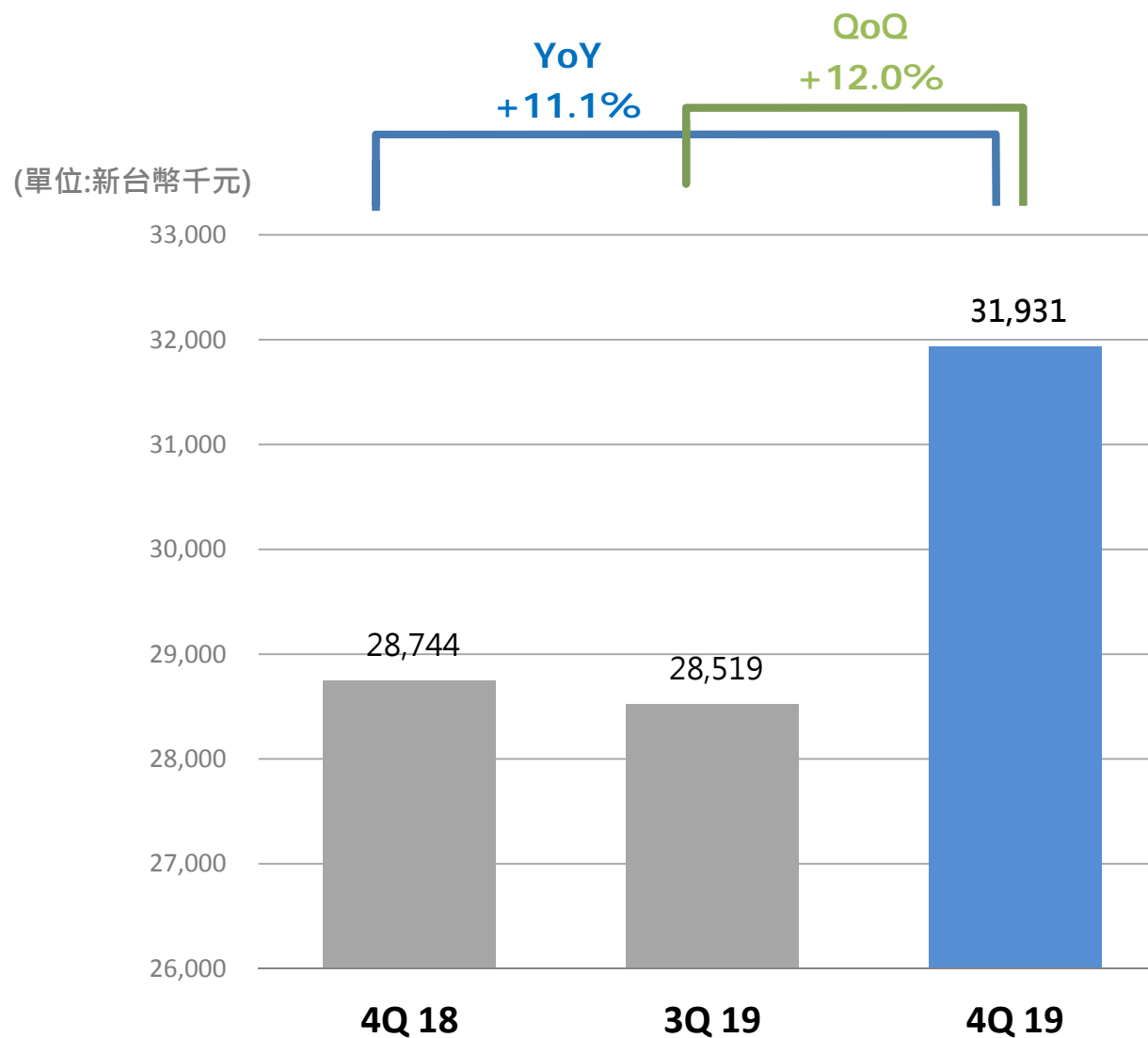


單位: 新台幣千元

前十大客戶貢獻66%的營收



2019年第四季權利金收入

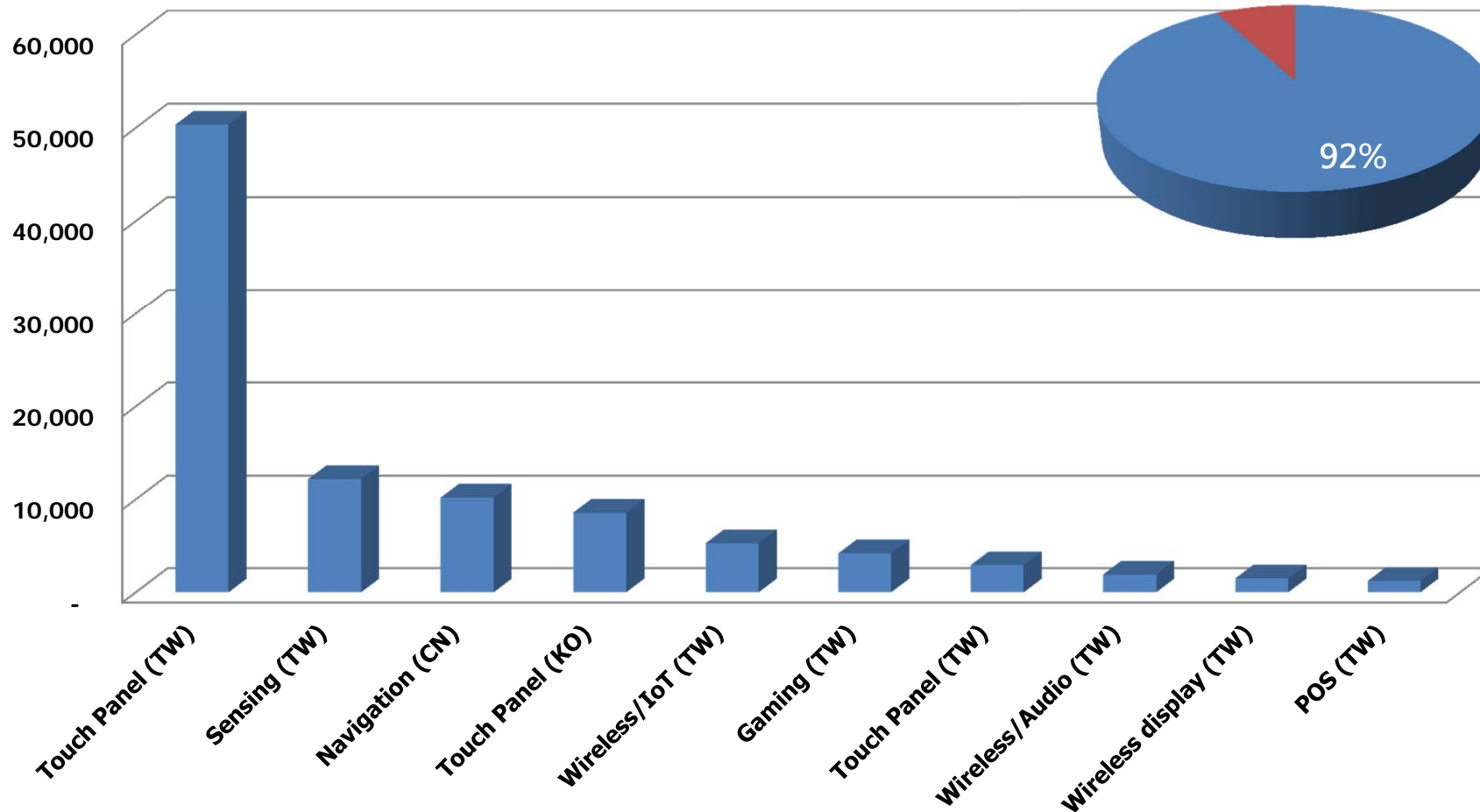


2019年度前十大權利金應用分析



(單位:新台幣千元)

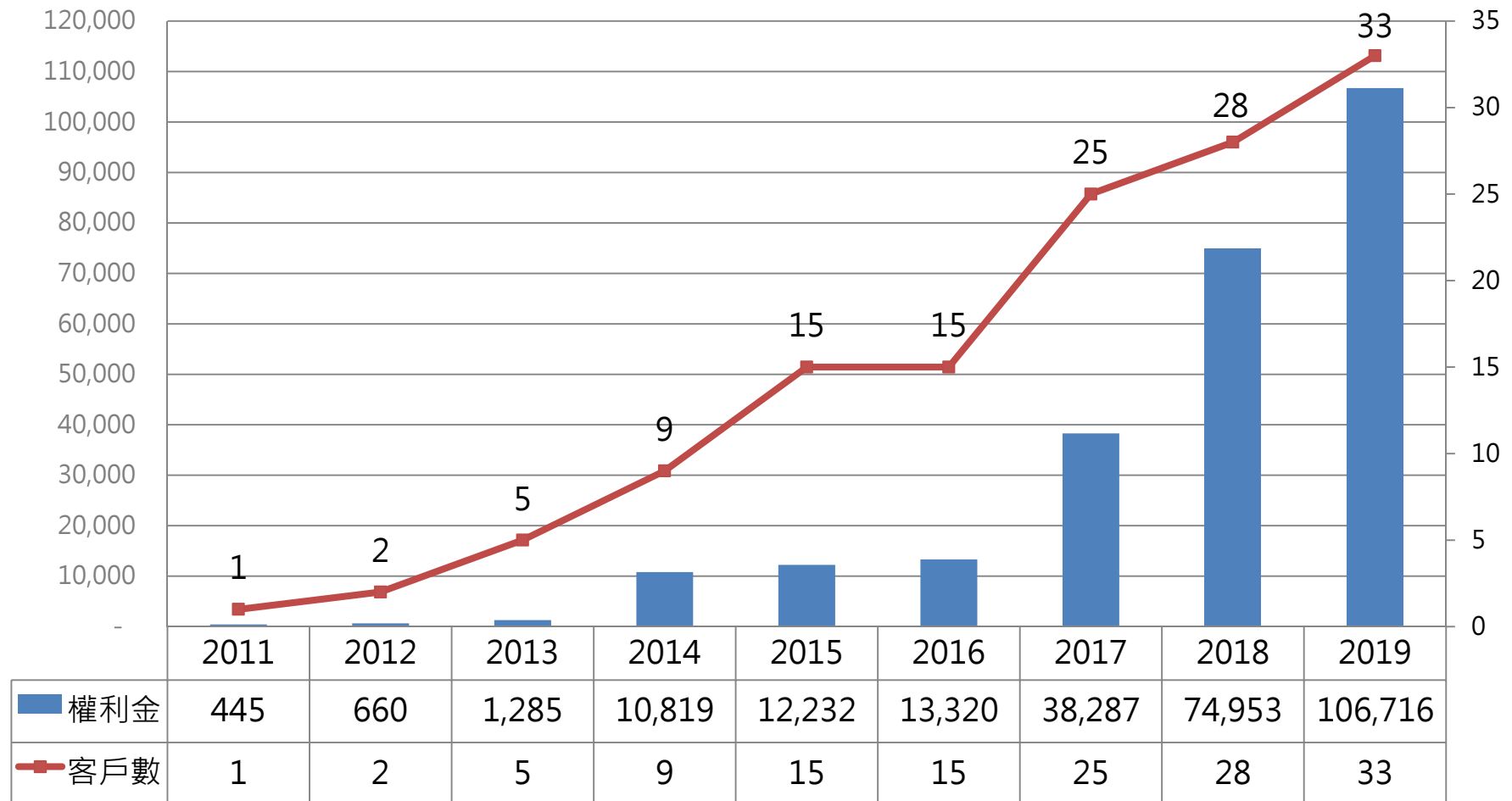
前十大權利金客戶貢獻比率 92%



權利金貢獻分析



(單位:新台幣千元)

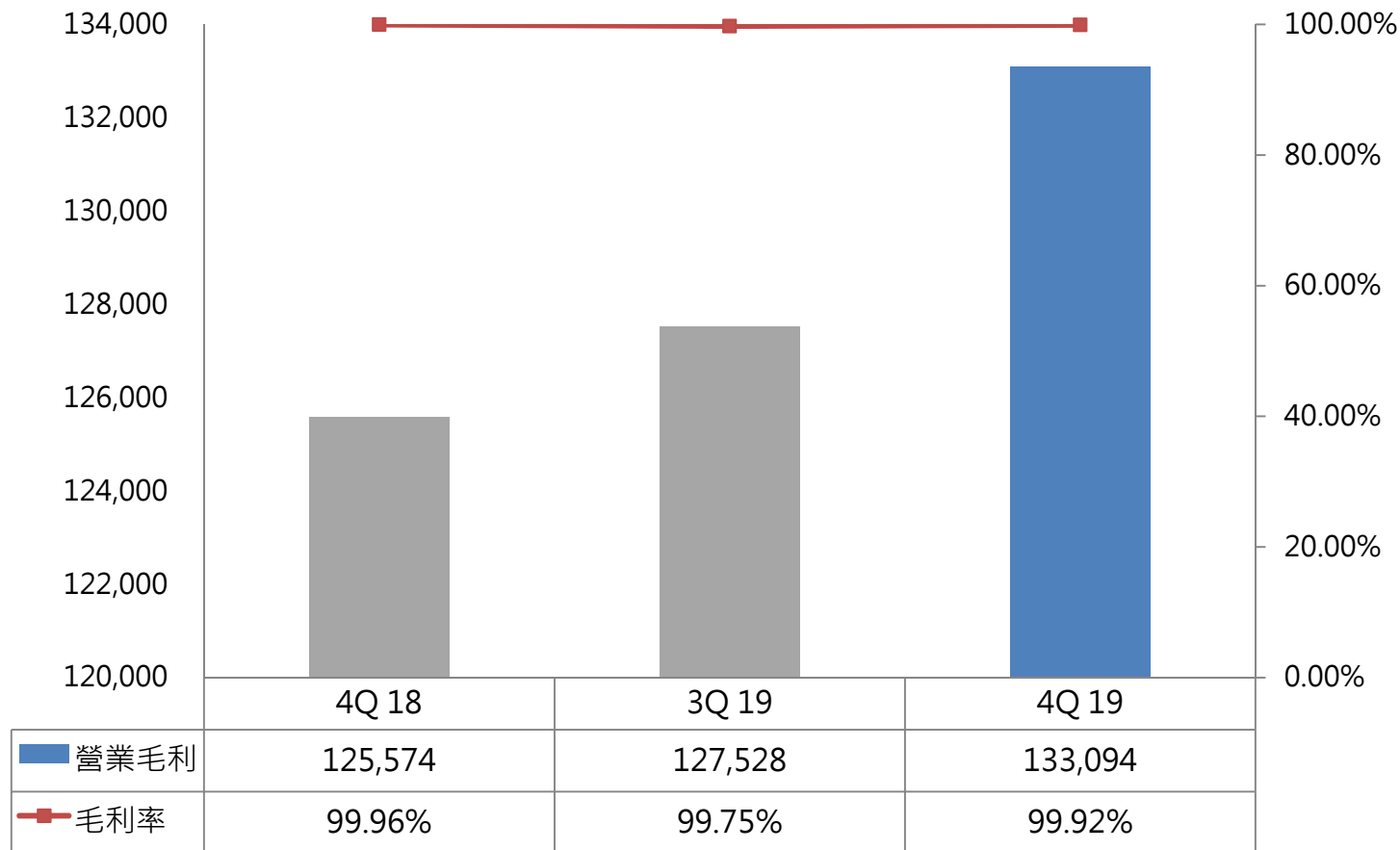


(單位:家數)

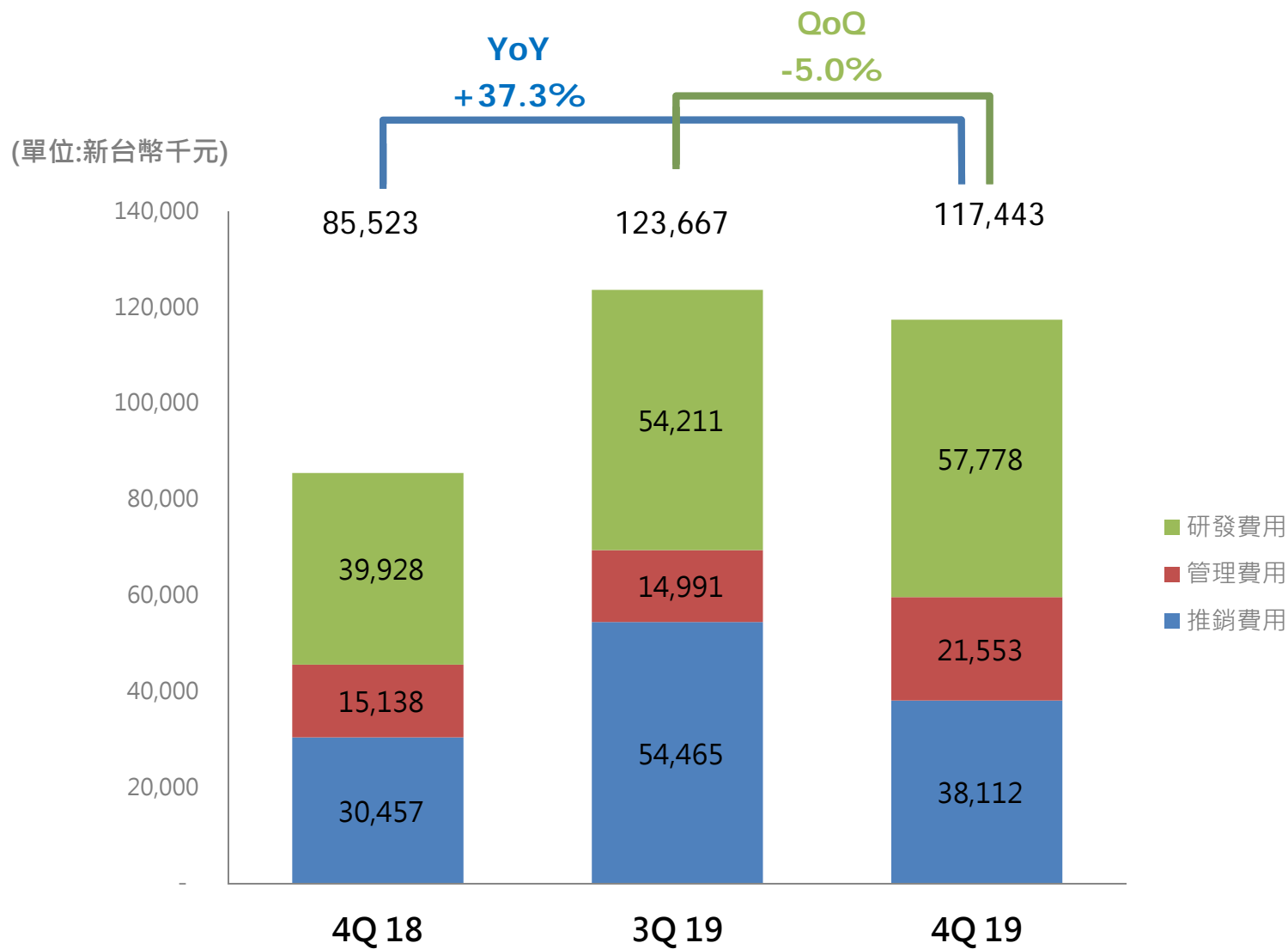
營業毛利與毛利率



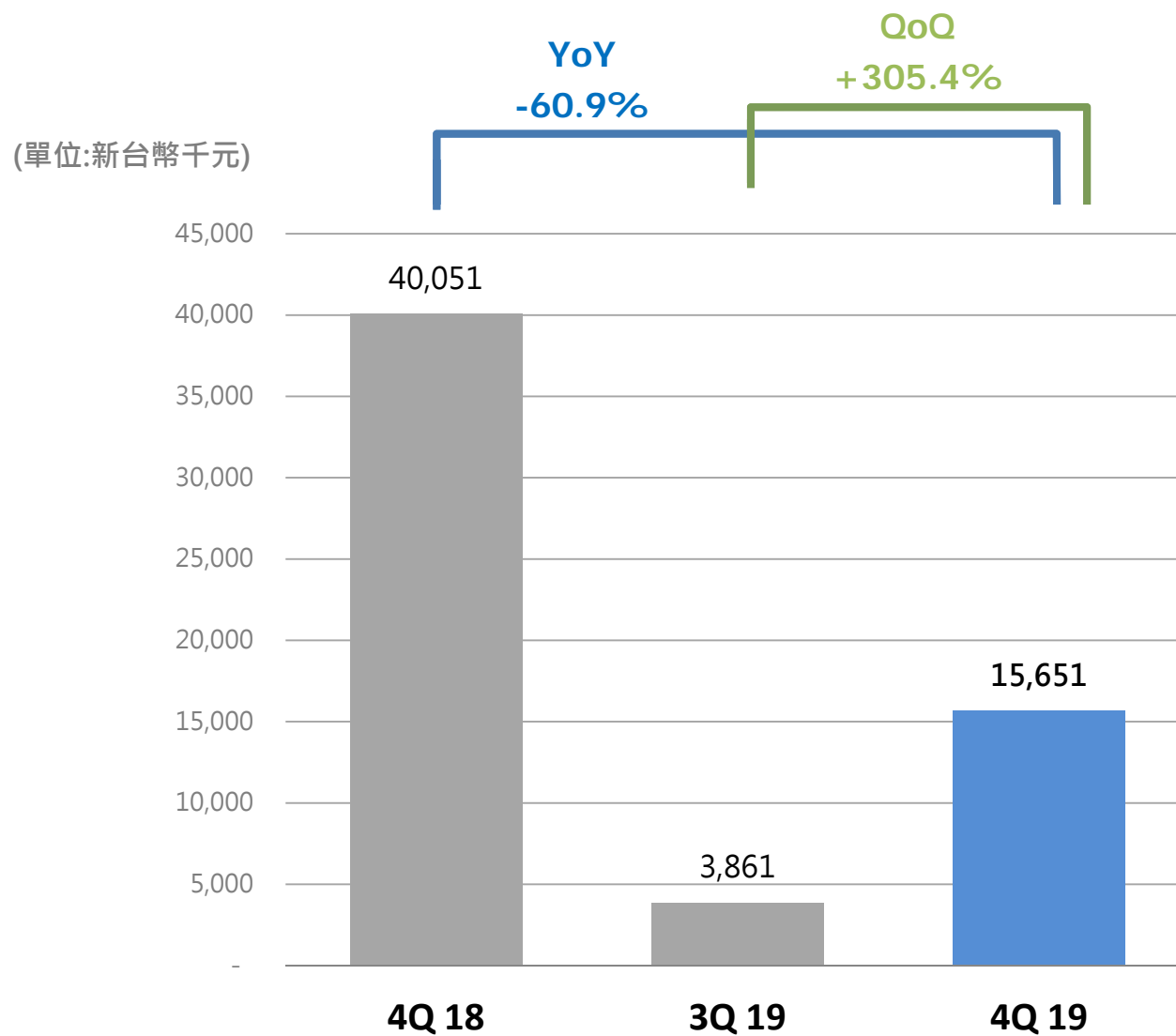
(單位:新台幣千元)



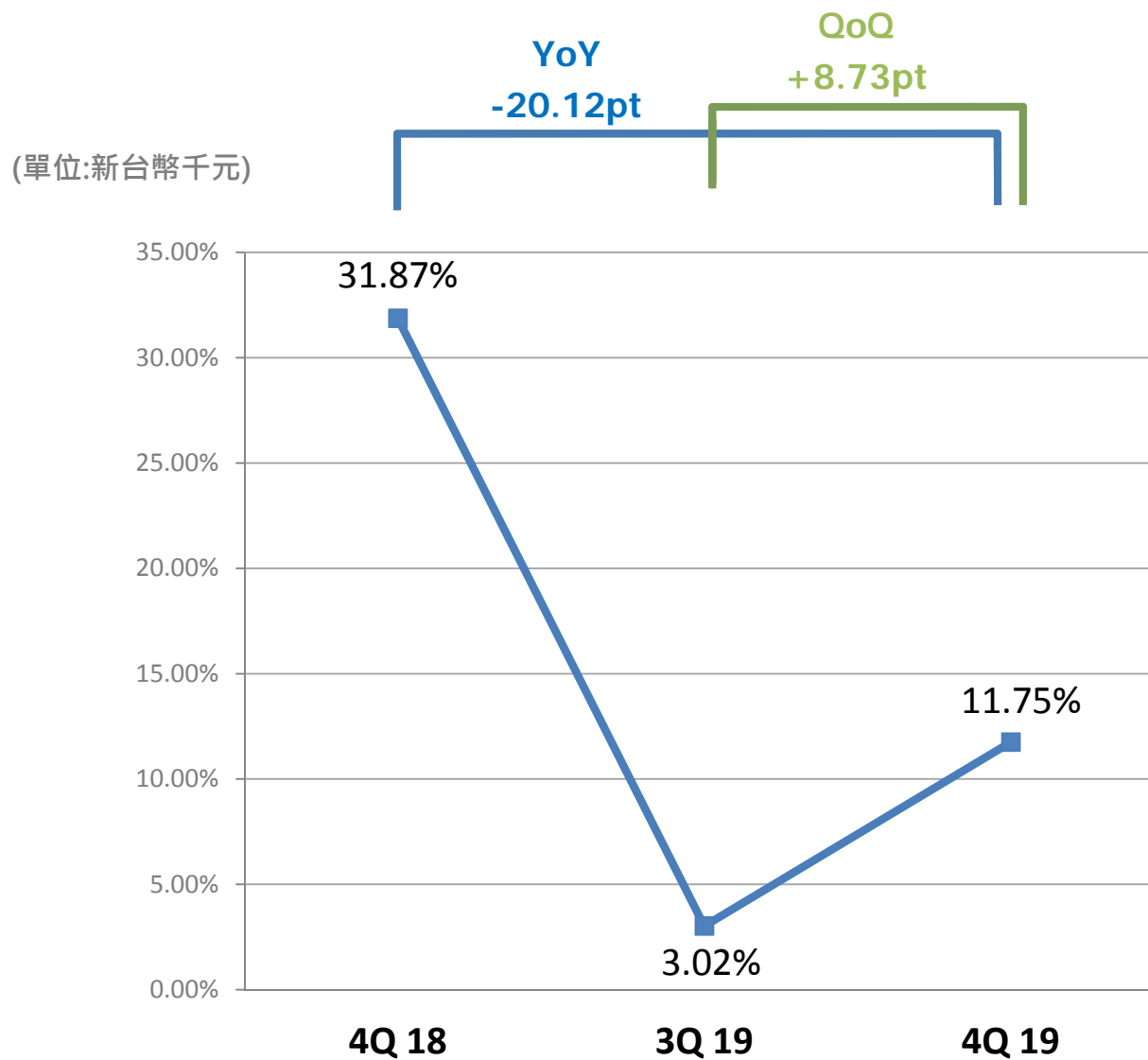
營業費用



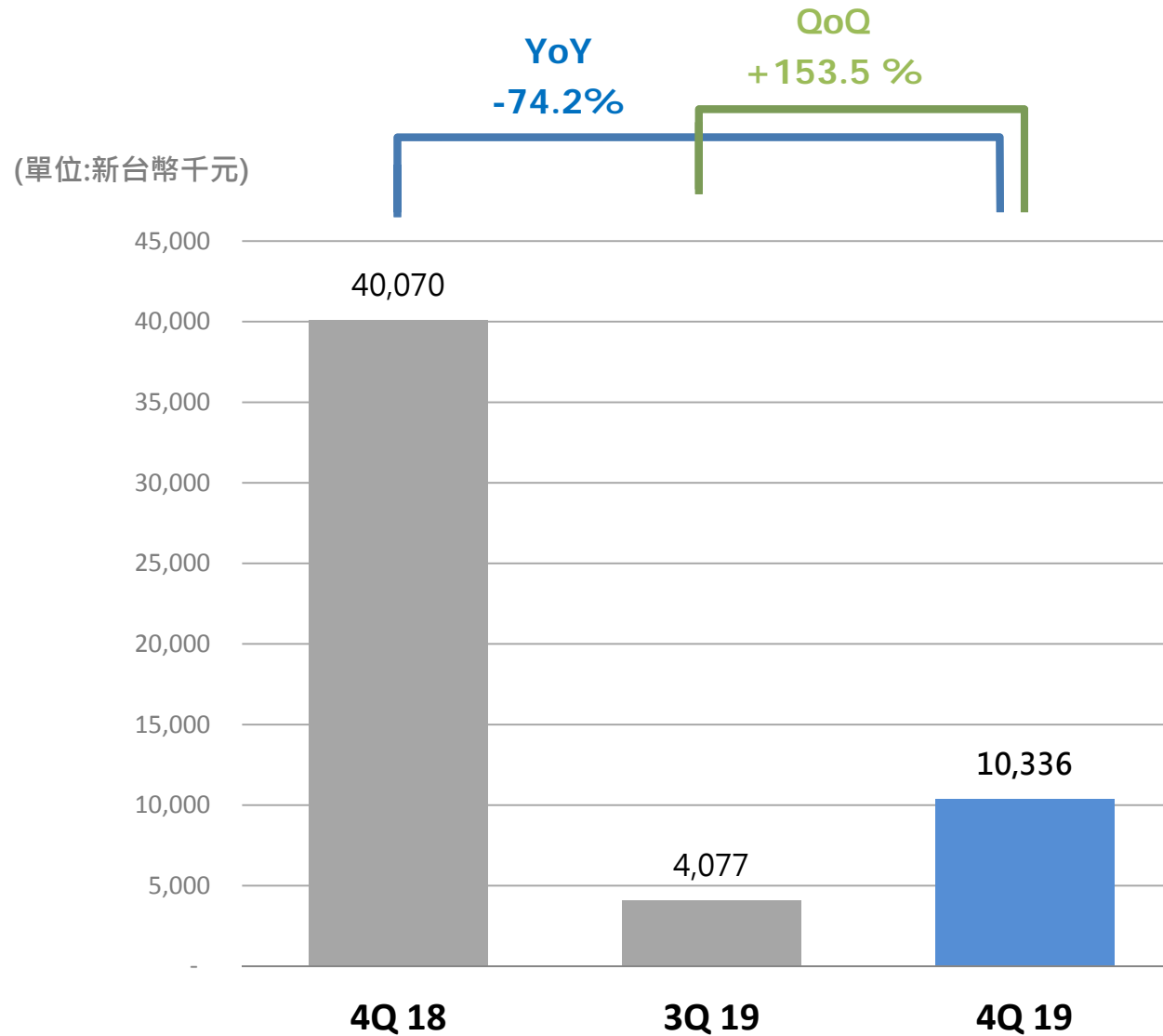
營業利益



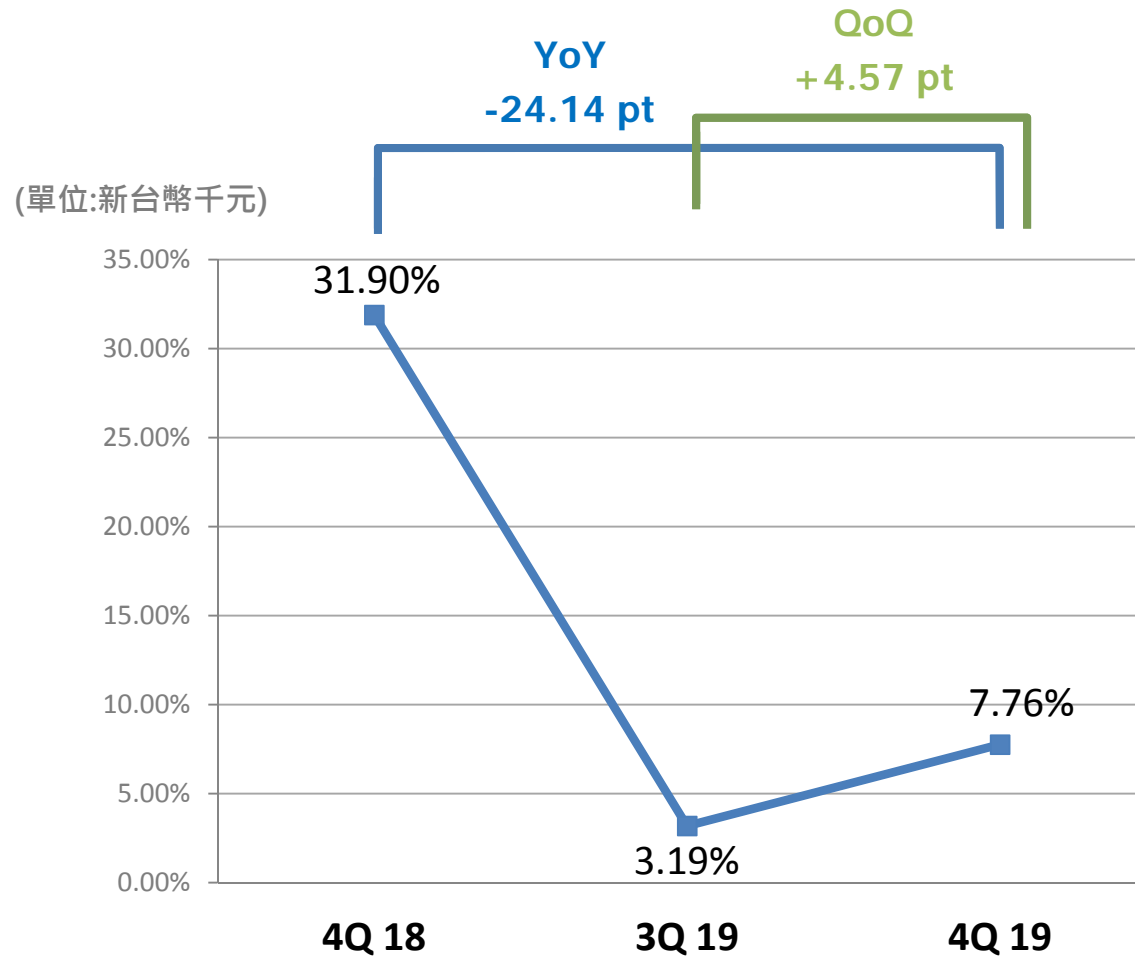
營業利益率



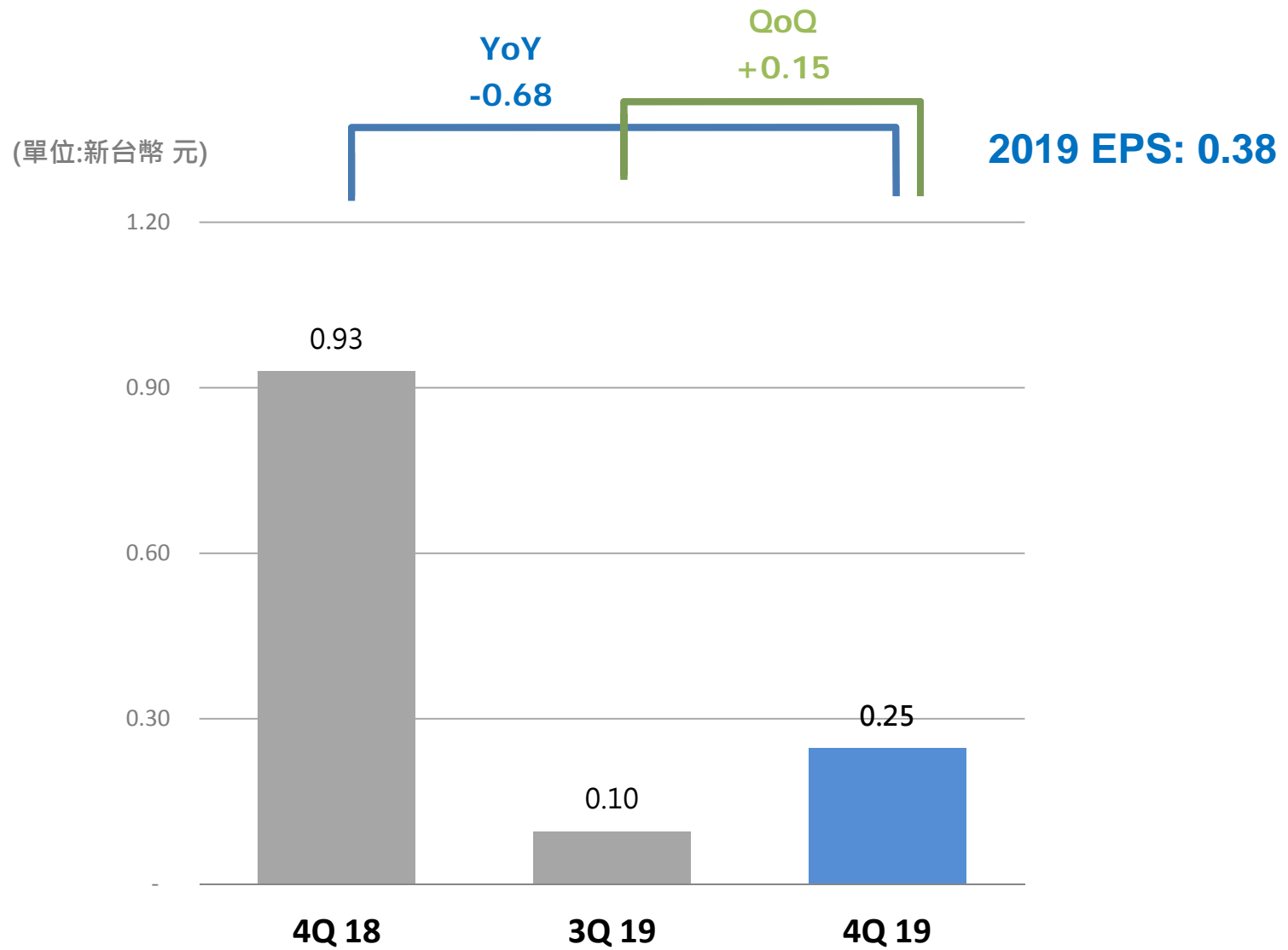
合併淨利



合併淨利率



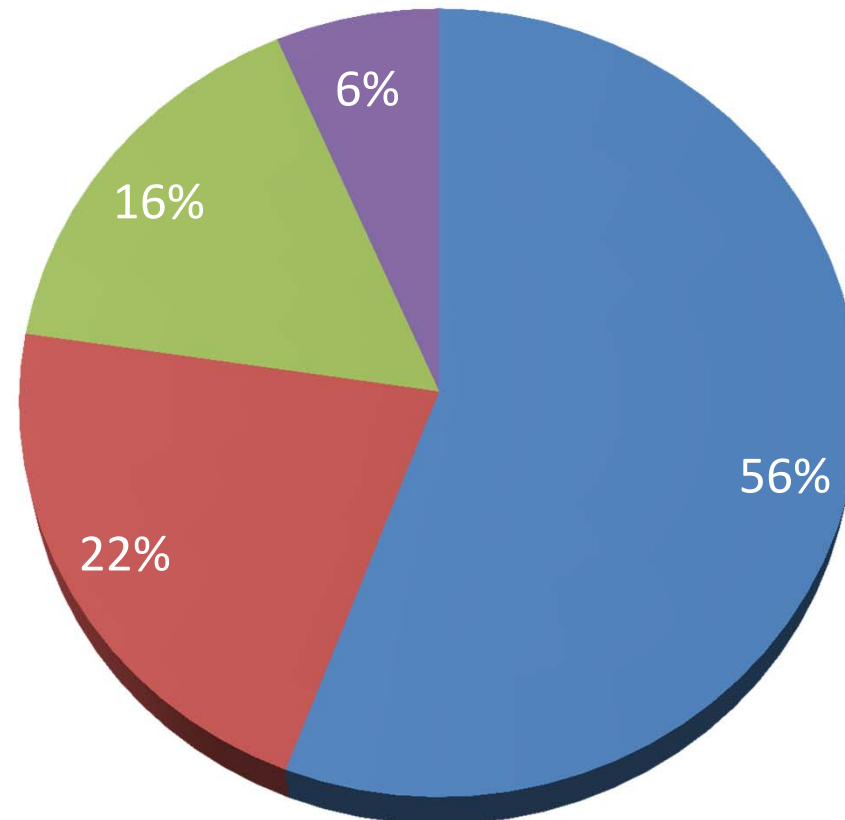
每股盈餘



2019年度銷售分析-收入模式



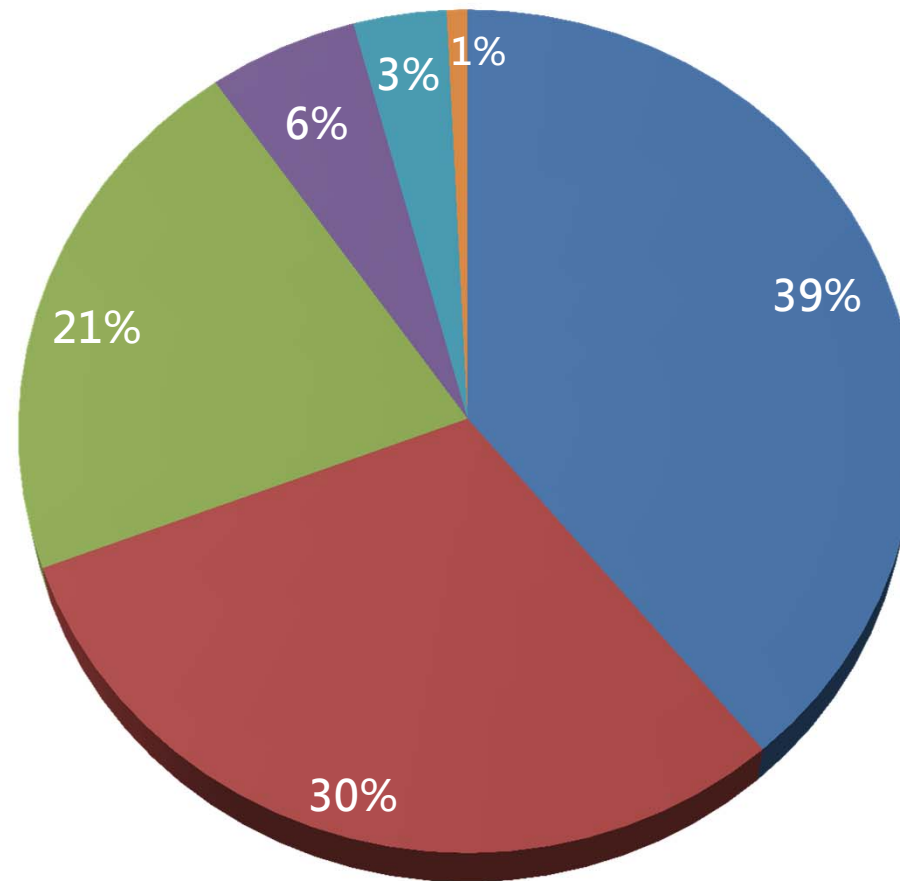
■ 矽智財授權收入 ■ 權利金收入 ■ 技術服務收入 ■ 維護服務收入及其他



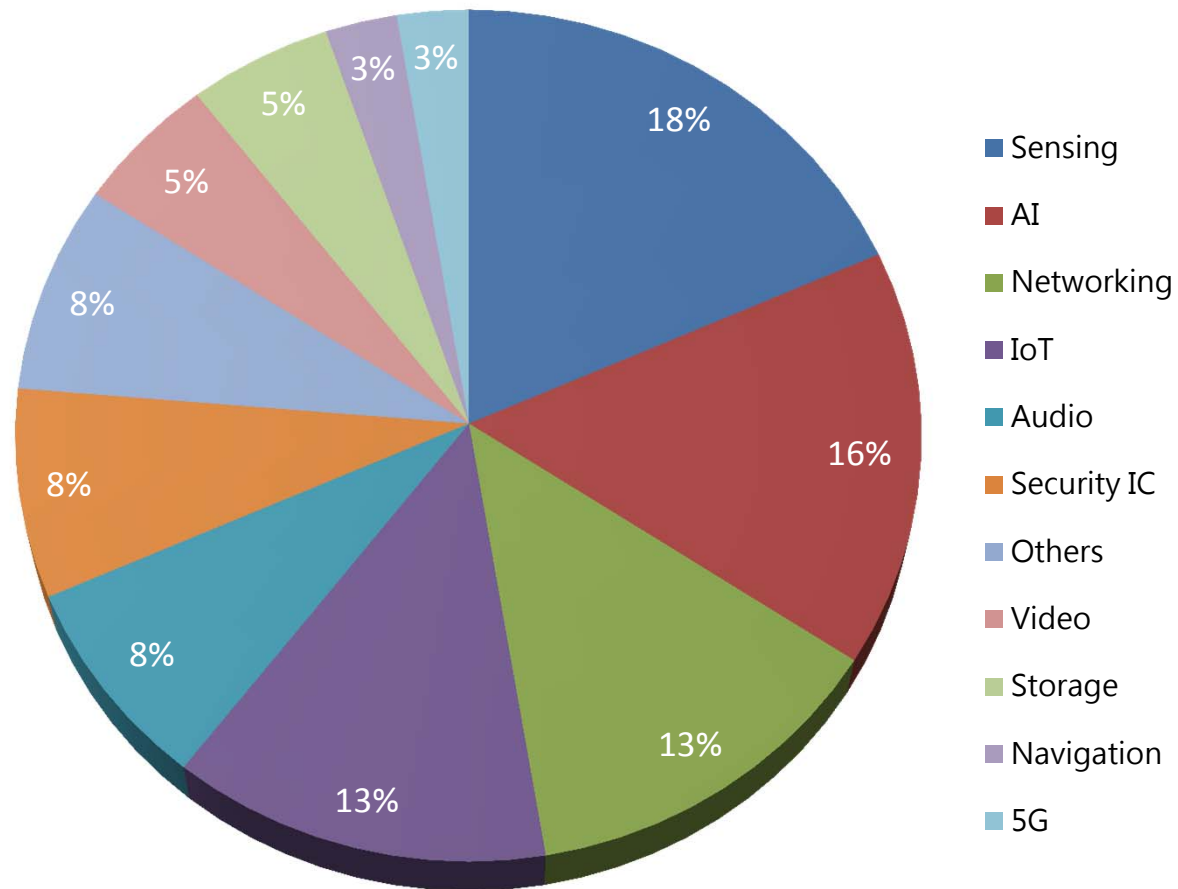
2019年度銷售分析-地區別



■ 台灣 ■ 美國 ■ 中國 ■ 歐洲 ■ 韓國 ■ 日本

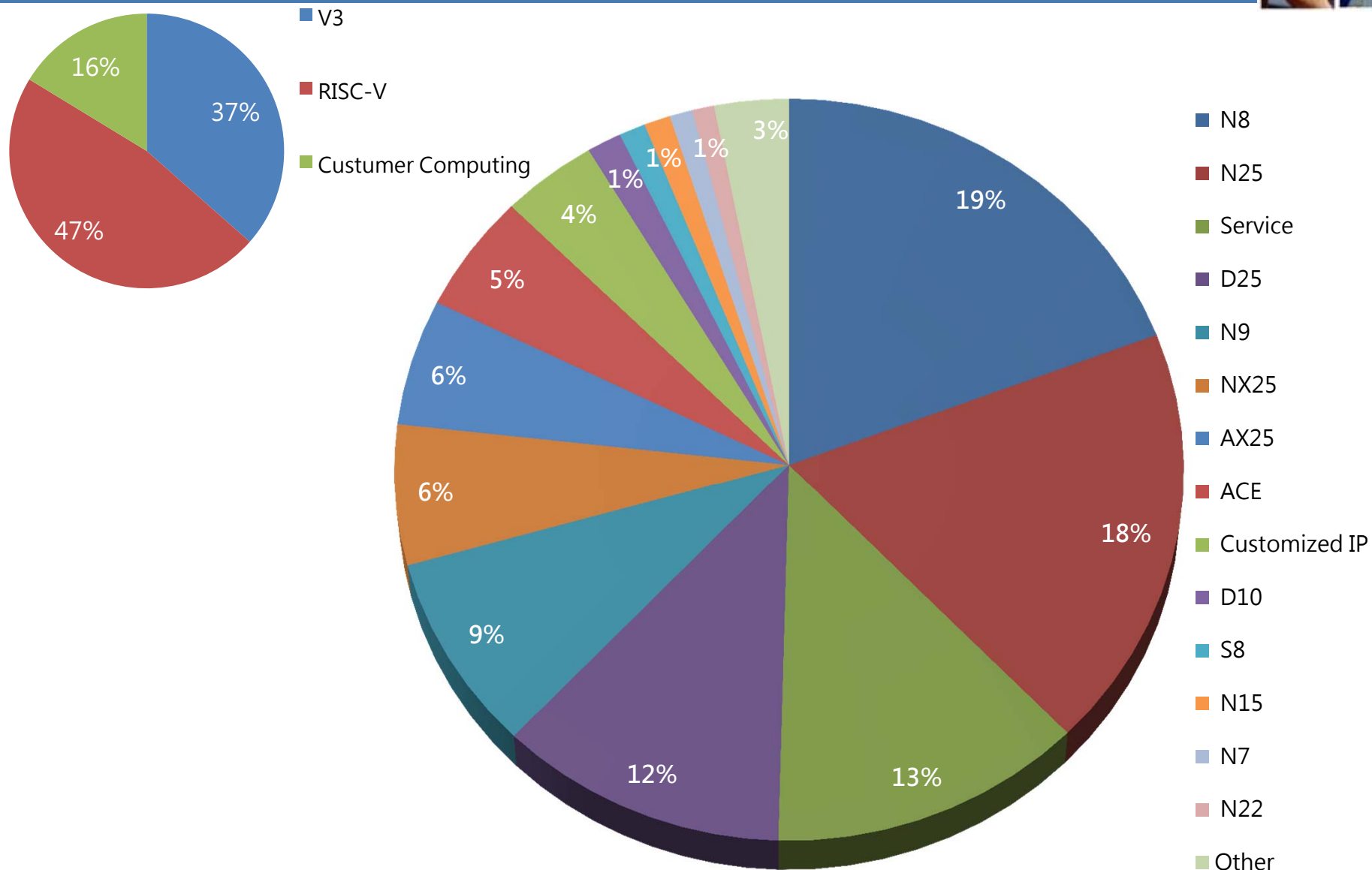


2019年度銷售分析-客戶應用



*Based on agreement number

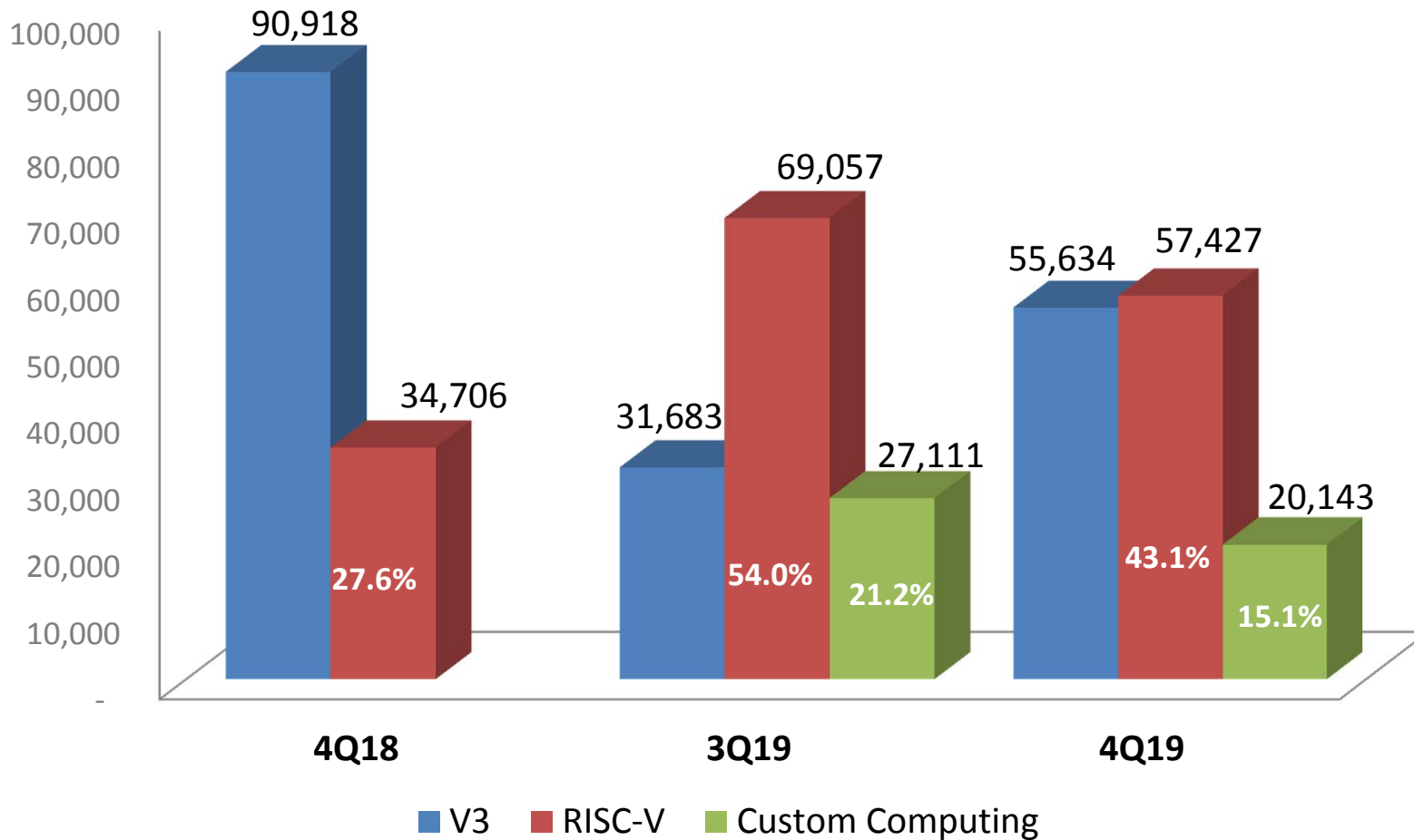
2019年度銷售分析-產品別



2019年第四季銷售分析 - RISC-V



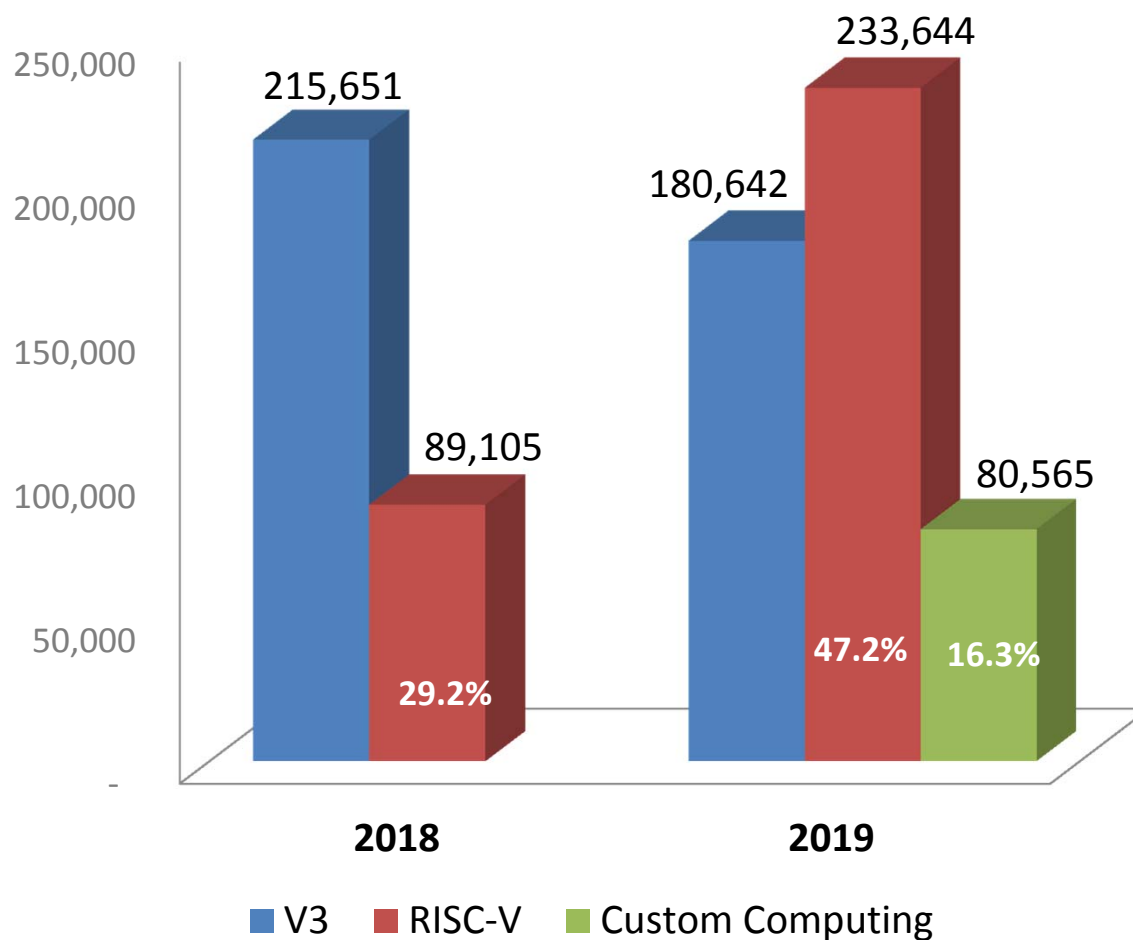
(單位:新台幣千元)



2019年度銷售分析 - RISC-V



(單位:新台幣千元)



產品應用

晶心概況



- ❖ A 15-year-old public CPU IP company



- ❖ A founding & platinum member of the RISC-V Foundation
- ❖ A major open source maintainer/contributor
- ❖ Active involvement in standard extensions
 - Chair of P-extension (Packed DSP/SIMD) Task Group
 - Co-chair of Fast Interrupt Task Group

GNU-Based Toolchains

- binutils, GCC: May, 2017
- glibc: February, 2018
 - only supports rv64i-based ISAs
- newlib: August, 2017
- "Probably not a compiler bug"

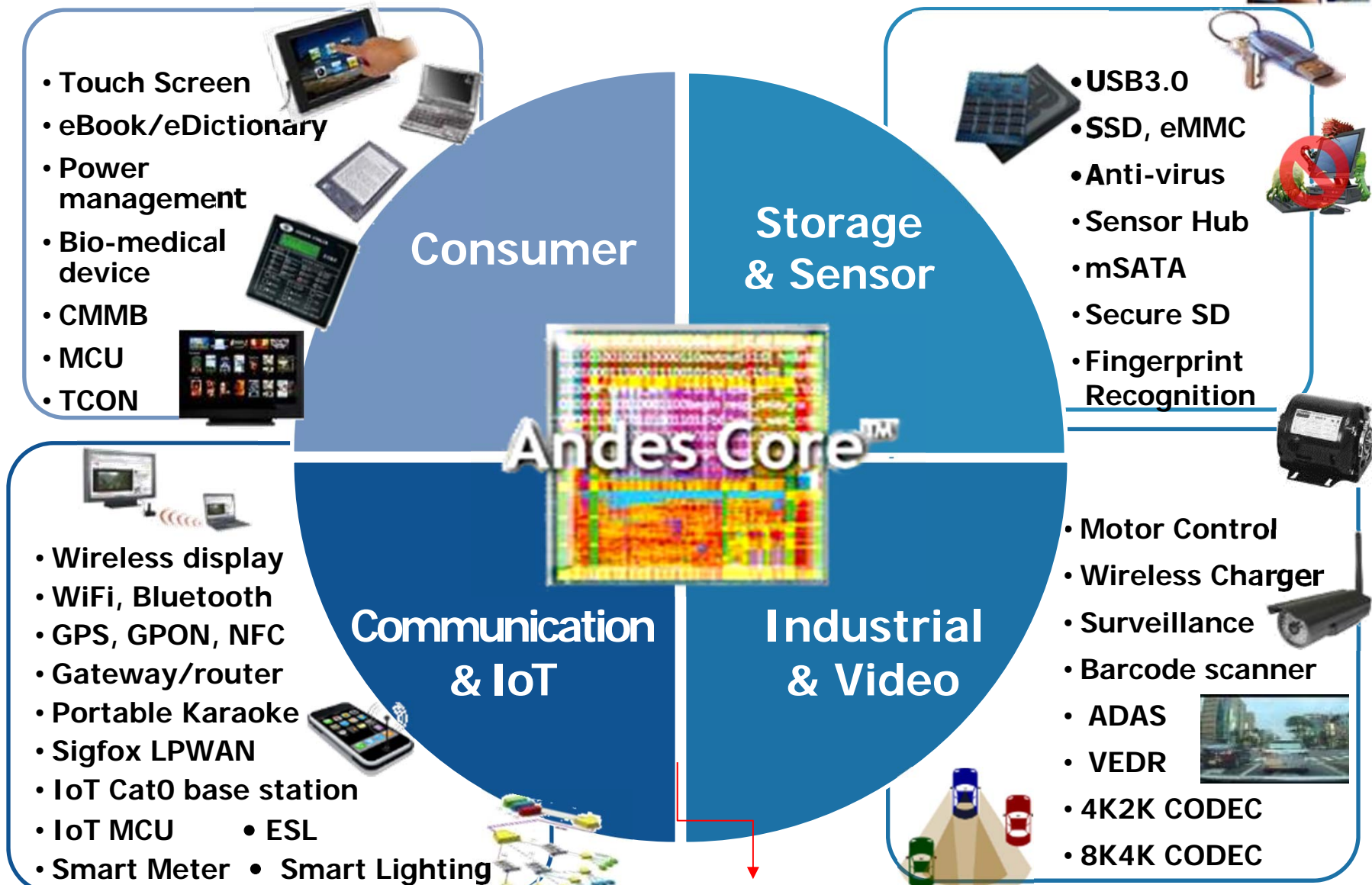
RISC-V LLVM Porting Effort

- Alex Bradbury is in charge of RISC-V LLVM
 - Talk yesterday afternoon
 - Poster on Tuesday night
- RV32IM[A]FD support upstream
 - Missing hard-float calling convention
 - Missing 64-bit support
 - Missing compressed support
- Clang, Go, and OpenJDK have run code
 - Rust port in progress
 - Poster on Tuesday

RISC-V Linux Kernel Port

- Linux: January, 2018
 - Only RV64i-based systems
 - Drivers are trickling in now

豐富多樣的客戶應用



and more.....

物聯網應用 - 1



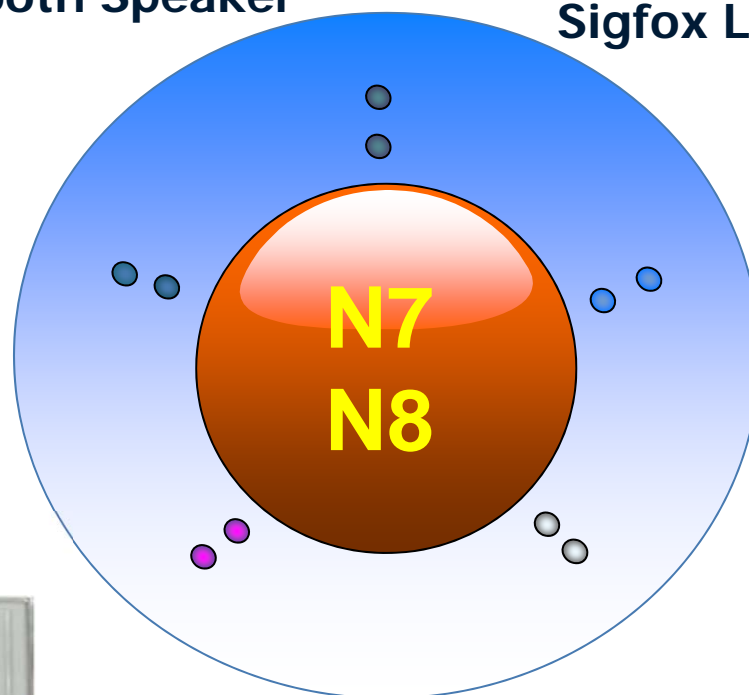
Bluetooth Speaker



Sigfox LPWAN



Healthcare device



Wearable device



Electronic price tags



Sensor Hub

物聯網應用 - 2



Wearable devices



Drone



Portable Karaoke



WiFi/GPS/FM/Bluetooth
combo



GPS/Beidou in shared bikes

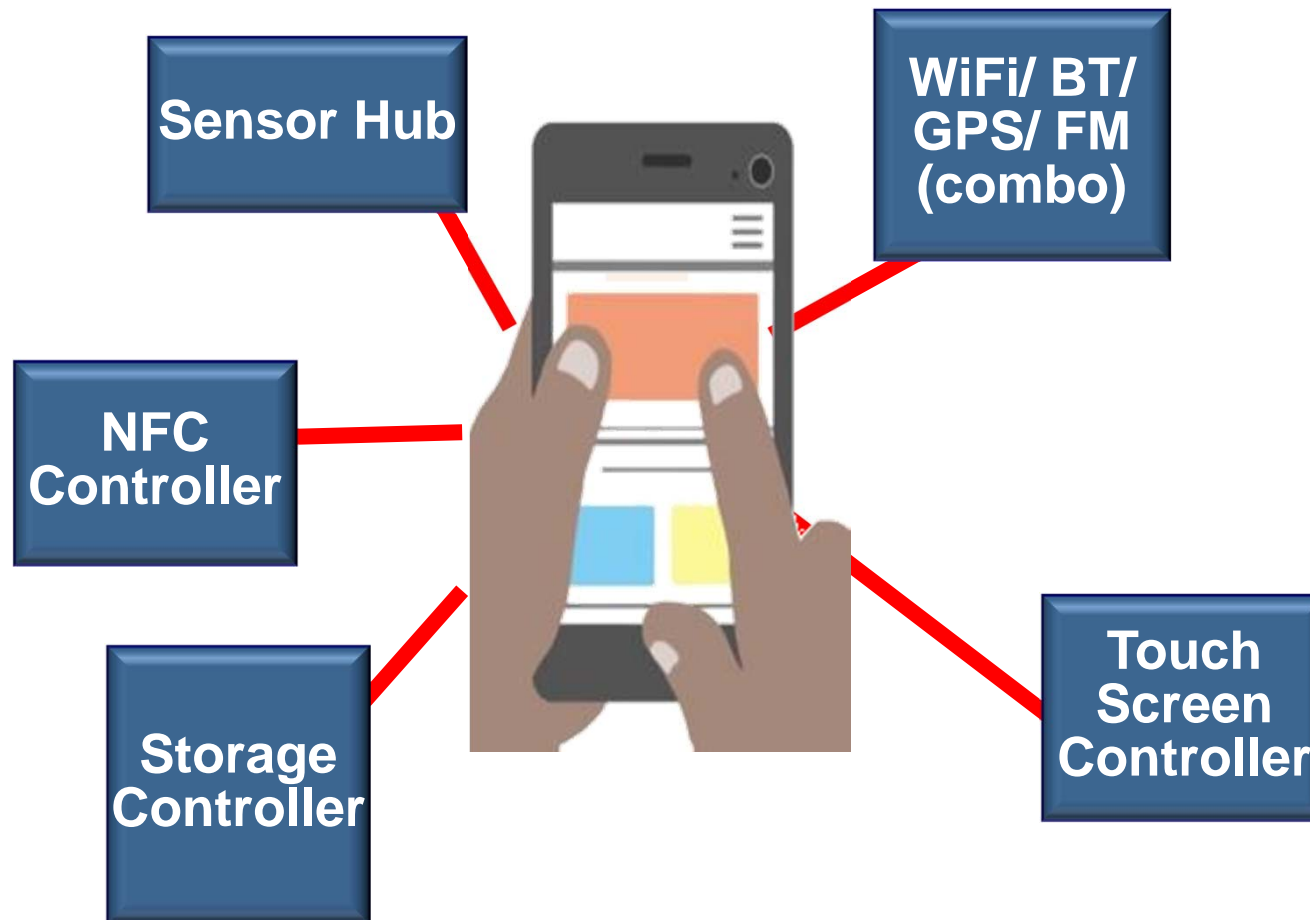


Contactless payment
(NFC)

晶心嵌入智能手機



1 in 5 Smart Phones are with Andes Embedded



晶心嵌入消費性裝置、車用電子 及資料處理中心



Switch:
MXIC Flash Ctrl



Echo Dot2:
Mediatek WiFi IoT



Bike Sharing:
GPS Ctrl



X-Trail:
ADAS Ctrl



- ❖ In leading machine learning computers for datacenter
- ❖ In tier-one switch routers for datacenter

- ❖ Recent applications: 5G networking, 802.11ax, machine learning processors (using Andes Custom Extension, ACE)

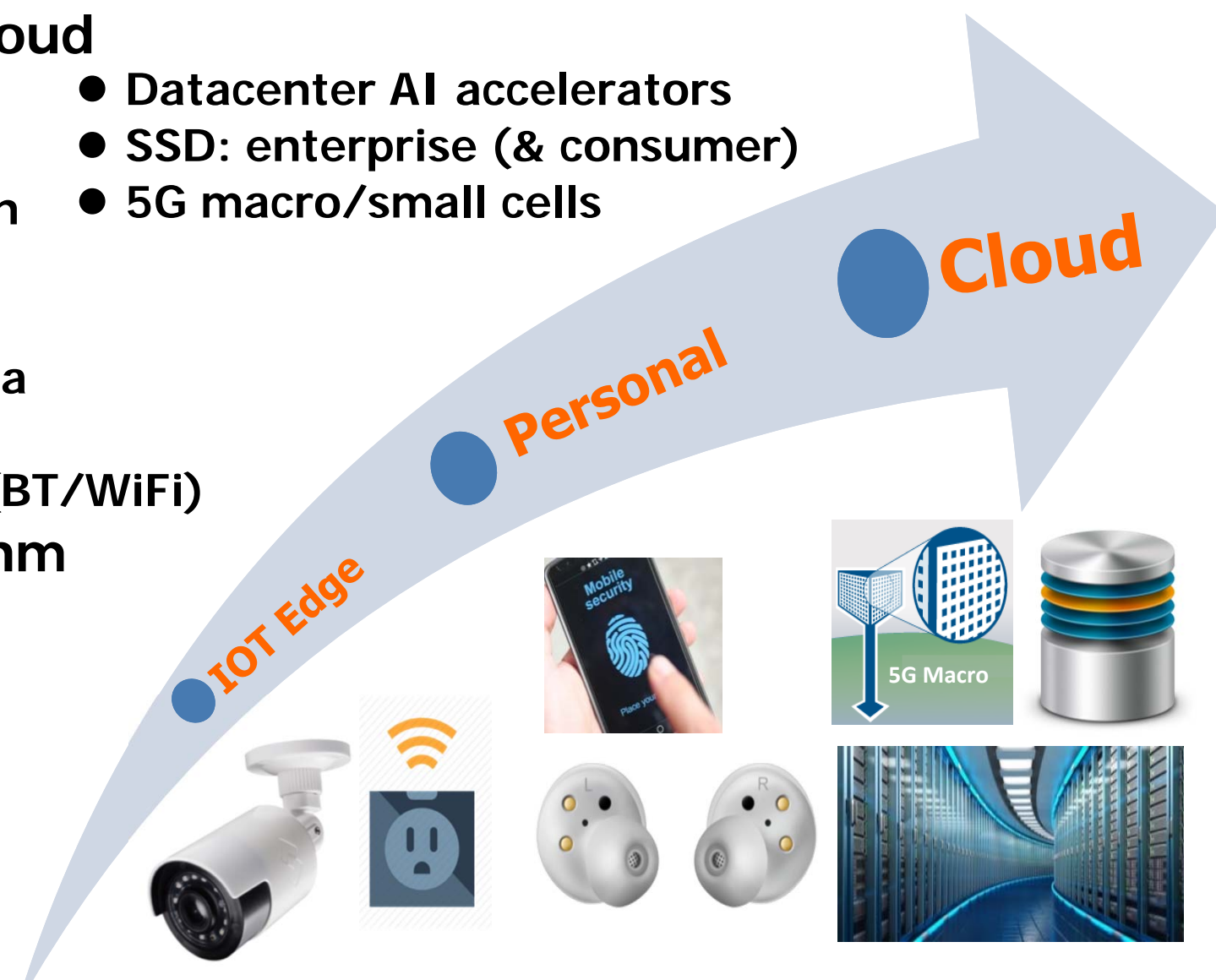
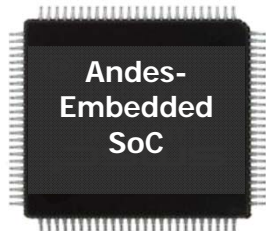
晶心RISC-V已應用在邊緣到雲端運算的SoC



❖ Edge to Cloud

- ADAS
- AIoT
- Blockchain
- FPGA
- MCU
- Multimedia
- Security
- Wireless (BT/WiFi)
- Datacenter AI accelerators
- SSD: enterprise (& consumer)
- 5G macro/small cells

❖ 40nm to 7nm



新產品及生態系統

晶心RISC-V產品概述



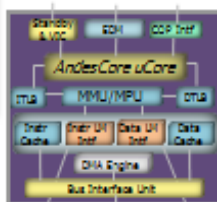
Best extensions to RISC-V

AndeStar™ Architecture V5



Highly optimized design with leading PPA

AndeCore™ Processors



```

    addi a0, 0, 0x10000000
    addi a1, 0, 0x10000000
    addi a2, 0, 0x10000000
    addi a3, 0, 0x10000000
    addi a4, 0, 0x10000000
    addi a5, 0, 0x10000000
    addi a6, 0, 0x10000000
    addi a7, 0, 0x10000000
    
```

AndeSight™ Tools



Professional IDE with high code quality

Handy peripheral IPs to speed up SoC construction



AndeShape™ Platforms



Extensive SW stacks from bare metal, RTOS to Linux

AndeSoft™ Stacks

完整產品線



A N D E S

AndesCore™ V3 產品線



Embedded Controller Solutions:

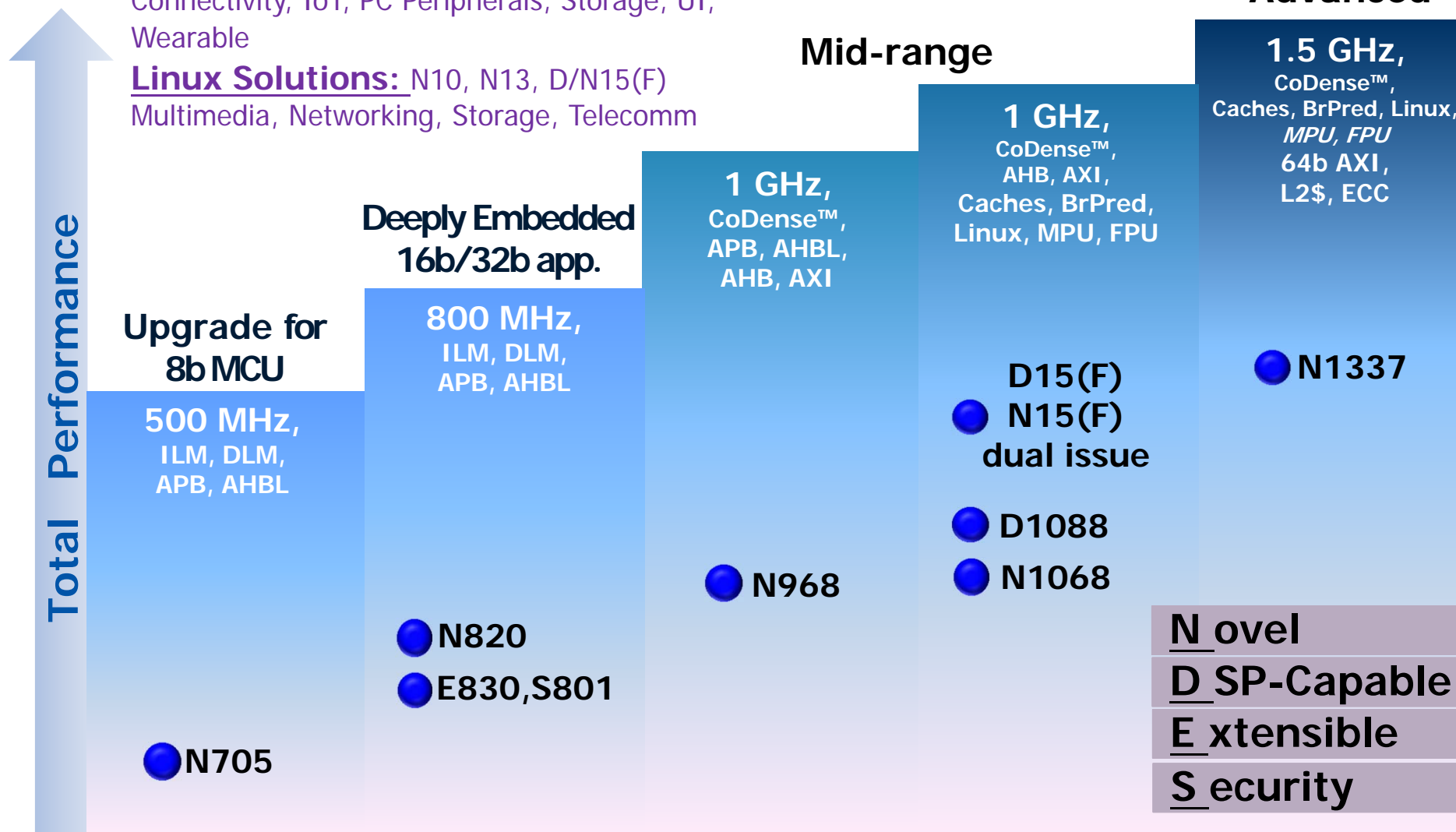
Connectivity, IoT, PC Peripherals, Storage, UI, Wearable

Linux Solutions: N10, N13, D/N15(F)

Multimedia, Networking, Storage, Telecomm

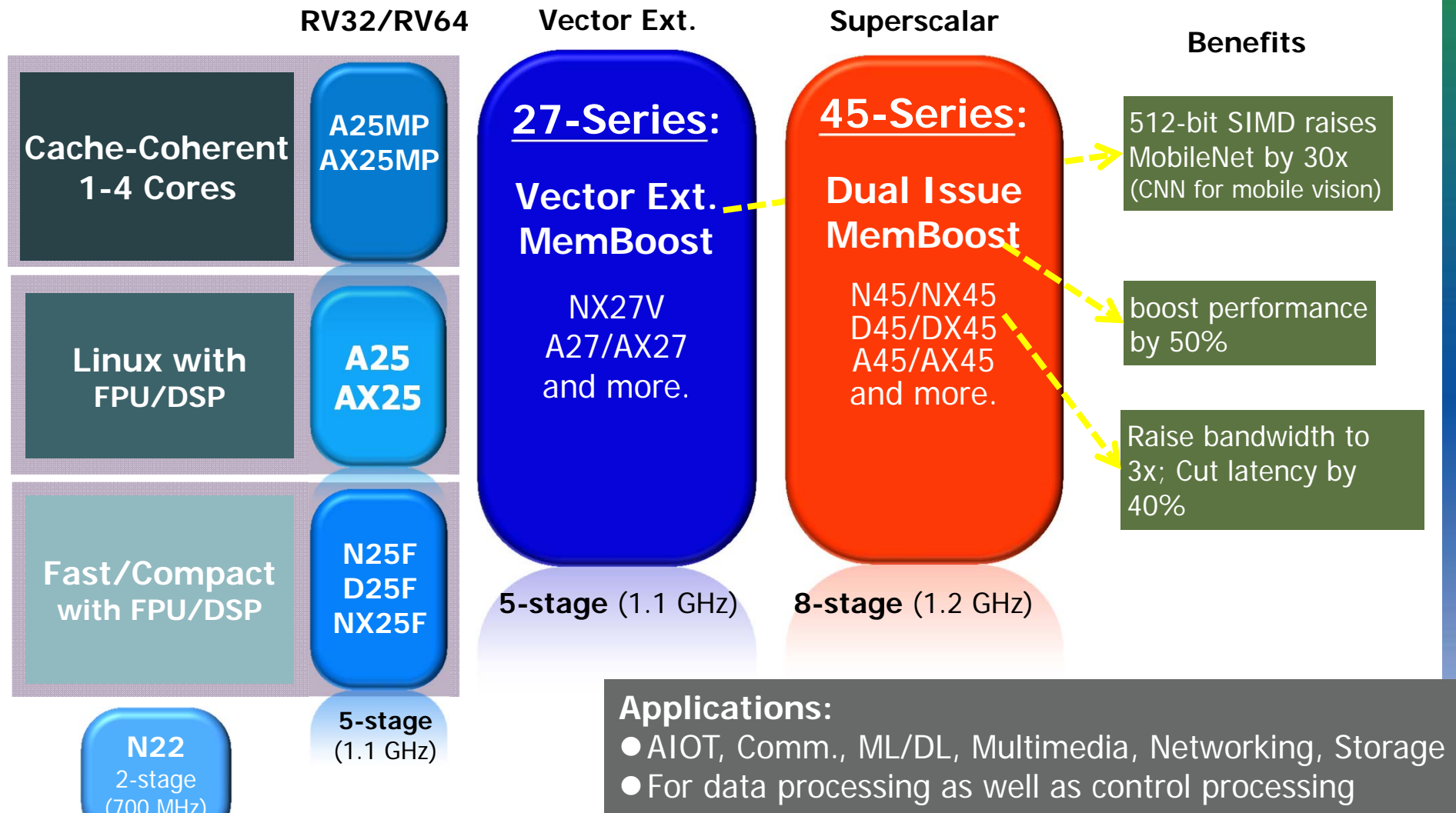
Advanced

Mid-range



Novel
DSP-Capable
Extensible
Security

晶心RISC-V產品路線圖



前進RISC-V處理器核心到新領域



- ❖ Andes is the industry leading CPU IP vendor to deliver RISC-V cores with
 - P-Extension → *A(X)25(MP), A(X)27, A(X)45, D25F*
 - V-Extension → *NX27V*
 - Custom-Extension (w/ ACE* support) → *Entire 25, 27, 45 series*

*: Andes Custom Extension

晶心RISC-V產品的優勢



Performance & Extensibility

- Leading PPA and code size
- Rich data processing in P, V, and ACE

Configurability

- Flexible configurations for rich features

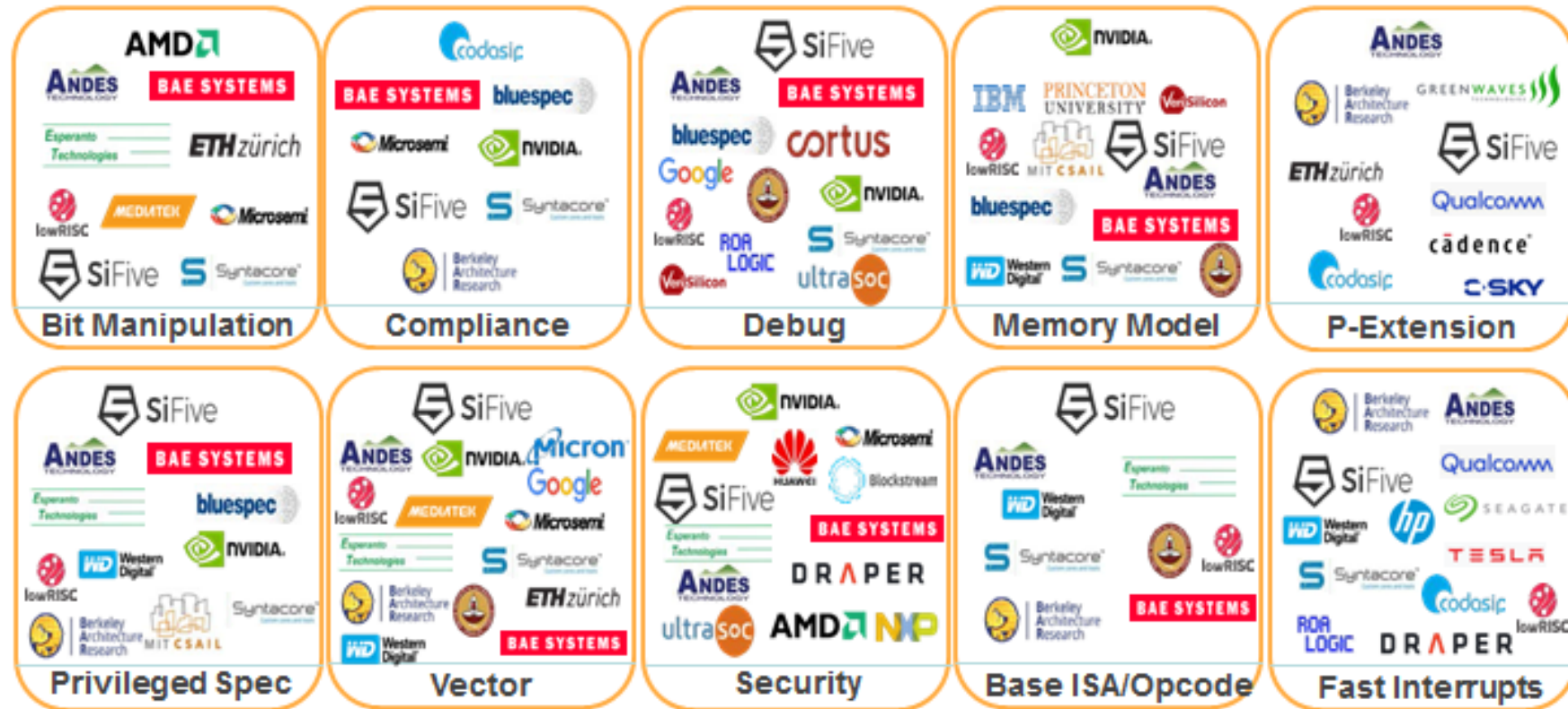
Maturity

- Compiler optimizations, and SW stacks
- Comprehensive features in AndeSight IDE

積極參與RISC-V社群活動



Foundation Task Groups (partial list)



- ❖ Contributing hardware architecture extensions
 - Chair of the P-extension (Packed SIMD/DSP) Task Group
 - Co-chair of Fast Interrupts Task Group
 - Closely reviewing activities of other Task Groups

晶心協助強化RISC-V生態系統



- ▶ More choices for customers are good
- ▶ Andes works closely with partners to grow RISC-V ecosystem



晶心在 RISC-V 上的定位



完整的產品組合

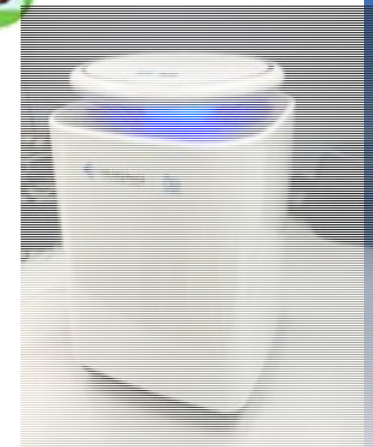
可靠的 RISC-V 核心 IP 供應商

超低功耗、高運算效能的處理器核心

領先世界推出 DSP, Vector, 以及具有客戶可自訂指令的 RISC-V 處理器核心

專業的客制化 CPU 技術服務

生態系統: Andes 與 Knect.me



Knect.me 生態系統

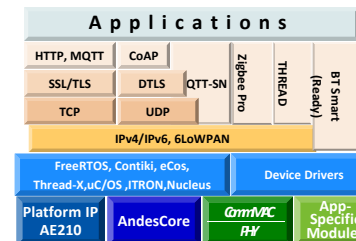
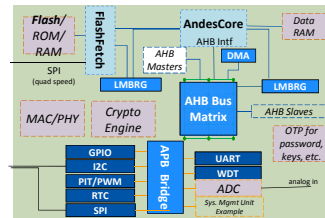


❖ Built up Ecosystem knect.me to help IoT Developing

- 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

actime™



FreeStart Program



❖ FreeStart Evaluation Program (FSEP)

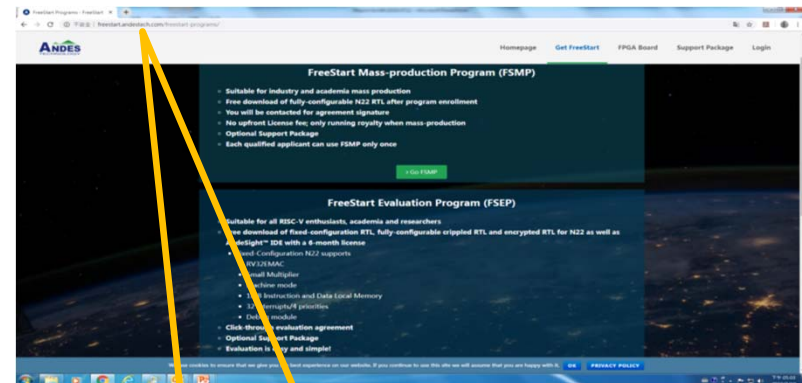
- For all RISC-V enthusiasts and educator/researcher
- Good for N22 evaluation and research project
- Fixed-Configuration N22 RTL
- Sign simple evaluation agreement directly on website

❖ FreeStart Mass-production Program (FSMP)

- For industrial and academy mass production
- Full-configuration N22 RTL
- License fee: \$0; only running royalty is required when mass production

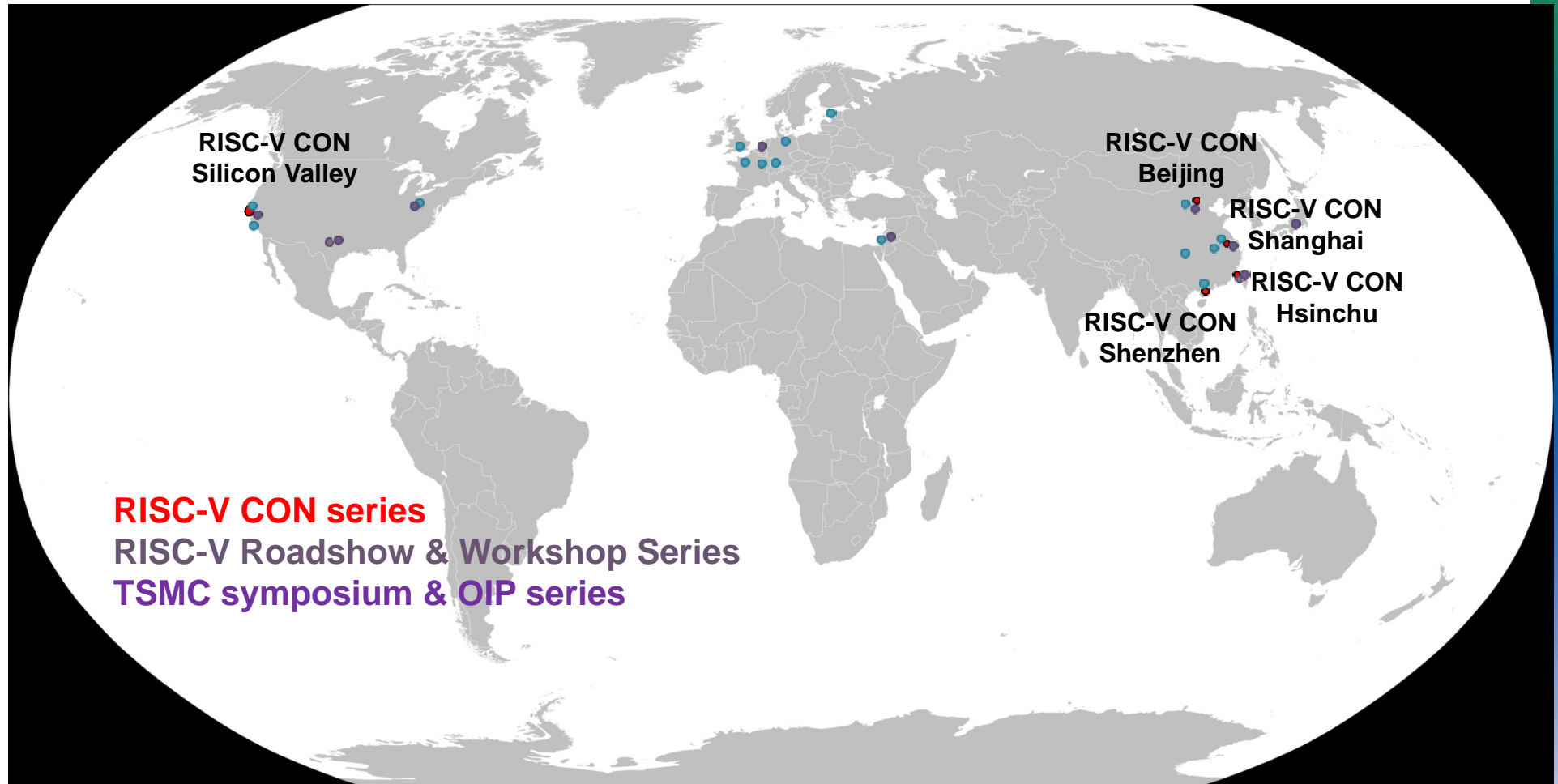
❖ Support Package (FSPP)

- For all
- \$20K for 1st year, including
 - 1 year e-service
 - FreeStart AE250 RTL
 - Corvette F1 FPGA board



For more info., please visit www.andestech.com

2019 Event Promotion



RISC-V CON series
RISC-V Roadshow & Workshop Series
TSMC symposium & OIP series

總結

晶心科技: Trusted Computing Expert



- ❖ 晶心科技成功地推出了新系列的RISC-V處理器核心(具有業界領先的DSP, Vector及客制化指令集架構延伸)、客制化CPU技術服務以及FreeStart Program來拓展更多客戶的應用與商機。
- ❖ 晶心科技持續積極參與 RISC-V 基金會科技與社群發展，並與RISC-V 生態系統互助。
- ❖ 成為RISC-V產業中之技術貢獻者、市場推廣者、銷售領導者!

謝謝指教



Andes Core™

www.andestech.com

問與答