晶心科技股份有限公司法說會

2020/09/22

ANDES TECHNOLOGY

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

01 公司簡介

02 營運成果

03 產品應用

04 新產品及生態系統

05 總結

ANDES TECHNOLOGY

公司簡介

http://www.andestech.com

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 。
- 晉升為RISC-V國際聯盟(前身為RISC-V基金會) 首席會員。 (2020)
- 獲得AI Global Media頒發「2020年最傑出嵌入式處理器IP供應商」。

晶心任務

- 創新架構高效能/低功耗嵌入式處理器。

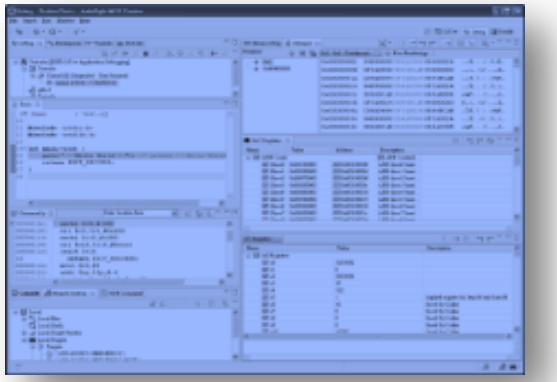
晶心利基

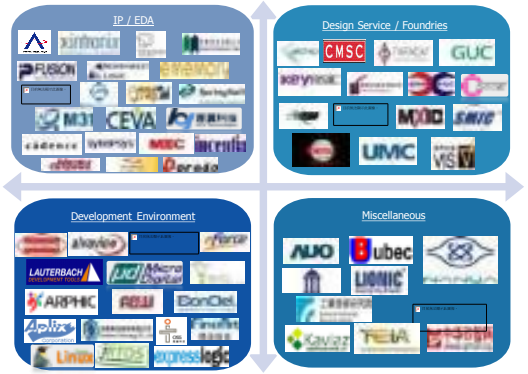
- 智能及環保之電子設備
- 雲端應用,人工智慧及物聯網

ANDES TECHNOLOGY

重要里程碑

- **200+** commercial licensees
  - Geographically distributed in Taiwan, China, Korea, Japan, Europe, and USA
  - **400+** license agreements signed
- AndeSight™ IDE:
  - **17,000+** installations
- Eco-system:
  - **150+** partners
- **5B+** Accumulative SoC Shipped

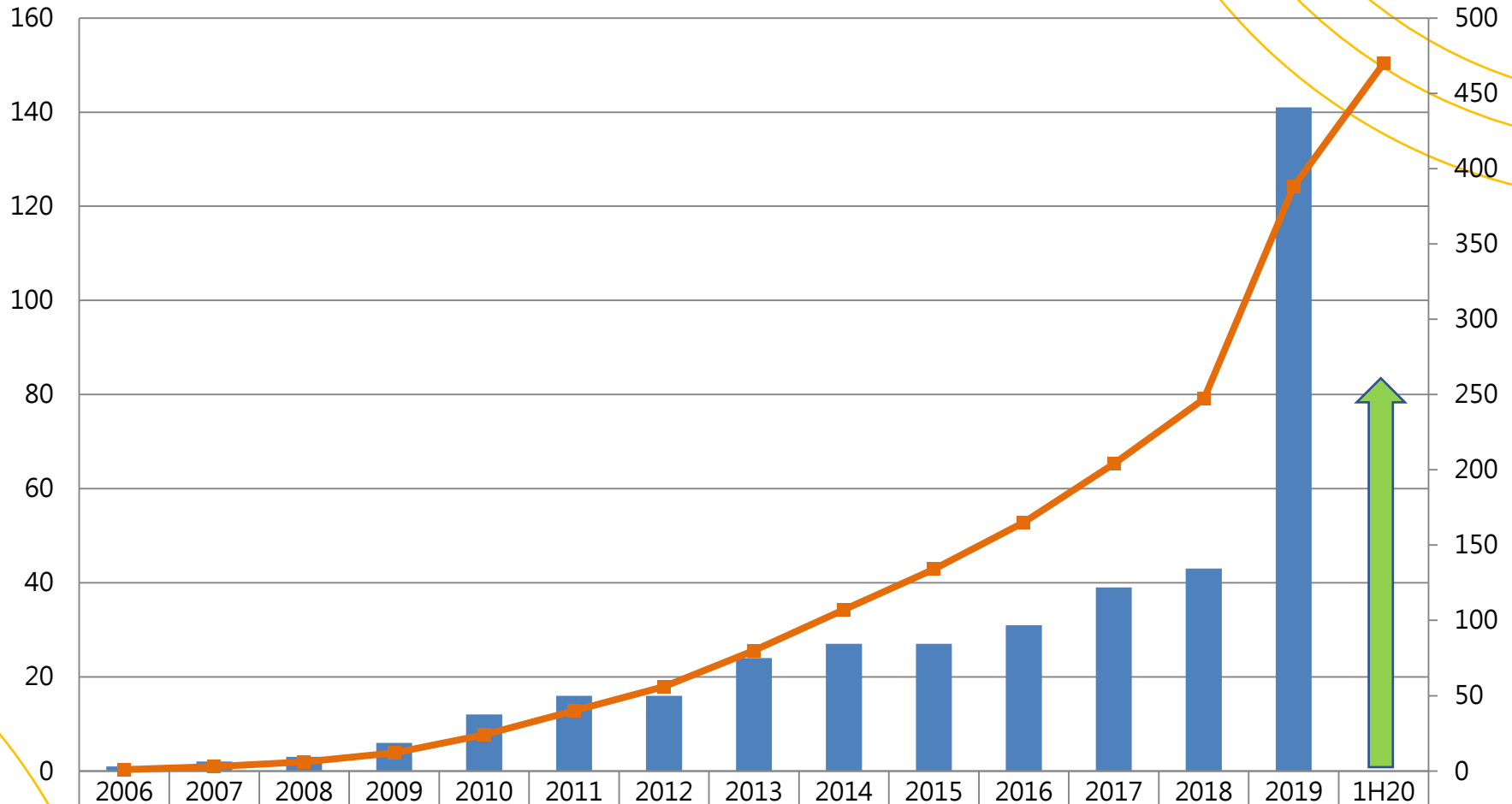




營運成果

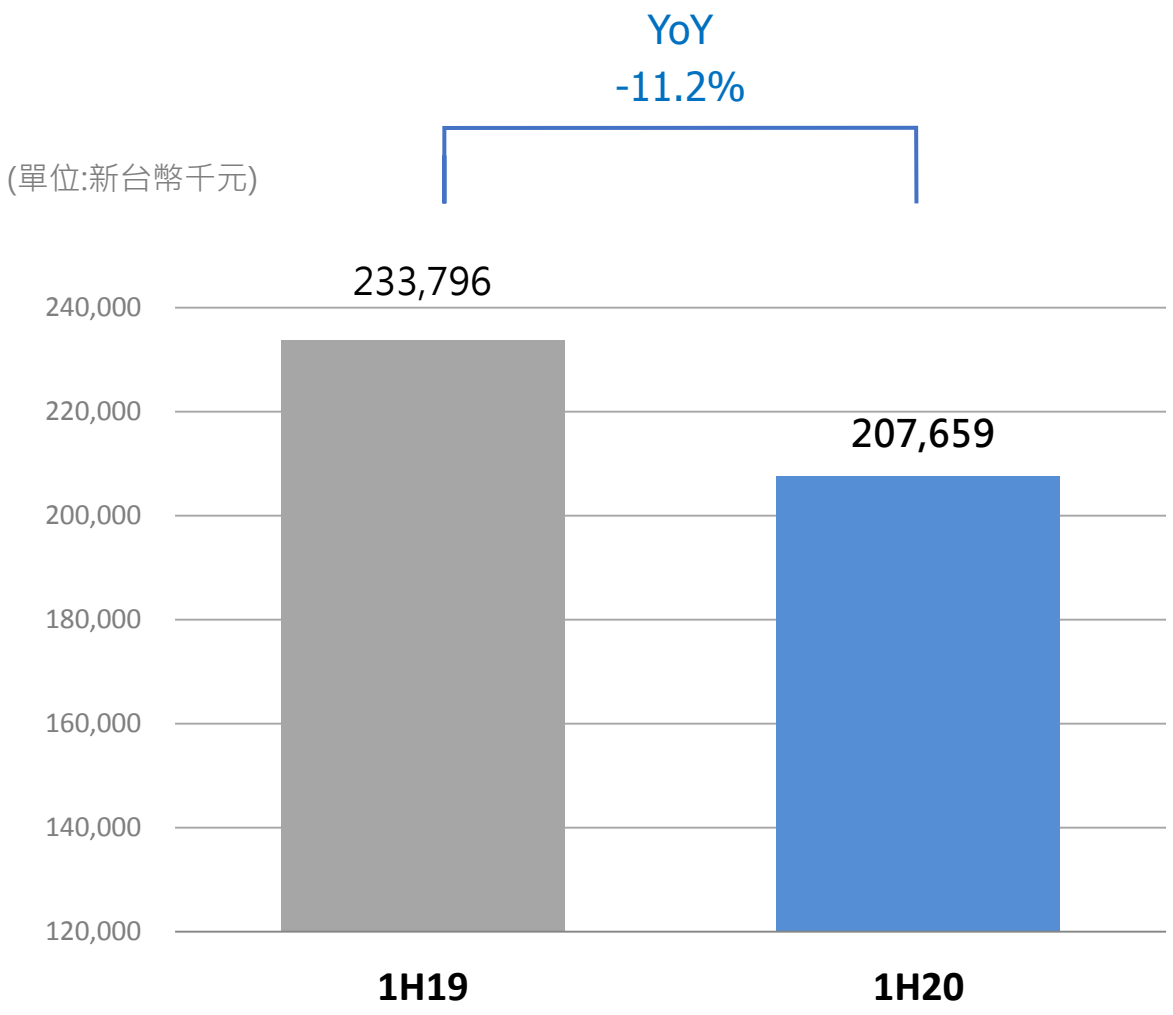
http://www.andestech.com

IP 授權合約數穩健成長



	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	1H20
IP授權合約數	1	2	3	6	12	16	16	24	27	27	31	39	43	141	82
累計IP授權合約數	1	3	6	12	24	40	56	80	107	134	165	204	247	388	470

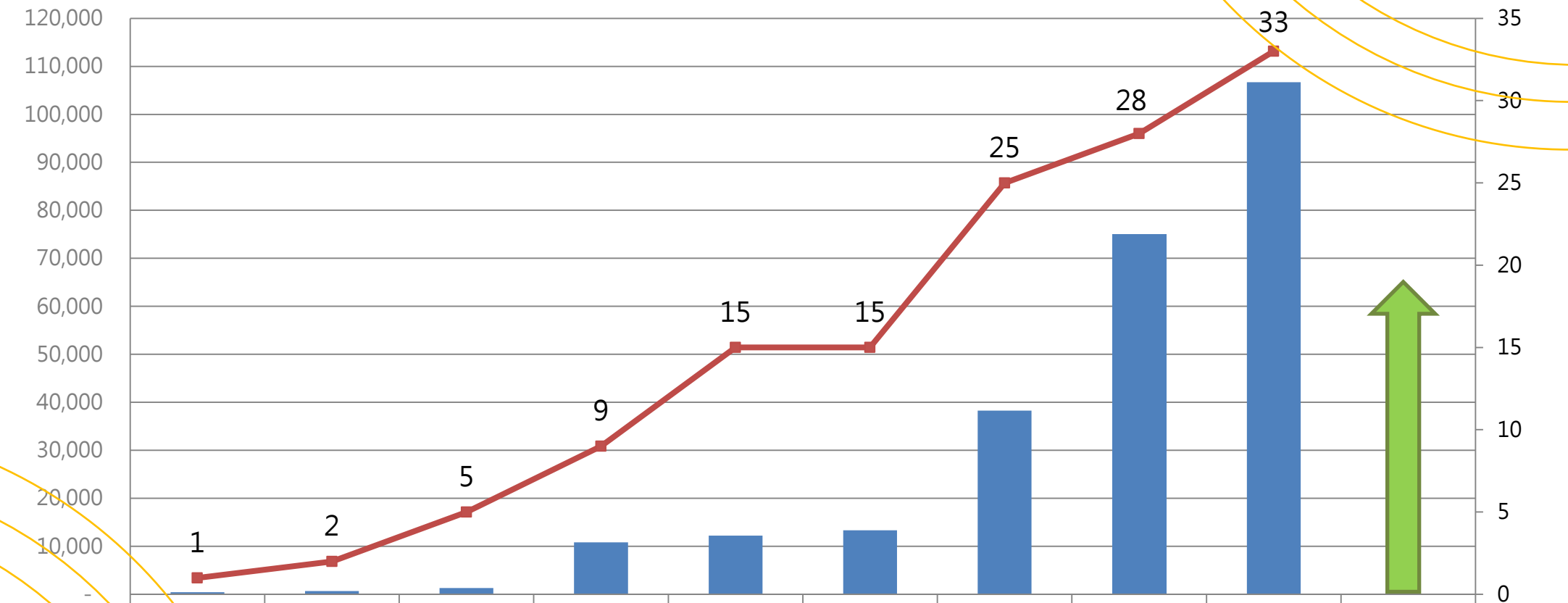
2020年上半年營業收入



2020年上半年權利金收入

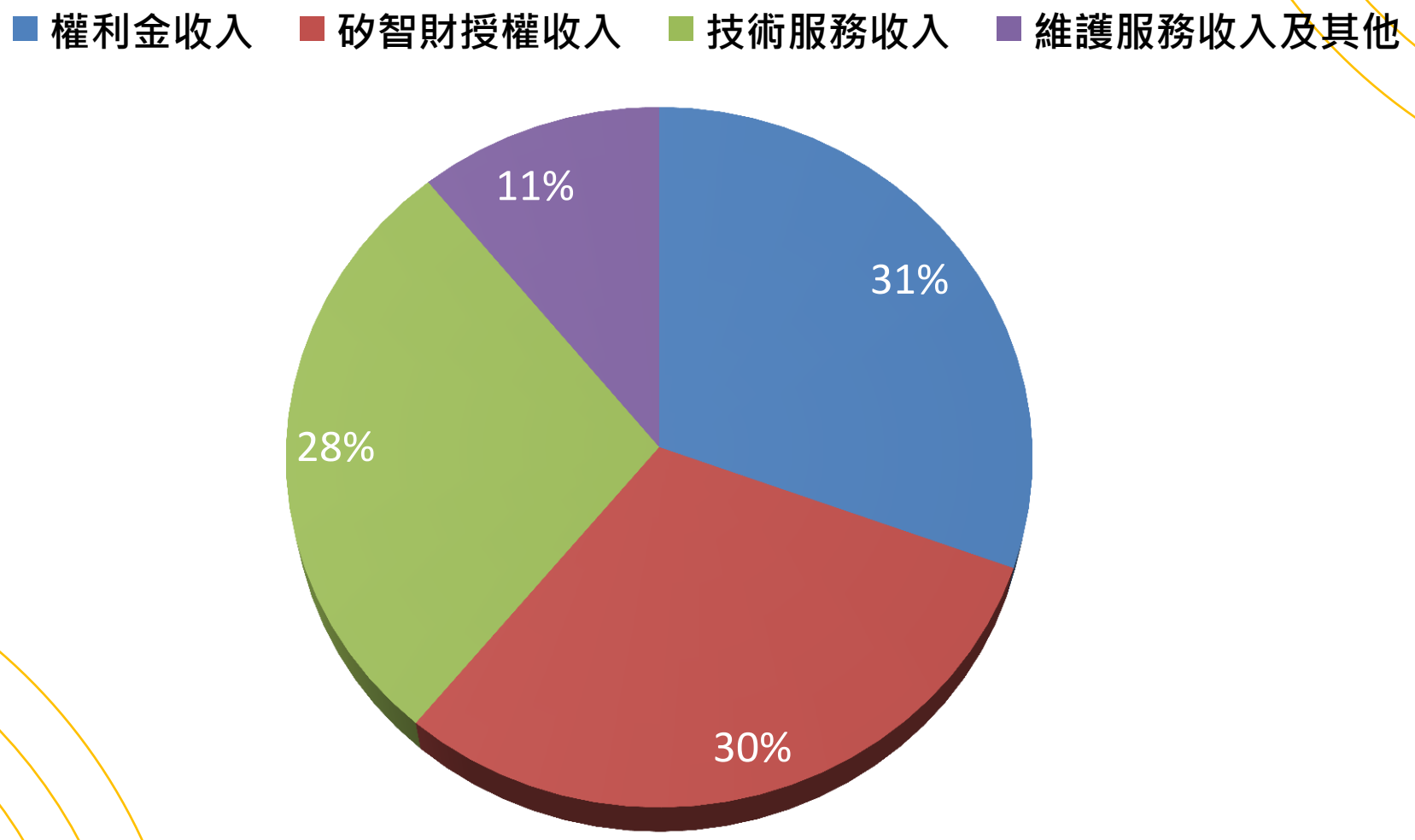
(單位:新台幣千元)

(單位:家數)

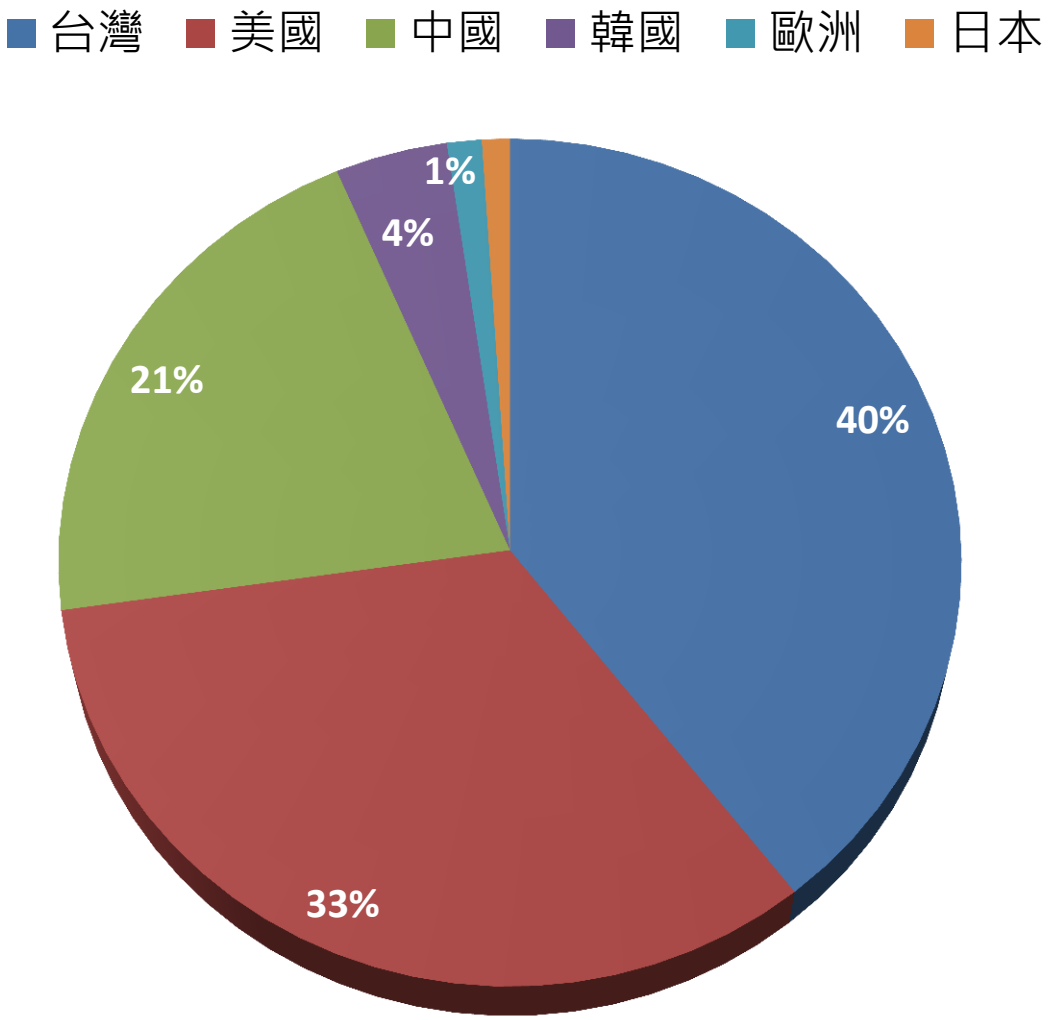


	2011	2012	2013	2014	2015	2016	2017	2018	2019	1H20
權利金	445	660	1,285	10,819	12,232	13,320	38,287	74,953	106,716	63,469
客戶數	1	2	5	9	15	15	25	28	33	

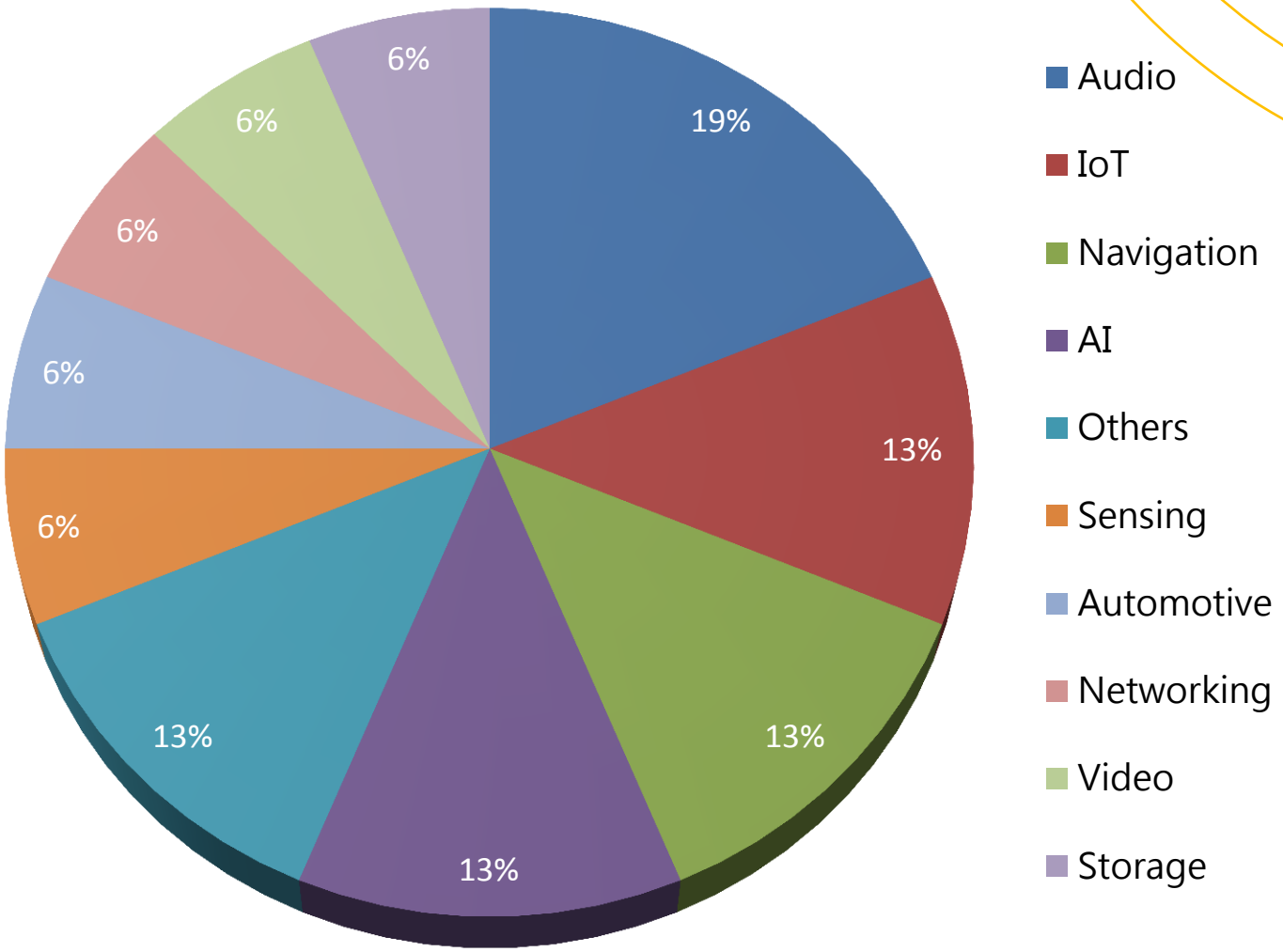
2020年上半年銷售分析-收入模式



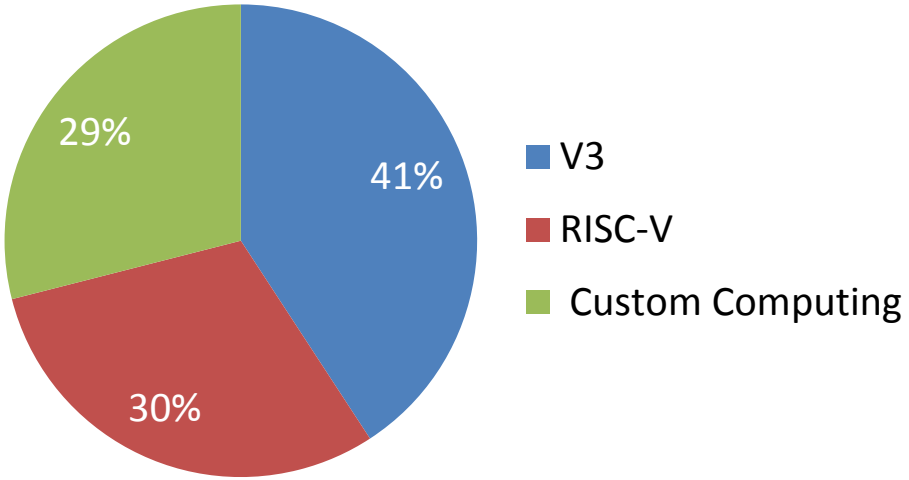
2020年上半年銷售分析-地區別

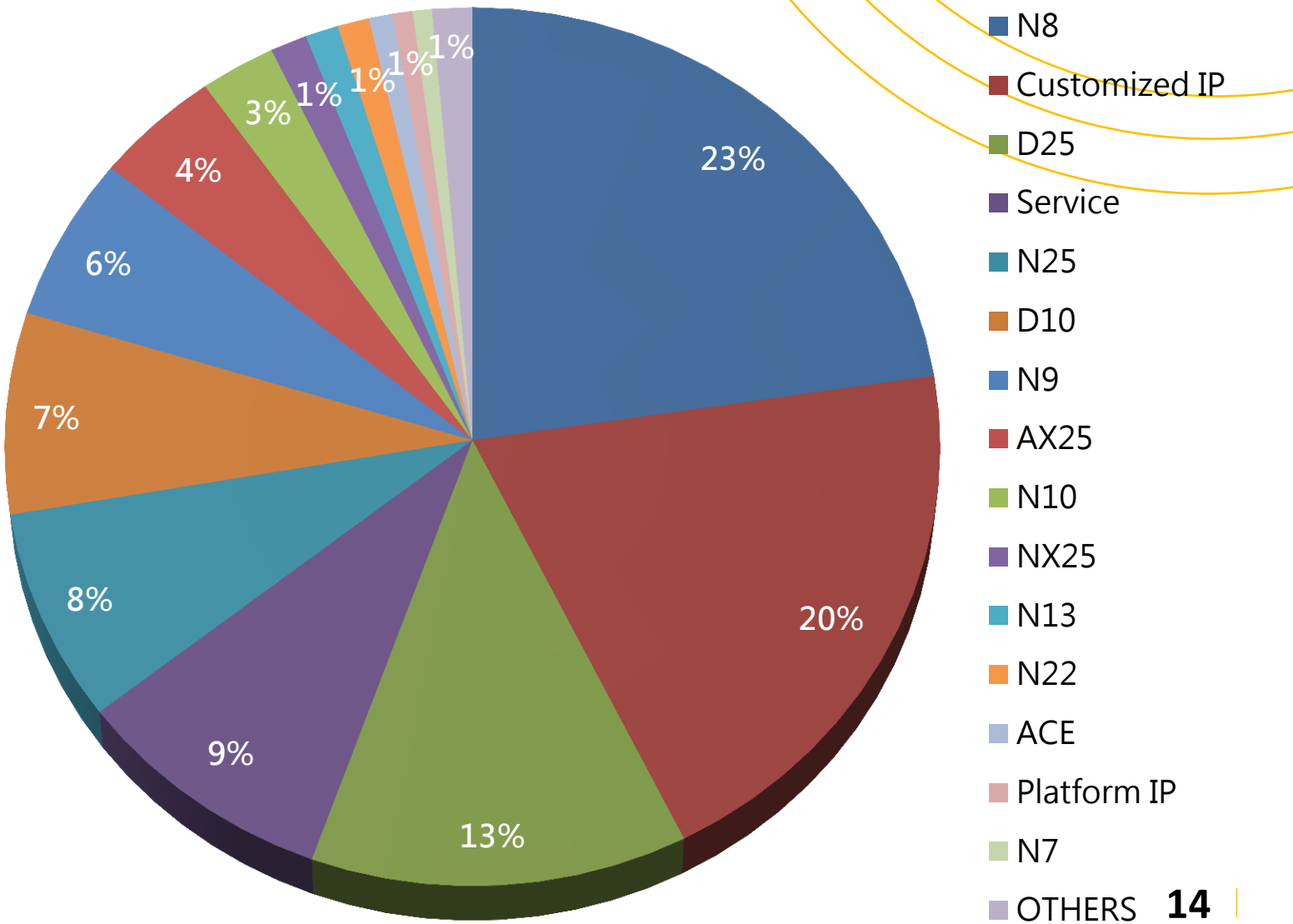


2020年上半年銷售分析-客戶應用

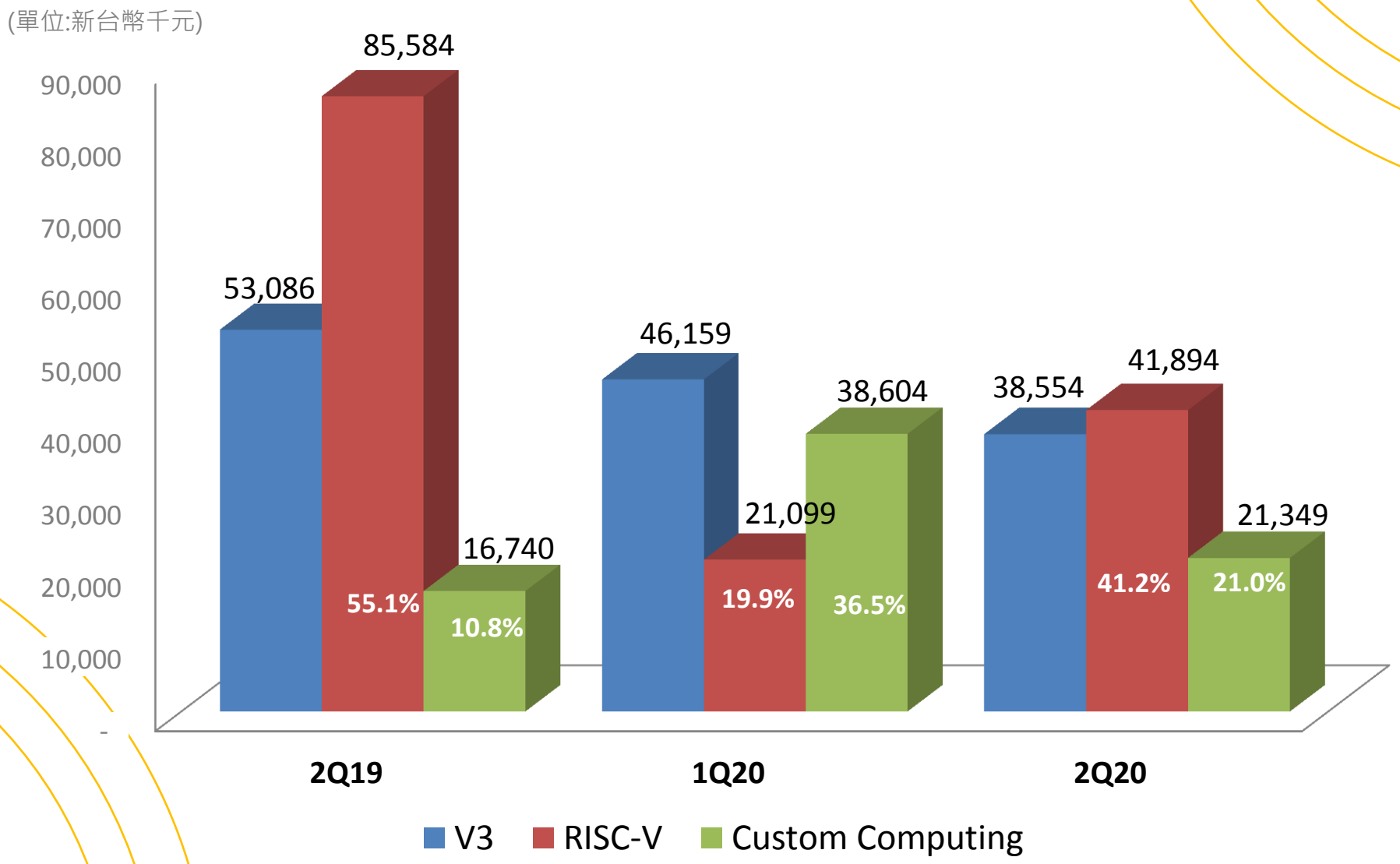


2020年上半年銷售分析-產品別



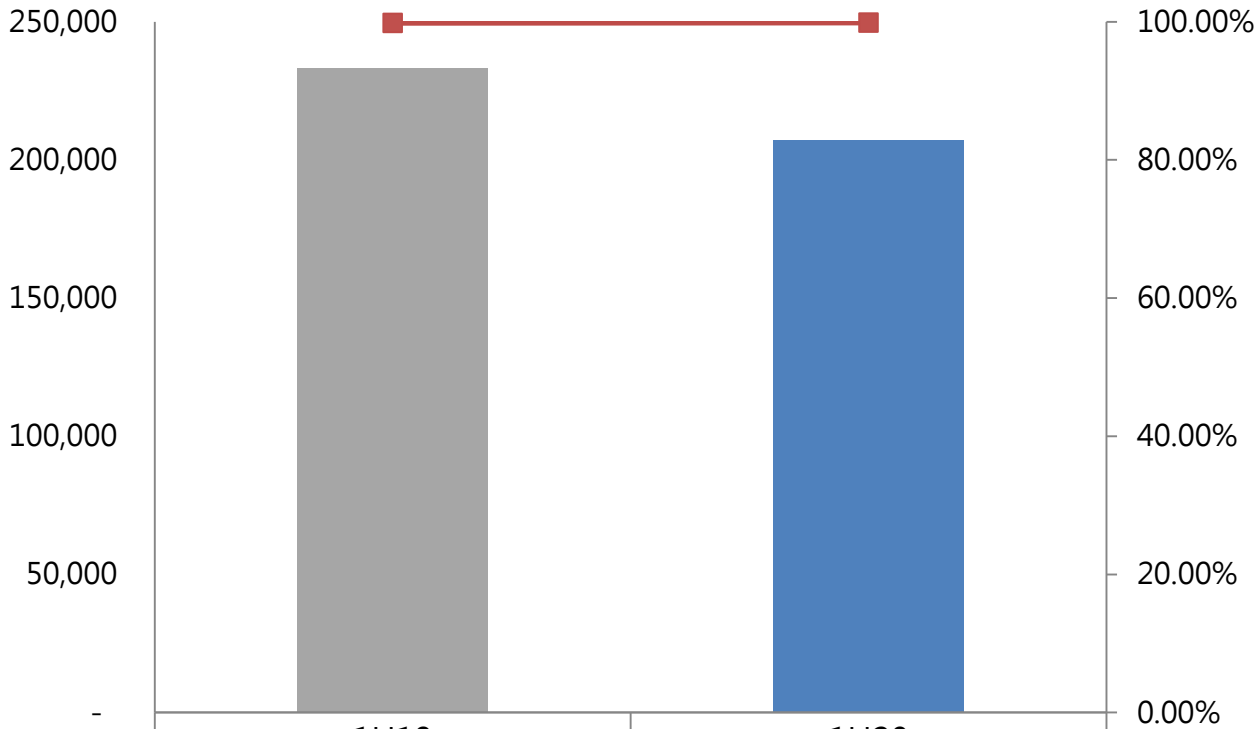


2020年上半年銷售分析- RISC-V



2020年上半年營業毛利與毛利率

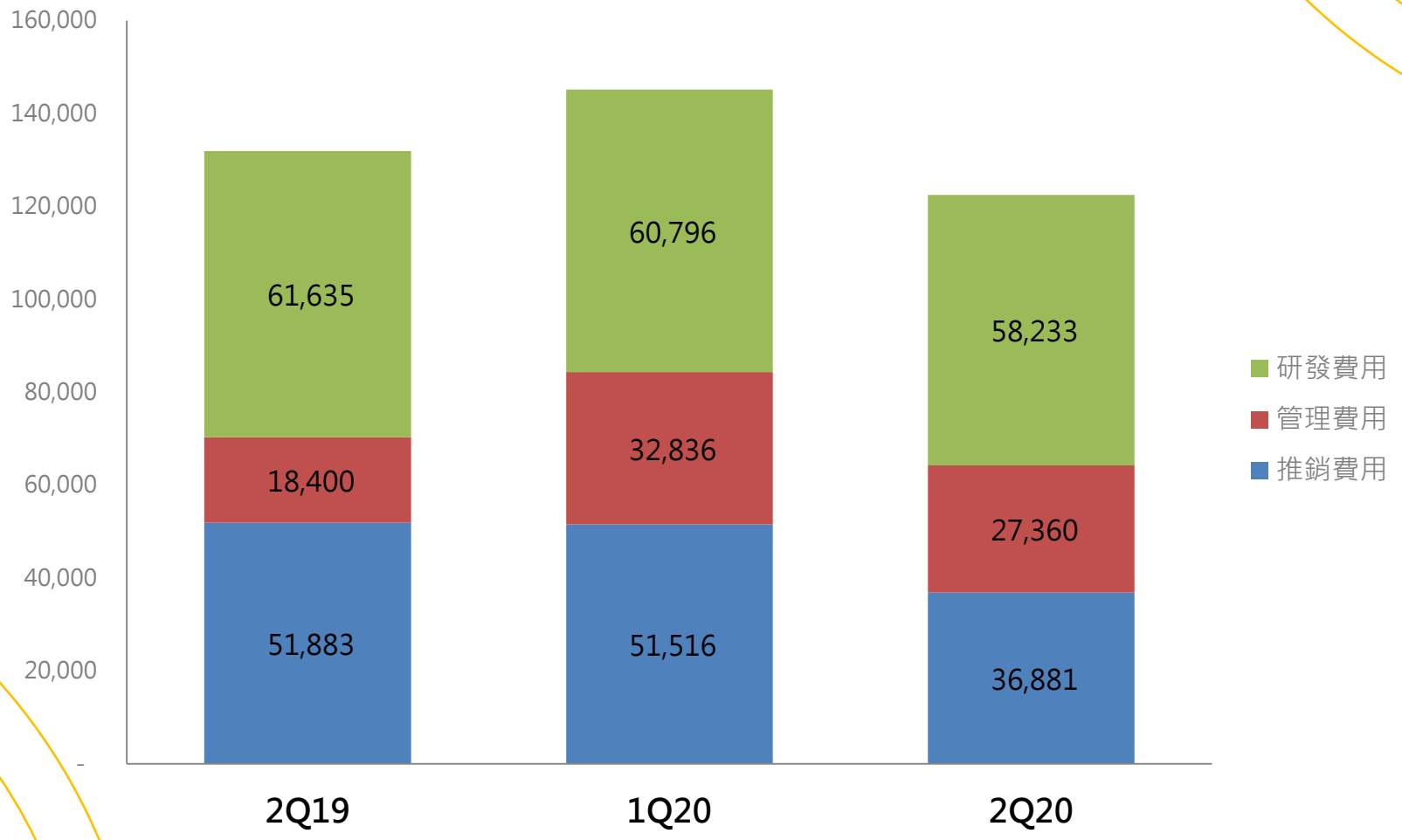
(單位:新台幣千元)



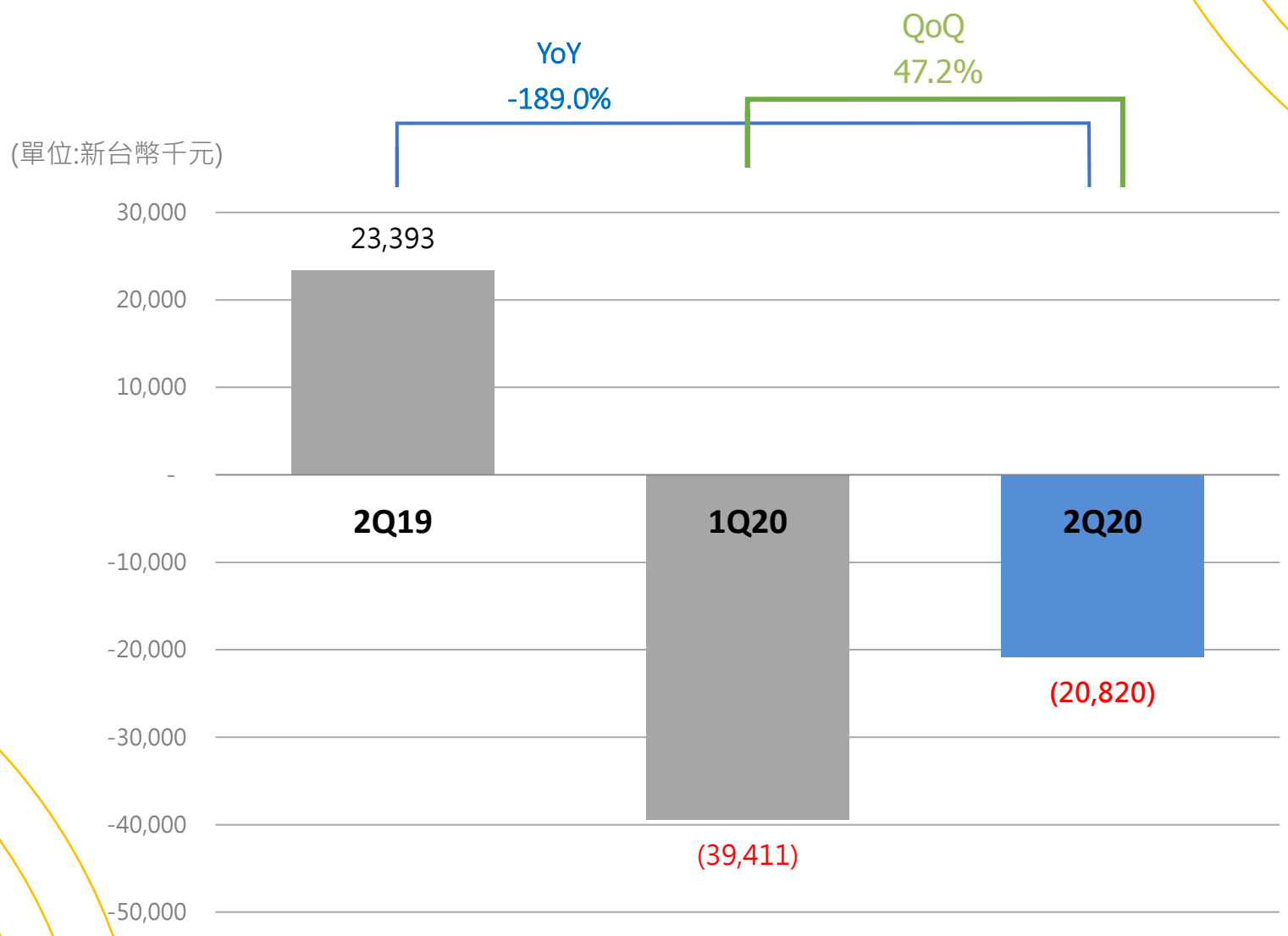
	1H19	1H20
營業毛利	233,409	207,391
毛利率	99.83%	99.87%

營業費用

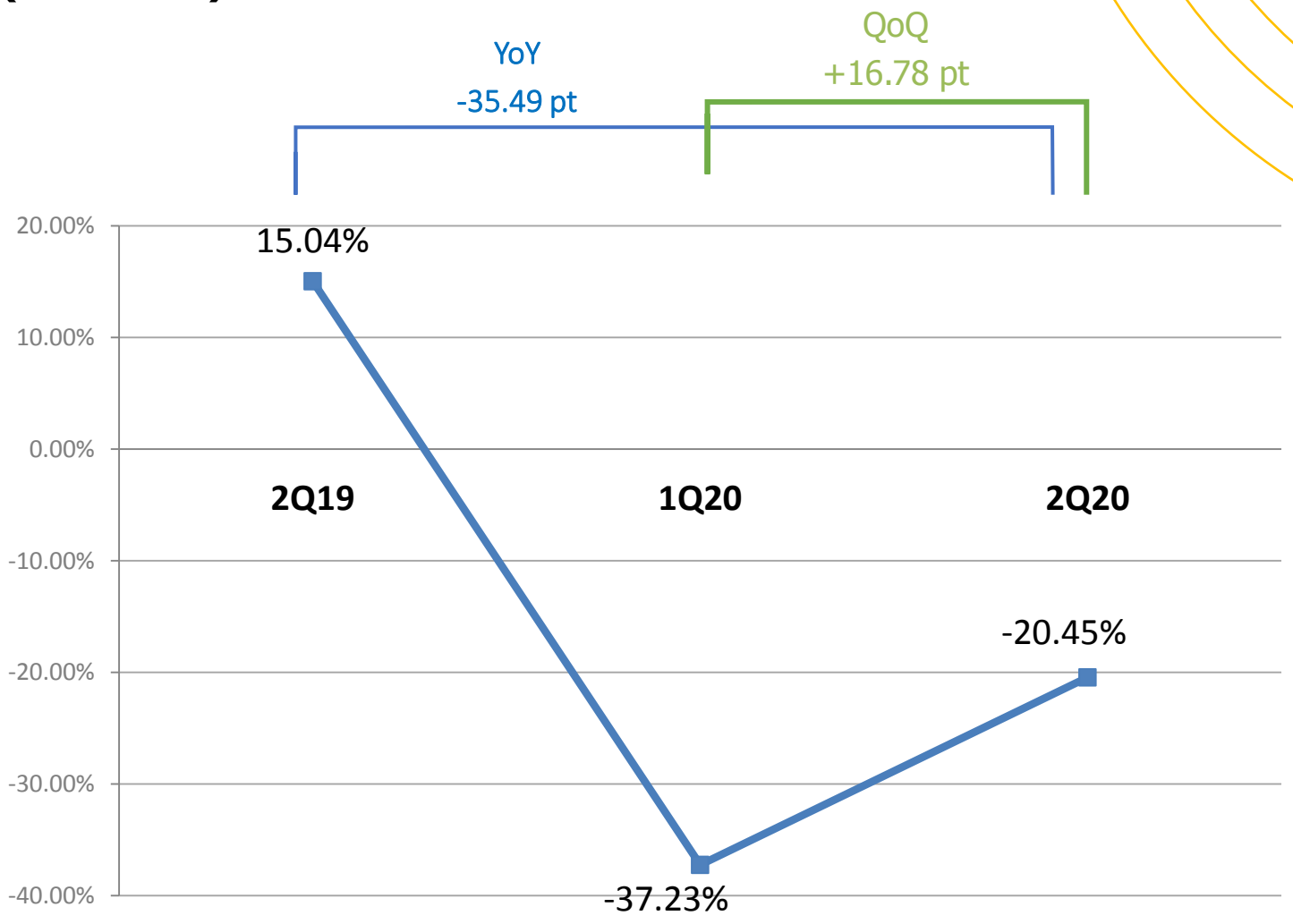
(單位:新台幣千元)



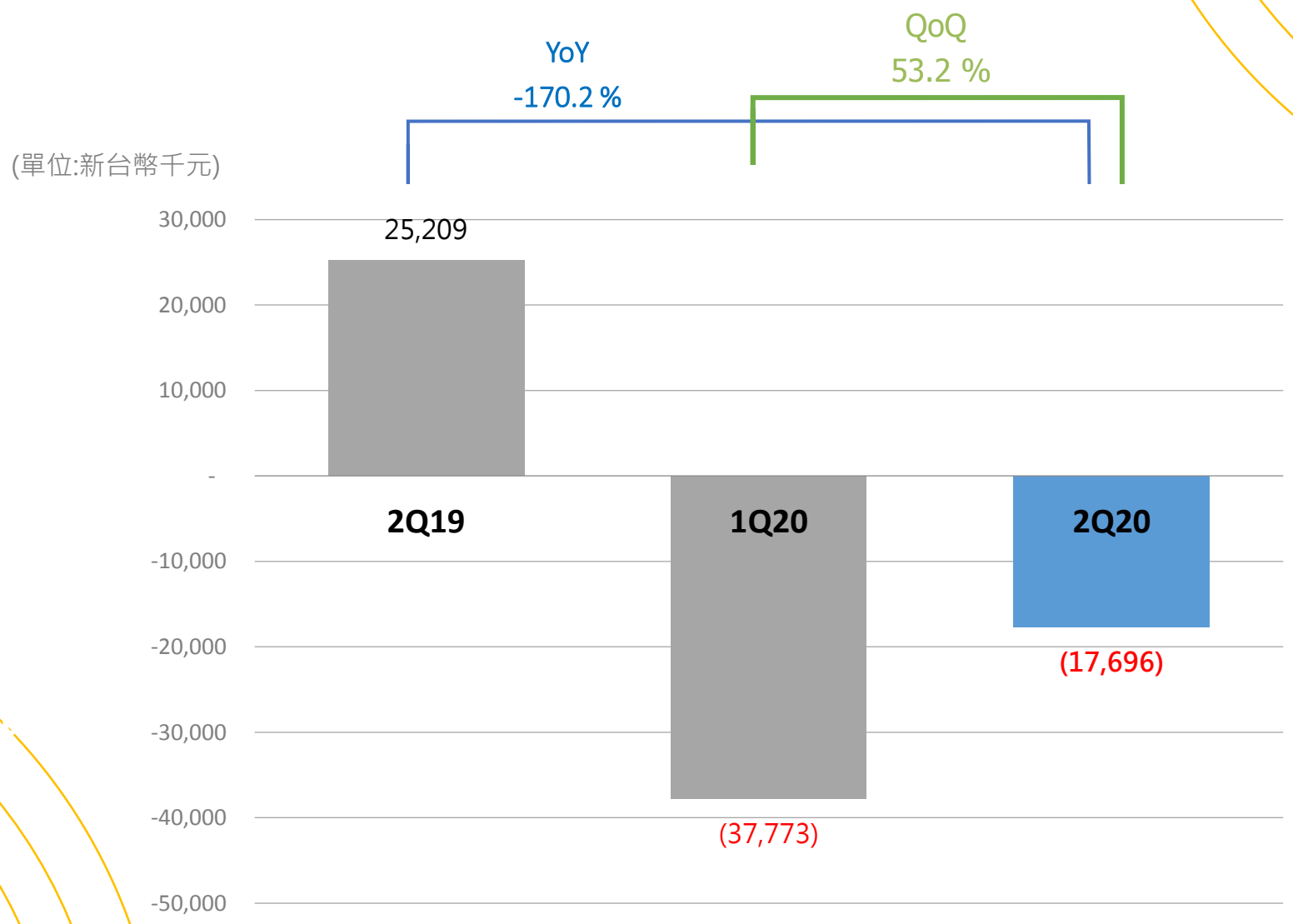
營業利益(損失)


YoY
-189.0%
QoQ
47.2%
(單位:新台幣千元)
30,000
20,000
10,000
-
-10,000
-20,000
-30,000
-40,000
-50,000
23,393
2Q19
1Q20
2Q20
(39,411)
(20,820)

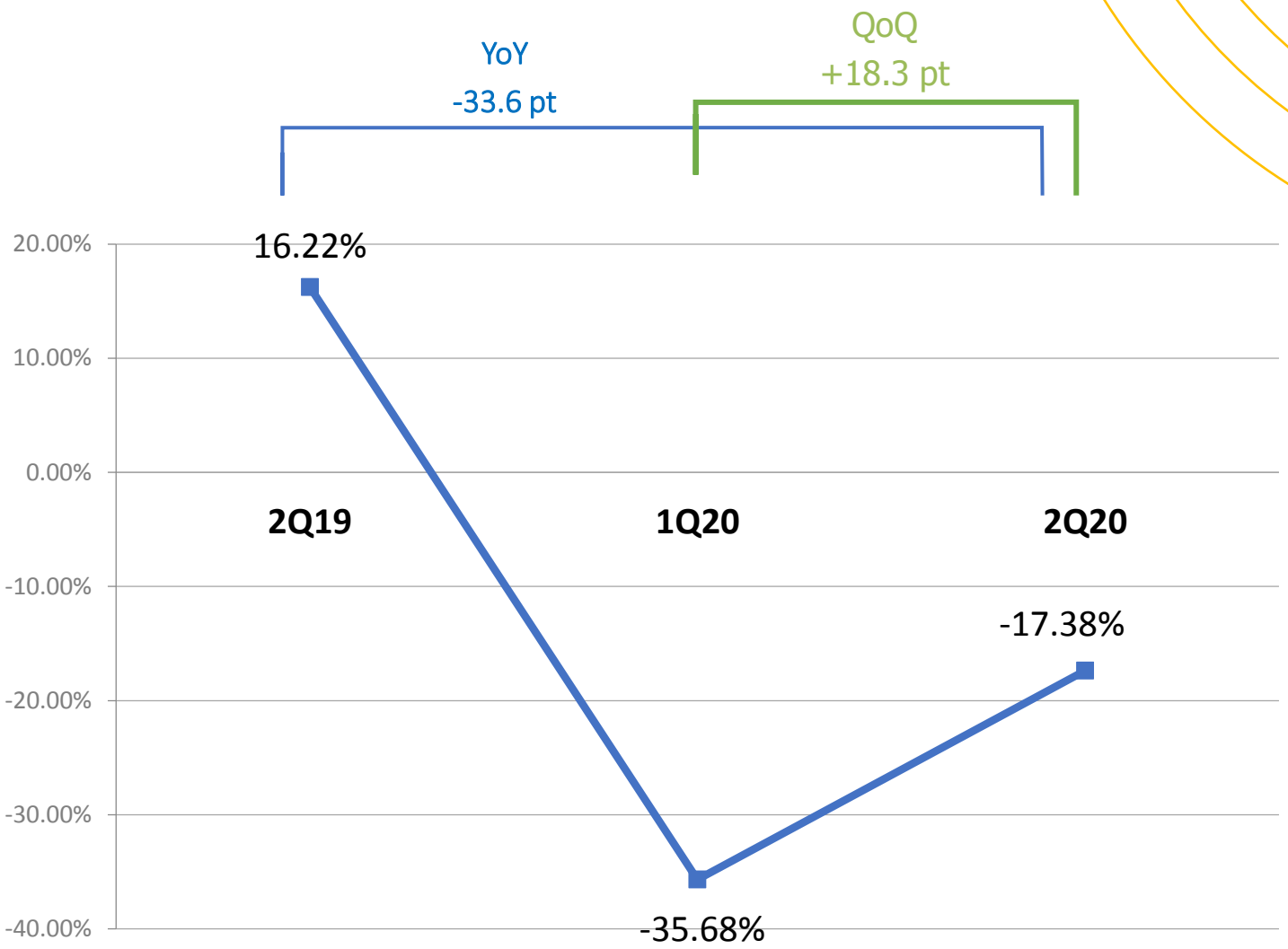
營業利益(損失)率


YoY
-35.49 pt
QoQ
+16.78 pt
20.00%
10.00%
0.00%
-10.00%
-20.00%
-30.00%
-40.00%
15.04%
-37.23%
-20.45%
2Q19
1Q20
2Q20

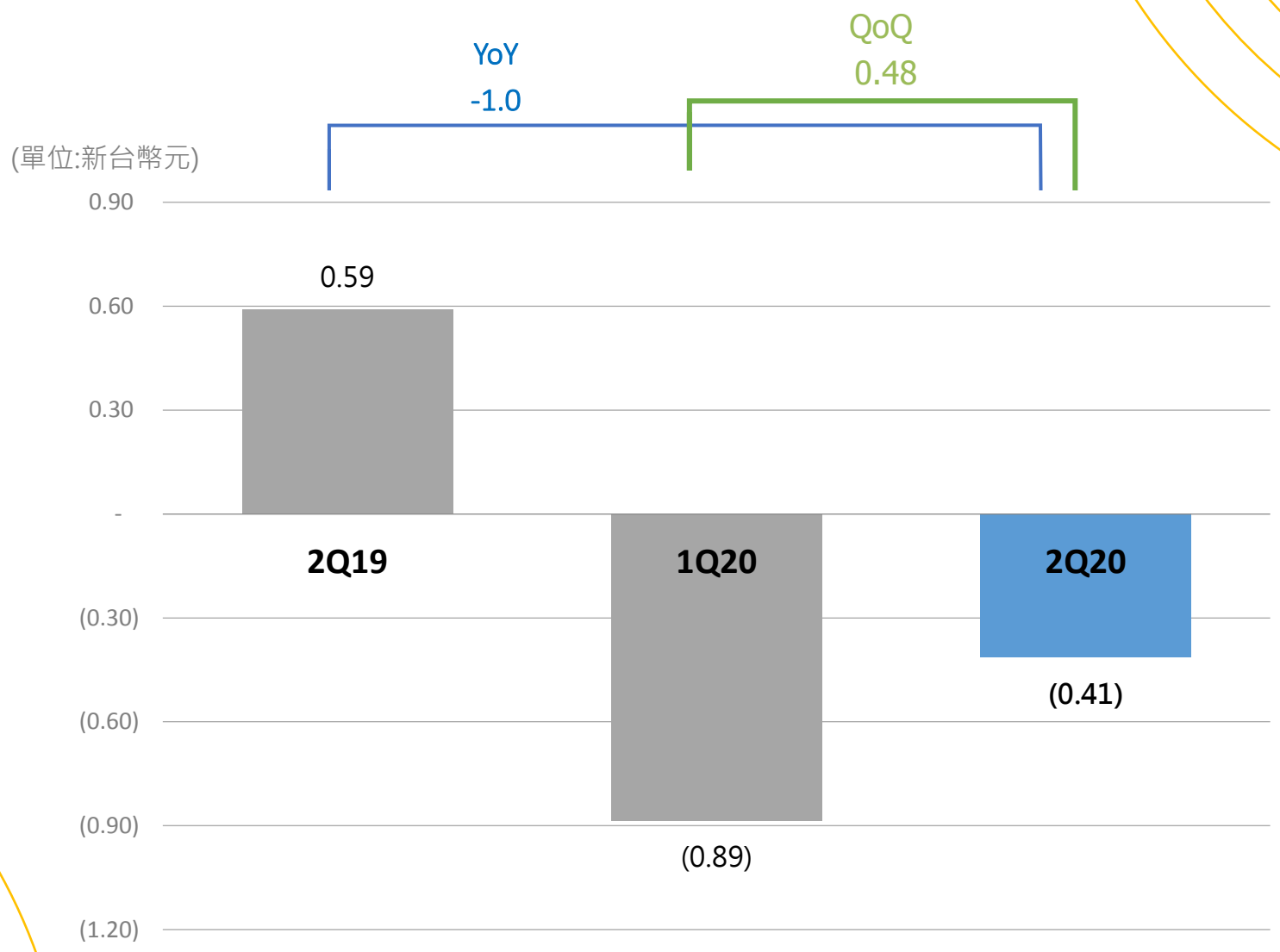
合併淨利(損)


YoY
-170.2 %
QoQ
53.2 %
(單位:新台幣千元)
30,000
20,000
10,000
-
-10,000
-20,000
-30,000
-40,000
-50,000
25,209
2Q19
1Q20
(37,773)
2Q20
(17,696)

合併淨利率


YoY
-33.6 pt
QoQ
+18.3 pt
20.00%
10.00%
0.00%
-10.00%
-20.00%
-30.00%
-40.00%
16.22%
-35.68%
-17.38%
2Q19
1Q20
2Q20

每股盈餘


YoY
-1.0
QoQ
0.48
(單位:新台幣元)
0.90
0.60
0.30
-
(0.30)
(0.60)
(0.90)
(1.20)
0.59
2Q19
1Q20
2Q20
(0.41)
(0.89)

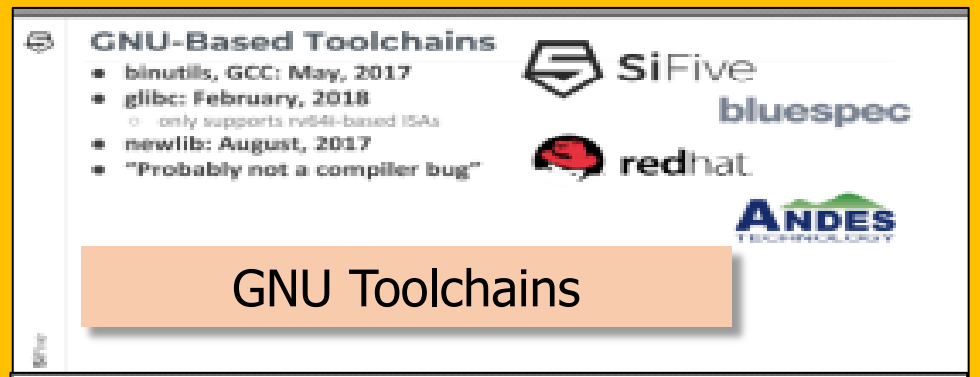
產品應用

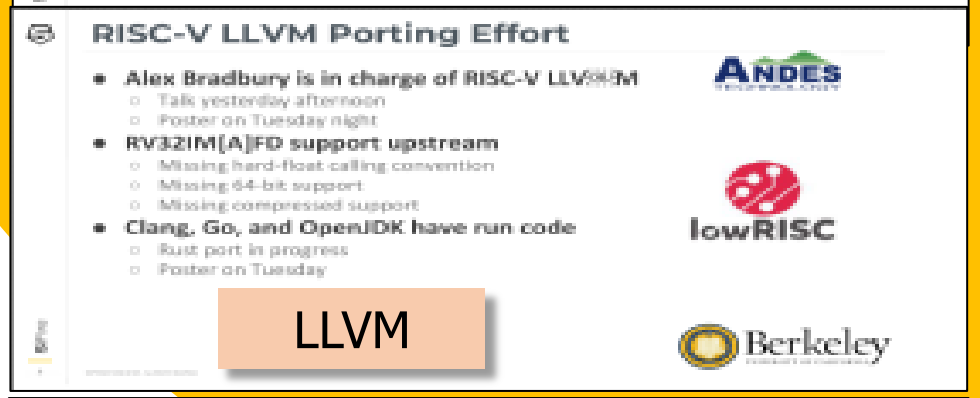
http://www.andestech.com

晶心概況

- A **15**-year-old public CPU IP company
- **1.5B+** Andes-Embedded SoC annually in 2019

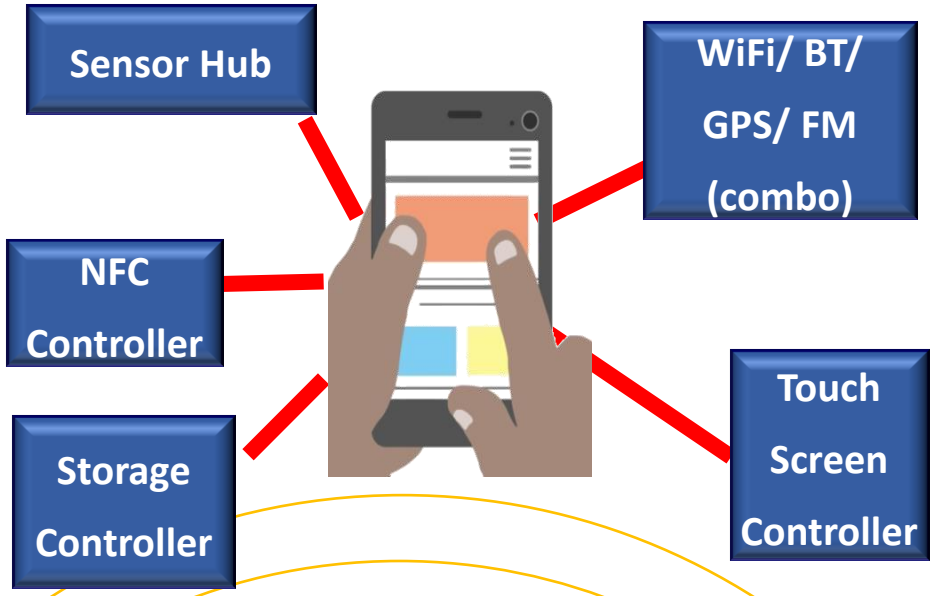
- A **founding premier** member of the RISC-V International
- An active role in RISC-V International & its extension task groups
  - **RISC-V Board Director**
  - **Vice Chair of Technical Steering Committee**
  - RISC-V Ambassador
  - Chair of P-extension (Packed DSP/SIMD) Task Group
  - Co-chair of Fast Interrupt Task Group
- A major open source maintainer/contributor





ANDES TECHNOLOGY

晶心嵌入各式各樣新的應用



Andes Embedded in Smart Phones

Smart Speakers: WiFi IoT

Bike Sharing: GPS Ctrl

X-Trail: ADAS Ctlr

Switch: Game Flash Ctlr

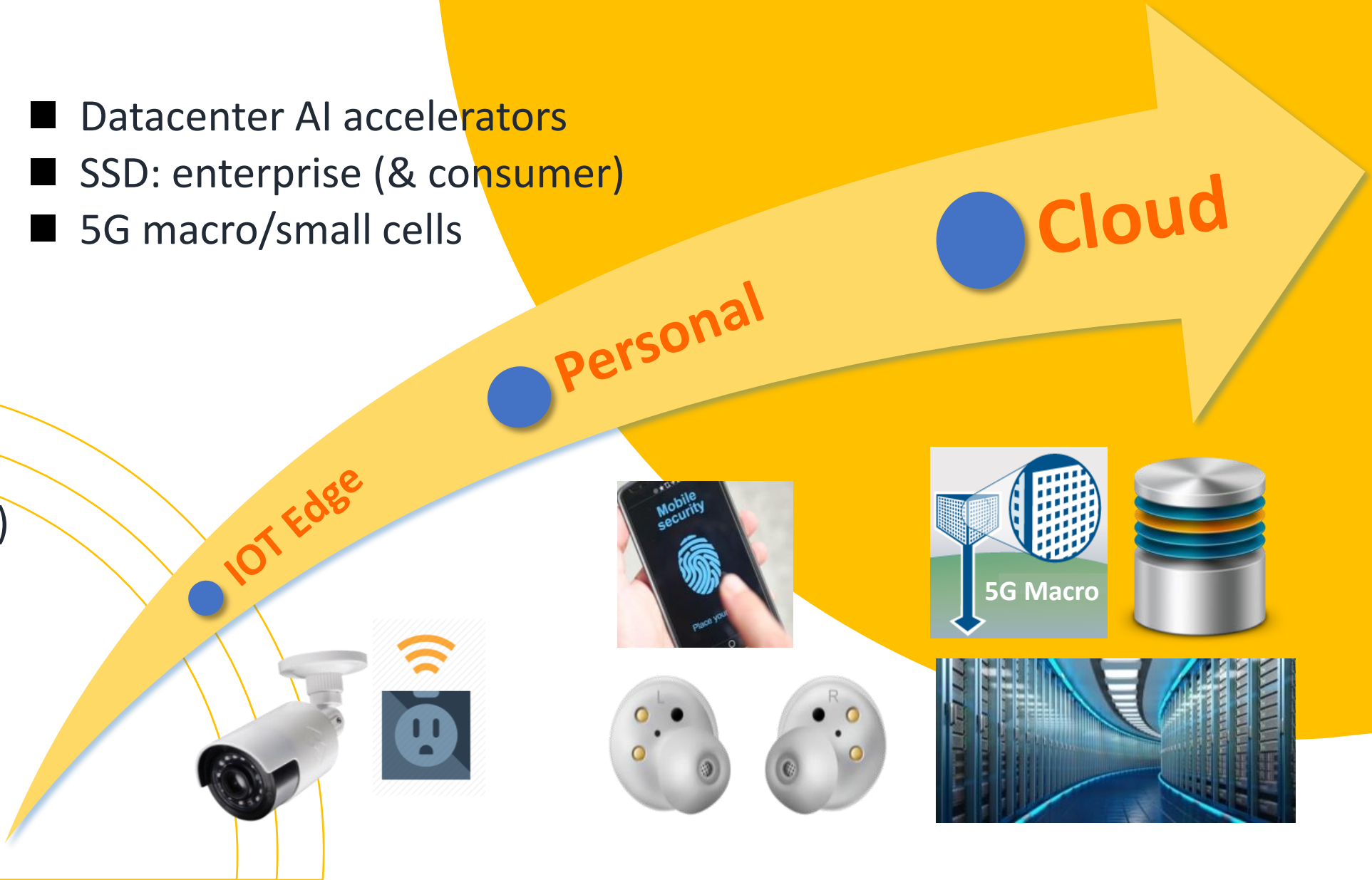
- In leading **machine learning computers** for datacenter
- In tier-one **switch routers** for datacenter
- Recent applications: **5G networking, 802.11ax, AI processors** (using Andes Custom Extension, ACE)

ANDES TECHNOLOGY

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)
- **40nm to 7nm**
- **Many in AI**

- Datacenter AI accelerators
- SSD: enterprise (& consumer)
- 5G macro/small cells



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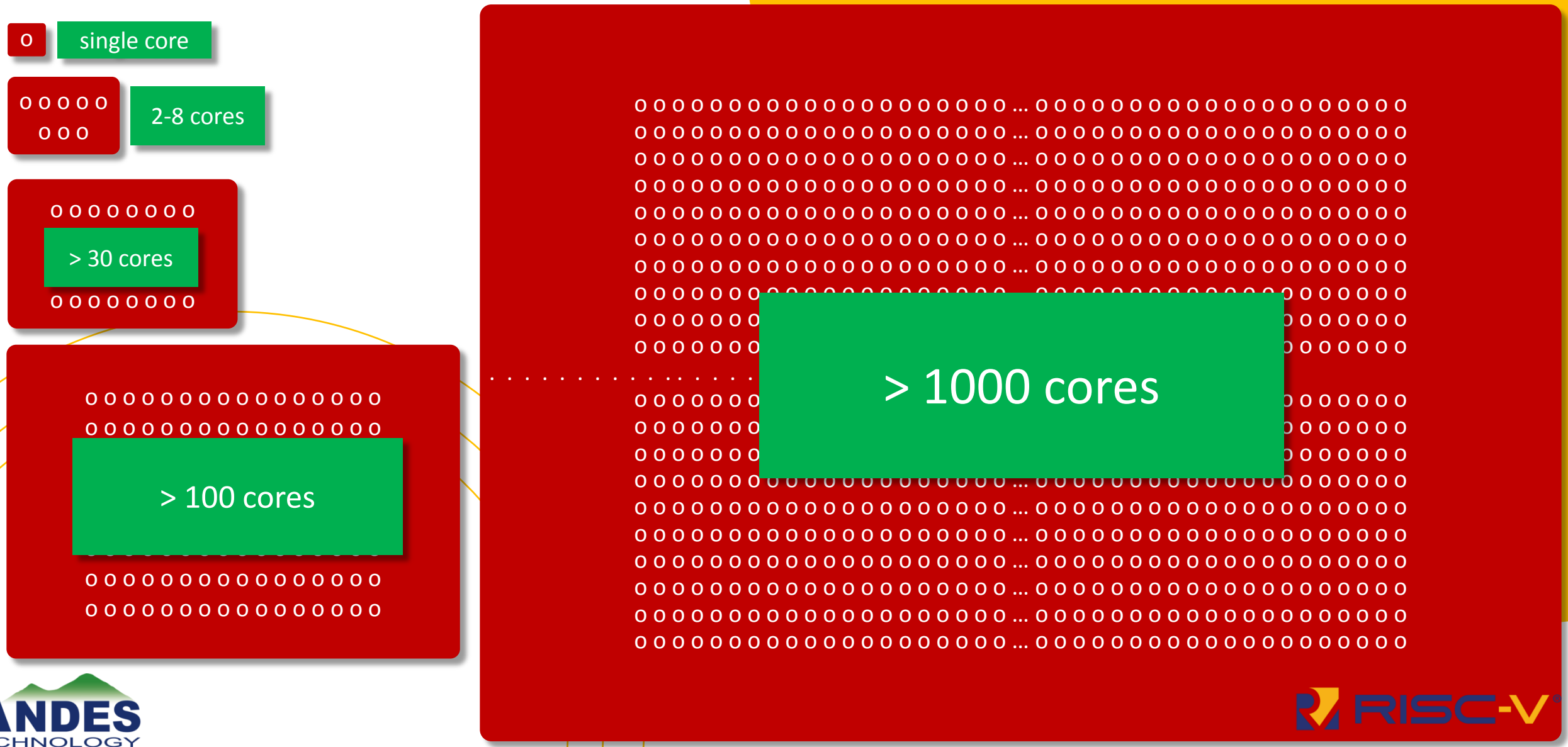
晶心RISC-V核心在SoC中被採用的數目



ANDES TECHNOLOGY

RISC-V

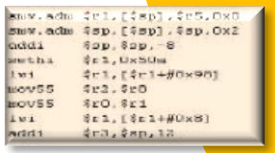
新產品及生態系統

http://www.andestech.com

晶心RISC-V產品概述

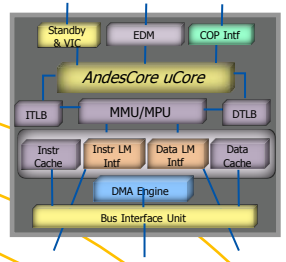
Best extensions to RISC-V

AndeStar™ Architecture V5

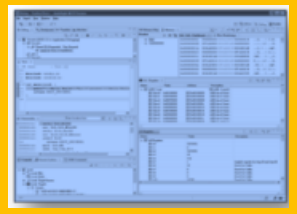


AndesCore™ Processors

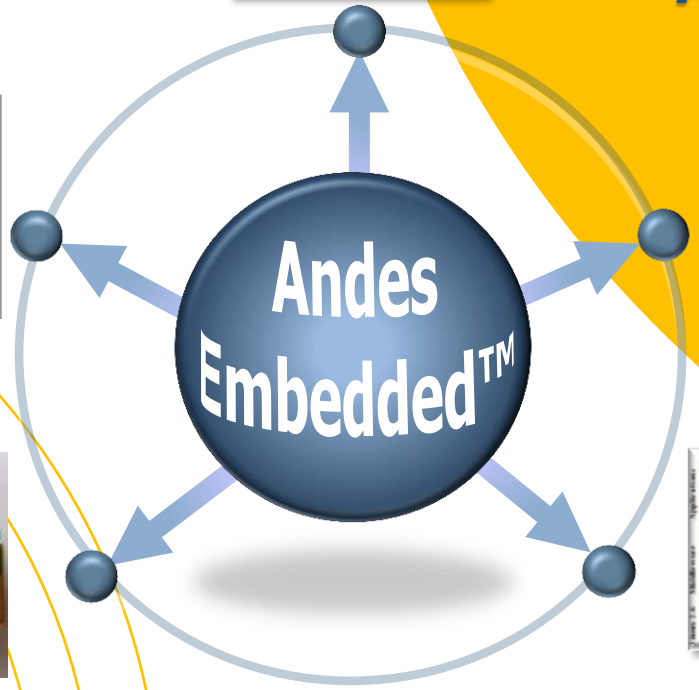
Highly optimized design with leading PPA



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

ANDES TECHNOLOGY

RISC-V®

完整產品線

ANDES TECHNOLOGY

RISC-V®

晶心RISC-V產品路線圖

	RV32/RV64
Cache-Coherent 1-4 Cores	A25MP AX25MP
Linux with FPU/DSP	A25 AX25
Fast/Compact with FPU/DSP	N25F D25F NX25F
N22 2-stage (700 MHz)	5-stage (1.1 GHz)

Vector Ext.

27-Series:

Vector Ext.
MemBoost

NX27V
A27/AX27
and more.

5-stage (1.1 GHz)

Superscalar

45-Series:

Dual Issue
MemBoost

N45/NX45
D45/DX45
A45/AX45
and more.

8-stage (1.2 GHz)

Benefits

- 512-bit SIMD raises MobileNet by 30x (CNN for mobile vision)
- boost performance by 50%
- Raise bandwidth to 3x; Cut latency by 40%

Applications:

- AIOT, Comm., ML/DL, Multimedia, Networking, Storage
- For data processing as well as control processing

ANDES TECHNOLOGY

RISC-V®

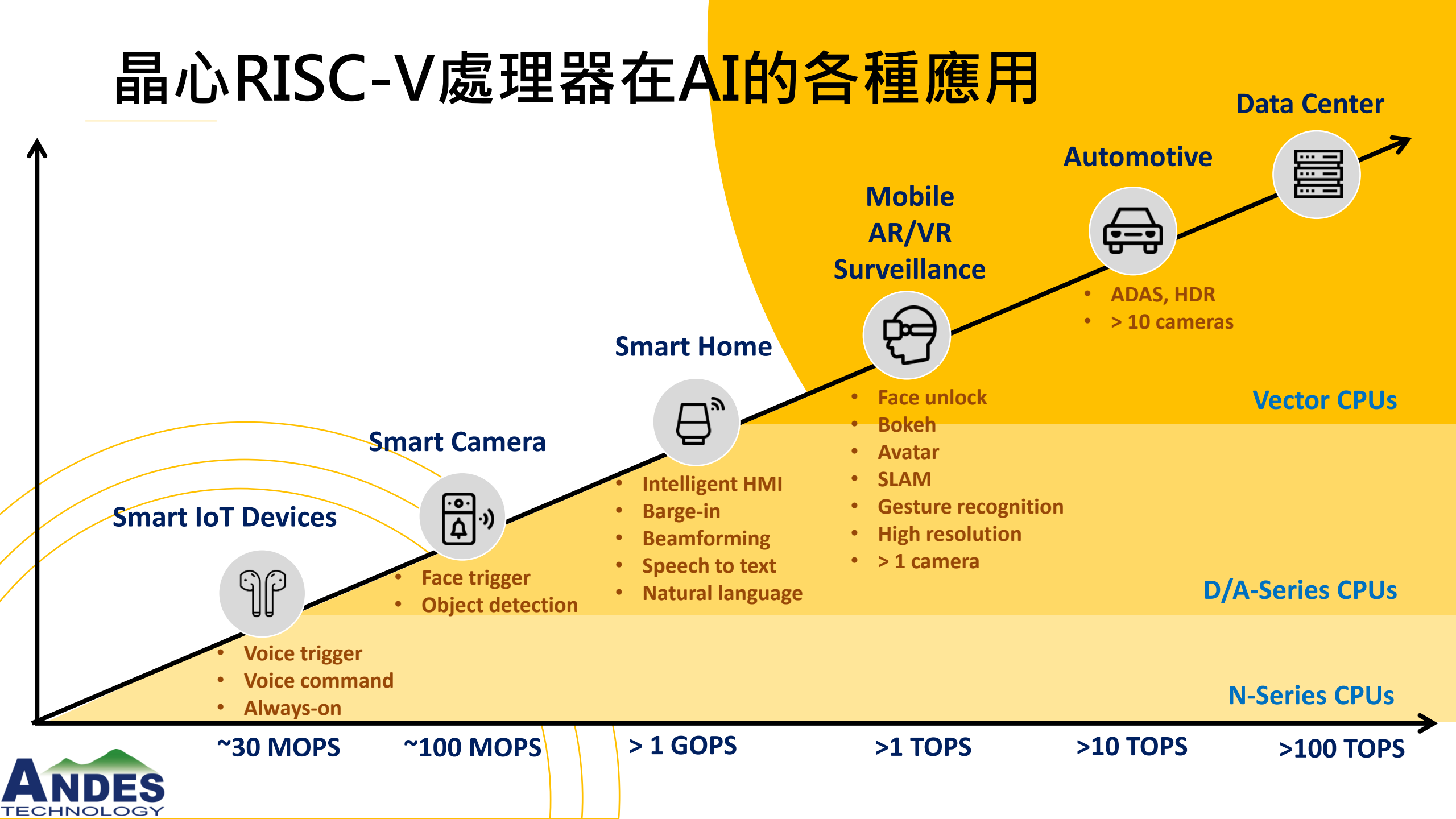
Andes V5適用於廣泛的運算架構

AndeStar™ V5 CPUs	Conventional Computing Architecture	Domain Specific Architecture (DSA)
RISC-V RV32/64 / ANDES TECHNOLOGY Andes Extension		
N/D-series N22 N(X)25 D25…	**Leading PPA Embedded Processor** IoT, Sensing, Storage, Audio, GPS	Andes Custom Extension
A-series A(X)25 A(X)27 A(X)45 Multicore…	**High Performance and Power Efficient AP** 5G, AI, Datacenter, Video Surveillance, Networking	
Vector NX27V, NX45V…	**Cray Style, Scalable Vector Processor** Datacenter, Server, Deep Learning	

- Define custom instruction to handle time critical codes
- Better approach for accelerator /co-processor to do particular jobs
- Automation Tool for the generation of toolchain, ISS, partial RTL and verification

ANDES TECHNOLOGY

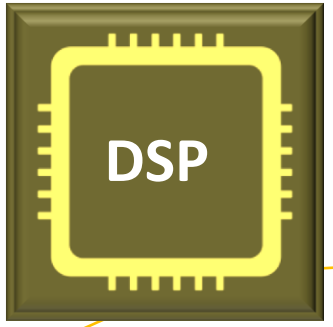
晶心RISC-V處理器在AI的各種應用

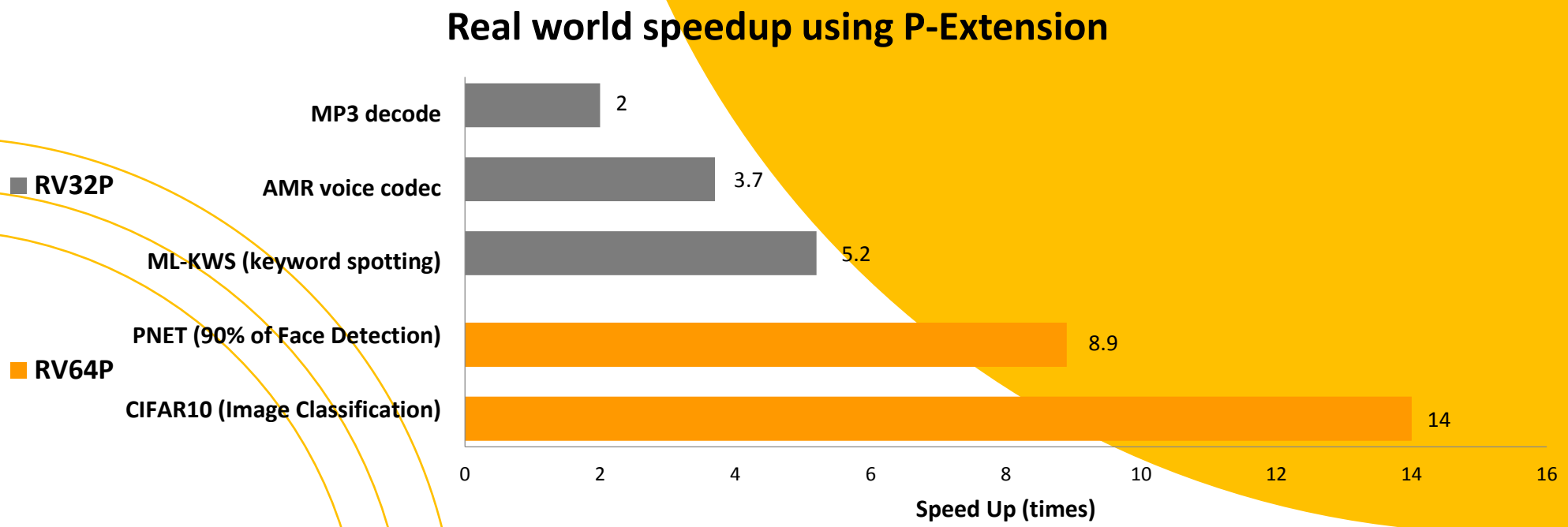


ANDES TECHNOLOGY

Andes RISC-V DSP 指令集延伸

- Andes contributed market-proven DSP(SIMD) as P-Extension
- Designed to accelerate slow video, audio/voice and low data rate DSP workloads





❖ Increase power efficiency to your DSP applications

ANDES TECHNOLOGY

晶心向量處理器(NX27V) - One for All Implementations

NX27V

*512b → Cloud Computing – Datacenter, HPC, Server

*256b → Edge Computing – 5G, Vision Processing

*128b → Endpoint Computing – Natural Language Processing

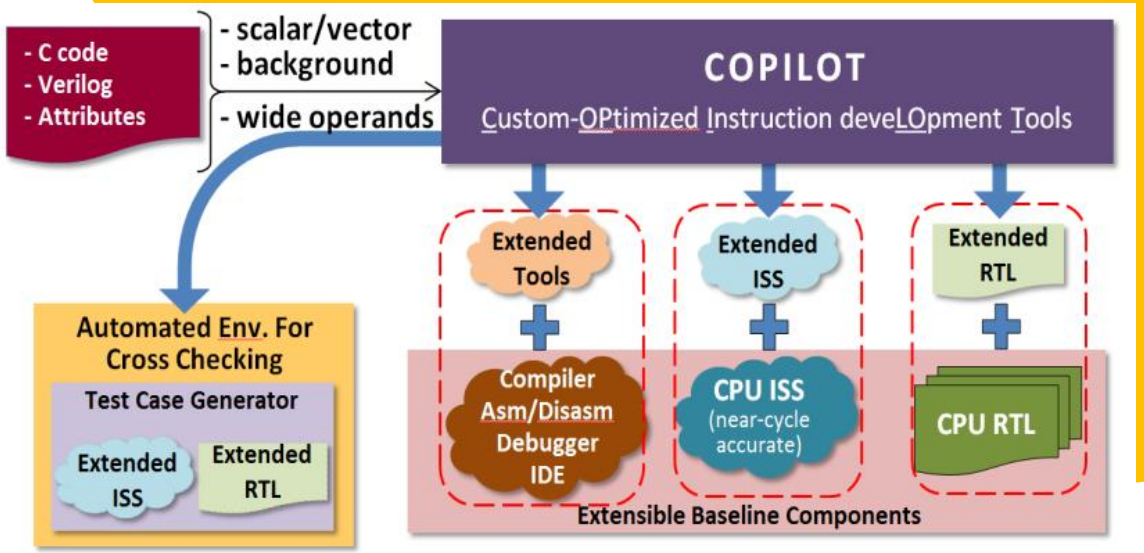
* Configurable compute data width (VLEN)

ANDES TECHNOLOGY

Andes 客製化指令集延伸

- ❖ ACE unlocks RISC-V's Potential of DSA
  - Define ACE instruction to handle time critical codes
  - Another approach to co-processor or accelerators

- ❖ All-in-one **COPILOT** development environment
  - Automation tool and ease of use
  - Extensions are easy to re-use, can be used as a library



ANDES TECHNOLOGY

Taking RISC-V Cores to Next Level

- Andes is the leading supplier shipping the commercial RISC-V cores to market with

P-Extension	• D25F, A(X)25(MP), A(X)27, A(X)45
V-Extension	• NX27V, NX45V
Custom-Extension (w/ ACE* support)	• Entire 25, 27, 45 series

*: Andes Custom Extension

ANDES TECHNOLOGY

RISC-V®

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

ANDES TECHNOLOGY

RISC-V®

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

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RISC-V®

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

- Complete product portfolio
- Reliable RISC-V core IP vendor
- Extreme low power consumption, high computing efficiency
- World’s leading P-, V- and Custom-Ext. Capable RISC-V cores
- Professional custom computing service

生態系統: Andes 與 Knect.me

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knectme™

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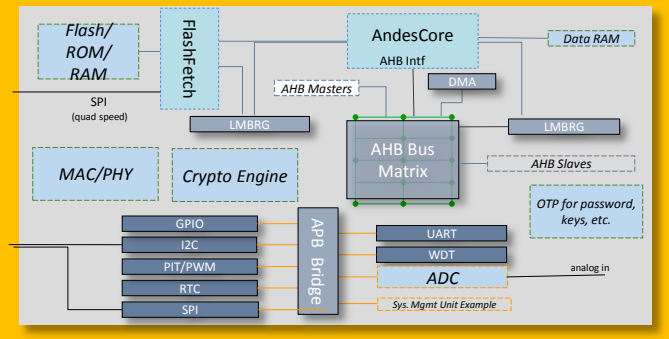
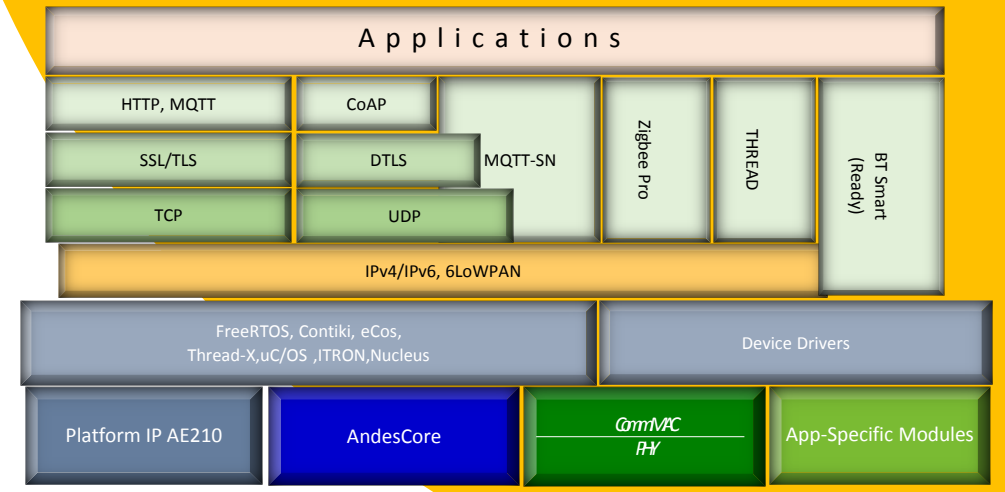
Knect.me 生態系統

- **Built up the community *to* help developing IoT products**
  - To knect solutions for silicon IP's, SW stacks, tools, applications, systems and products
  - Including
    - SoC IP Platforms
    - Software Stack
    - Development Boards
    - Development Tools
- **Forms a IoT League**
  - To knect chip vendors, partners, application developers, system vendors





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FreeStart Program

- **FreeStart Evaluation Program (FSEP)**
  - For all RISC-V enthusiasms and educator/researcher
  - 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 (FSSP)**
  - 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

ANDES TECHNOLOGY

Event Promotion

RISC-V Summit in San Jose

2020: Diamond Sponsor

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RISC-V®

總結

A Trusted Computing Expert

Andes Technology

Successfully rolled out new series of RISC-V cores (w/ leading P-, V- and Custom-Ext.), custom computing service and FreeStart program to extend more oppty.

Aggressively involved in RISC-V Foundation new technology development, contributing and leveraging RISC-V eco-system.

Becoming a technology contributor, market promoter, and sales leader in the RISC-V industry

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RISC-V®

Thank You

http://www.andestech.com

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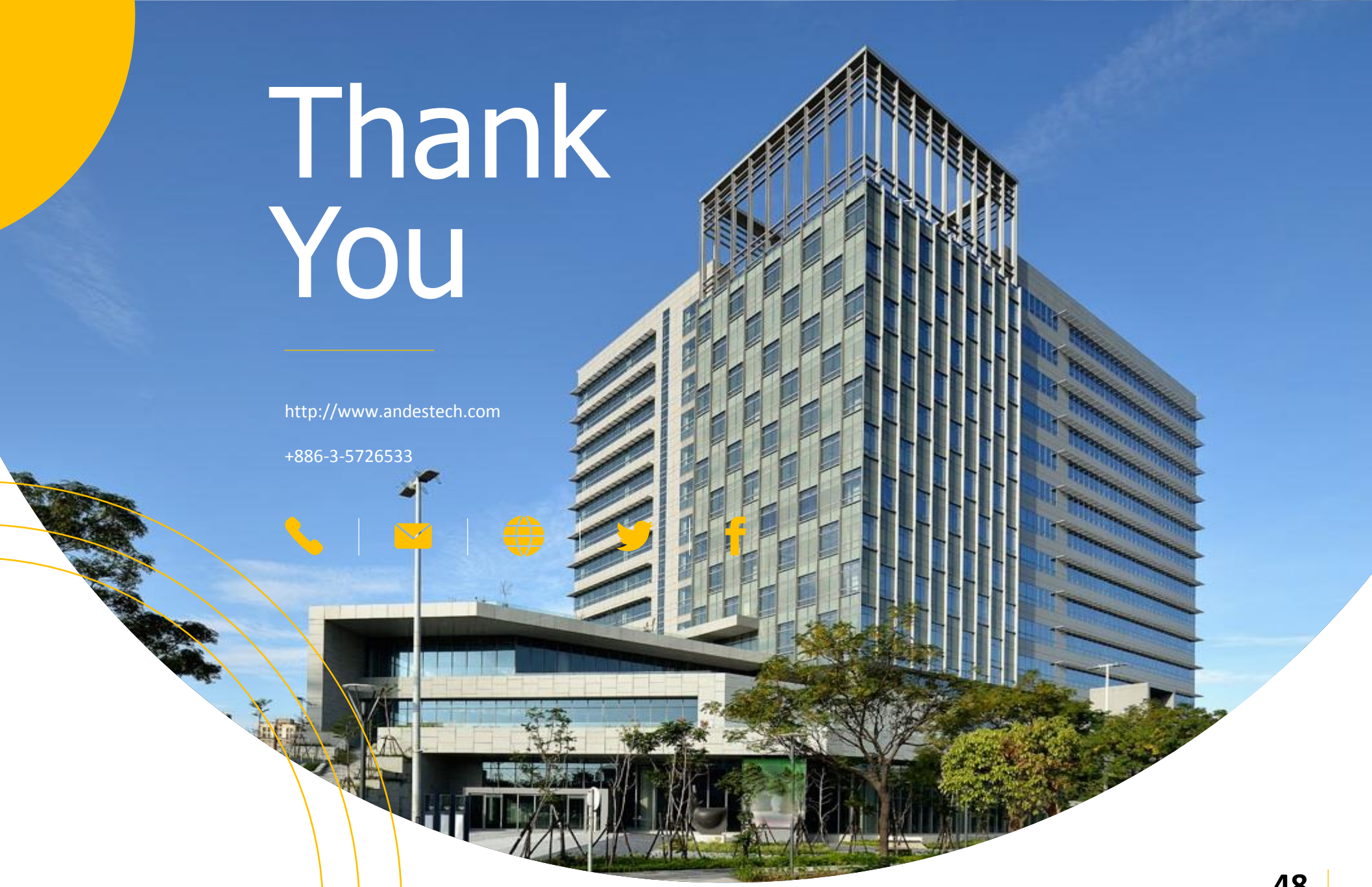

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