晶心科技股份有限公司

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280人；80%為工程師。
- 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」。
- 向量處理器核心NX27V獲頒「新竹科學園區優良廠商創新產品獎」 (2020)
- EE Awards亞洲金選獎 -「Taiwan 產品獎」,「Asia 企業獎」(2021)

晶心任務

- 創新架構高效能/低功耗嵌入式處理器。

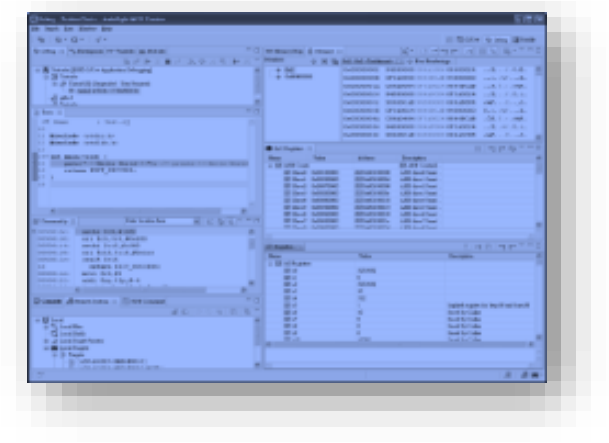
晶心利基

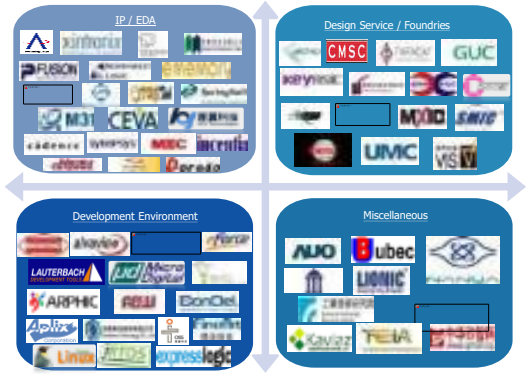
- 智能及環保之電子設備
- 雲端應用,人工智慧及物聯網

ANDES TECHNOLOGY

重要里程碑

- **250+** commercial licensees
  - Geographically distributed in Taiwan, China, Korea, Japan, Europe, and USA
  - **600+** license agreements signed
- AndeSight™ IDE:
  - **22,000+** installations
- Eco-system:
  - **500+** partners
- **10B+** Accumulative SoC Shipped



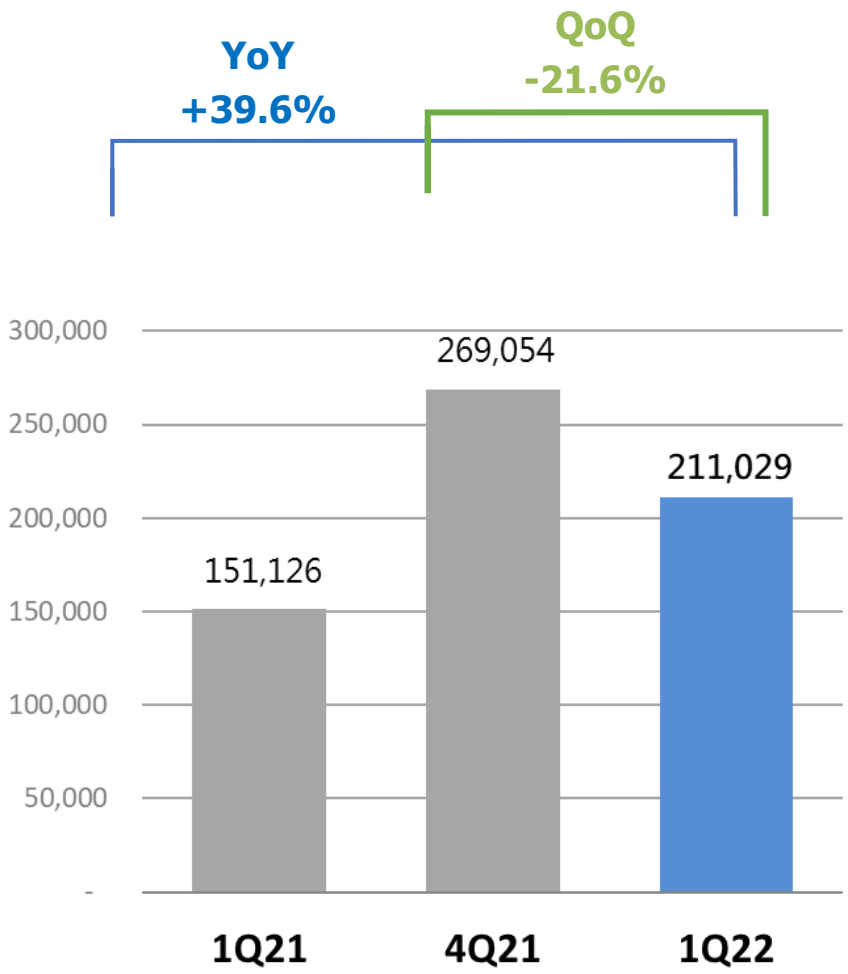


營運成果

http://www.andestech.com

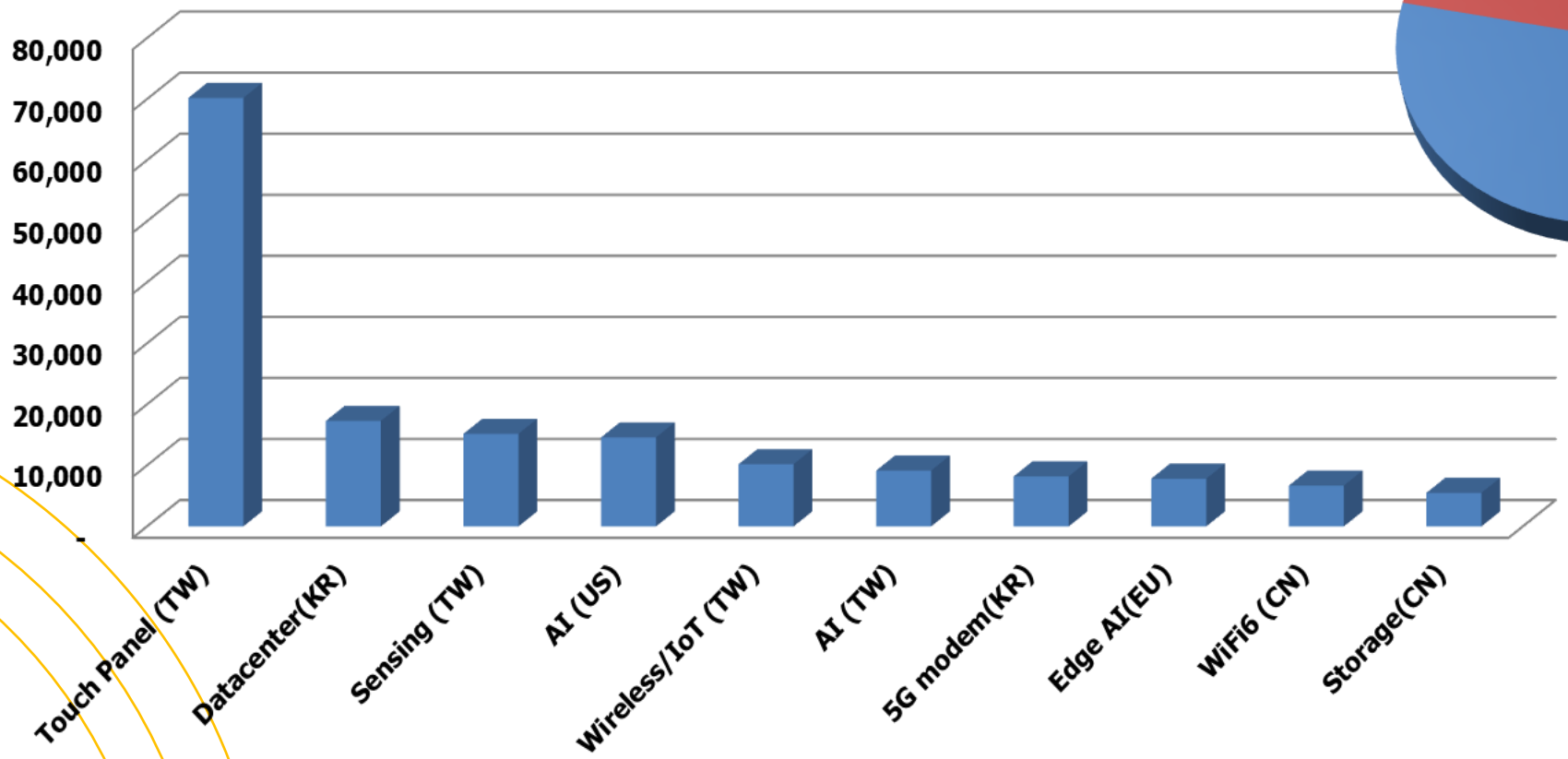
1Q22 營業收入

(單位:新台幣千元)

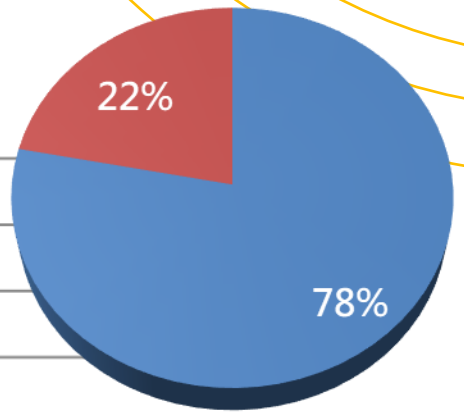


1Q22前十大客戶之應用分析

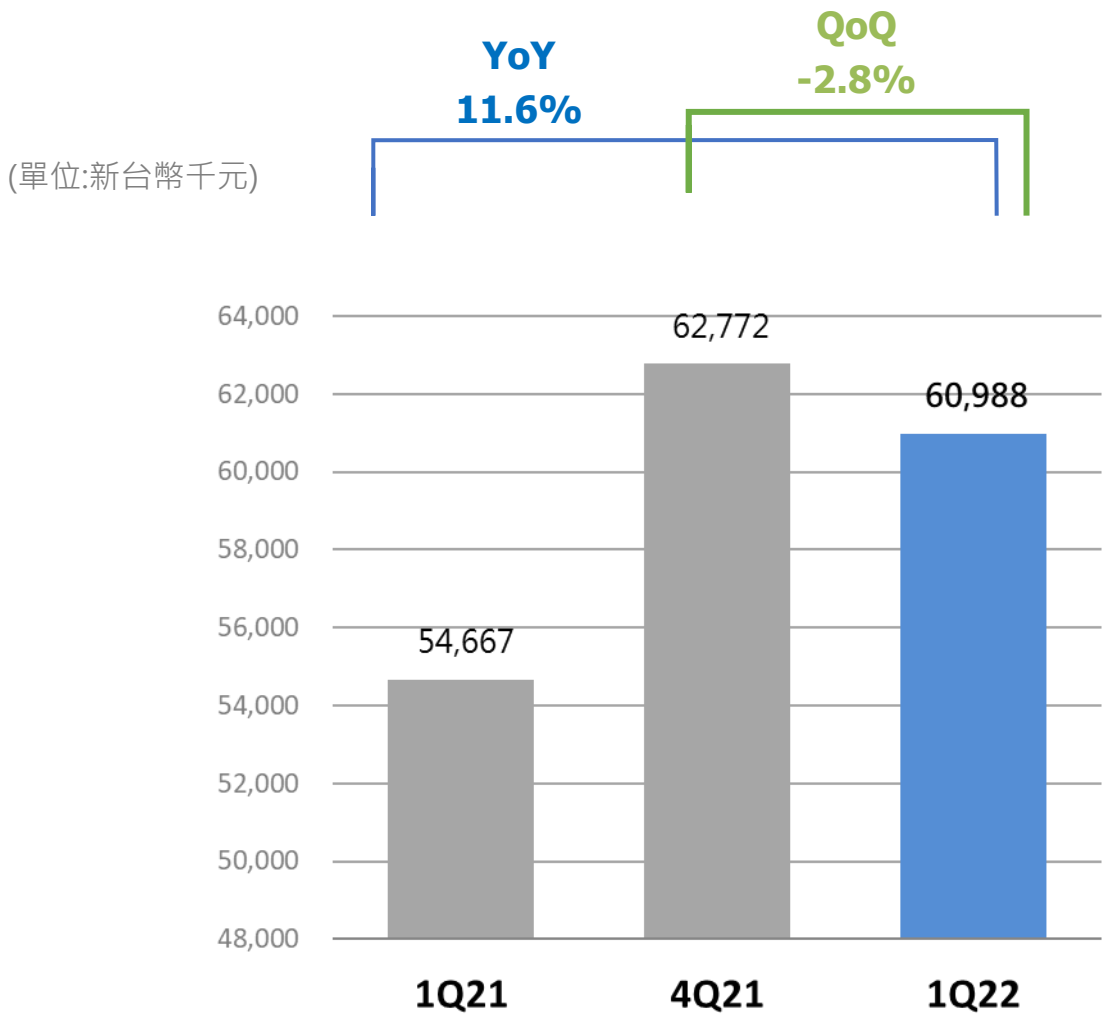
單位: 新台幣千元



前十大客戶貢獻78%的營收



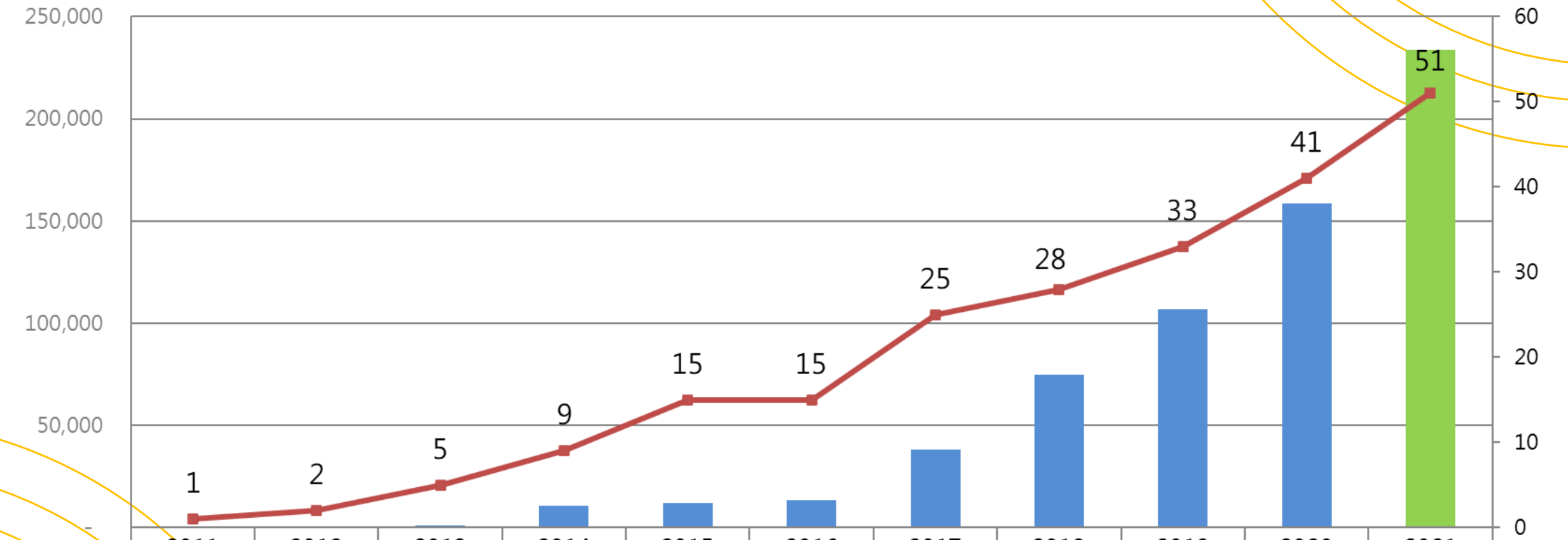
1Q22 權利金收入


YoY
11.6%
QoQ
-2.8%
(單位:新台幣千元)
64,000
62,000
60,000
58,000
56,000
54,000
52,000
50,000
48,000
54,667
62,772
60,988
1Q21
4Q21
1Q22

權利金變動表

單位: 新台幣千元

(單位:家數)

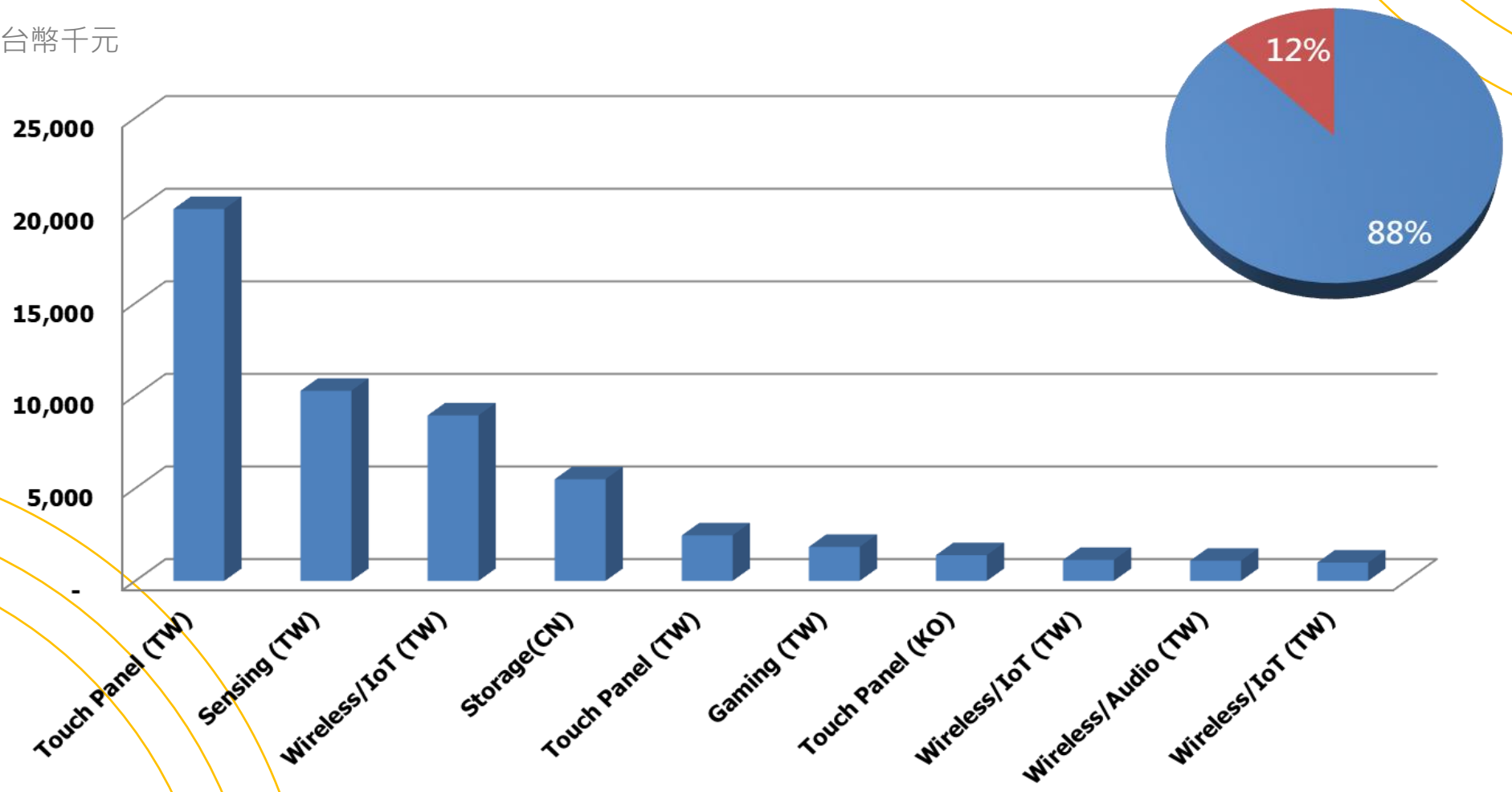


	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
權利金	445	660	1,285	10,819	12,232	13,320	38,287	74,953	106,716	158,792	233,676
客戶數	1	2	5	9	15	15	25	28	33	41	51

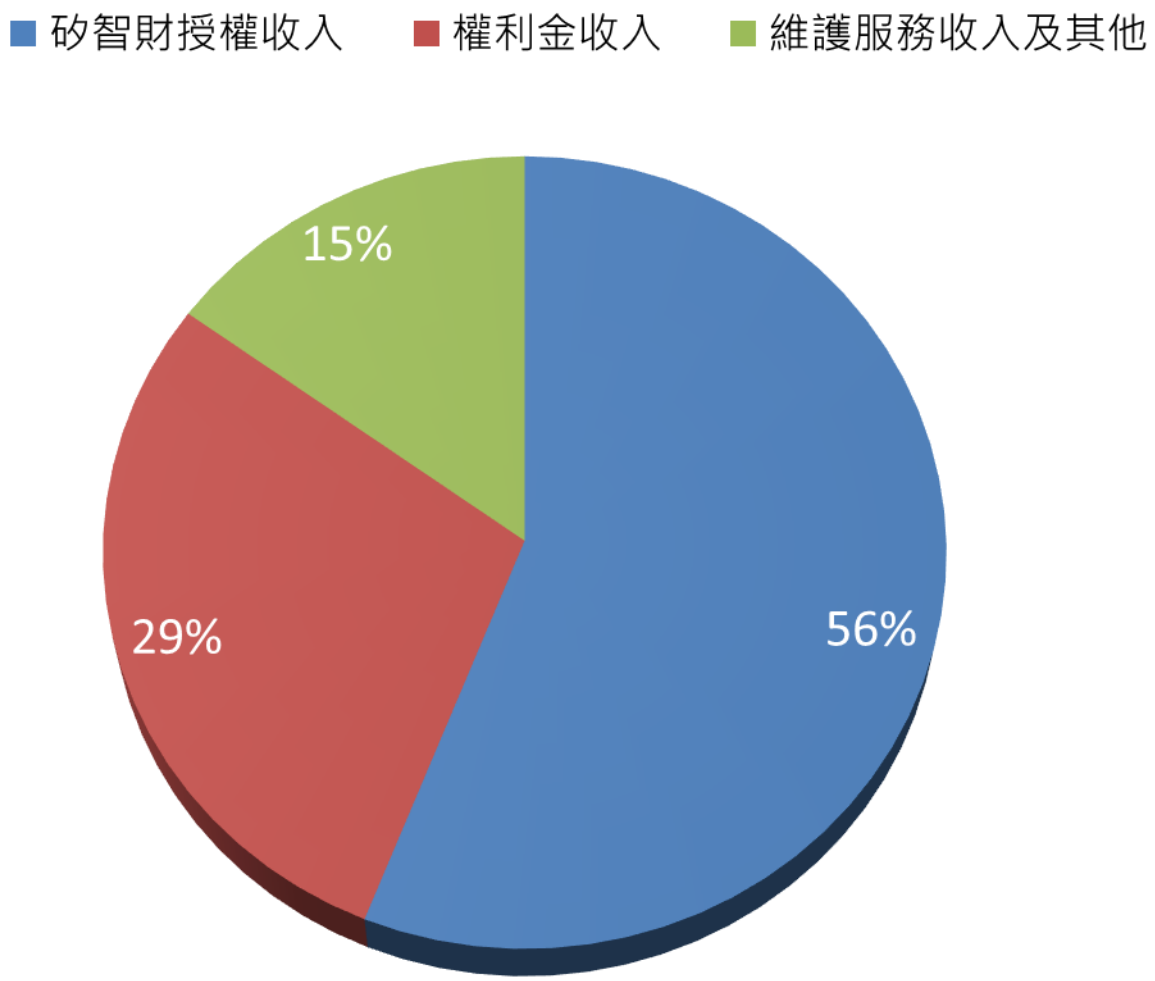
1Q22 權利金應用分析

前十大權利金客戶貢獻比率 88%

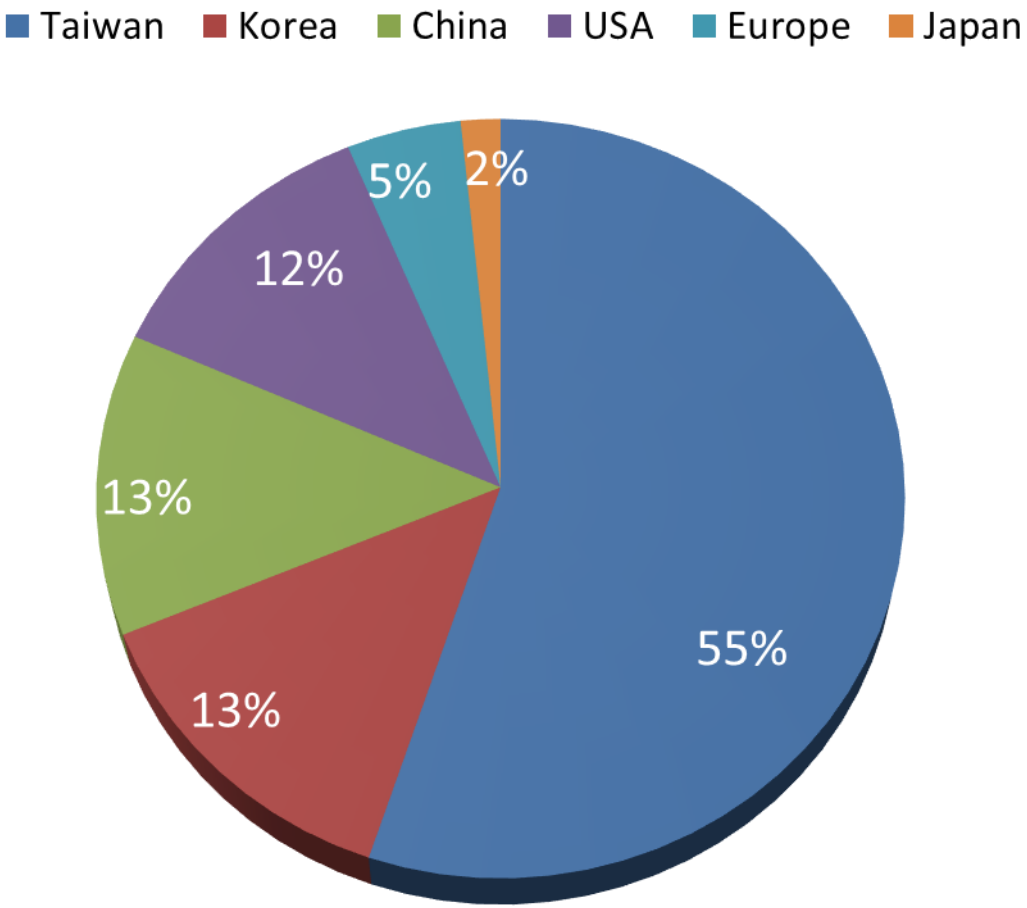
單位: 新台幣千元



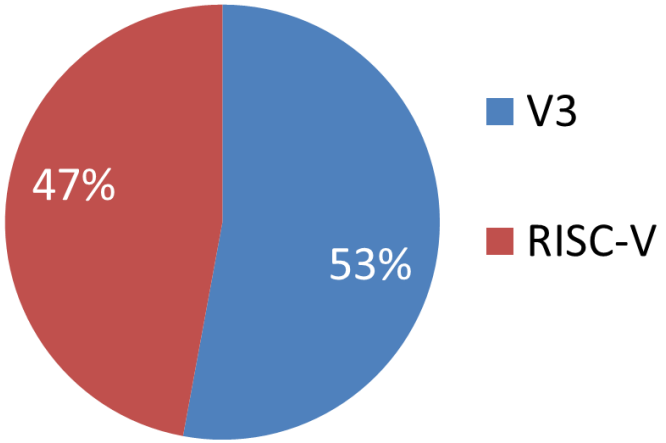
1Q22 季銷售分析-收入模式

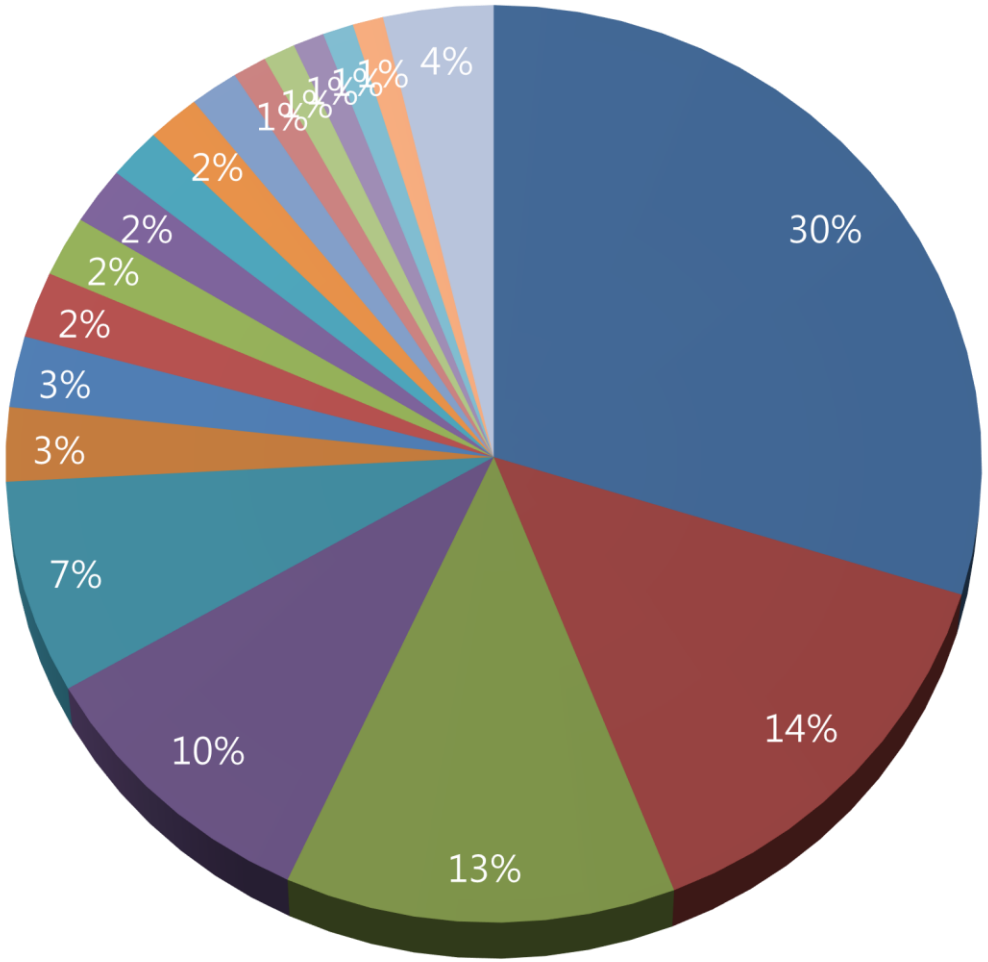


1Q22 銷售分析-地區別

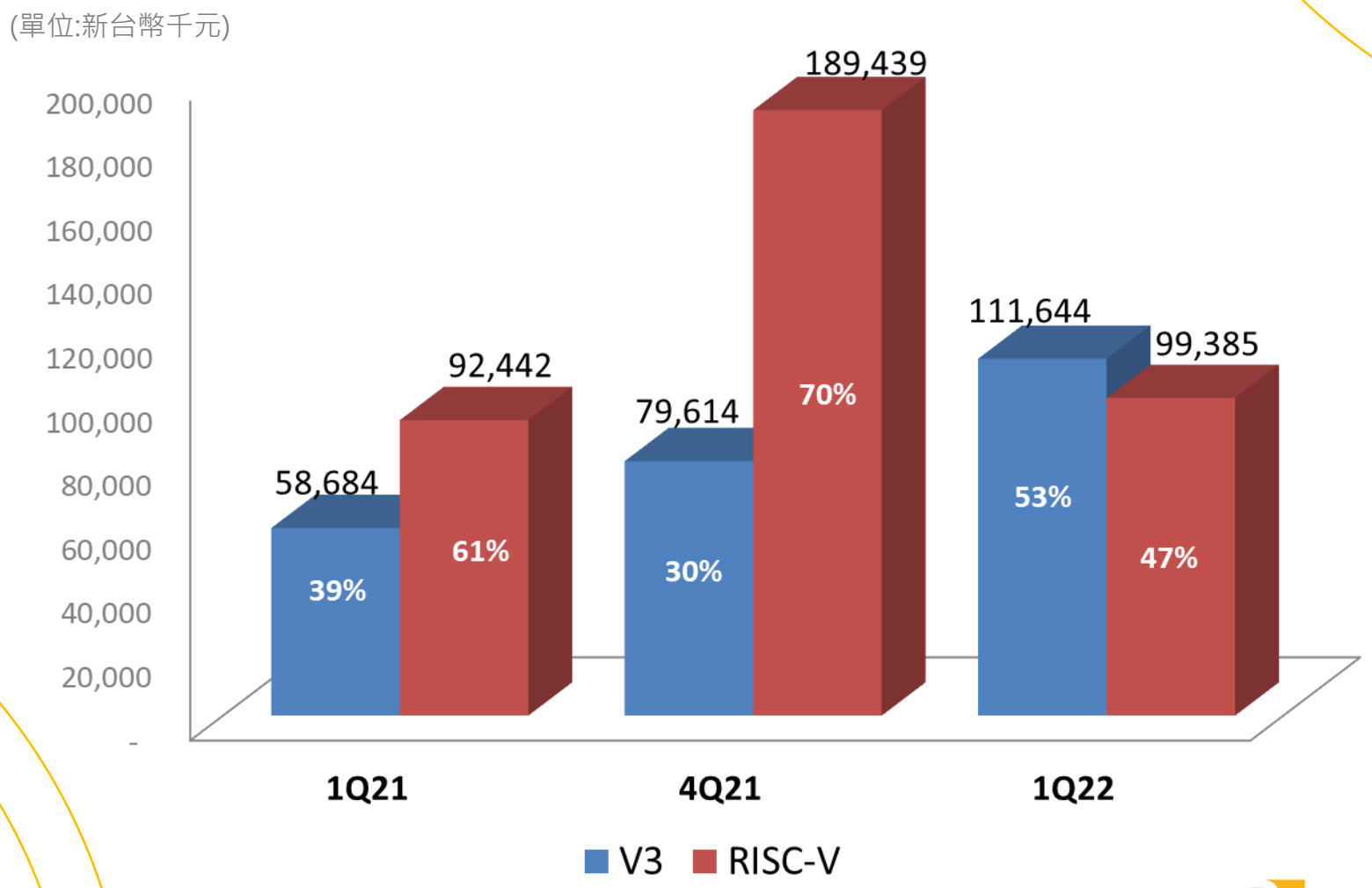


1Q22 銷售分析-產品別

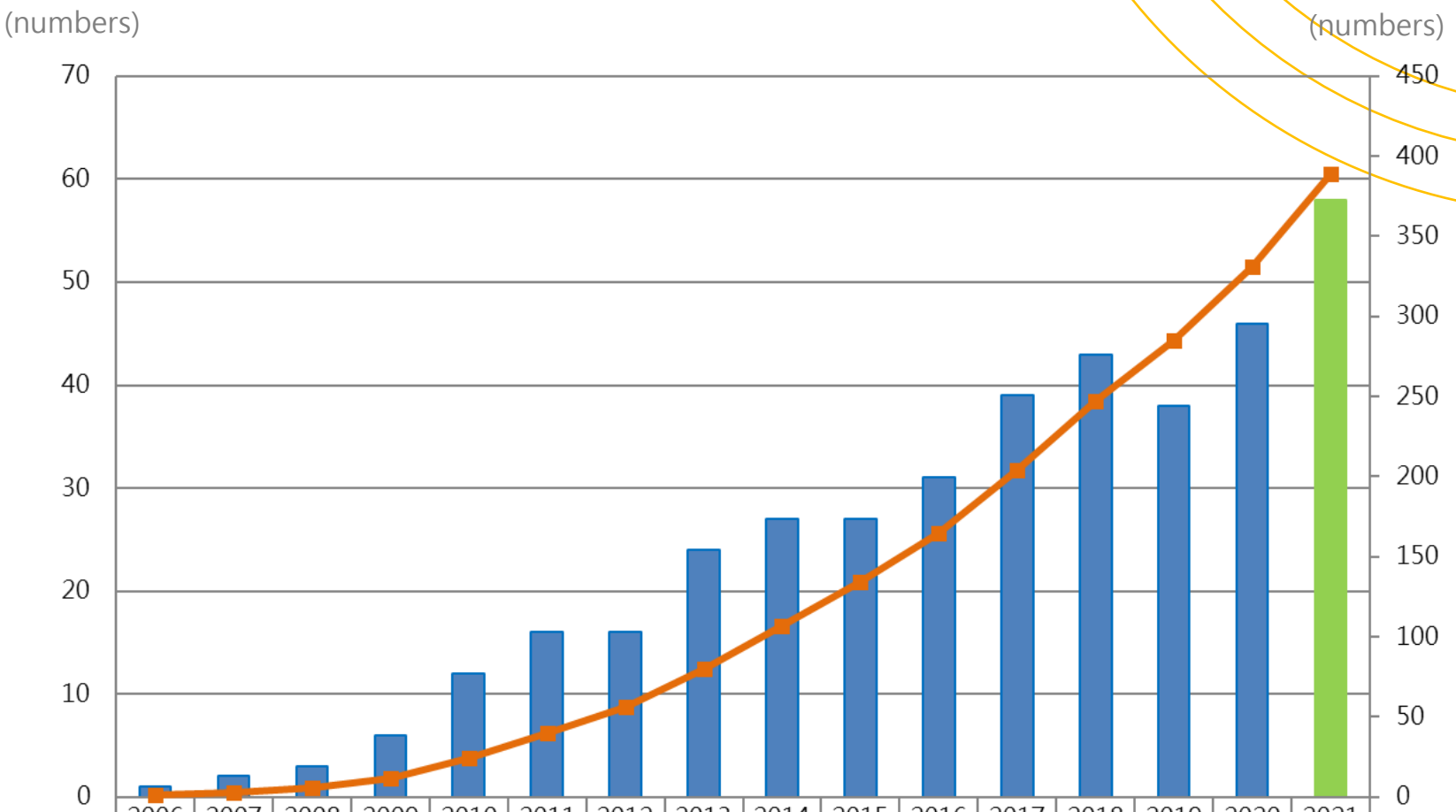




1Q22 銷售分析- RISC-V



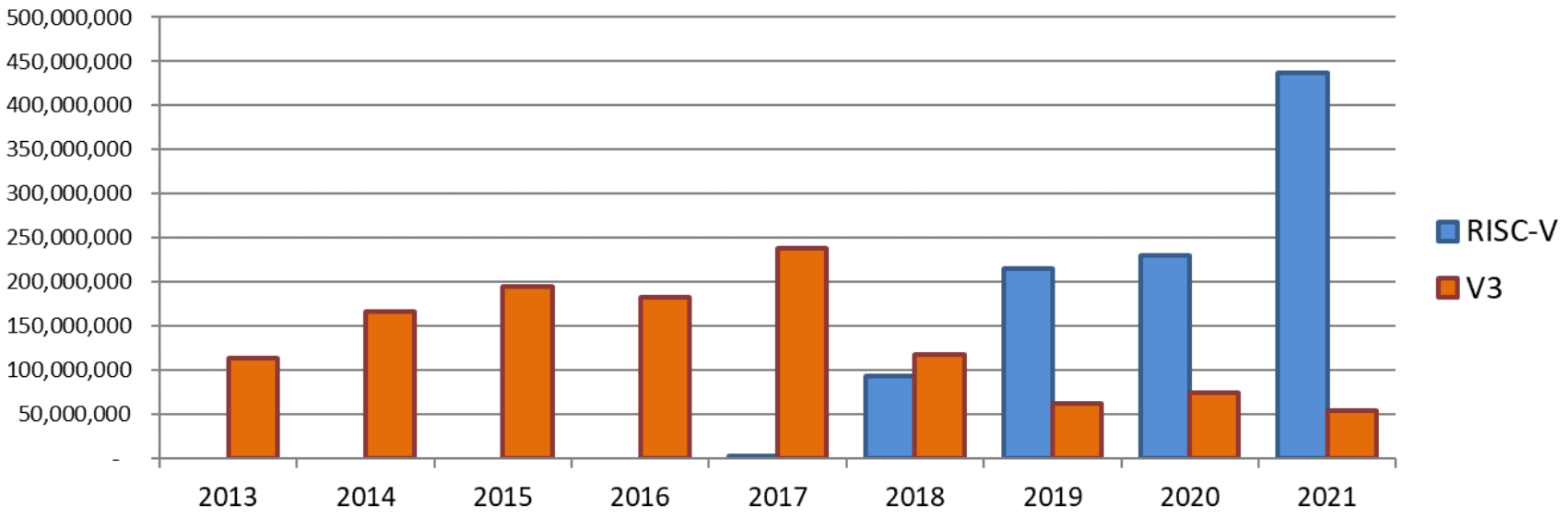
歷年商業授權合約



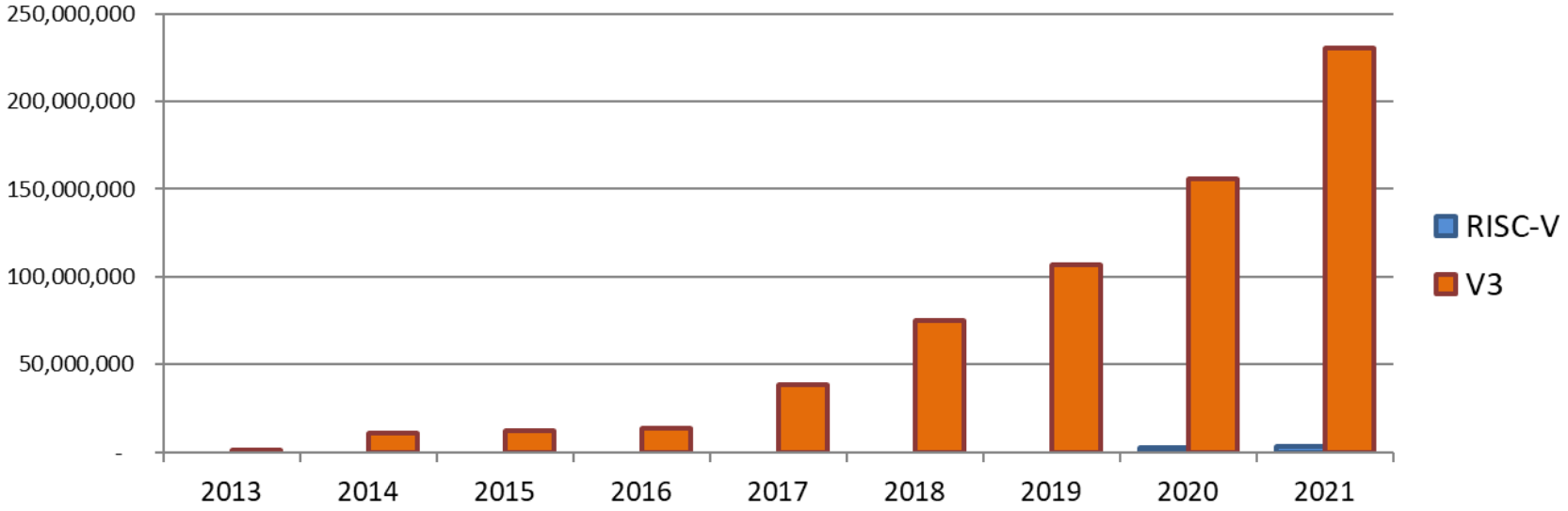
	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Commercial IP agreements	1	2	3	6	12	16	16	24	27	27	31	39	43	38	46	58
Commercial Accumulated IP agreements	1	3	6	12	24	40	56	80	107	134	165	204	247	285	331	389

歷年收入分析

(NT$)



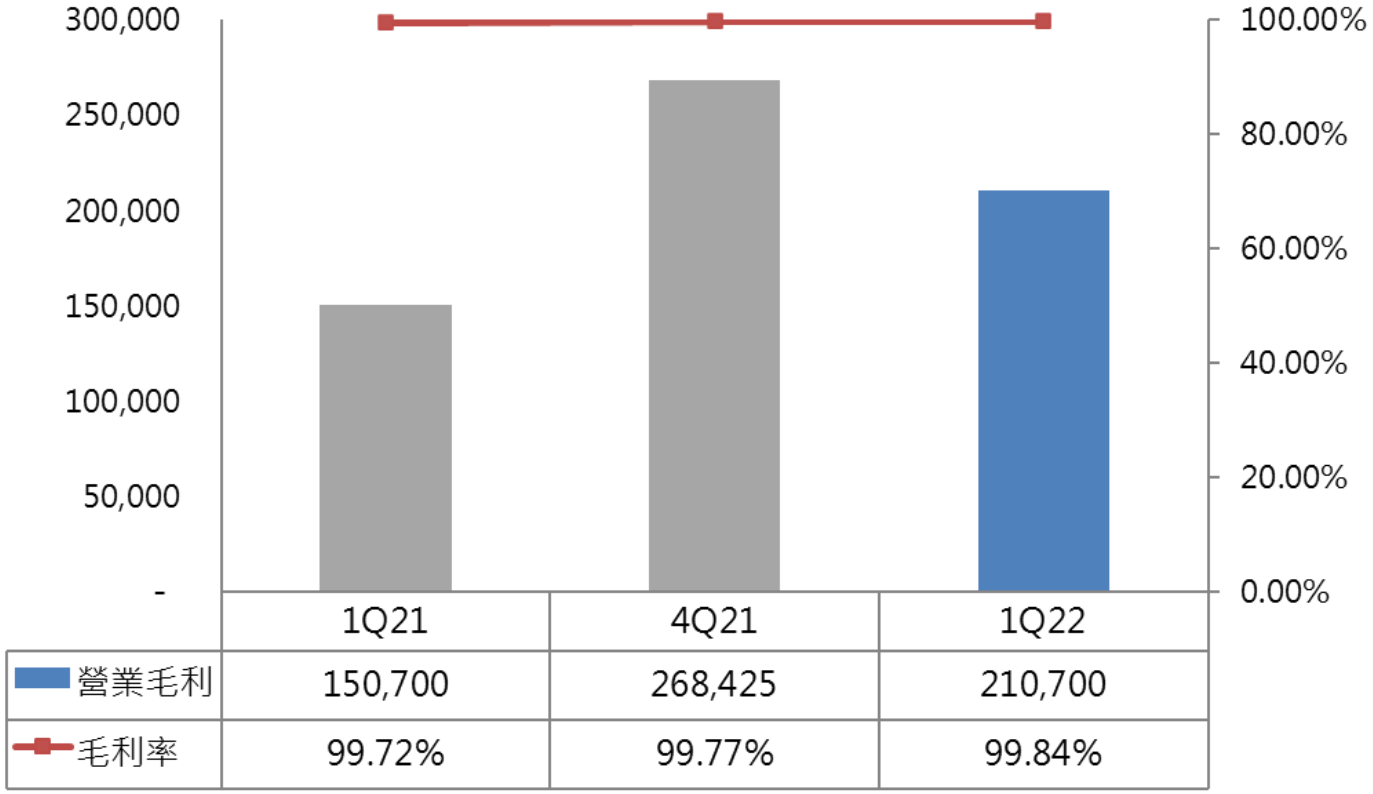
License



Royalty

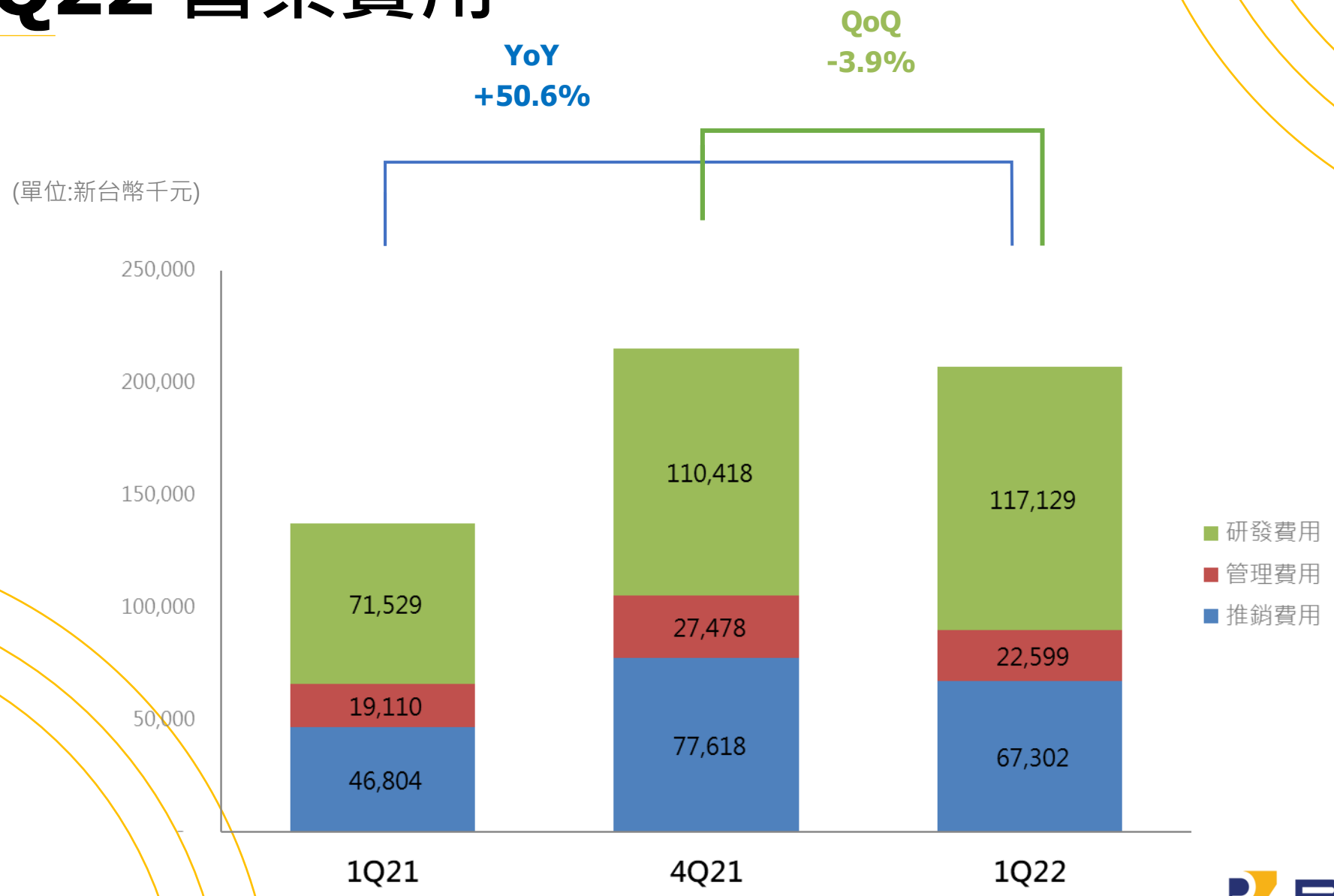
1Q22 營業毛利與毛利率

(單位:新台幣千元)

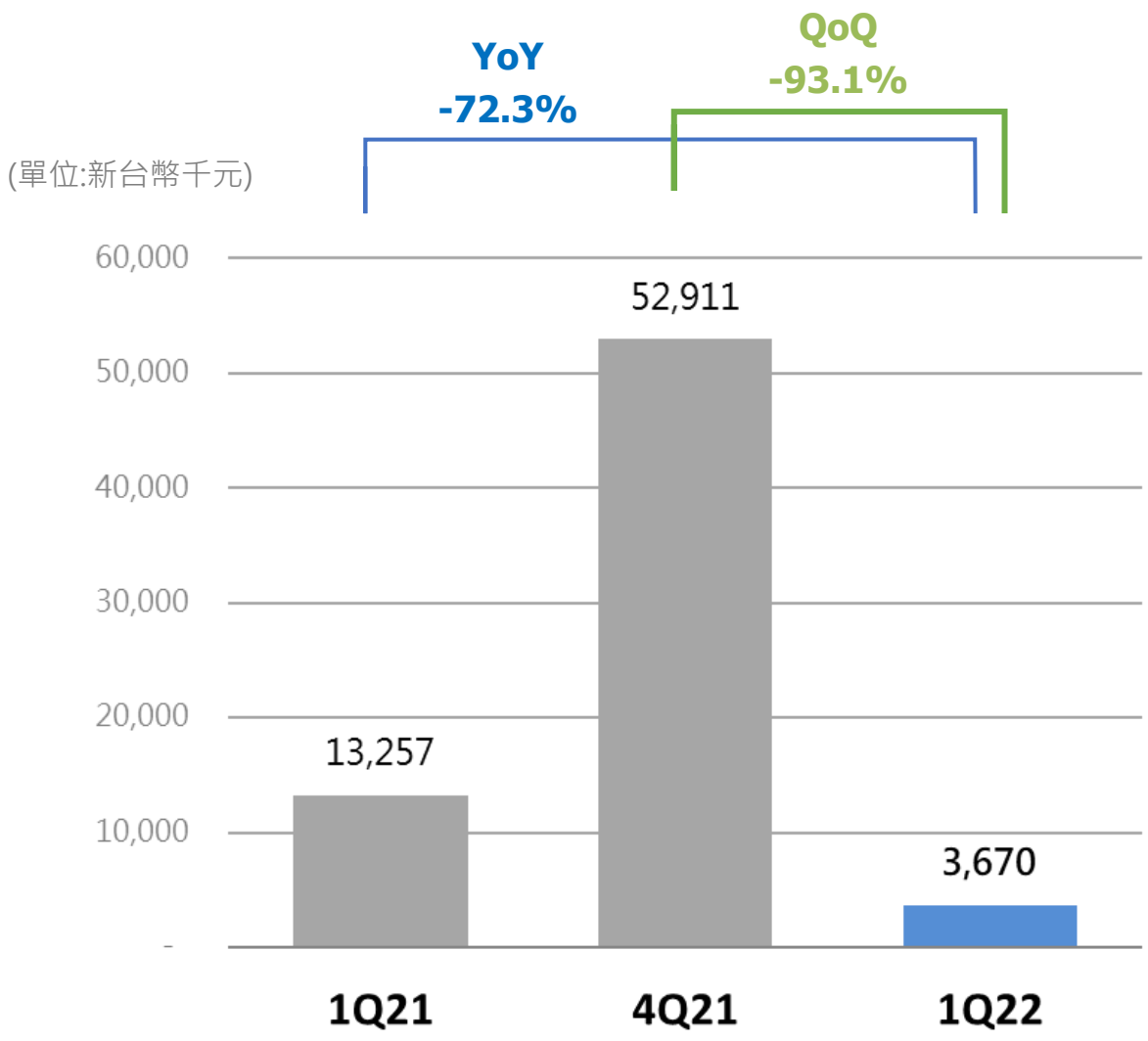


	1Q21	4Q21	1Q22
營業毛利	150,700	268,425	210,700
毛利率	99.72%	99.77%	99.84%

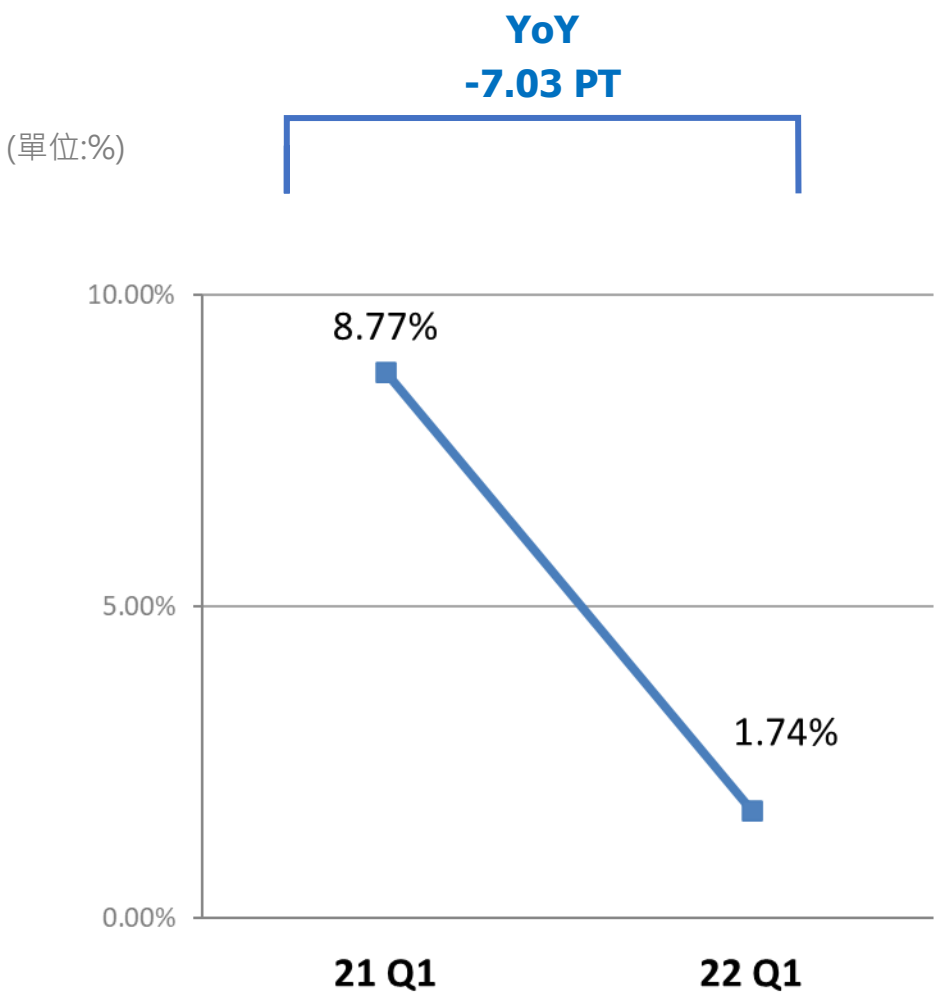
1Q22 營業費用


YoY
+50.6%
QoQ
-3.9%
(單位:新台幣千元)
250,000
200,000
150,000
100,000
50,000
-
71,529
19,110
46,804
110,418
27,478
77,618
117,129
22,599
67,302
1Q21
4Q21
1Q22
研發費用
管理費用
推銷費用

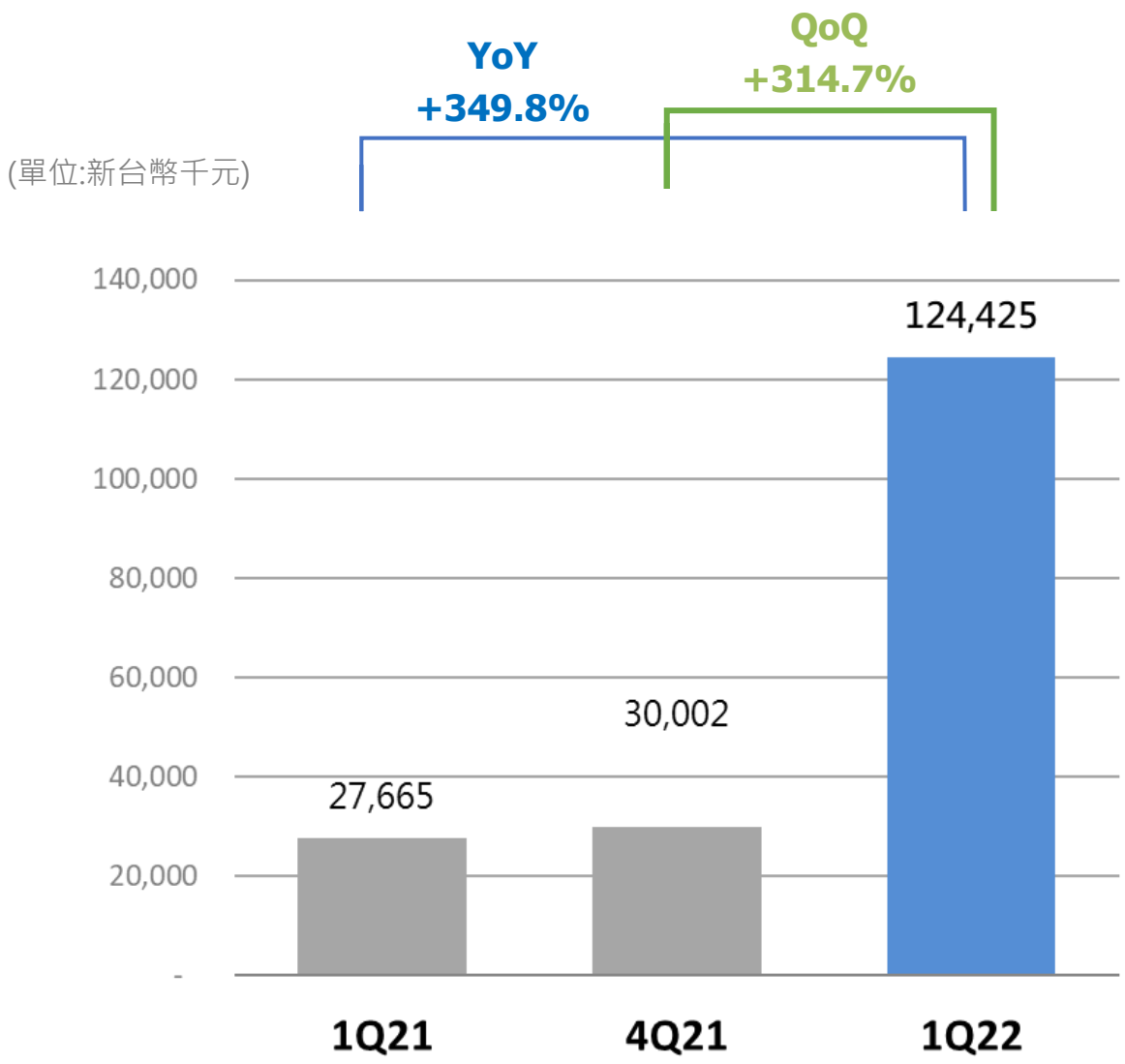
1Q22 營業利益


YoY
-72.3%
QoQ
-93.1%
(單位:新台幣千元)
60,000
50,000
40,000
30,000
20,000
10,000
-
13,257
52,911
3,670
1Q21
4Q21
1Q22

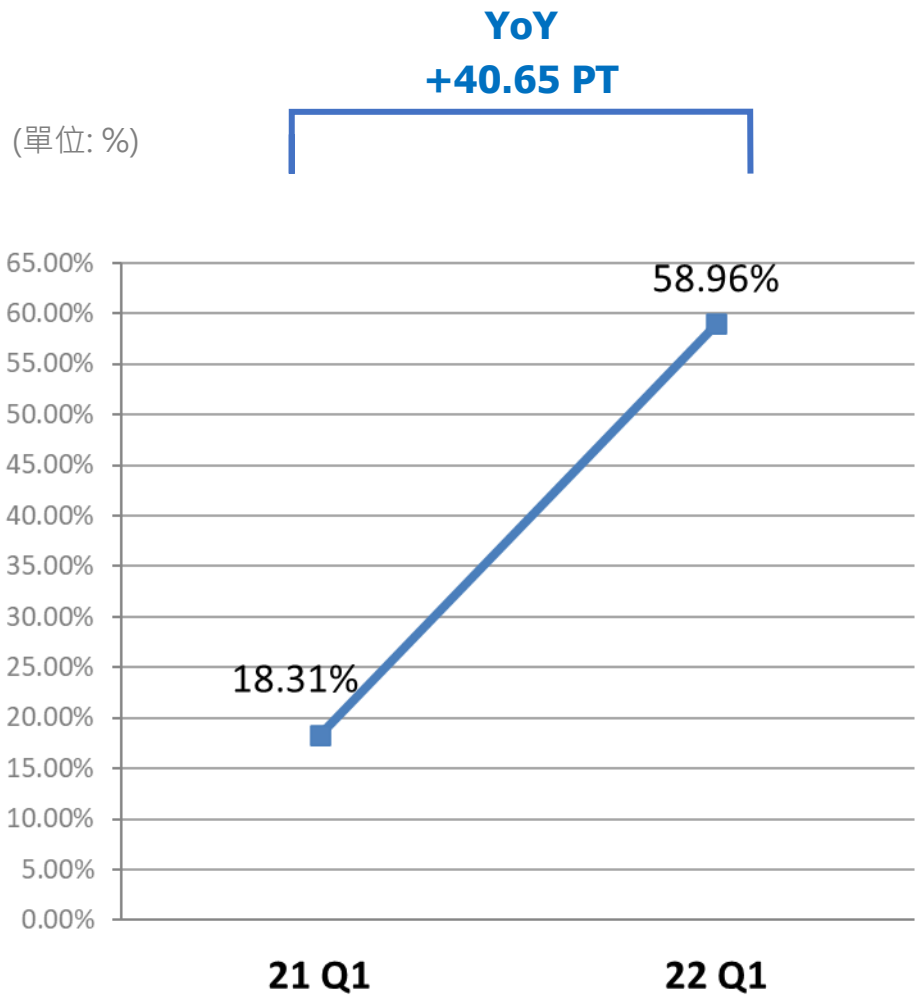
1Q22 營業利益率



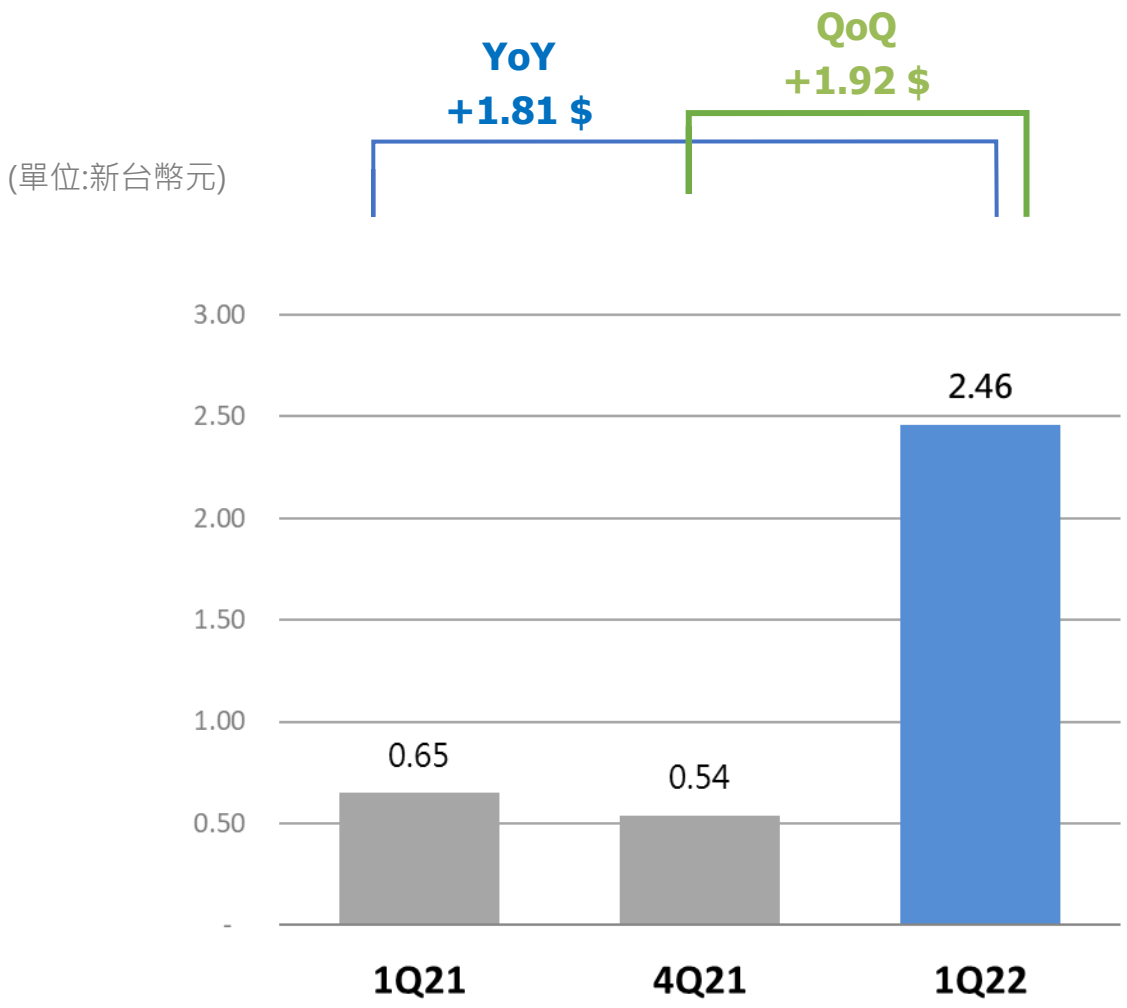
1Q22 合併淨利


YoY
+349.8%
QoQ
+314.7%
(單位:新台幣千元)
140,000
120,000
100,000
80,000
60,000
40,000
20,000
-
124,425
30,002
27,665
1Q21
4Q21
1Q22

1Q22 合併淨利率


YoY
+40.65 PT
(單位: %)
65.00%
60.00%
55.00%
50.00%
45.00%
40.00%
35.00%
30.00%
25.00%
20.00%
15.00%
10.00%
5.00%
0.00%
58.96%
18.31%
21 Q1
22 Q1

1Q22 每股盈餘


YoY
+1.81 $
QoQ
+1.92 $
(單位:新台幣元)
3.00
2.50
2.00
1.50
1.00
0.50
-
0.65
0.54
2.46
1Q21
4Q21
1Q22

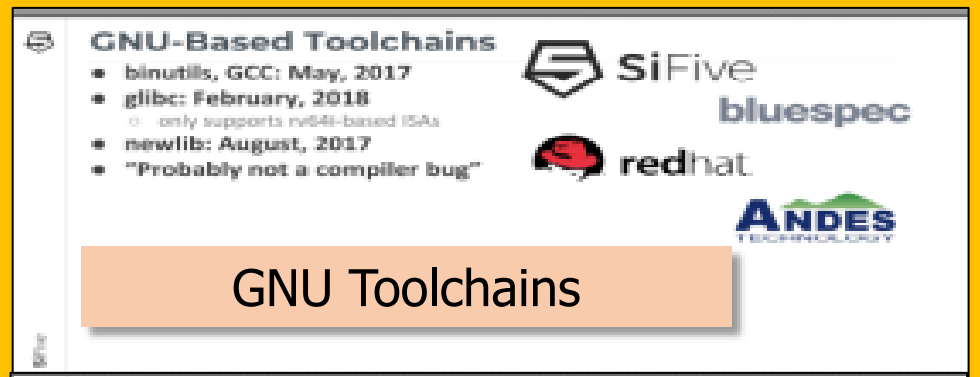
產品應用

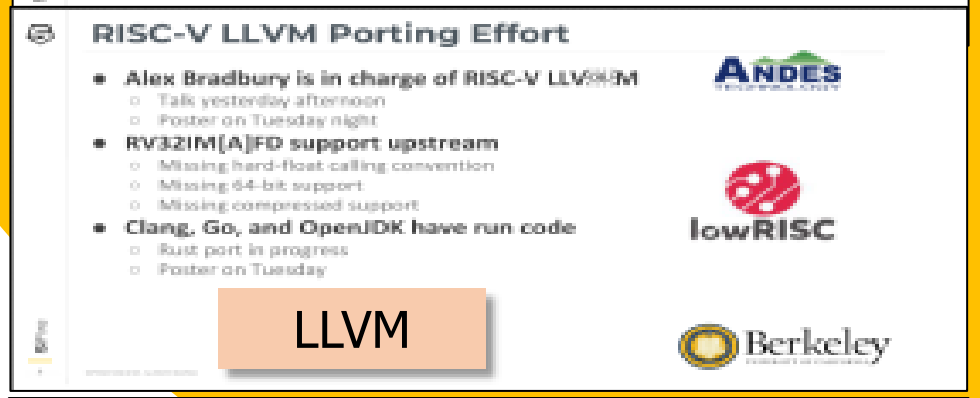
http://www.andestech.com

晶心概況

- A **17**-year-old public CPU IP company
- **3B+** Andes-Embedded SoC annually in 2021

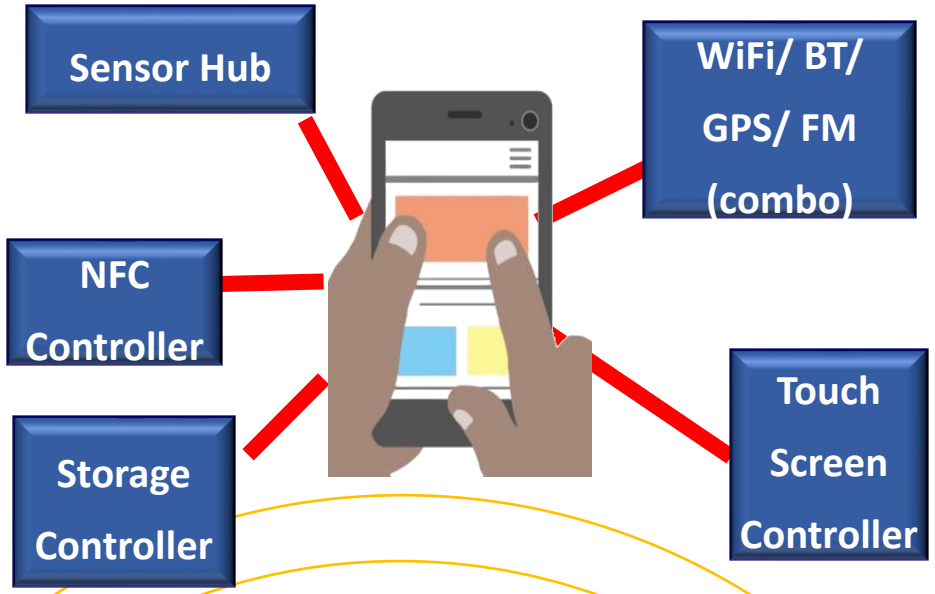
- A **founding premier** member of the RISC-V International
- An active role in RISC-V International & its extension task groups
  - **RISC-V Board Director**
  - **Member of Technical Steering Committee**
  - RISC-V Ambassador
  - Chair of P-extension (Packed DSP/SIMD) Task Group
  - Co-chair of Fast Interrupt Task Group
  - Vice Chair of TEE 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, WiFi 6/7, AI processors** (using Andes Custom Extension, ACE)

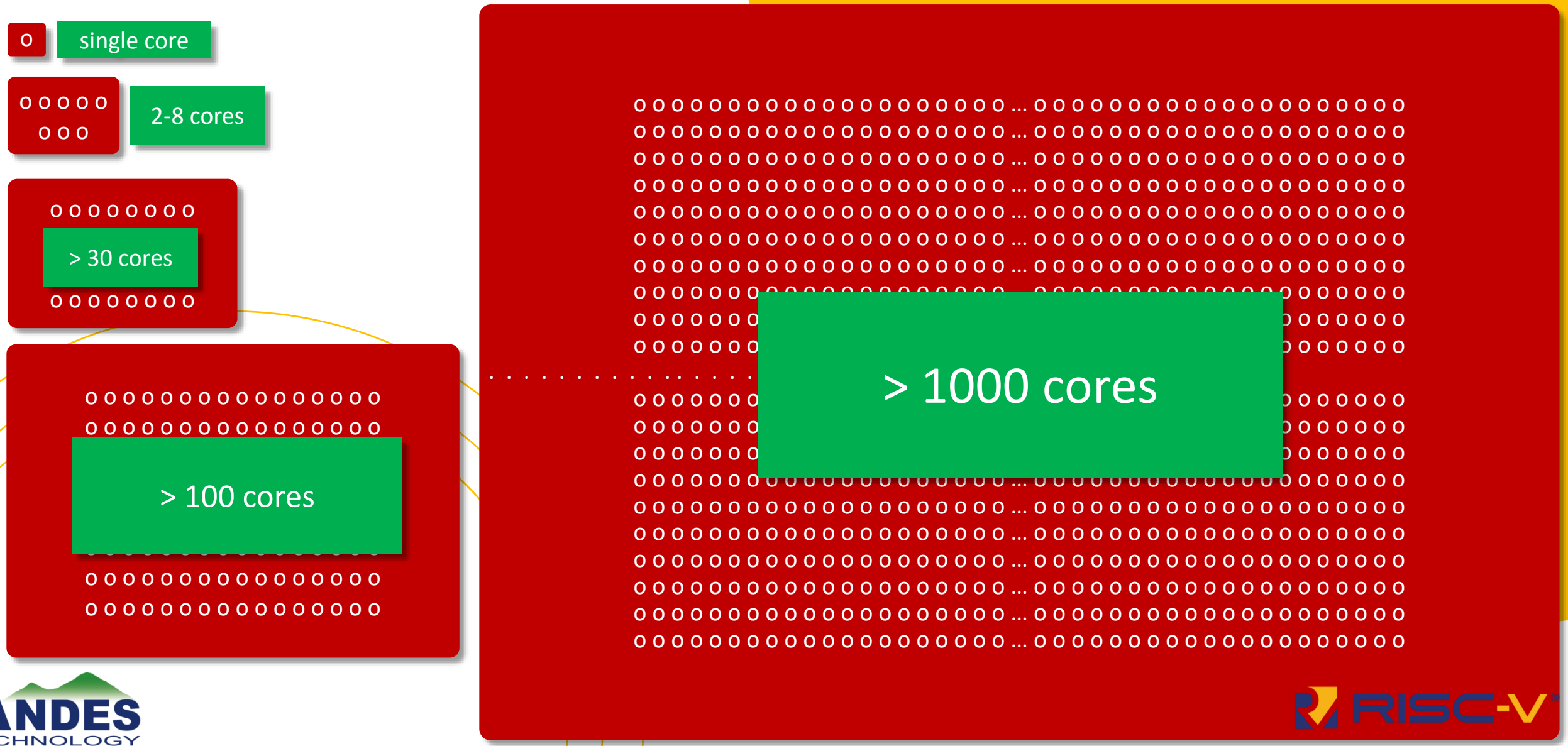
ANDES TECHNOLOGY

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 5nm**
- **Many in AI**

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

晶心RISC-V核心在SoC中被採用的數目



ANDES TECHNOLOGY

RISC-V

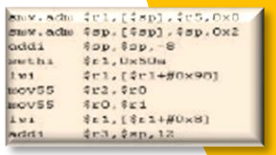
新產品及生態系統

http://www.andestech.com

晶心RISC-V產品概述

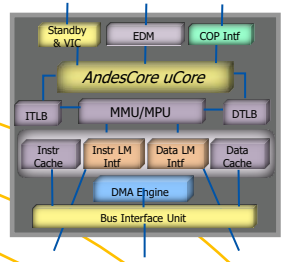
Best extensions to RISC-V

AndeStar™ Architecture V5

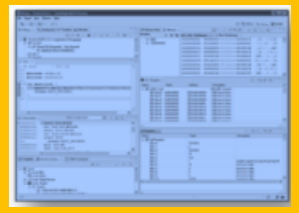


AndesCore™ Processors

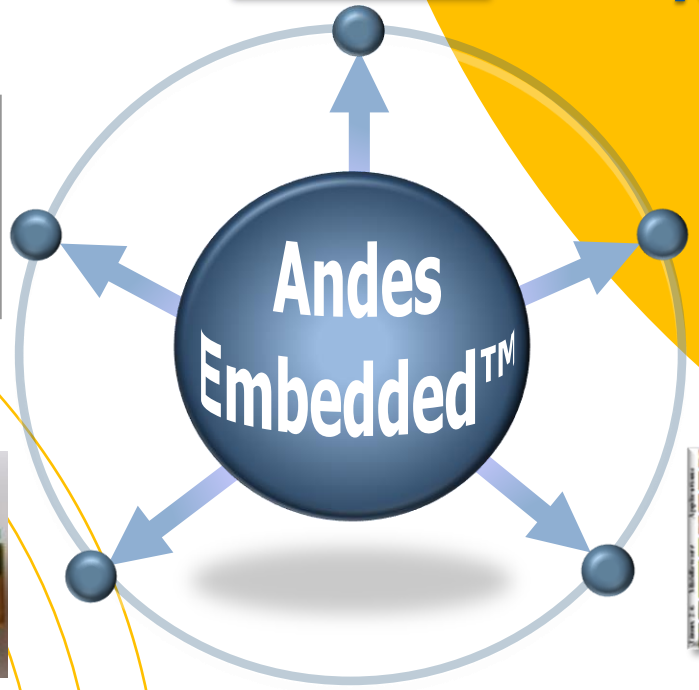
Highly optimized design with leading PPA



AndeSight™ Tools



Professional IDE with high code quality



Handy peripheral IPs to speed up SoC construction

Extensive SW stacks from bare metal, RTOS to Linux

AndeShape™ Platforms

AndeSoft™ Stacks

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	Define custom instruction to handle time critical codes
A-series A(X)25 A(X)27 A(X)45 Multicore…		**High Performance and Power Efficient AP** 5G, AI, Datacenter, Video Surveillance, Networking		Better approach for accelerator /co-processor to do particular jobs
Vector NX27V NX45V…		**Cray Style, Scalable Vector Processor** Datacenter, Server, Deep Learning		Automation Tool for the generation of toolchain, ISS, partial RTL and verification

晶心RISC-V產品路線圖

	RV32/RV64	Vector Ext.	Superscalar
Cache-Coherent 1-4 Cores	A25MP AX25MP	**27-Series:** Vector Ext. MemBoost NX27V A27/AX27 A27L2/AX27L2 and more.	**45-Series:** Dual Issue MemBoost N45/NX45 D45 A45/AX45 A45MP/AX45MP and more.
Linux with FPU/DSP	A25 AX25		
Fast/Compact with FPU/DSP	N25F D25F NX25F		
	5-stage (1.1 GHz) >3.53 Coremark/MHz	5-stage (1.1 GHz) >3.53 Coremark/MHz	8-stage (1.2 GHz) >5.50 Coremark/MHz

N22
2-stage
(700 MHz)

Benefits

- 512-bit SIMD raises MobileNet by 66x (CNN for mobile vision)
- boost performance by 50%
- Raise bandwidth to 3x; Cut latency by 40%

Leading positions:

- The first company offering commercial RVP DSP CPU
- The first company offering the most updated spec of commercial RVV Vector processor
- Tools for RISC-V custom extension: ACE

ANDES TECHNOLOGY

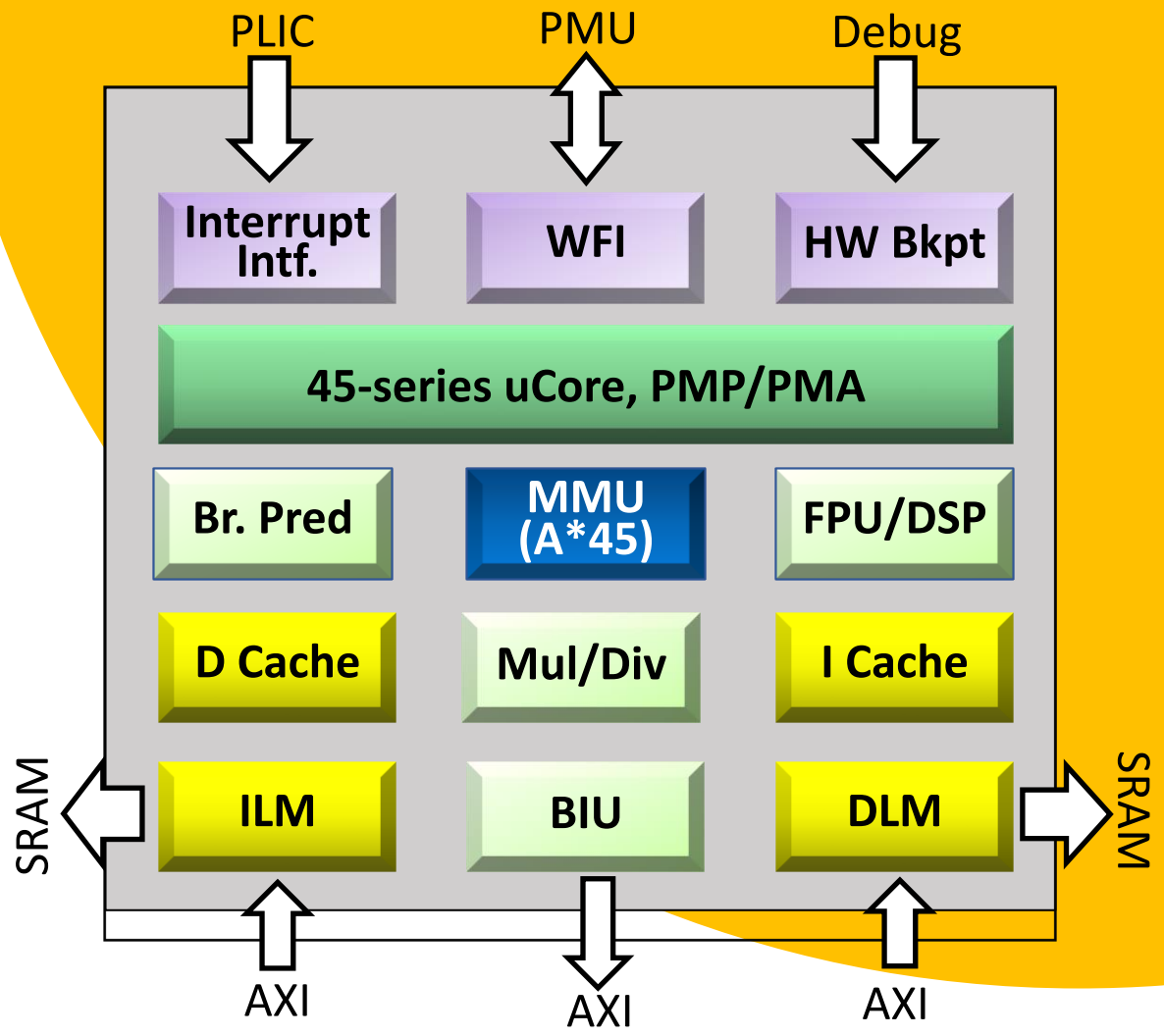
AndeCore™ 45 系列產品

32-bit AndesCore™ N45/D45/A45/A45MP

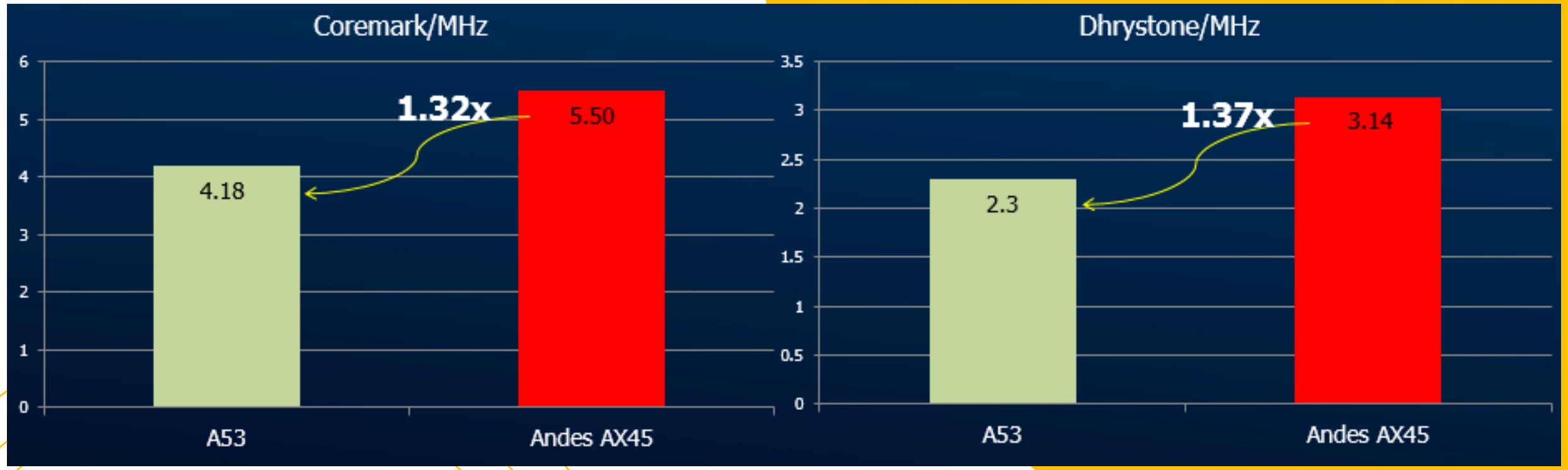
64-bit AndesCore™ NX45/AX45/AX45MP

AndesCore™ 45-Series概述

- **8-stage In-Order Dual-Issue**
- **AndeStar™ V5 ISA:**
  - RV*GCN (S/D FPU): All Series
  - RV*P-ext (DSP/SIMD): D45/A(X)45
  - MMU for Linux Applications: A(X)45
- **MemBoost memory subsystem**
- **Low power dynamic branch prediction**
- **Unaligned data accesses**
- **Fast or small multiplier**
- **StackSafe™ (Andes Ext.)**
- **CoDense™ (Andes Ext.)**
- **Multi-core support: A(X)45MP**
  - Up to **8** cores



AX45 Can Do More (vs. 64bit A-series)



- **A53**
  - 8-stage In-Order Dual Issue
  - **Widely adopted by industries in many applications**

- **AX45**
  - 8-stage In-Order Dual Issue
  - **Performance is better!**
    - **Coremark/MHz: 1.32x**
    - **Dhrystone/MHz: 1.37x**

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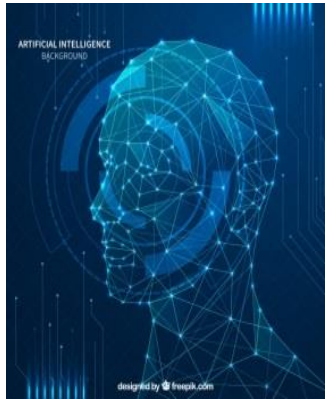
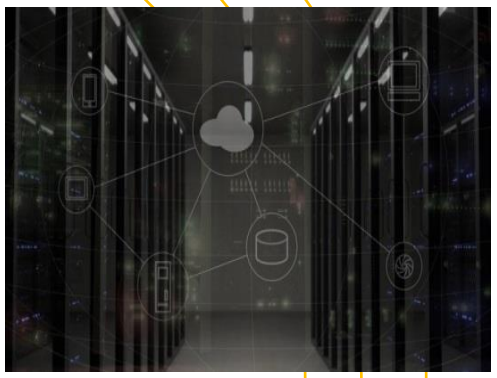
27 & 45系列產品的目標市場

- AI/Deep Learning
- AR/VR
- 5G



- Networking

- Storage



- Video Surveillance

- ADAS

- V2X (Vehicle to Everything)

- IVI (In-Vehicle-Infotainment)

Metaverse and more…

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Configurability

- Flexible configurations for rich features

Maturity

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

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