Apple 'home' chip manufacturing journey, threatening rulers Qualcomm and Intel

Currently, Apple has made a lot of chips for iPhone, iPad, Mac and Watch.

In recent years, Apple is designing more and more chips for its products. This helps create a better user experience and helps them overcome other competitors. Recently, they are even more motivated to step into the day market: that is the discovery of two vulnerabilities of Meltdown and Specter on processors of Intel, ARM and AMD.

Steve Jobs has long argued that Apple should have the technology inside the product instead of relying on chip makers like Samsung, Intel or Imagination Technologies. In 2008, they took a small but very important step when buying chip maker PA Semi. Two years later, Jobs announced the iPad.

At that time, the world only looked at large touch screens and applications, but the breakthrough technology was inside. That's A4, the first processor designed by Apple itself.

Steve Jobs introduced the first iPad in 2010

The first SoC then gradually gained the next generation of chips. Now, Apple devices have their own customized accessories links with the ability to run AI tasks, track footsteps, play high-definition graphics, Face ID face detection or Touch fingerprint sensors. ID **,** run Apple Watch **,** connect AirPod to your phone and help your Mac work the way users want. As a result, these chips will one day threaten Qualcomm's dominance and even Intel.

1. The speed of fingerprint sensor under the screen on the Vivo X20 Plus UD and Face ID of iPhone X, which one is faster?
2. Why does Apple spend $ 400 million on lasers?

IPhone and iPad chips

SoC - System on Chip - combines all the components onto a piece of silicon, designed by Samsung for the iPhone before 2010.

Apple Chips Chip devices Features of the 2010 **chip** iPhone 4, iPad, iPod Touch 4, Apple TV The first 2 SoC of Apple. A5 2011 iPad 2, iPhone 4S, iPad Mini 1, iPod Touch 5, Apple TV 3 SoC first dual-core Apple, introduced Apple designed chip (ISP) to process images.

A5X 2012

iPad 3

The first chip optimized for high-resolution iPad screen support.

2012 A6

iPhone 5, iPhone 5C

A6X 2012

iPad 4

The first chip optimized for high-resolution iPad screen support.

A7 2013

iPhone 5S, iPad Air, iPad Mini 2, ipad Mini 3

1. Secure Element (storage of billing information and biometric data) The first chip to store Touch ID data and payment data.
2. Motion Co-Processor (measurement of motion). M7 - is the first iPhone chip to track footsteps.

A8 2014
iPhone 6 Plus, iPad Mini 4, iPod touch 6, Apple TV 4, Apple HomePod

1. M8: Optimized for larger iPhone screens.

A8X 2014

iPad Air 2

1. M8

A9 2015

iPhone 6S Plus, iPhone SE, iPad 9.7 inches

1. M9: Redo the on-chip repository for faster data processing.

A10 Fusion 2016

iPhone 7 Plus

1. M10: Apple's first chip has two high-performance components and two power-efficient components.

A10X Fusion 2017
Apple TV 4K 5

1. M10

A11 Bionic 2017 iPhone 8 Plus, iPhone X

1. M11
2. Apple's first chip has two high-performance components and four power-efficient components. Support for Face ID data of iPhone X. GPU (graphics engine for gaming and other heavy tasks).
3. The first chip with a self-refining Apple GPU. Previously designed by Imagination Technologies.
4. Nerural Engine (micro-physics running machine learning and AI applications) Apple's first AI chip.

Analyst MIke Olson at Piper Jaffrey said that its own chip design helps Apple cut down on component costs, making it easier to take the lead when making new features because it can control the process of research, development and secrecy before rivals like Samsung.

Apple is not the first company to make its own chips, they are just the most successful.HP, Motorola, International Busines Machines and Koninklijke Philips NV each had their own chip making units but eventually failed or tilted.Because chip production is not simple: it is both expensive and requires a large scale.

Bionic A11 is Apple's latest chip that supports FaceID and AI

Very smart, Apple focused its silicon design (for SoC) and consulted designs from ARM.The production is delivered to another company, including Taiwan semiconductor manufacturing company.

1. Thanks to iPhone X, Apple sells less iPhone but earns more money
2. Broadcom wants to buy Qualcomm with an unprecedented 130 billion dollar deal

The fact that Apple entered this expensive and complex industry is understandable because they are selling 300 million units a year.Other players also have their own plans.Qualcomm invests in a 5G network, some AI chip makers, and Intel promotes mobile processor production.Samsung, Apple's longtime rival, has long been a famous chip manufacturer.

Chip on a Mac

Mac Co-Processor - the chip has reduced some features from Intel chips.

Apple Chip Chip devices Character chip T1 Mac Co-Processor 2016 MacBook Pro has Touch Bar The first custom chip for the Apple Mac Control Bar Touch Bar on the keyboard. T2 Mac Co-Processor 2017 Mac Pro Power management, computer security.

Apple has a chip manufacturing and testing facility around Cupertino, California and in Herzliys, Israel, the cradle of new technologies.Hundreds of people are under the control of Johny Srouji, joining Apple in 2008 after having worked at Intel, IBM and comparing their chip architecture as 'artist'.

In recent months, Srouji is using many modem engineers from Qualcomm.Although providing chips for iPhone, Qualcomm and Apple are also disputing the fee they charge Apple.Hiring Qualcomm people means that Apple is planning to make a private modem that connects power to the mobile network.Bloomberg News reports that Apple is currently considering using an Intel or MediaTek modem for iPhones this year.

1. Apple considers removing Qualcomm chips on iPhones and iPads next year
2. 5 things to know about Qualcomm Snapdragon 845 chip

Wireless chip

Manage pairing for more efficient Bluetooth and WiFi connectivity.

Apple chips Devices running chips Features W1 **chip** 2016

AirPod

1. Apple's first chip has wireless control.
2. Ability to synchronize audio, customize wireless network pairing, power management.

W2 2017 Apple Watch 3

1. More efficient when connecting to wireless networks and Bluetooth.

Last year, Apple added a collection of its mobile chips to a wireless version of W2 that connects Bluetooth to the latest Apple Watch series, an AI chip called Neural Engine and uses a refined GPU graphics processor. Particularly for iPhone 8 and iPhone X.

Use on Apple on any device that connects products in the Apple ecosystem

The new iPad to be released later this year will probably also use Apple's graphics engine and AI chip.Apple's entry into GPU will also affect Imagination Technologies, which previously provided chips for iOS devices.

Engine on Apple Watch watch

System in a Package (SiP) The chip is about the size of a stamp for Apple Watch.

Apple chips Devices running chips Chip characteristics

S1 2015

Apple Watch

Apple's first chip is designed for smart watches.

S1P 2016

Apple Watch 1

The first dual-core chips from Apple Watch.

S2 2016

Apple Watch 2

The first dual-core chips from Apple Watch.

S3 2017 Apple Watch 3
Those who still watch Apple believe that Apple's overall CPU design for their products is only a matter of time.And then, Intel not only lost its 5th largest customer but also had a formidable competitor.

See more:

1. Looking back at Apple 2017
2. What is the CPU?
3. Apple is about to launch 3 Macs using its own chip