

Current Issues

November 3, 2021



iPhone 13 Teardown

Battle for performance pushes component prices skyward

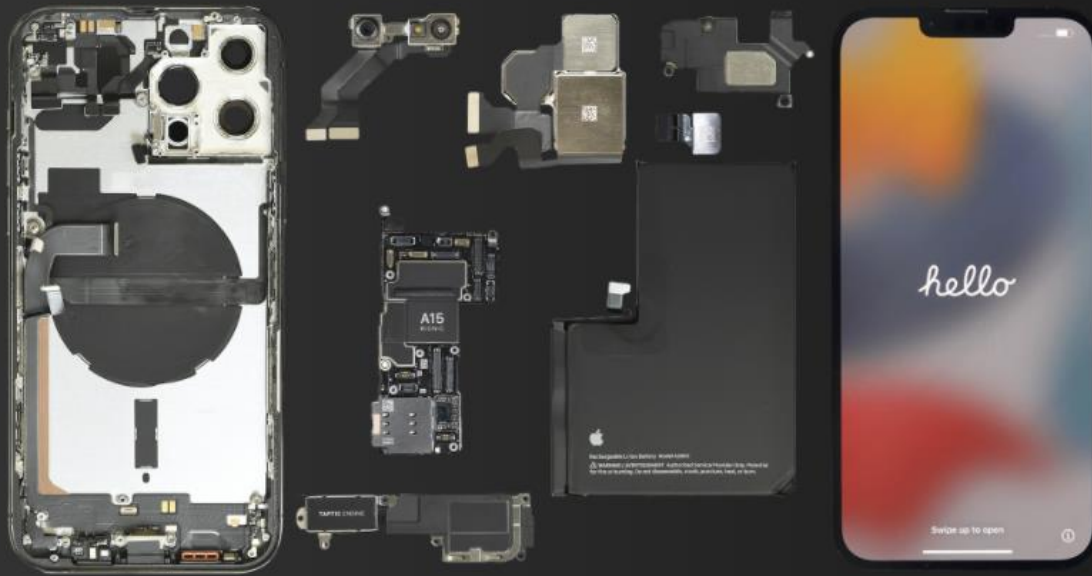


Source: <https://vdata.nikkei.com/en/newsgraphics/iphone-teardown/>



Nikkei and the Financial Times, in collaboration with teardown specialist Fomalhaut Techno Solutions, took apart the latest top-end iPhone model, the iPhone 13 Pro Max. The teardown found that Apple is likely sacrificing profit margins to improve performance in the face of intense competition with rivals. The total price of components was 2.5 times higher than 10 years ago, exceeding the 60% increase in the device's retail price. The price of the camera shot up tenfold, while its semiconductors have tripled in price. The phone's use of recycled materials has also increased, highlighting Apple's focus on environmental concerns.

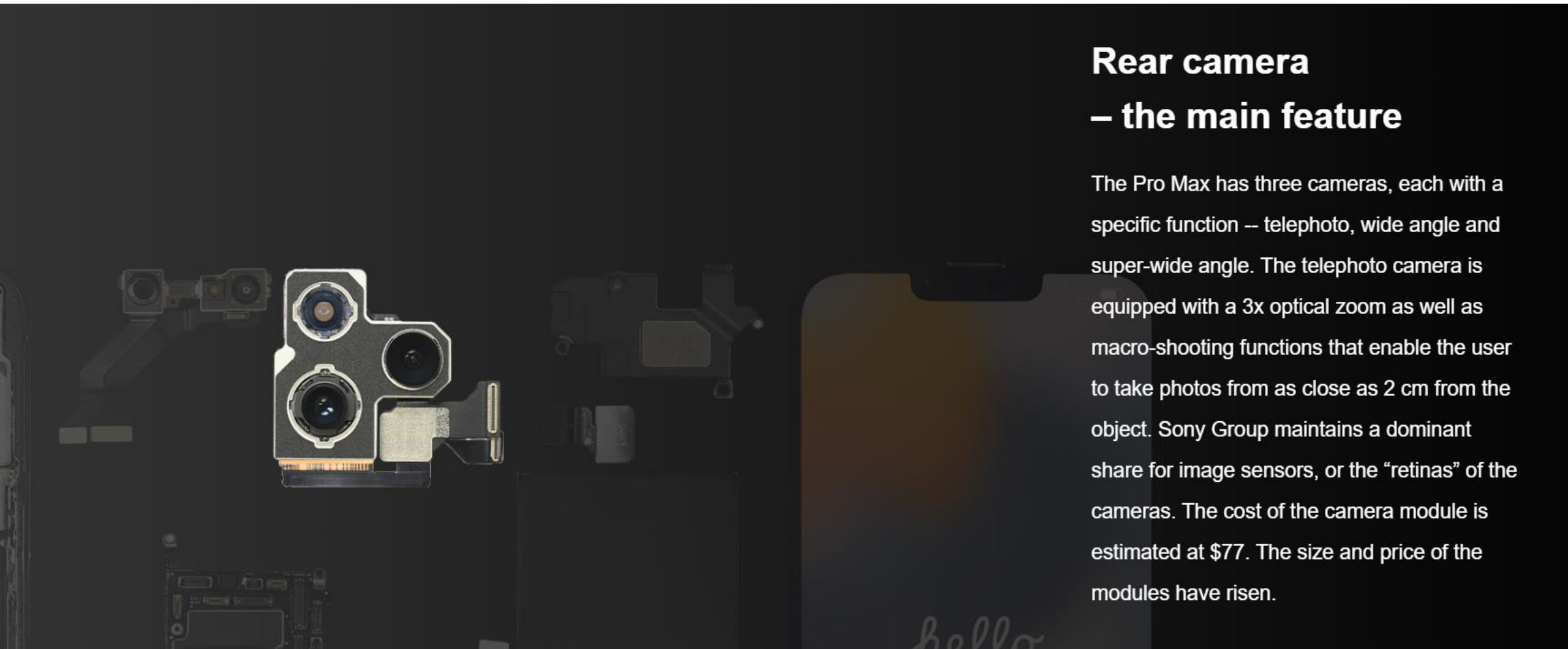
Source: <https://vdata.nikkei.com/en/newsgraphics/iphone-teardown/>



Stronger adhesive presents challenge to teardown



Newer iPhones -- the iPhone 12 and 13 series -- hold together more firmly than older handsets

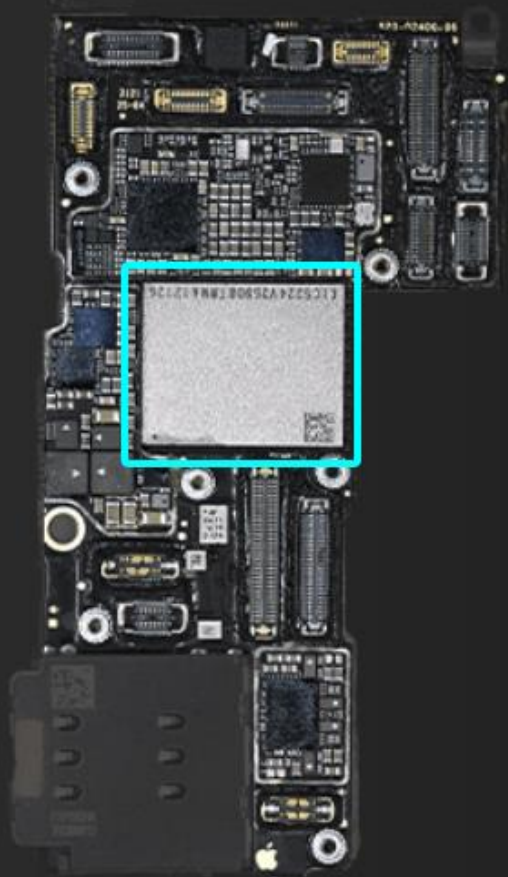


Rear camera – the main feature

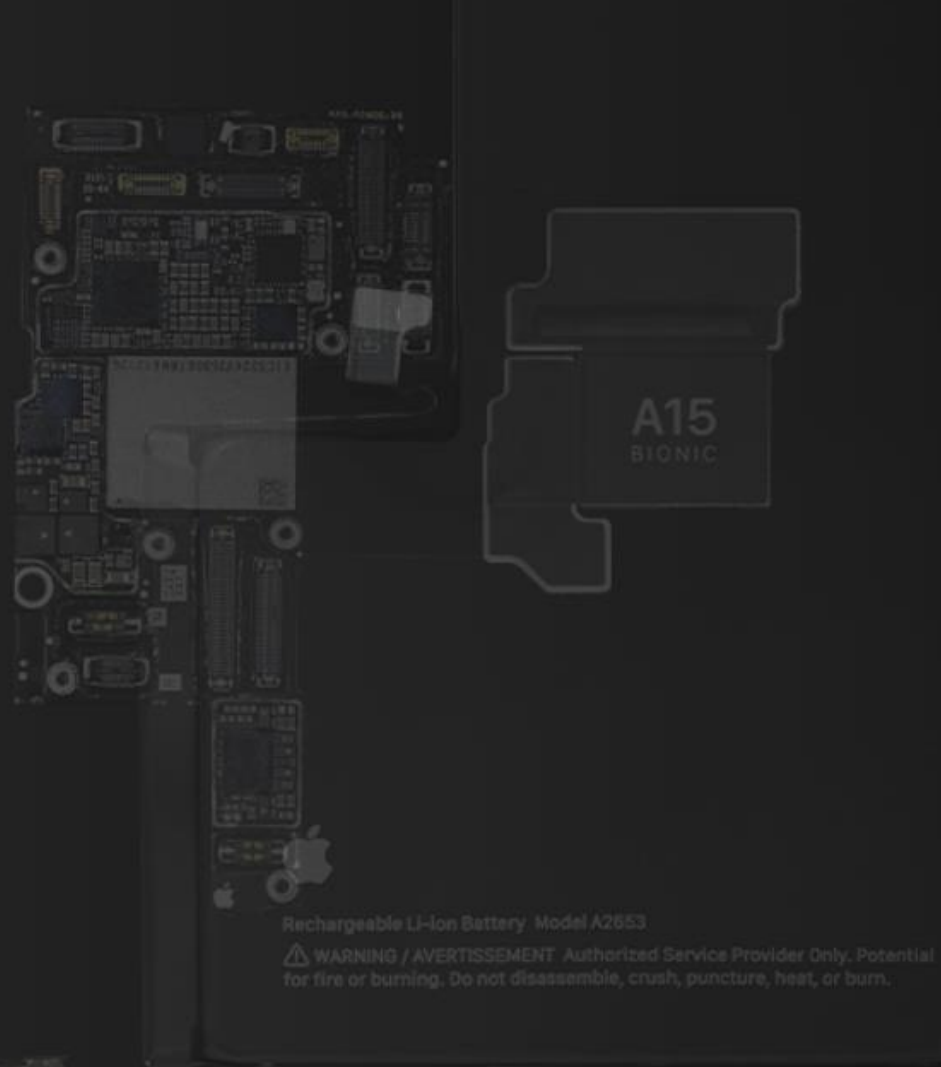
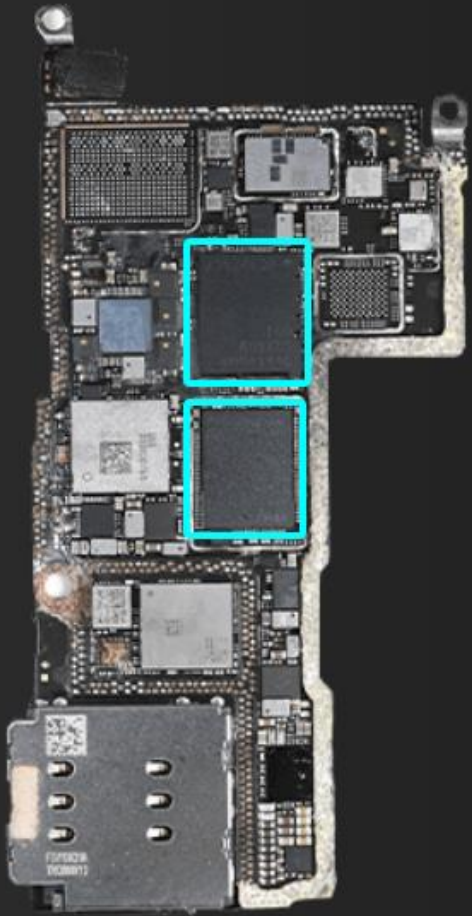
The Pro Max has three cameras, each with a specific function – telephoto, wide angle and super-wide angle. The telephoto camera is equipped with a 3x optical zoom as well as macro-shooting functions that enable the user to take photos from as close as 2 cm from the object. Sony Group maintains a dominant share for image sensors, or the “retinas” of the cameras. The cost of the camera module is estimated at \$77. The size and price of the modules have risen.

Japan-made flash memory

The Pro Max uses Kioxia's flash memory to store photos, videos and other data. Although South Korean companies such as Samsung Electronics are strong in flash memory chips, Apple has adopted the Japanese semiconductor manufacturer's product.



Rechargeable Li-Ion Battery Model A2553



Qualcomm maintains strong presence *hello*

The Pro Max, like its predecessor, features a 5G modem chip designed by Qualcomm. Although Apple acquired Intel's modem business in 2019 and has since been accumulating its own technologies, Qualcomm appears more highly regarded now. The American maker's chips also used in smartphones produced by Xiaomi and Samsung.



Motherboard - minimalistic design

The motherboard is small, occupying about 15% of the handset's total area. Compared with other manufacturers' smartphones, an iPhone packs in more components in a small circuit board, reflecting the minimalist approach that Apple founder Steve Jobs favored. To increase sophistication, Apple has adopted its own space-saving technologies.

Rechargeable Li-Ion Battery Model A2653

⚠ WARNING / AVERTISSEMENT Authorized Service Provider Only. Potential for fire or burning. Do not disassemble, crush, puncture, heat, or burn.

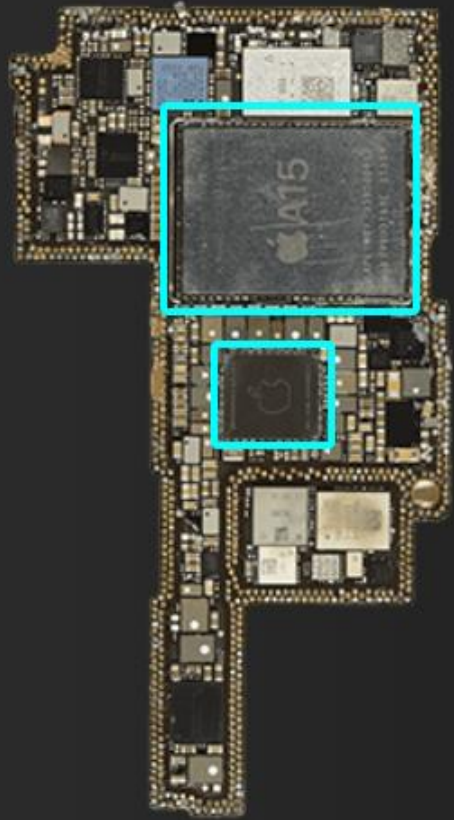


Battery by China's Sunwoda

The phone's lithium-ion battery capacity is 20% higher than the previous model. Sunwoda Electronic of China reportedly manufactures the battery. Sunwoda makes batteries not only for smartphones and tablets but also cars. Although the U.S.-China trade friction shows no signs of ending, Apple continues to rely on products made in China, whose manufacturers are cost-competitive.

The brain behind the motherboard

The A15 Bionic, designed by Apple, is used as the main semiconductor – or brain – of the Pro Max. The chip is made using 5-nanometer technology, the most advanced production tech currently in use for smartphone chips. At \$45, the A15 Bionic accounts for 10% of the total cost of the phone. Apple started designing its own semiconductors optimized for the iPhone working to further improve its performance.

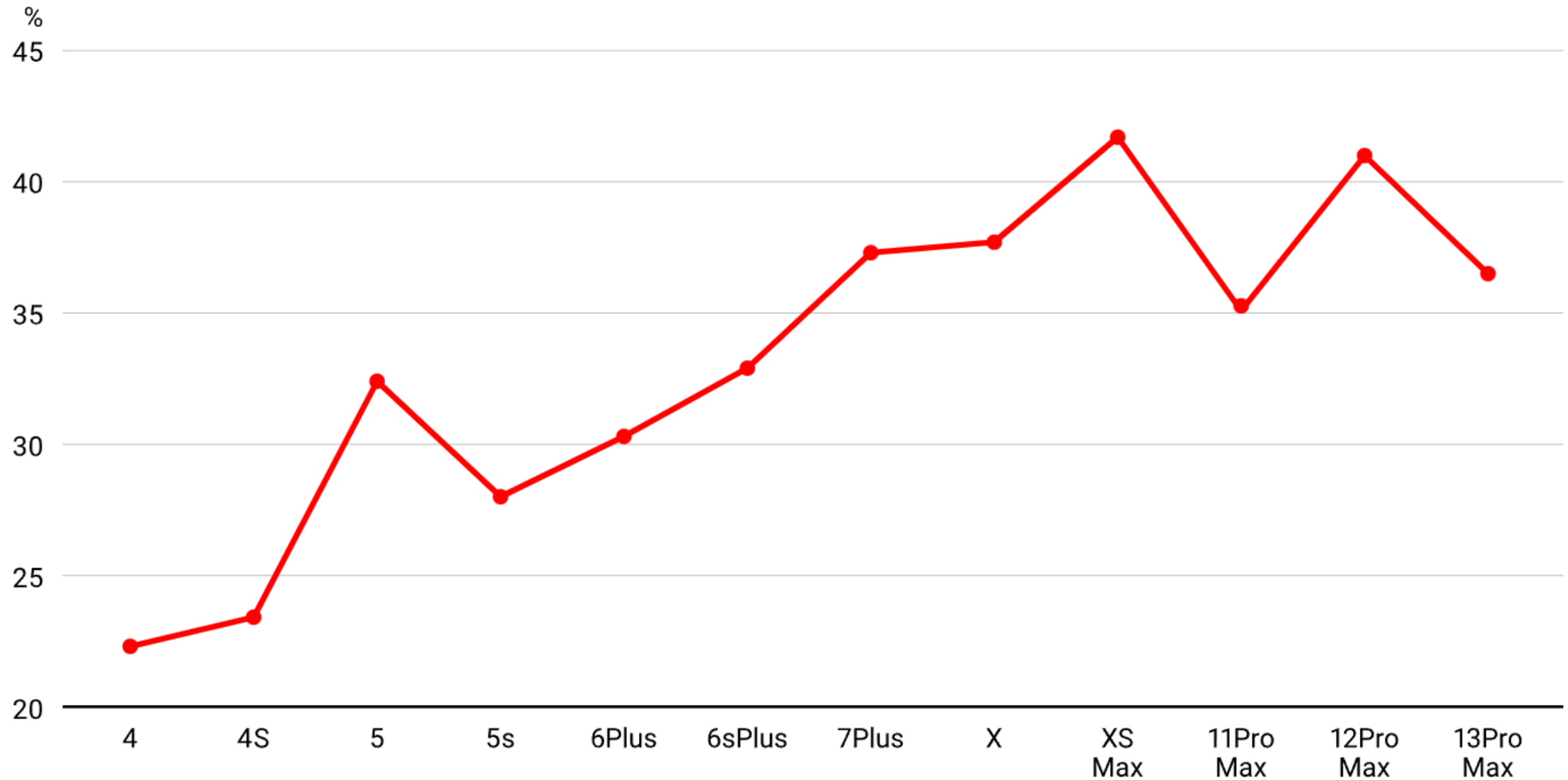


Profit margin is high, thanks to Apple's brand power

Comparison with other smartphones

Maker	Apple		Sony	Xiaomi	Samsung Electronics	Google	Huawei
Model	iPhone13 ProMax (256GB)	iPhone13 (512GB)	Xperia 1 III	Mi Mix Fold	Galaxy Z Fold3	Pixel 5	Mate40E
Cost-to-retail-price ratio (in percent)	36.5	37.1	37.9	38.5	39.4	44.9	51.0
Cost (in dollars)	438	407	493	601	710	314	367
Price (in dollars)	1199	1099	1300	1560	1800	699	720
Launch date	Sept, 2021		Aug, 2021	April, 2021	Aug, 2021	Oct, 2020	March, 2021

Change in cost-to-retail-price ratio versus previous models



Betting on Displays

Apple supplier Foxconn is in talks to make smartphone screens, the most expensive parts in iPhones.

Apple iPhone 6

COST OF SELECTED PARTS

Display	\$45
Memory	15
Communications	37.50
Cameras	11
Processor	20
Mechanical	30
Other	37.60

TOTAL PARTS \$196.10

Labor 4

TOTAL \$200.10

U.S. RETAIL PRICE \$649

Sources: IHS iSuppli (price), Apple (photo)
The Wall Street Journal



Apple iPhone 6 Plus

COST OF SELECTED PARTS

Display	\$52.50
Memory	15
Communications	37.50
Cameras	12.50
Processor	20
Mechanical	35
Other	38.60

TOTAL PARTS \$211.10

Labor 4.50

TOTAL \$215.60

U.S. RETAIL PRICE \$749

Note: Both price breakdowns are based on the 16 GB Sprint model without contract

TECHNOLOGY

iPad Pro teardown shows sharp increase in Taiwan parts

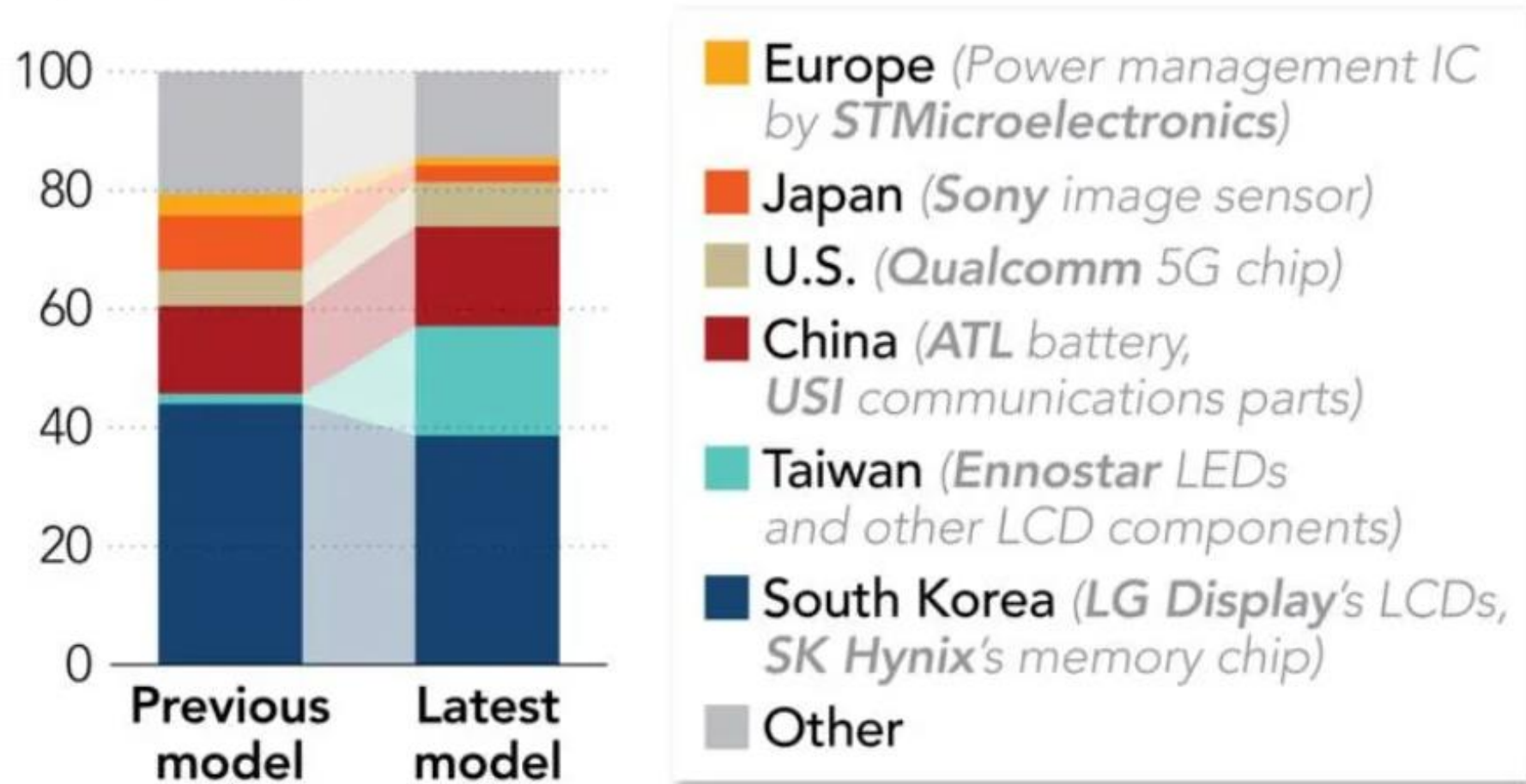
Apple's dependence on supplies from the island may increase supply chain risks



Nikkei tore down the latest 12.9-inch iPad Pro, released in May, to discover which Asian companies are making the most from the high-end tablet. (Photos by Kotaro Igarashi)

National/regional shares of iPad Pro components

(By value, in percent)



Source: Fomalhaut Techno Solutions, Nikkei research

TECHNOLOGY

iPhone 12 teardown showcases South Korean parts makers

Samsung's OLED display pushes country's share of handset value past US



The inside of a iPhone 12: The handset is packed with more parts to make it 5G capable.

TECHNOLOGY

Key Apple, Tesla suppliers halt production amid China power crunch

Weeklong stoppages to hit peak season for electronics goods including latest iPhone



An Apple Store in Beijing sells the new Apple iPhone 13. Supply chains of the new series have been affected by China's restrictions on energy use. © Reuters

LAULY LI and CHENG TING-FANG, Nikkei staff writers
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Apple supply shortages bite into revenues and cost iPhone maker \$6bn

Shares fall after tech group says component disruptions will be worse in holiday quarter



Apple supply shortages bite into revenues and cost iPhone maker \$6bn

- **Apple shares fell** after the **world's largest company missed earnings estimates** owing to the **global chip crisis**, which it said would linger into the holiday period.
- Tim Cook, chief executive, said “**larger than expected supply constraints**” cost the company **\$6bn** in **the three months to September**, adding that the shortages would cost it even more in the holiday period — its most lucrative time of the year.
- Supply constraints “**affected the iPhone**, the **iPad** and the **Mac**”, Cook told investors, citing **chip shortages** and “Covid-related manufacturing disruptions” in **south-east Asia**.
- The company reported \$83.4bn of revenue in its fiscal fourth quarter, up 29 per cent from a year ago but below expectations of \$84.3bn.

Apple supply shortages bite into revenues and cost iPhone maker \$6bn

- The **iPhone** accounted for **46.6 per cent** of all revenue last quarter, with smartphone sales up 47 per cent to \$38.9bn.
- The comparison was flattered by **Covid-related delays** for **the launch of the iPhone 12 a year ago**, with overall revenues from **Greater China increasing 83 per cent** to \$14.6b.
- For the 12-month period, Apple **earned more than \$1bn a day** for the fiscal year for the first time.
- **Revenues** rose **33.3 per cent** to \$365.8bn, its fastest growth rate since 2012.
- **Net profits** came close to \$100bn for the year, **rising 64.9 per cent** to \$94.7bn.

Top chip tool maker sticks with Singapore amid supply chain shift

Kulicke and Soffa says not everyone in supply chain needs to expand overseas



Kulicke & Soffa says staying close to its Asian customers is more important than being part of the global diversification trend. (Photo courtesy of Kulicke & Soffa)