

THE Semiconductor Supply Chain

VISUALIZED

From smartphones to electric cars, computers, and industrial machines, as well as the many global businesses they enable, semiconductors are changing the world.



22.5% of the global GDP is made up by the global digital economy.

Source: Accenture Research and Oxford Economics

Semiconductors have a huge role to play as part of the digital economy, with massive growth for the industry on the horizon.

Source: UNCTAD, Gartner

\$0.4 trillion

2020

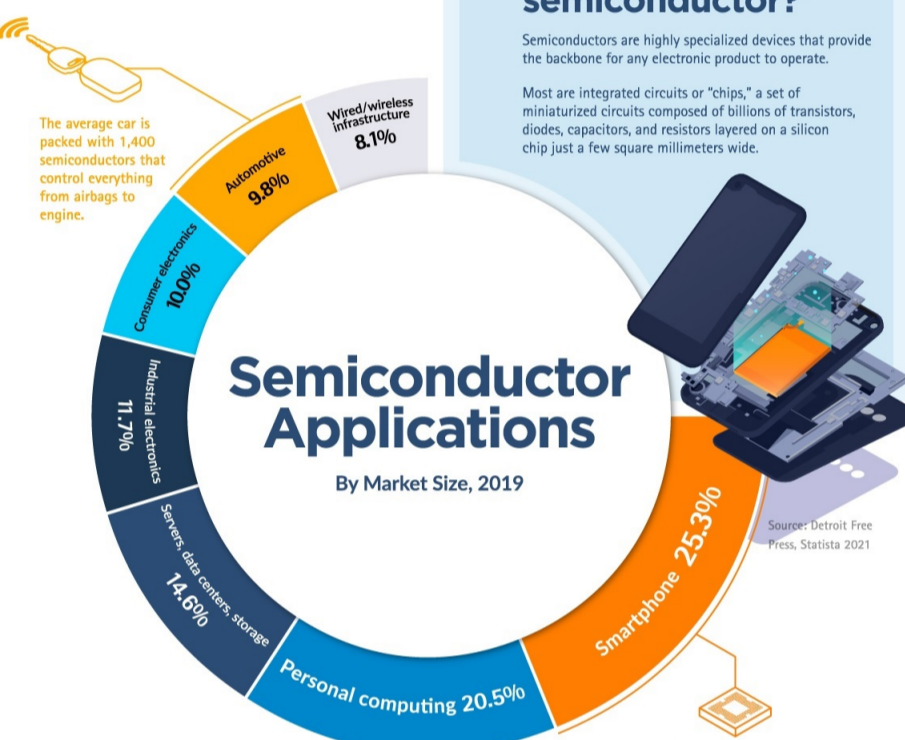
\$1.0 trillion

2035E

In fact, semiconductors are the world's fourth most traded product.

The more digital our world becomes, the more critical the enabling roles of semiconductors, chips, and integrated circuits become.

Source: SIA



Smartphones, computers, and modern cars would not exist without the collective power of the semiconductor supply chain.

How do semiconductor chips make their way from concept to consumer?

The answer:

An integrated semiconductor supply chain that involves thousands of companies and millions of people around the world, forming the backbone of today's digital economy.

Stage 1 Design

Semiconductor chip designs are created for either specific or general product usage.



Location

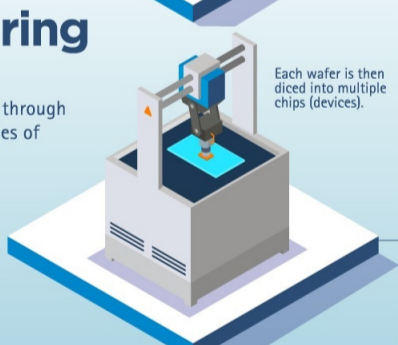
Fabless semiconductor companies

Electronics manufacturers

Independent design companies

Stage 2 Manufacturing Front End

Silicon wafers are processed through a complex and extensive series of manufacturing steps.



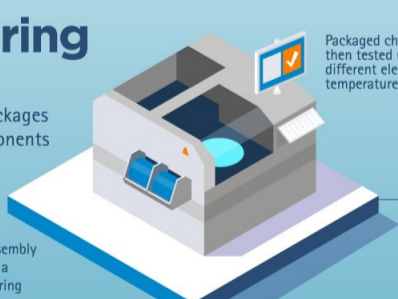
Each wafer is then diced into multiple chips (devices).

Foundries

Captive Factories (IDMs)

Stage 3 Manufacturing Back End

Chips are assembled into packages to form the electronic components that can be mounted onto circuit boards.



Packaged chips are then tested under different electrical and temperature conditions.

Outsourced Semiconductor Assembly & Test (OSATs)

Stage 4 End Product Integration

Chips are integrated by EMS and OEM companies to create end products.



Original Equipment Manufacturers (OEMs)

Electronics Manufacturing Service (EMS)

\$0.58 trillion Global market size for EMS and ODM in 2020.

1.04 trillion Semiconductor chip units shipped in 2020.

Integrated Device Manufacturers (IDMs)

While the foundry model separates semiconductor manufacturing steps to different companies, IDMs traditionally manufacture their own chips.

IDMs also rely on the foundry model to supplement a portion of manufactured devices.

Stage 5 Consumption

End products are shipped to companies, retailers, and consumers worldwide for a growing number of applications.



Mobility & connectivity

Personal computers

Cars

Servers & storage drives

Smart homes

Smart medtech

Industry 4.0, smart factories

From starting production to integrating in finished products, semiconductor production can take months.

Components for a chip can travel more than 25,000 miles by the time of final product integration.