# About Semiconductor and Electronics

This is the huge impact of electronics on our lives. Miniature electronic brains – also called semiconductor chips – are embedded in almost all modern tech gadgets.

These chips help us live, work, play, and learn better.

Imagine life without the Internet, smartphones, or computers...

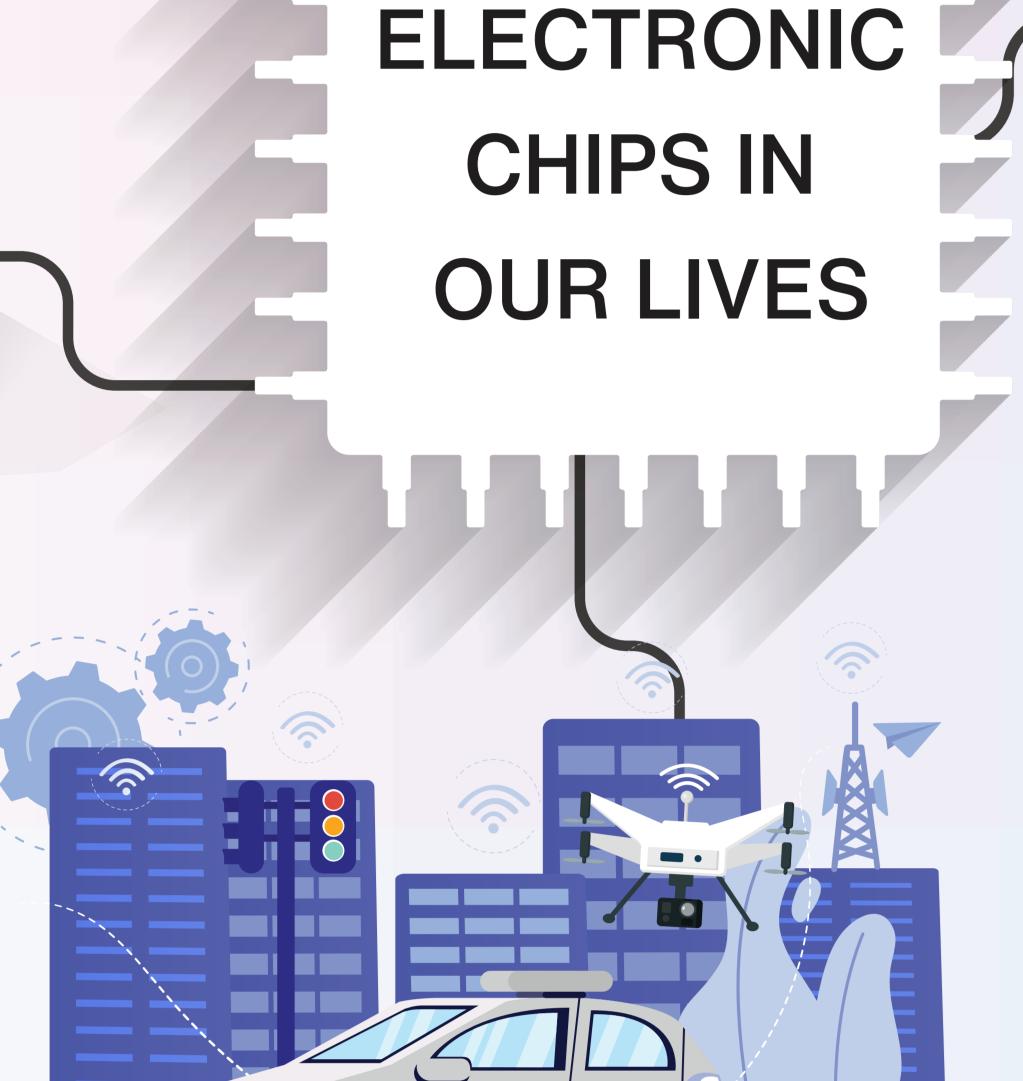
### In your home

Smart home devices, appliances, and entertainment systems





Computers, servers, and office equipment



## On the street

In your pocket

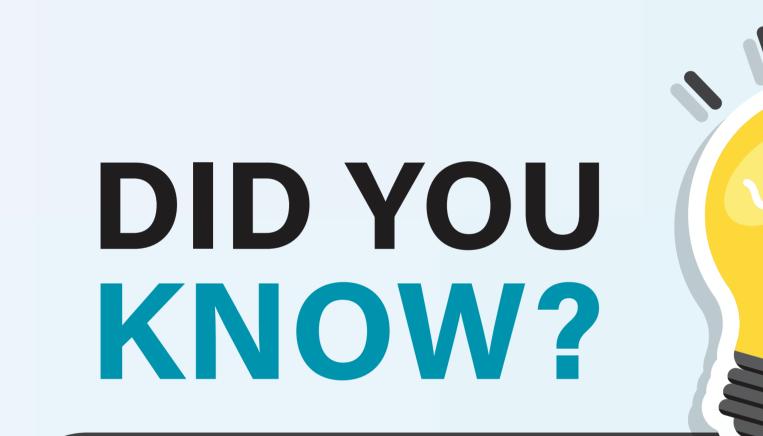
Smartphones

and tablets

Cars, public transportation, and traffic management systems

# What is an Integrated Circuit (IC)?

An IC chip is a microchip where hundreds, thousands, or millions of active and passive electrical components such as transistors, resistors, and capacitors are built on a semiconductor substrate such as silicon to perform a particular function (e.g., logic gates, microprocessor, microcontroller, memory, etc.).



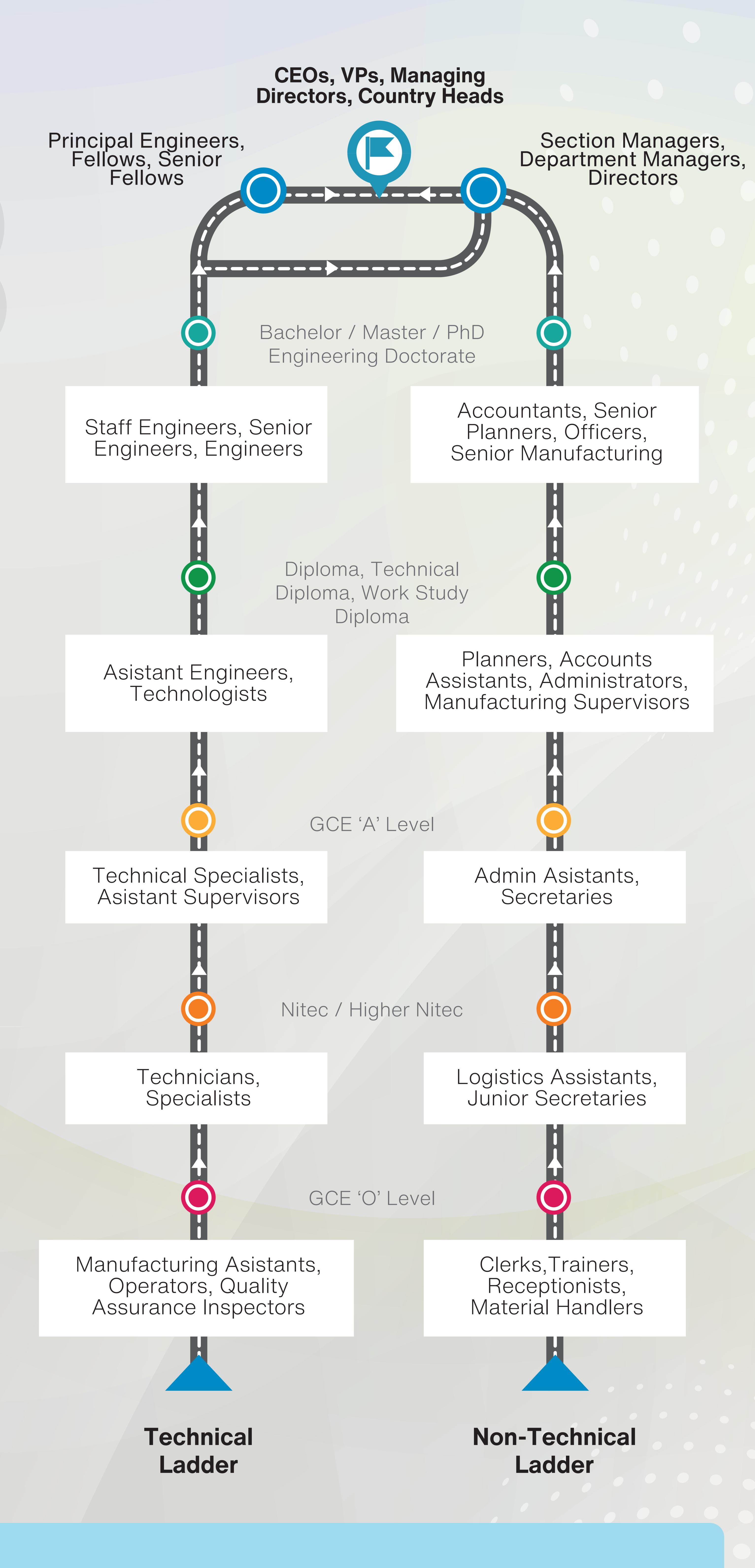
An electronic chip
(also known as an integrated circuit or IC) can contain as few as hundreds or as many as billions of transistors.

There are different semiconductor technologies such as Bipolar, Complementary Metal Oxide Semiconductor (CMOS), and Bipolar CMOS (BiCMOS).

#### Where are they used?

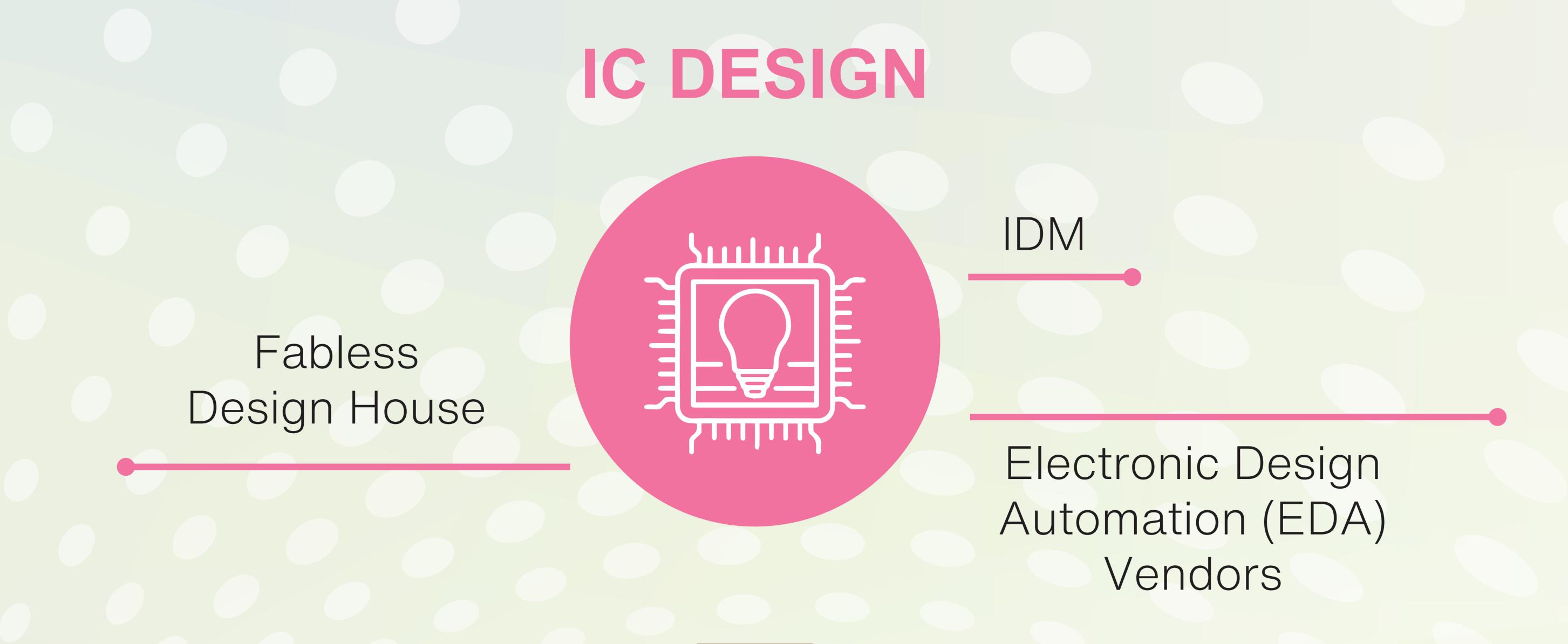
Innovation in semiconductor technology, with smaller, faster, and more reliable chips, enables transformative technologies and applications such as 5G, smart wearables, medical devices, smart cities, smart factories, smart phones, robots, cloud computing, artificial intelligence, network & connectivity, AR/VR, IoT, autonomous electric vehicles, etc.

# Career Pathways



Electronics power the technologies that drive smart cities, transforming the way we live and work

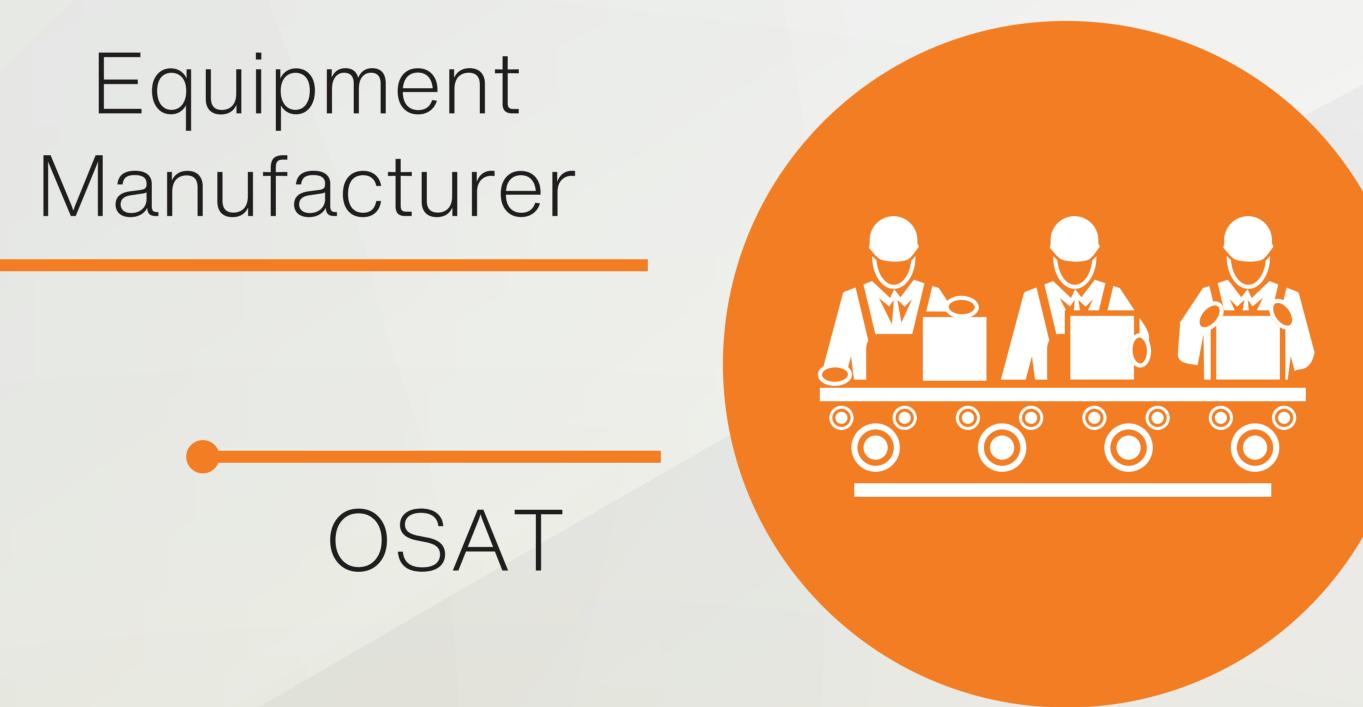
# The Semiconductor Value Chain



#### FABRICATION







IDM

Materials & Chemical Suppliers

## Fabless IC Design House

Companies that design & develop products, and subcontract the manufacturing process to foundries.

## Integrated Device Manufacturer (IDM)

Companies that design, manufacture, and market their integrated circuit products.

## Foundry/Wafer Fabrication Plant

Companies that own the fab to manufacture semiconductors. Fabs are cleanrooms with various modules equipment to process integrated circuit devices.

equipment for semiconductor manufacturing.

## Materials & Chemical Supplier Companies that provide the ba

Companies that provide the base materials and other raw materials required for semiconductors manufacturing.

# Electronics Manufacturing Services (EMS) / Original Design Manufacturer (ODM)

Companies that provide manufacturing services or products that are used by manufacturing companies.

#### Other Services

Companies that provide a wide

## About SSIA

Established in 2004 as MIDAS and rebranded in 2010 as the Singapore Semiconductor Industry Association (SSIA), our organization has been steadfastly championing the interests of Singapore's microelectronics devices sector. Embracing a wider spectrum of companies within the semiconductor and electronics manufacturing ecosystem, SSIA continues to thrive as a dedicated non-profit entity.

#### Our Vision

To create and sustain a highly competitive, leading-edge, and vibrant semiconductor industry in Singapore and the region.

#### Our Mission

To steer, advocate, and facilitate the full value chain of the semiconductor industry in Singapore, acting as a common industry voice.

#### Unlock Industry Insights for Your Students!

Educators and ECG Counsellors can connect with semiconductor industry professionals for engaging and insightful talks at their institutions. Inspire the next generation by bringing real-world industry expertise into your classrooms! Contact SSIA at secretariat@ssia.org.sg to explore collaboration opportunities.







# Smarter Future Ahead