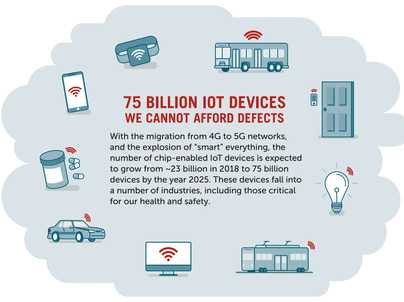
Supporting the Internet of Things: Challenges and Opportunities for Semiconductor Fabs

The growth of the Internet of Things (IoT) predicts a staggering growth in the number of chip-enabled devices, and in the amount of data that will be collected from those devices and processed in data centers. Semiconductor fabricators face a number of critical challenges from this explosive growth – especially since much more is at stake if devices fail. Fortunately, Entegris is here to help. Here's how:



75 BILLION IOT DEVICES
WE CANNOT AFFORD DEFECTS

With the migration from 4G to 5G networks, and the explosion of "smart" everything, the number of chip-enabled IoT devices is expected to grow from ~23 billion in 2018 to 75 billion devices by the year 2025. These devices fall into a number of industries, including those critical for our health and safety.

MEDICAL

Chip-enabled medical devices and "smart" pharmaceuticals can provide real-time health data to doctors and patients

SMART HOME

Basic appliances, lighting systems, environmental controls, and security systems will have intelligence and connectivity

SMART CITY

Law enforcement and traffic regulation can be enhanced with widespread use of sensors, cameras, and control systems

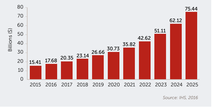
TRANSPORTATION

Cameras and sensors abound in modern vehicles and public transportation, eventually leading toward self-driving technology

DATA CENTERS

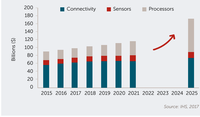
Data centers must grow dramatically to keep up with the explosion of data being collected from these devices. The global market for processors is expected to grow by roughly 350% by the year 2025.

ANNUAL SIZE OF GLOBAL DATA SPHERE



Source: IHS, 2018

IOT SEMICONDUCTOR MARKET

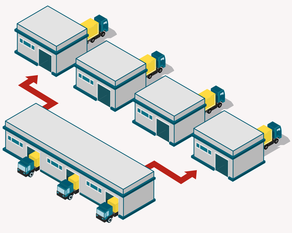


Source: IHS, 2017

CHALLENGES FOR FABRICATORS

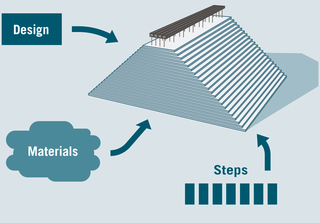
1
CAPACITY AND COST

Fabricators must increase their capacity while also supporting increasingly complex chips. This will require significant capital expenditure to add or upgrade facilities.



2
PERFORMANCE AND COMPLEXITY

Chip designs are increasingly complex in their geometries and materials, requiring more process steps and more care in handling. Perfection is required at every step.



3
YIELD AND RELIABILITY

Put simply, "every chip matters." Material and environmental purity will be scrutinized at every step to ensure high yield and high reliability, particularly for chips in critical uses.

Learn More

www.entegris.com/IOT

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