



leti
cea tech

5G SYSTEMS

Technology for new
business models



Leti, technology
research institute

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5G: New way of interacting with the world

5G will expand mobile networks and technologies into a much wider range of industries. It will enable smart cities that can sustain tomorrow's urban population growth, autonomous cars that communicate with each other and traffic lights to save lives, VR headsets that allow us to experience the world in new ways, body sensors that monitor our health and make dietary recommendations, and so much more. It will change the way we interact with our world and each other.

DIGITAL REVOLUTION WILL IMPACT ALL MARKETS, ALL SERVICES FROM THE MOBILE NETWORK



Enhanced Mobile Broadband



Massive Internet of Things



Mission-Critical Services

× 1,000

increasing mobile network capacity 1,000 times

7B

connecting 7 billion people

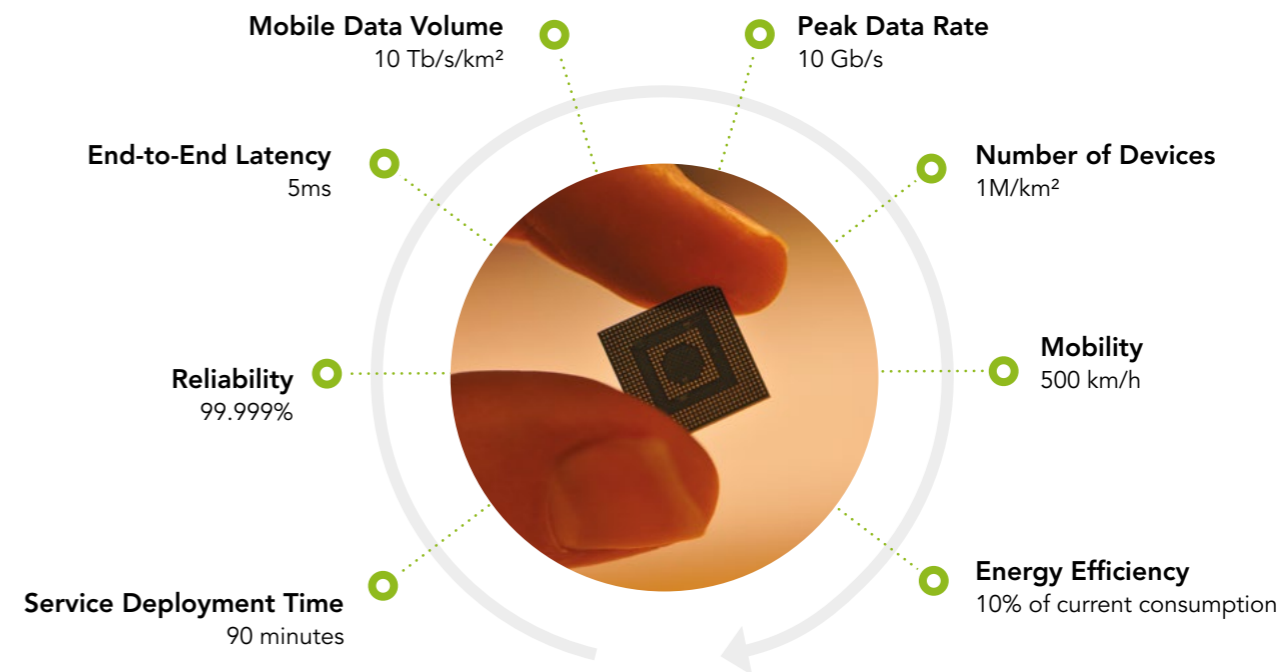
7T

connecting 7 trillion "things"

2019

first 5G business development

BETTER PERFORMANCES, LOWER COSTS, EASIER DEPLOYMENTS



A NEW GENERATION OF ELECTRONICS IS REQUIRED: IT'S TIME TO THINK 5G

LETI, A STRATEGIC PARTNER FOR ALL 5G PLAYERS

**ANTICIPATE BUSINESS OPPORTUNITIES
ACCORDING TO EMERGING TECHNOLOGIES**

5G will be a global revolution in digital economics leading to disruption of business models and new challenges for all players , e.g. technology providers, vertical industries, smart cities.

Leti has a unique combination of advanced technology platforms and industrial demonstration capabilities. Our commitment is to help our industrial partners anticipate new business models according to the technology roadmaps and to build a competitive barrier with innovative technology and IP portfolio.

We perform objective-driven R&D projects integrated in your business-change strategy.

**YOU ARE
A 5G PLAYER**



SMART TERRITORY

Infrastructure & data
Technology public policy



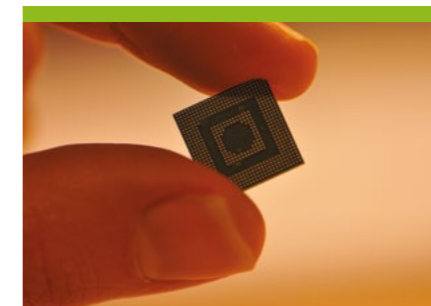
SMART INDUSTRY

Innovative supply chain
Digitalization



5G DEVICES

Innovative embedded electronics
New business models



5G INTEGRATED CIRCUIT

Low-power, low-cost solutions
Custom software



TECHNOLOGY

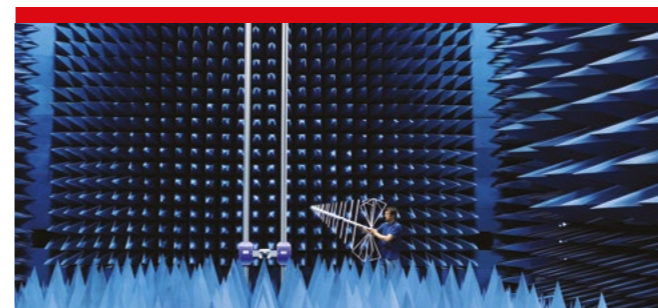
Advanced CMOS
RF, sensors, imaging

**YOU NEED
INNOVATION
PLATFORMS**



BUSINESS PROTOTYPES

Field trials and proof-of-concept
Security solutions



WIRELESS SYSTEMS

Implementation and evaluation
Industrial transfer and ecosystem



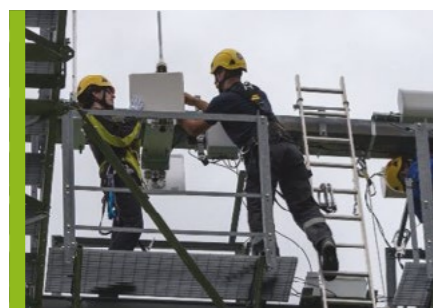
SILICON IMPULSE

IC design, Multi-project wafer
Prototyping and IC supply chain

FACING 5G CHALLENGES WITH LETI

NEW TECHNOLOGY INNOVATIONS ARE CRUCIAL TO 5G TAKE ADVANTAGE OF ONE OF THE LARGEST IP PORTFOLIO

Moore's Law is becoming more difficult to sustain. But microelectronics and nanotechnologies still lead integration. Meanwhile, the roadmap to drive and pull technology toward 5G prospects is under construction in the semiconductor industry. We are at the moment when 5G underlies multiple disruptions in network capabilities that are necessary to unleash the digitalization. The pioneers will have many opportunities: original business models vs. the competition, better ways to tackle global issues, new services with security and inclusion. Leti leads multiple technology-and-system roadmaps. We believe that the low-cost integration and the low-cost deployment of 5G technology requires an end-to-end vision, including new materials in microelectronics, innovative architectures in integrated systems and a new paradigm in software/hardware interaction.



TRIALS



SYSTEM ON CHIP

TAKE ADVANTAGE OF NEW TECHNOLOGIES

- Silicon-on-Insulator (SOI) ultra-low-power design
- SOI radio frequency (RF) device
- 3D silicon integration
- Packaging technologies
- Non-volatile memory technologies



EXPERTISE

DRIVE YOUR LOW-COST INTEGRATION ROADMAP

Multi-radio system

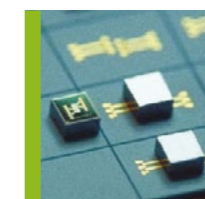
- Power amplifier integration with switches
- Tunable filters in front-end module
- Tunable embedded antennas
- Compact MIMO antenna solutions

Mm-waves

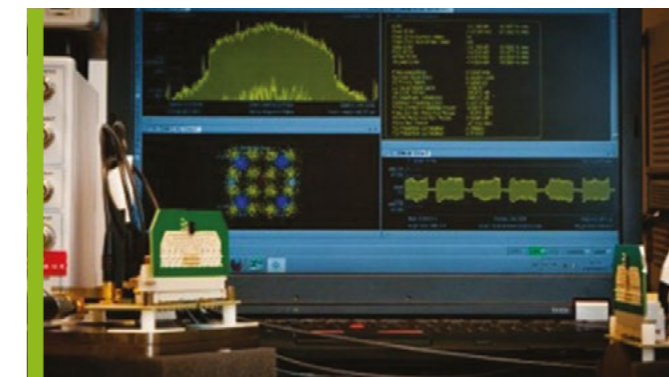
- High-power mm-wave RF low-cost integration
- Best-in-class frequency synthesis
- Very-high-gain compact antenna solutions
- Hybrid beamforming architectures
- Multi-Gbps codec



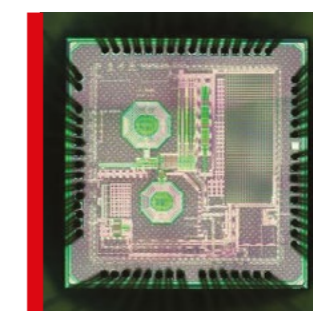
MANUFACTURING



SAMPLING



PLATFORMS



RADIO FREQUENCY

PIONEER THE DEPLOYMENT OF 5G

- Critical IoT network
- Multi-service, software-defined air-interface platform
- In-band full-duplex platform
- Interference-aware receivers



ABOUT LETI

Leti is a technology research institute at CEA Tech and a recognized global leader in miniaturization technologies enabling smart, energy-efficient and secure solutions. Committed to innovation, its teams create differentiating solutions for Leti's industrial partners.

By pioneering new technologies, Leti enables innovative applicative solutions that ensure competitiveness in a wide range of markets. Leti tackles critical, current global issues such as the future of industry, clean and safe energies, health and wellness, safety & security...

Leti's multidisciplinary teams deliver solid micro and nano technologies expertise, leveraging world-class pre-industrialization facilities.

For more than 50 years, the institute has been building long-term relationships with its industrial partners providing tailor-made solutions and a clear intellectual property policy.

Leti, technology research institute

Commissariat à l'énergie atomique et aux énergies alternatives

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