CTB: Component Technology Board & its EEE Roadmap

Jean-Louis Cazaux, chairman

(03/2021)

What is the CTB?

- **CTB: Component Technology Board**
- An ESCC body, subordinate to the SCSB *(Space Components Steering Board)*, along with PSWG *(Policy & Standard Working Group)* and MPTB *(Materials & Processes Technology Board)*
- Created in 2002 according to ESCC Charter 00000, Defined by ESCC 10400

*The CTB is charged with **the formulation of strategic programmes and work plans for technology research and development** in the area of **European EEE space components**.*

*It **harmonises** the collectively funded component research, development, evaluation, qualification, standardisation and quality assurance activities.*

CTB Membership:

1) Space Agencies:

2) Equipement Manufacturers: through ASD-EUROSPACE The Space group in ASD

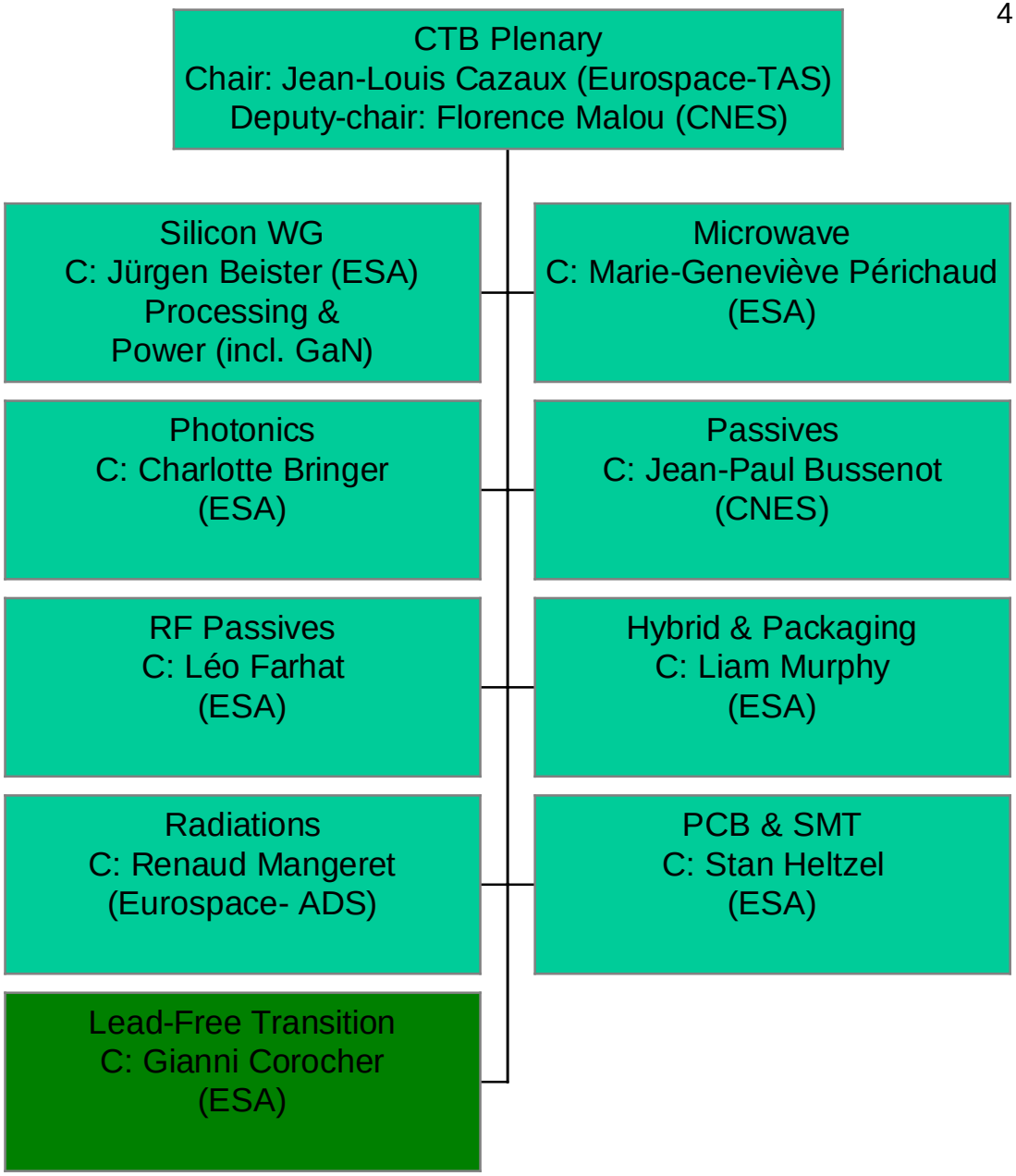
3) Component Suppliers

+ Observers: IMEC (for RTOs)

+ European Commission

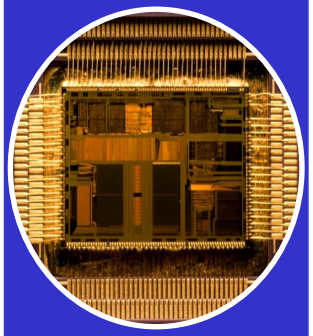
CTB's Internal Organization

- **8 permanent thematic Working Groups (WG) reporting to the "CTB Plenary"**
- In total, and as for today, CTB WGs involve about 200 individuals from 50 different organizations
- + Lead-Free Transition Working Group reporting to CTB and MPTB

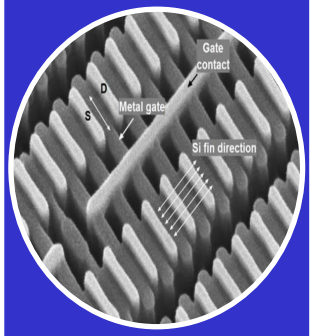


- **The CTB Roadmap**:
  - Updated continuously
  - Released once a year
- **Presentation which follows is focused on the main axis and priorities, sorted thematically**
  - Silicon >> computing, processing and power
  - Microwave
  - Photonics
  - Passives and RF passives
  - Report and packaging technologies
  - Focus on « New Space » mindset with COTS, and Lead-free transition

« Silicon » Priorities



Consolidation on middle-range technologies: 150nm / 130nm



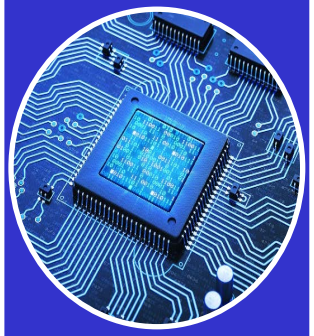
UDSM for OBDP: under 20nm FDSOI / FinFET

1st activities on 7/6nm

European BRAVE FPGA Family with NanoXplore: ULTRA and ULTRA-300

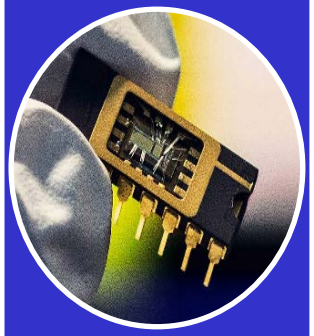
Simulation tools

Organic packaging



Microcontrollers Microprocs including RISC-V

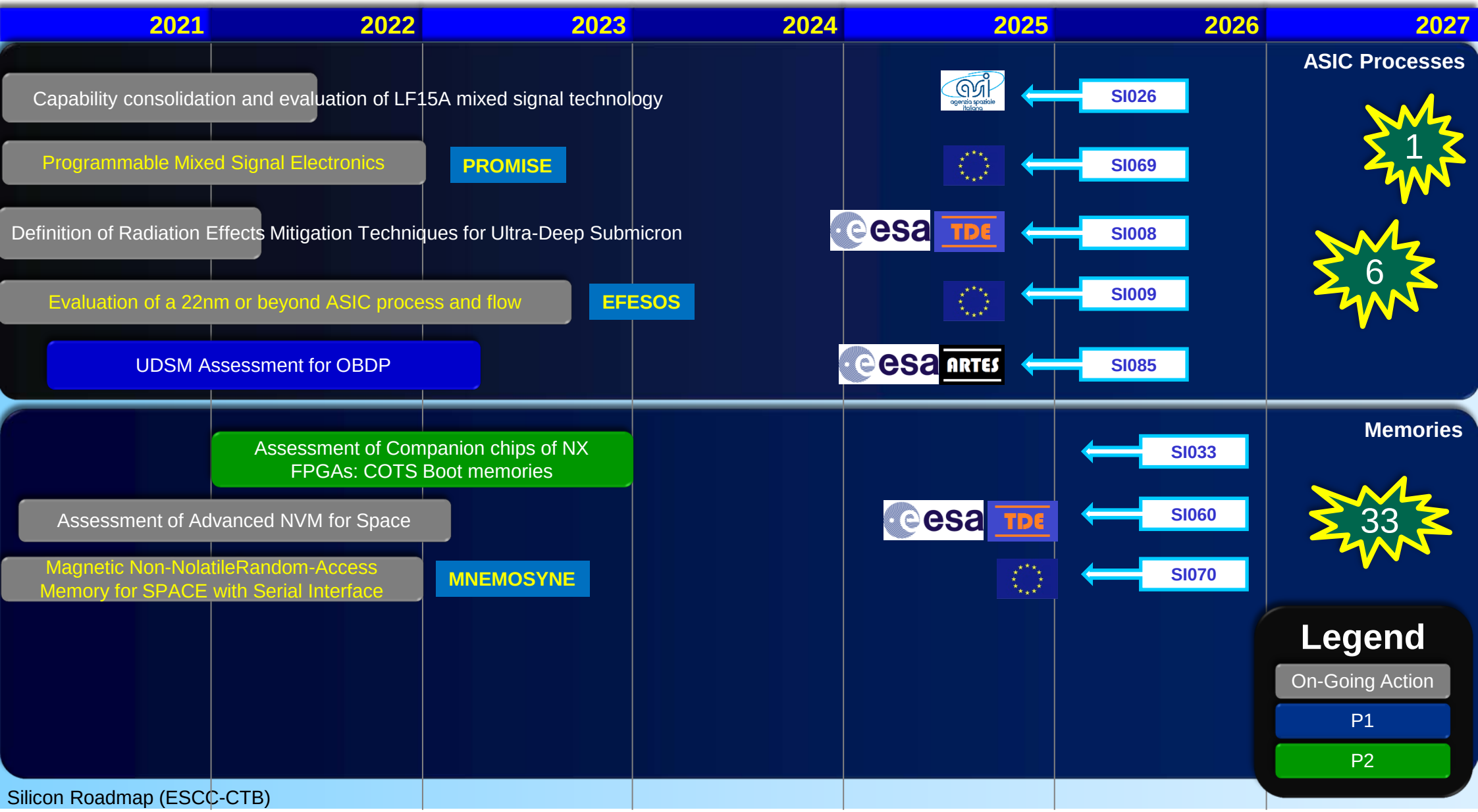
High Speed interface, Ka-Band ADC or Direct Conversion



European GaN Power transistors, Power ICs

Silicon (computing, processing, power)

Excerpt of CTB Roadmap



Disclaimer: The links with JTF domains (xx) are given as an illustration of the thematic of the corresponding actions. It does not mean that these JTF domains are limited to those CTB actions only. It does not mean that these CTB actions are the priority elected by these JTF domains.

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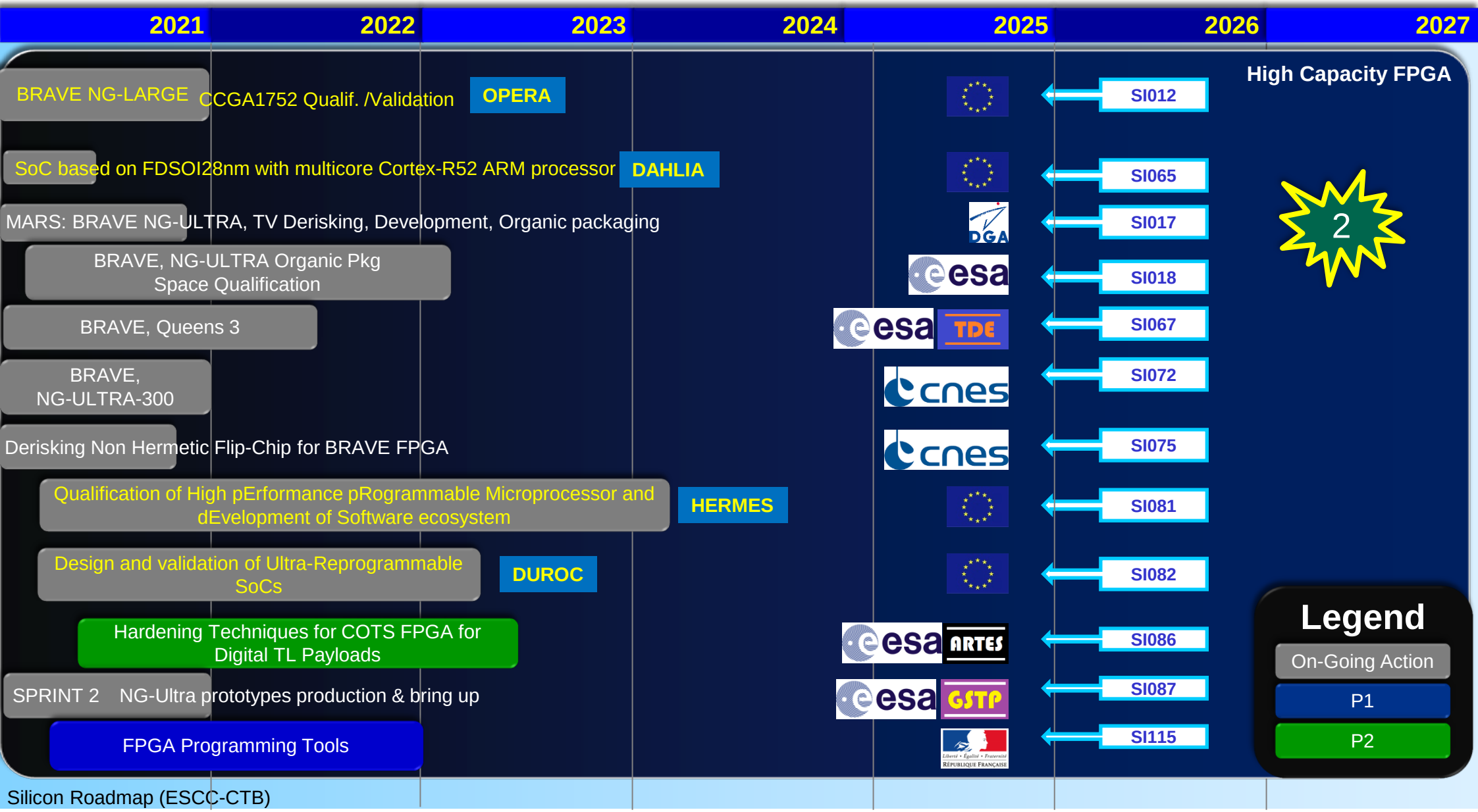

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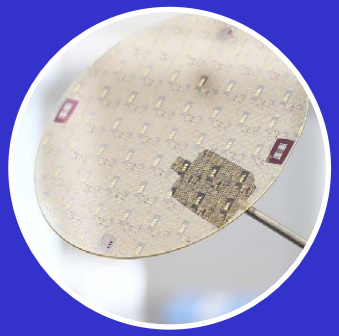
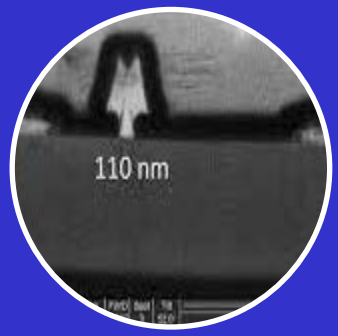
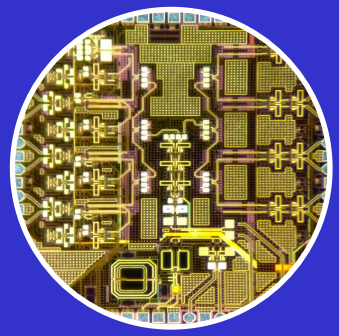
Microwave Priorities



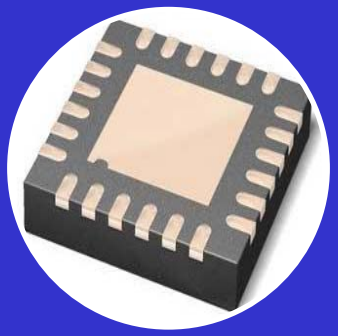
European GaN: Higher power & efficiency in Ku-, Ka-band



European GaN: Higher frequencies, Q/V and beyond



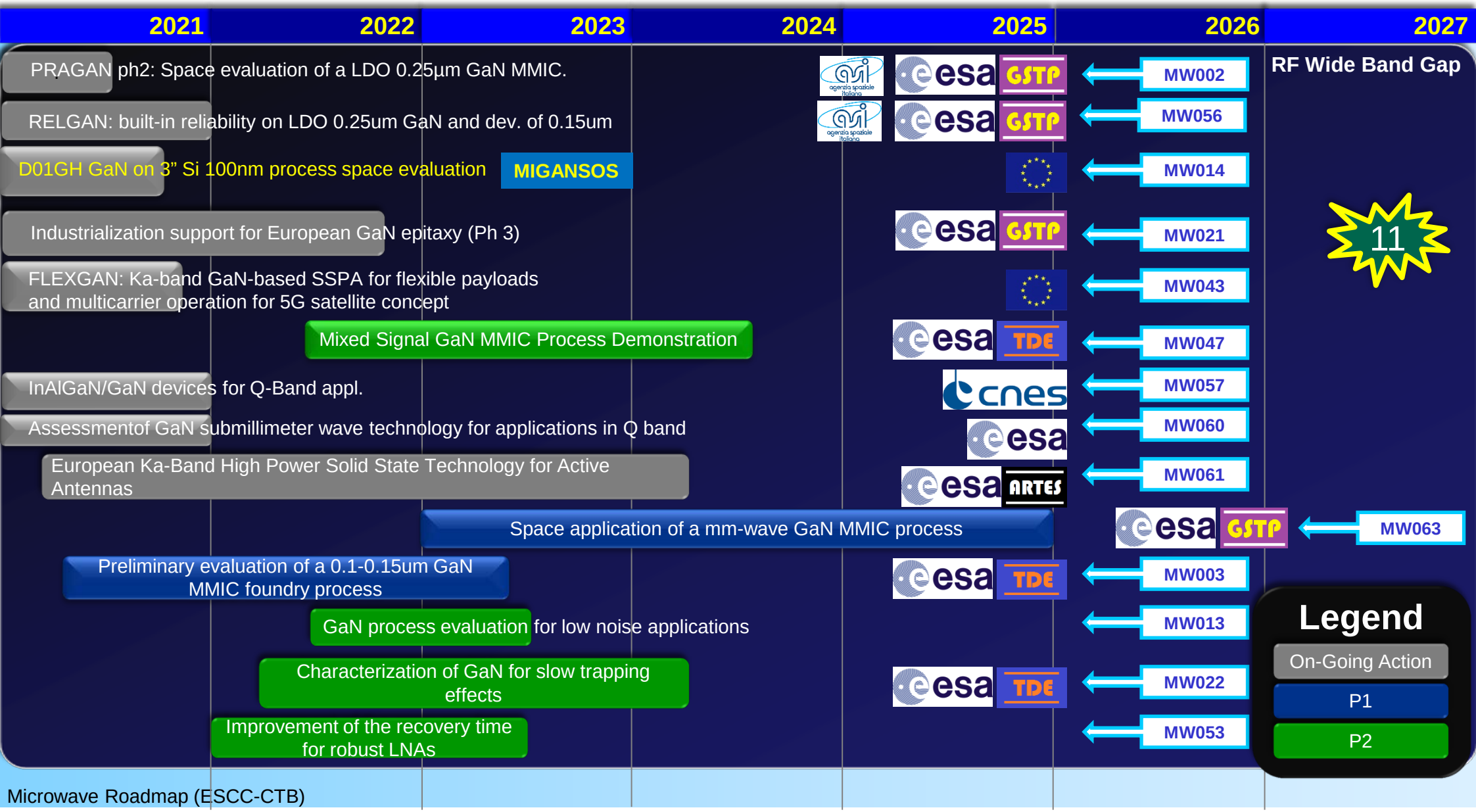
Si-based MMIC: SiGe, RF CMOS



Constraints of non-hermetic packaging

MicroWave

Excerpt of CTB Roadmap



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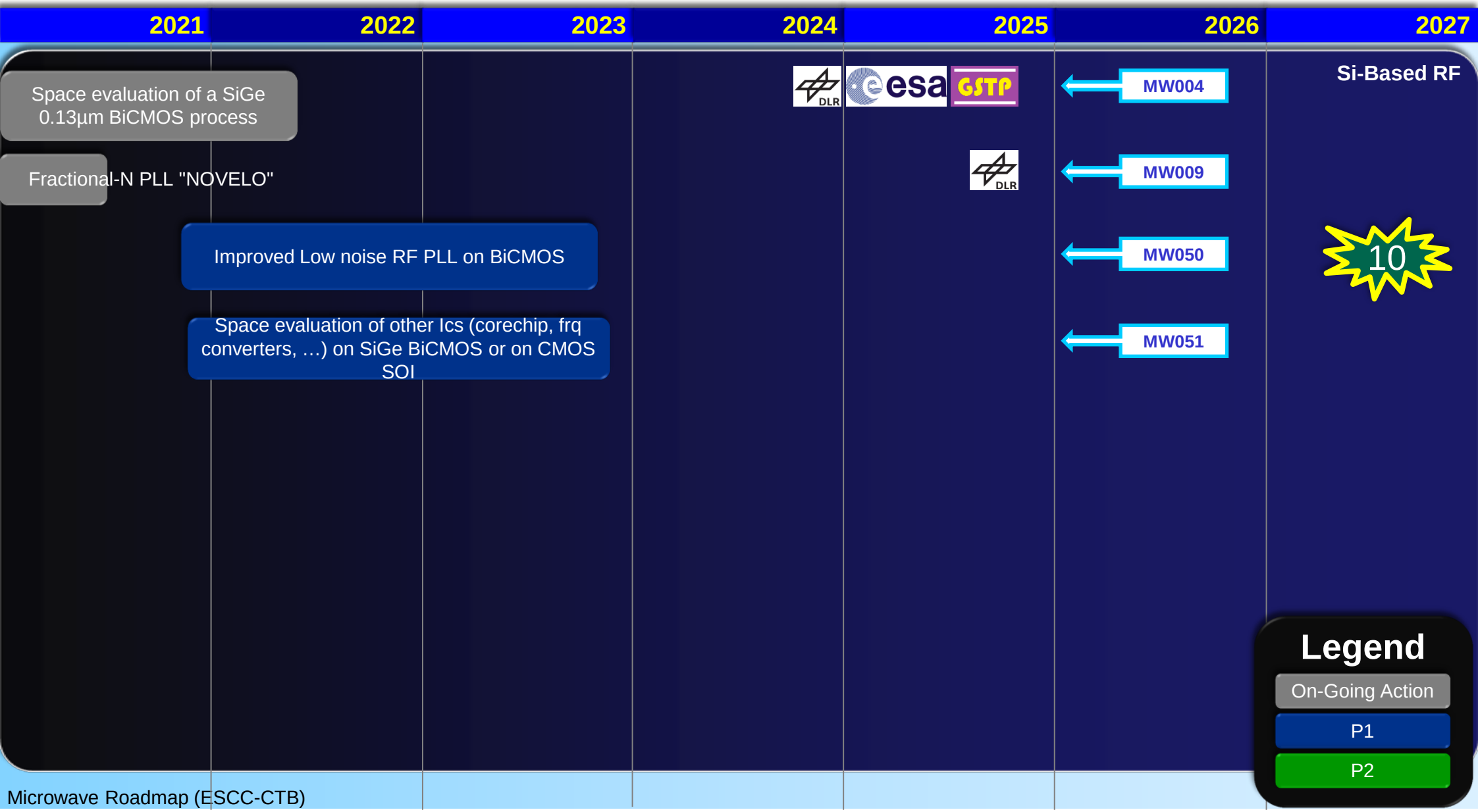

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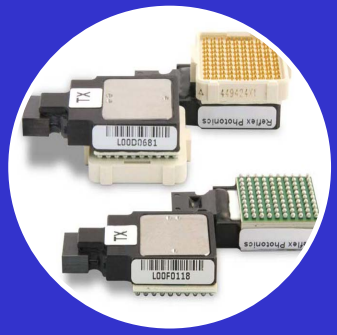
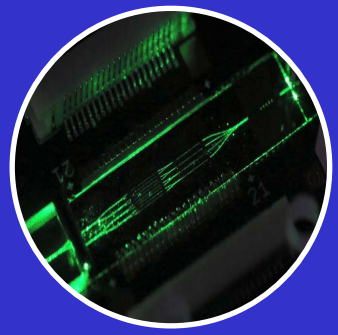
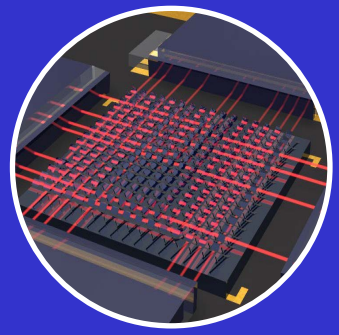
Photonics Priorities



Components for Optical coms, Photonic Payload, Optical digital interfaces Non-dependent, affordable solutions



Photonics Integrated Circuits (PICs)

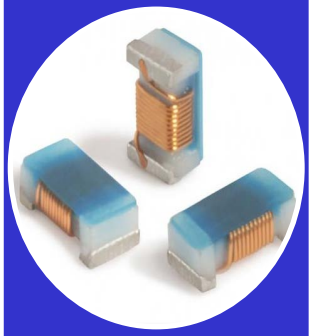


Optical switch matrices

Passive optical: splitters, connectors, fibers, …

Photonics

Passives and RF Passives Priorities

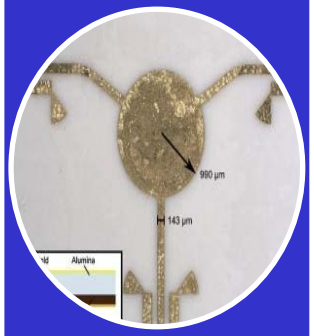


New, smaller passives

Press-fit connectors

Development of super-capacitors

HV & HT cables, harnesses, relays



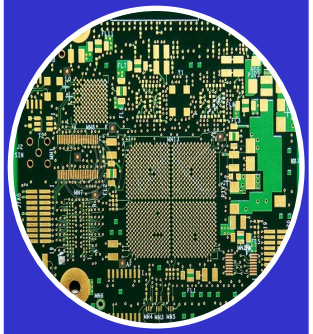
High frequency circulators, isolators >> Q/V, W band

Micro electro-mechanical relays, switches

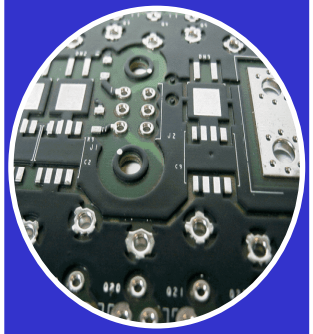
High frequency fast-locking connectors >> W band

Passives and RF Passives

Report and Packaging Priorities

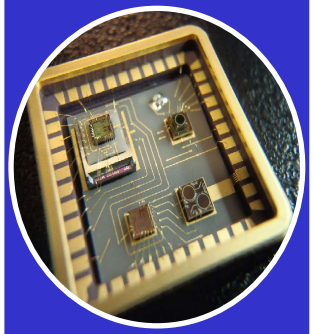


High Density PCB Assembly

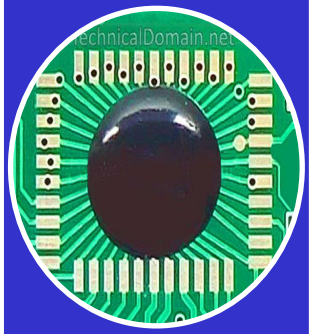


High Temperature PCB

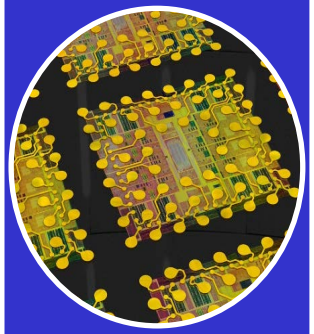
Printed electronics, Flexible solutions



System-In-Package (SiP)



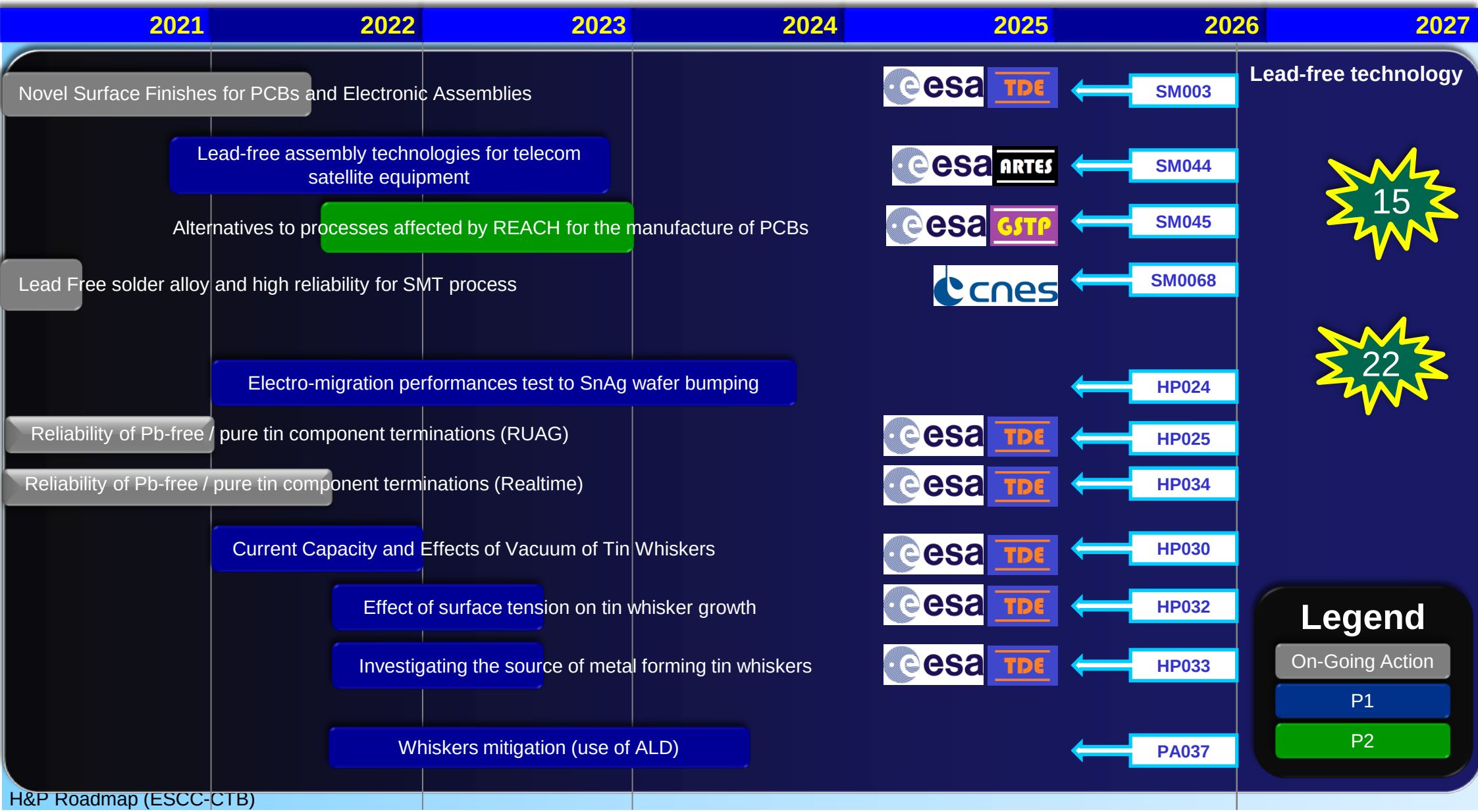
Chip-On-Board (COB)



3D, WLP, …

PCBs. SMT. Hybrids. Packaging

Excerpt of CTB Roadmap



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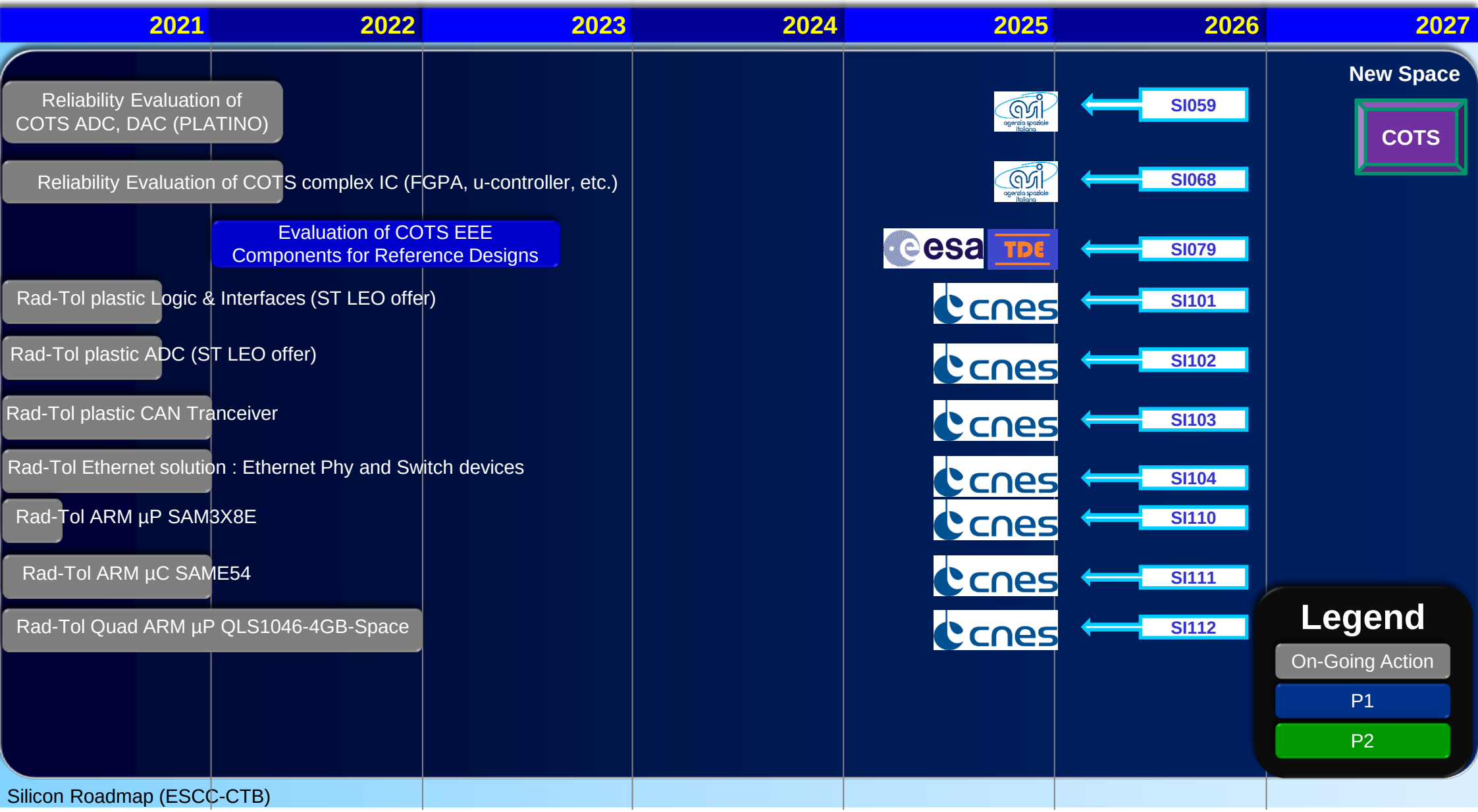

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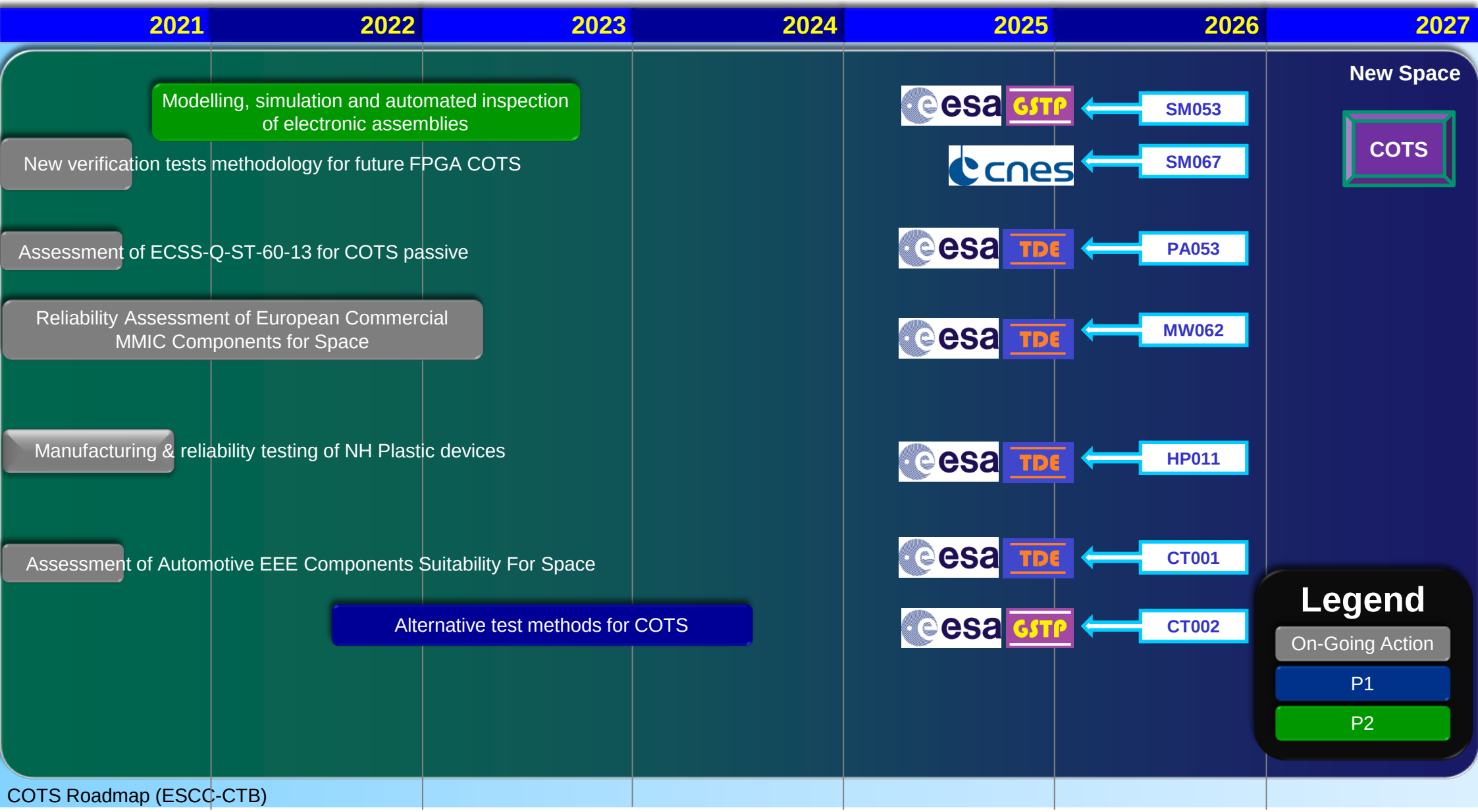

COTS Roadmap (ESCC-CTB)

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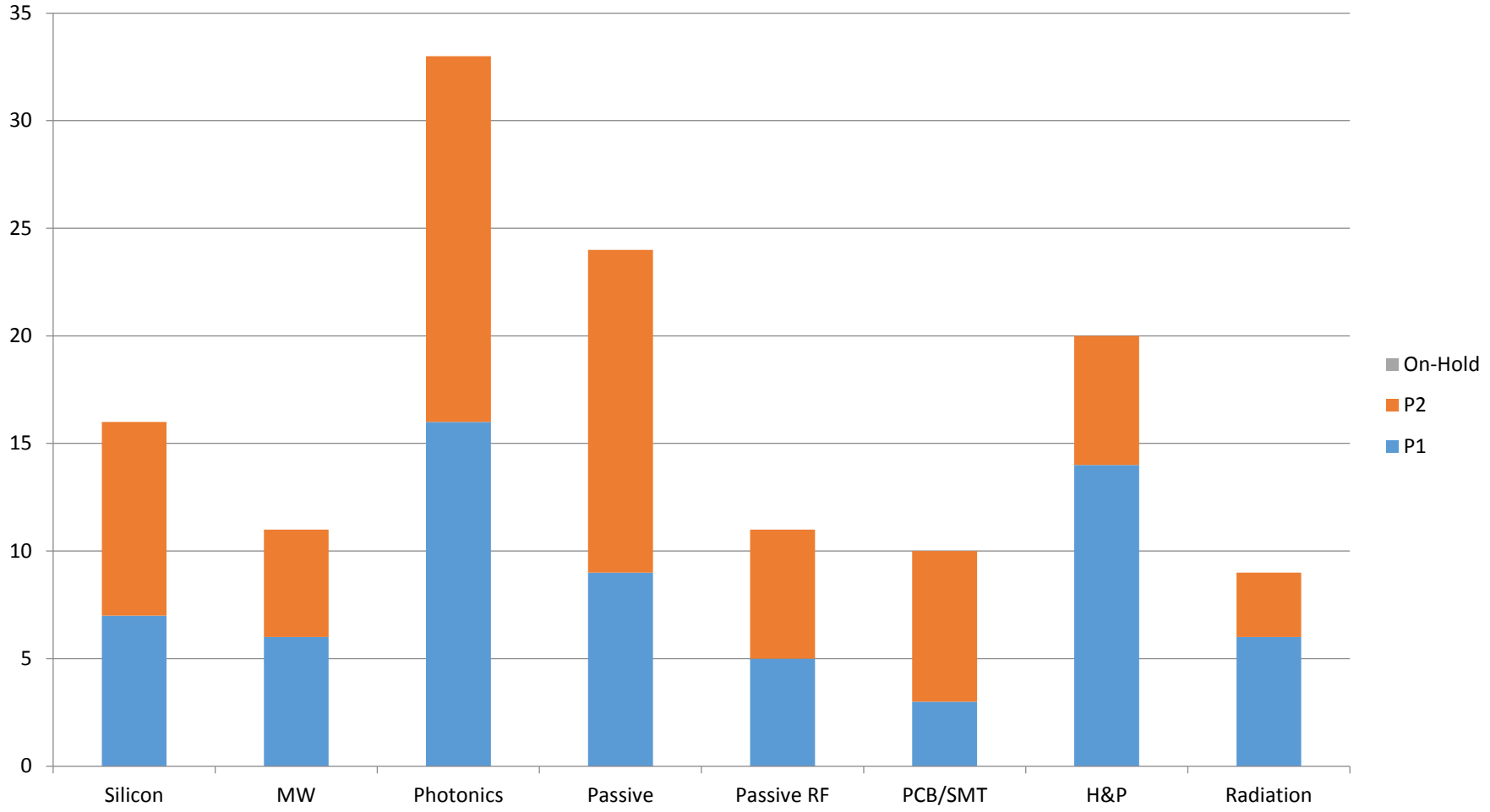
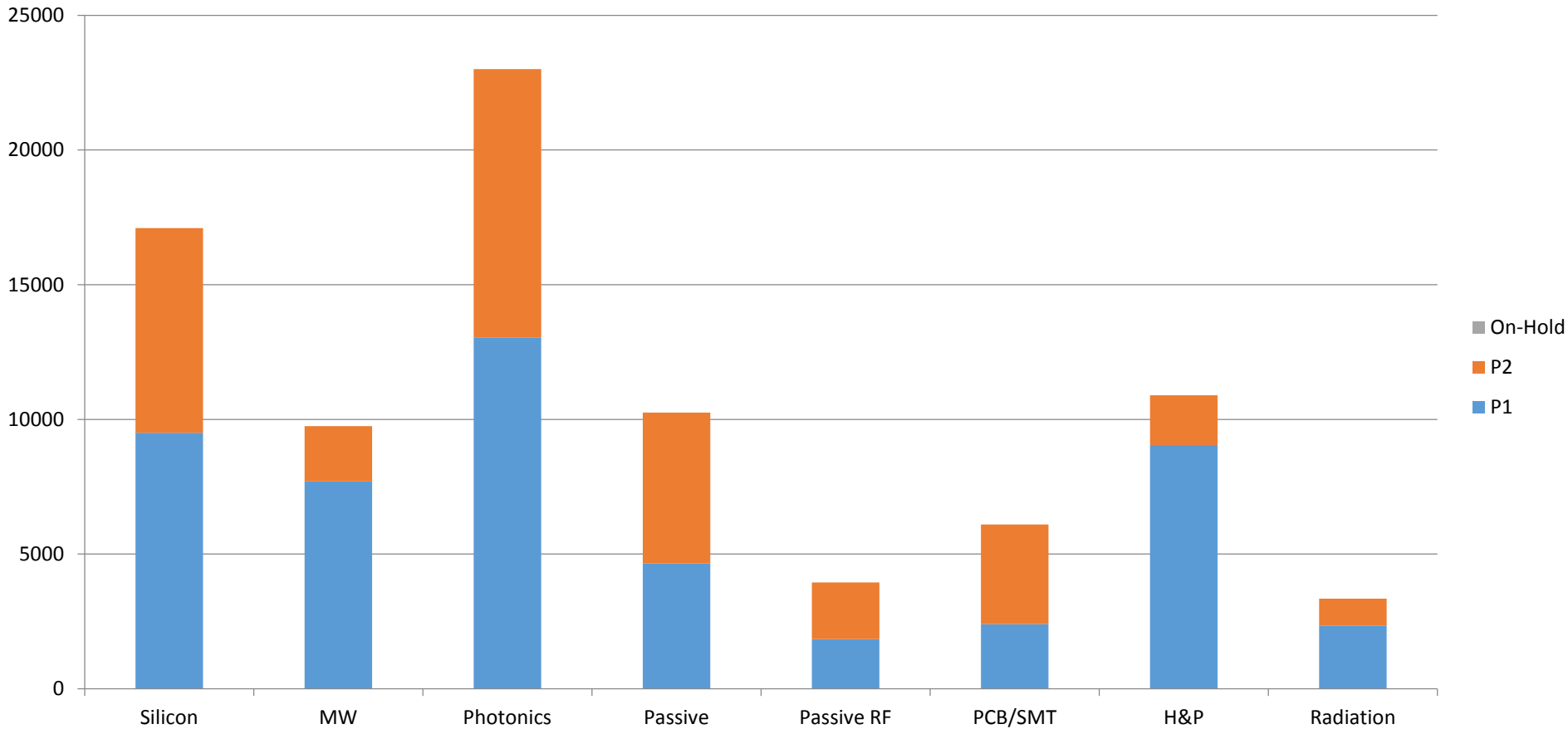
Number of activities

P1: 66
P2: 68



Budget (k€)

P1: 50 M€ / 4y
P2: 34 M€ / 4y



Thank you for your attention

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