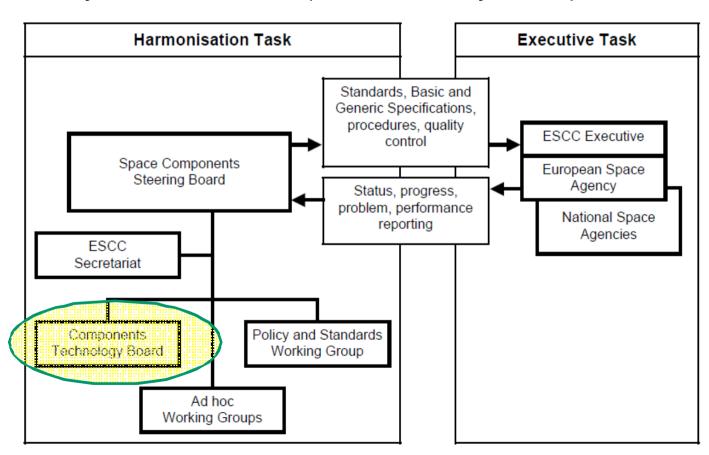


# CTB Roadmap 2017-2025 September 2016

(Jean-Louis Cazaux, as CTB Chairman)



- CTB: Component Technology Board
- An ESCC body, subordinate to the SCSB
- Created in October 2002 according to ESCC Charter 00000
- Defined by ESCC 10400 (Issue 2, July 2003)





3



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.





4

- According to ESCC charter, members belong to 3 categories:
  - the European space component user industries collectively represented by Eurospace
  - the European EEE space component manufacturers
  - the European national and international public space organisations.
- 3 meetings of 1.5 day per year



# The CTB Plenary

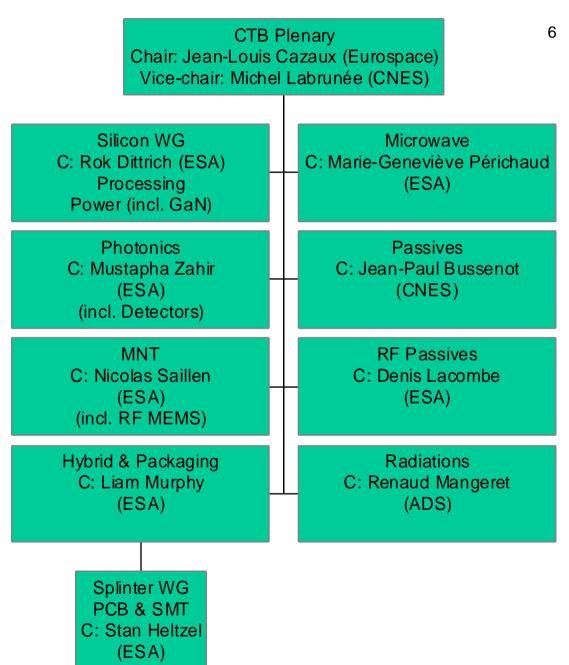
Function	Affiliation	Members	Voting right	Other members (deputy)
	STM	Thibault Brunet		
Silicon Manufacturers				
	ATMEL	Bernard Bancelin	X	
GaAs Manufacturers	UMS	Ulf Meiners	X	
Passive Manufacturers		To be nominated		
Hybrid Manufacturers	THALES ALENIA SPACE Belgium	Pascal Delporte	X	
	e2v	Jean-François Bruyeres		
Eurospace - CTB chairman	THALES ALENIA SPACE	Jean-Louis Cazaux	X	
Eurospace	ADS	Klaus Hirche	X	
	ADO			Richard Wiest
	THALES ALENIA SPACE	Ulisse di Marcantonio	X	
	OHB	Burak Gökgöz		
	RUAG Space	Andreas Billström		
	Alter	Augustin Coello-Verra	X	
DLR	TESAT	Ottmar Heger	X	
DER	IESAI			
ASI	ASI	Rita Carpentiero	X	Silvia Natalucci
ASI Advisor	IMT			Giovanni Cuccinella
UKSA	EEE Components Quality and Reliability Consultancy Ltd	John Wall	X	
CNES - CTB Dpty-Chair	CNES	Michel Labrunée	Χ	
CNES	CINES			Pierre Tastet
ESA	ESA	Laurent Marchand	X	
ESCC technical secretary	ESA	Ralf de Marino		
EC Observer	EC	Fabio Vitobello		

5



- 9 thematics Working Groups (WG) reporting to the "CTB Plenary"
- In total, and as for today, CTB WGs involve 155 individuals from 46 different organizations
- Materials issues now dealt by MPTB (Chair: Thomas Rohr, ESA) which directly reports to SCSB

# CTB's Internal Organization



03/10/2016



#### CTB Roadmaps: making-up

- Roadmaps made from the inputs of all CTB Working Groups and from the contribution of all CTB Members
- Potential ECI-5 has been defined at large: "could be ECI-5" in addition to other scheme: GSTP, TRP, ARTES, ...



# CTB Roadmaps: synthesis

8



ESCC

	Nbr of Actions	Total Amount	Nbr of Potential ECI-5	Total Amount
P1	41	37 M€	35	32 M€
P2	34	33 M€	24	13 M€

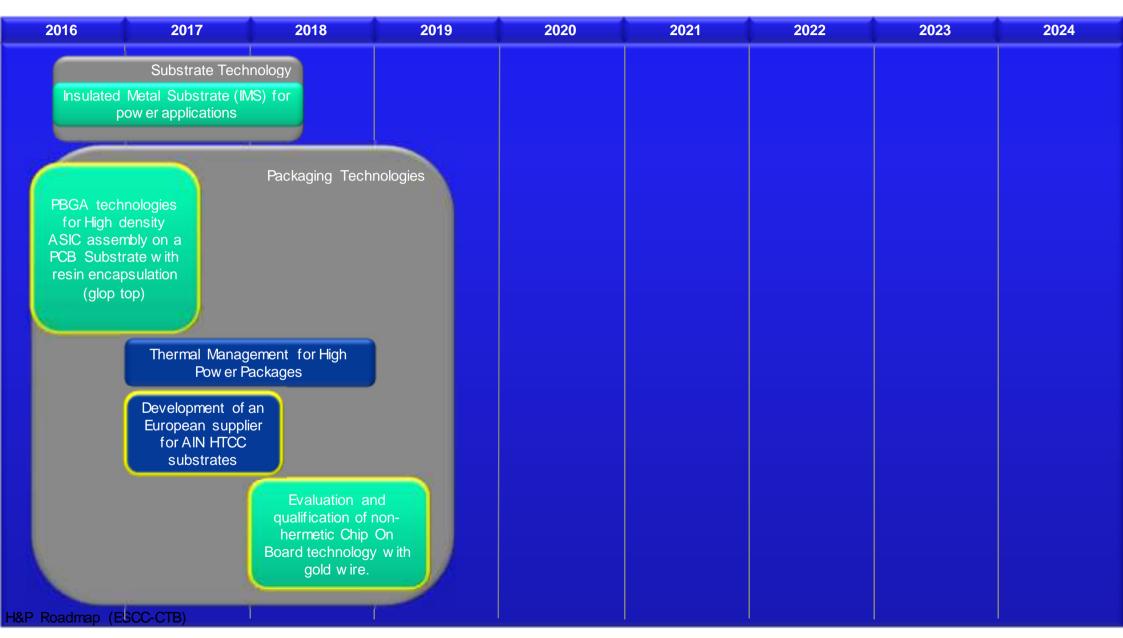
# Legend for next detailed charts



03/10/2016

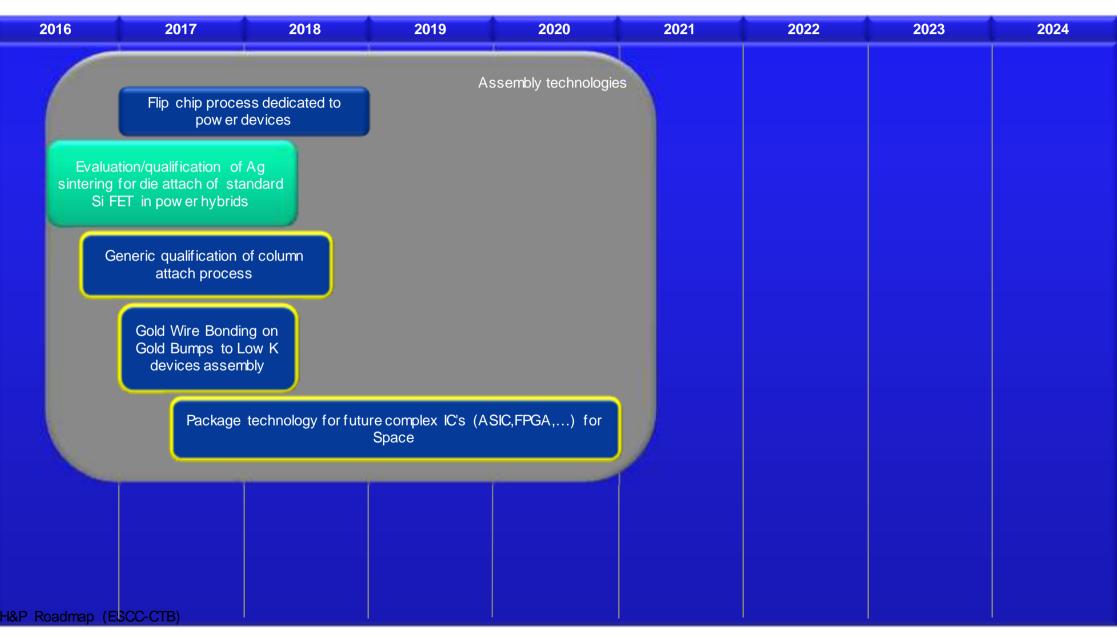


# Hybrids and Packaging 1/2



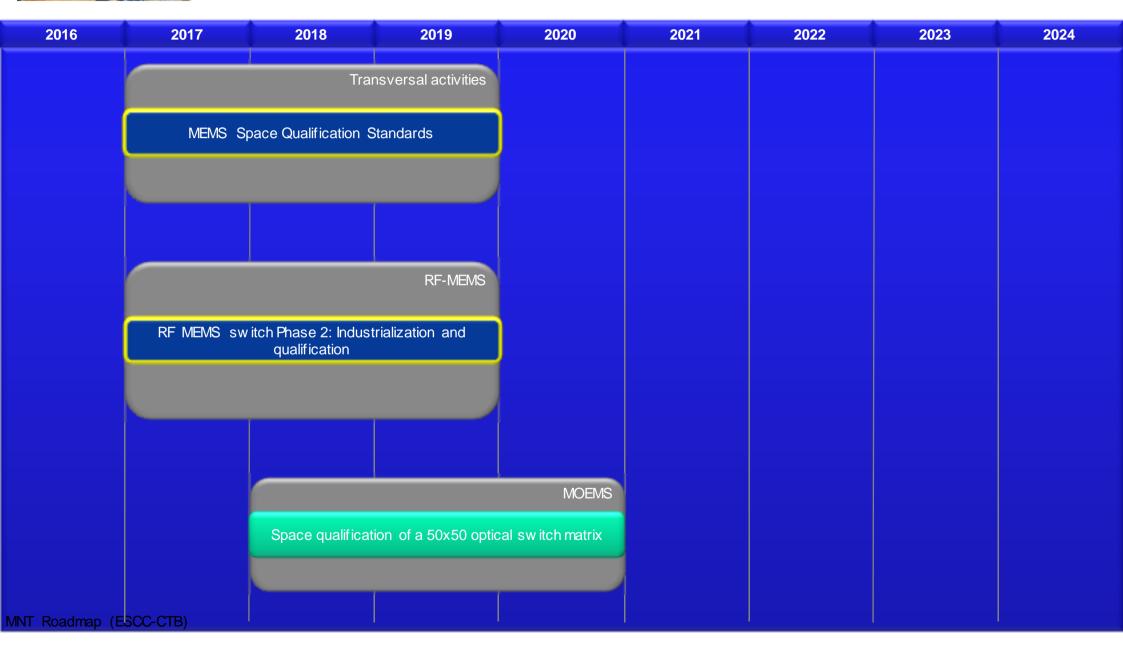


# Hybrids and Packaging 2/2





#### Micro- & Nanotechnologies roadmap





# Microwave technologies

2016	2017	2018	2019	2020	2021	2022	2023	2024
		Mixed Analog/Dig	ital RF Processes					
	Space evaluation	of a SiGe 0.13µm	BiCMOS process					
			Low-c	ost components				
		GoAc/GoN MM						
		GaAS/Gain iviiv	IIC process for use in environment	non-nermetic				
	Pre-ma	ntched GaN power	_	y, Medium to High	Pow er Systems			
				of a 0.1um GaN N	MMC process			
			$\overline{}$	ora orram carri	THE PROCESS			
	Space evaluation	on of a 0.25um GaN	I MMIC process					
	Critical RF com	ponents, European	non-dependance					
		I/v Davel MDA						
		Ku-Band MPA						
		Fractional-N PLL						
	Low	noise RF PLL on Bi	CMOS					
vW Roadmap (E	300-27							



# Passive components

2016	2017	2018	2019	2020	2021	2022	2023	2024
		Generic						
	Development ar multianode pol capa	nd evaluation of lymer tantalum citor						
	Selection and evaluation of decoupling capacitor for next generation of FPGA							
	Development ar high volta	nd evaluation of age relay						
Passives Roadmar	(ESCC CID)							

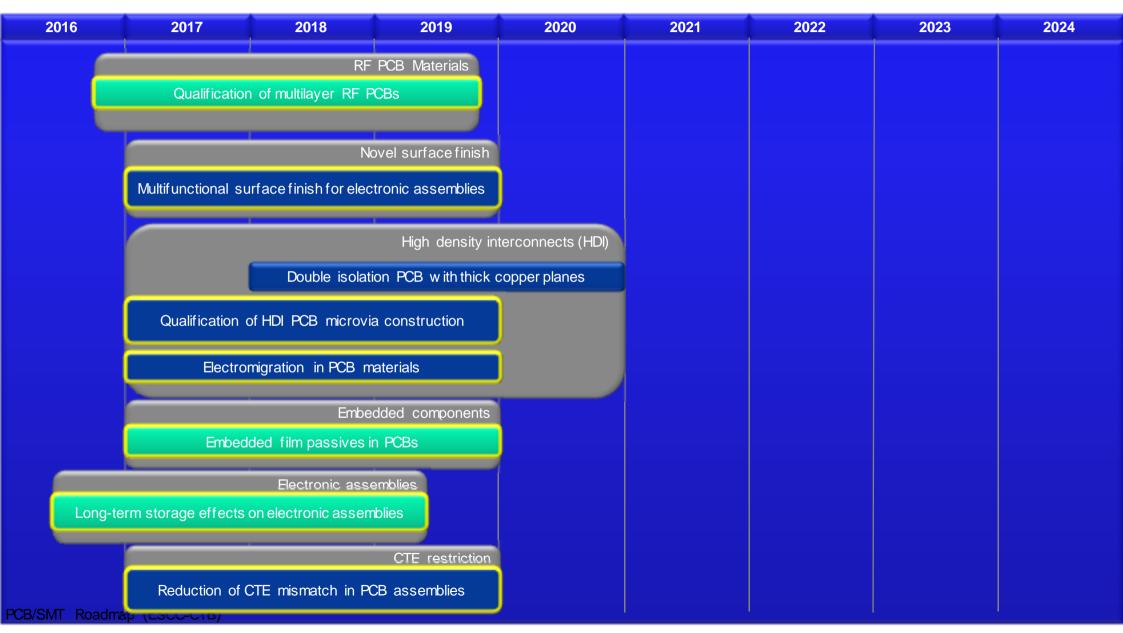


# RF Passive components

2016	2017	2018	2019	2020	2021	2022	2023	2024
		High Reliability						
	ESCC Evaluation and Qualification of SMP-Lock connectors, attenuators, load & assemblies							
		High Frequencies						
	ESCC Evaluation of Q/V bands circ and I	and Qualification culators, isolators oads						
		High Power						
	Qualification of l high power	RF chip load for applications						
		Generic						
	ESCC Evaluation of SMA cable	and Qualification e assemblies						
RF Passives Road	map (ESCC-CTB)							

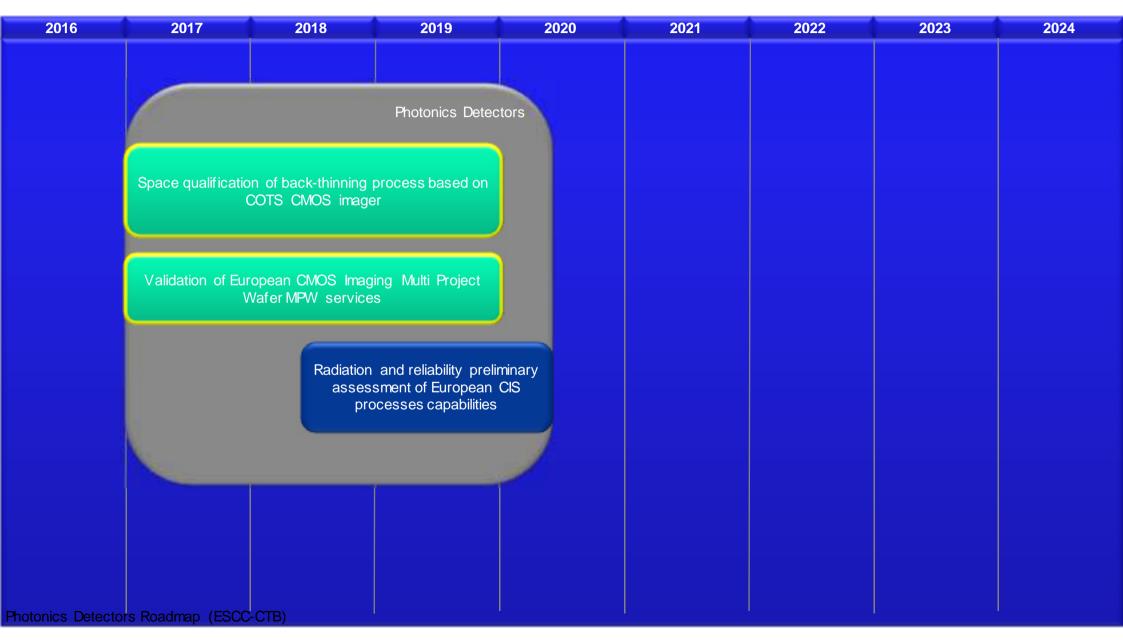


# PCB/SMT Roadmap



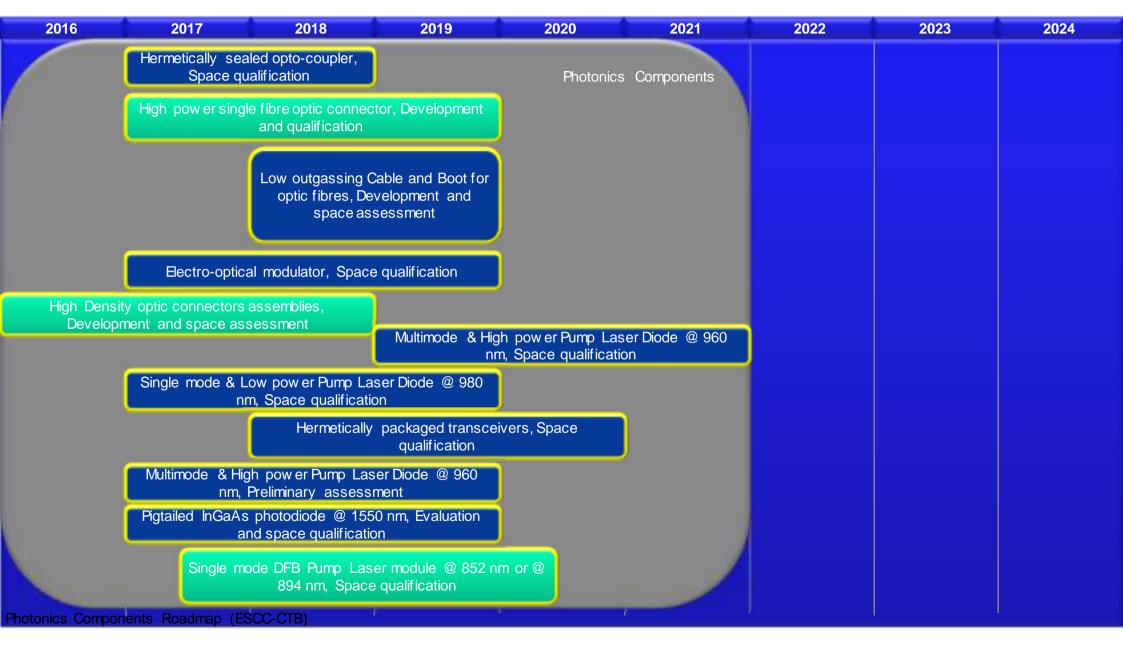


#### Photonics detectors roadmap

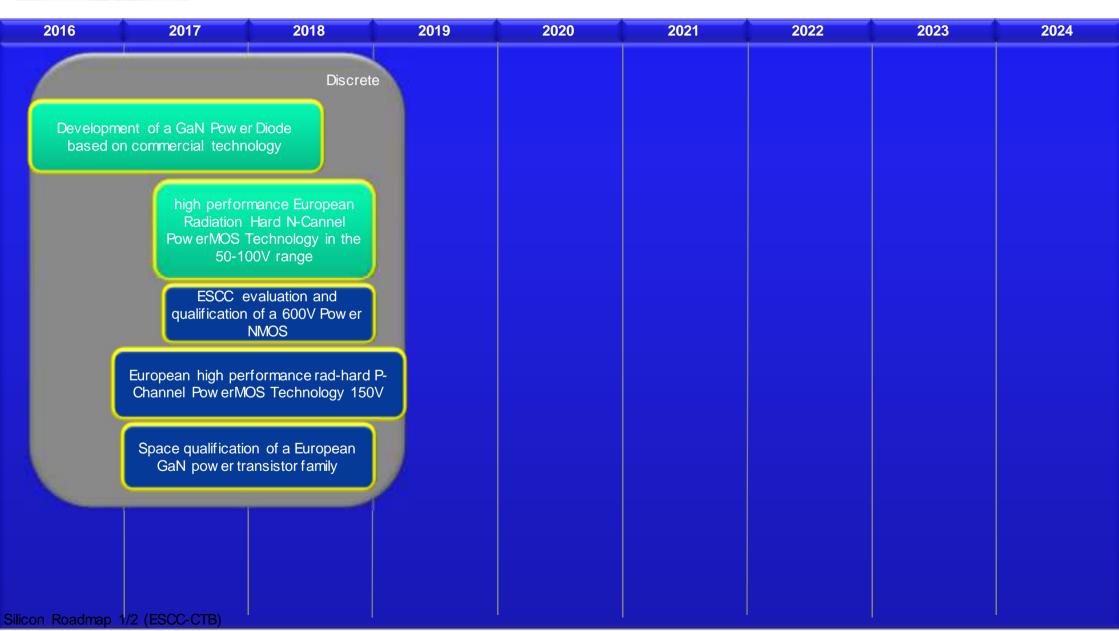




#### Photonics components roadmap

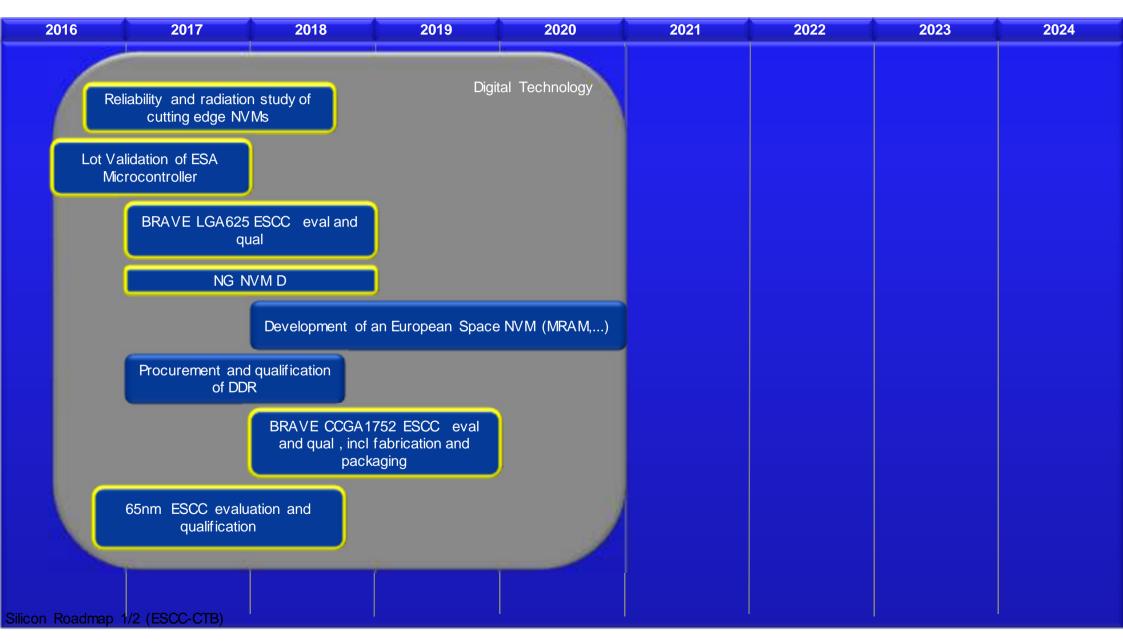


# Silicon roadmap 1/4



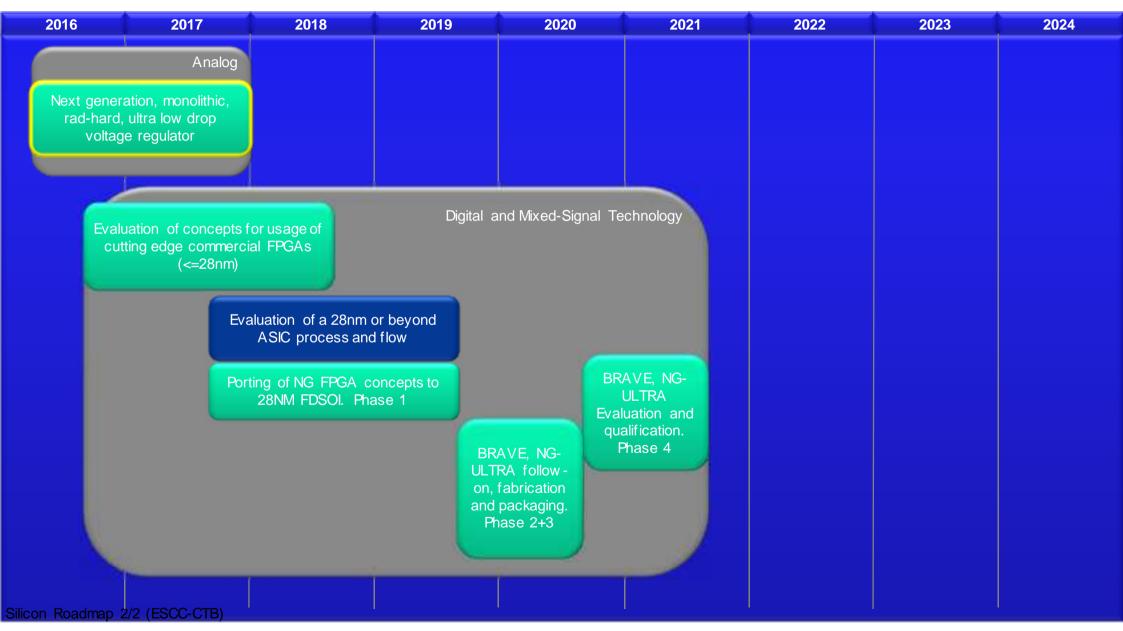


# Silicon roadmap 2/4











# Silicon roadmap 4/4

