



*D-band RAdio 5G netwOrk techNology*

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# D-band RAdio 5G netwOrk technology (DRAGON)

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VTT



Horizon 2020

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# DRAGON

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- Innovation project
- Duration: 3 years
- Starting date: 01.12.2020
- Coordinator: VTT
- Consortium: 13 partners from six countries:  
France, Finland, Italy, Austria, Spain and Turkey





# Vision



Nearly 10x wireless speed increase every 4 years. Extrapolating into the future, 100Gb/s will be required around 2020

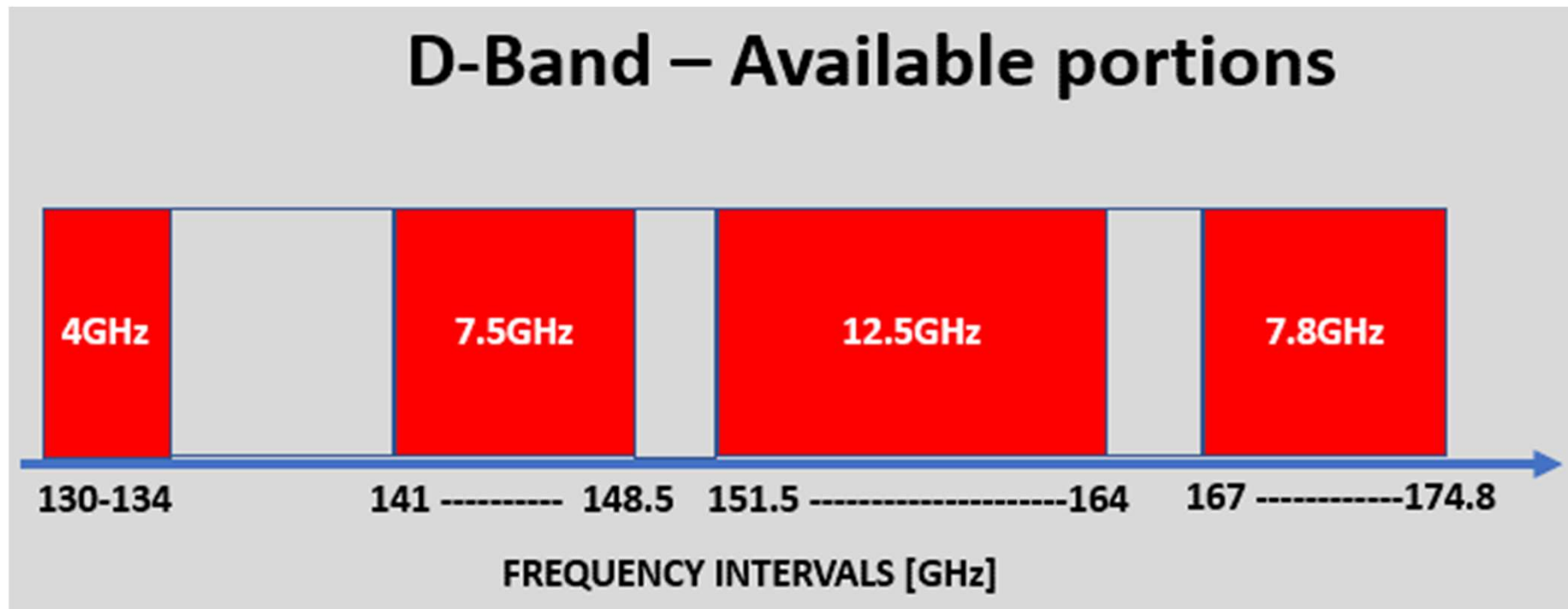
> 50% world population in dense urban areas responsible for the majority of wireless traffic

New network architectures required to address high density urban environment. Macro-, micro- and pico-cell coverage, complement each other and need high speed, flexible and low-cost wireless backhaul solutions

**DRAGON will reap the fruits of earlier R&D investments in mmW backhaul enabling technologies (H2020 DREAM project (01.09.17 - 28.02.21) <http://www.h2020-dream.eu> ) to demonstrate on field conditions a high-capacity D-band (130-174.8 GHz) wireless back/front haul solution able to address the needs of 5G transport network.**



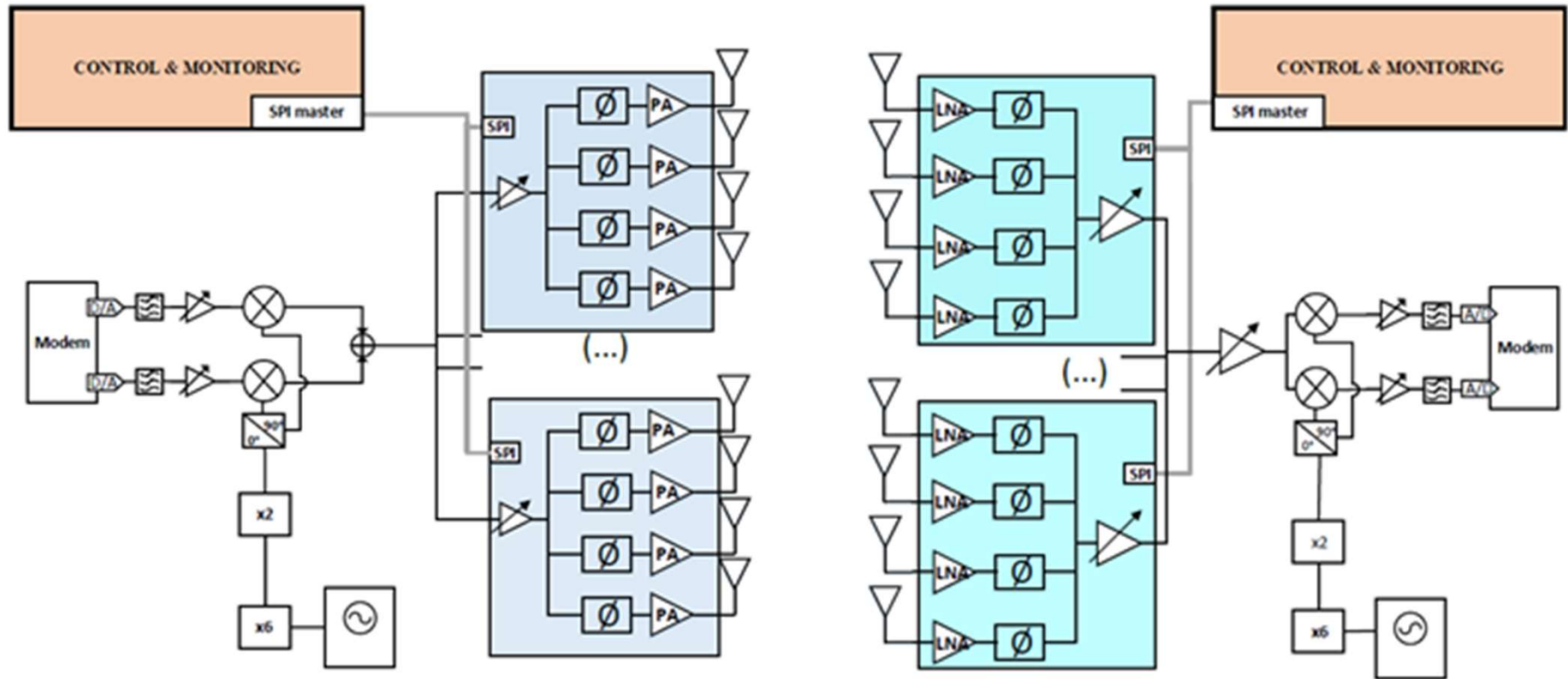
# Available portions of D-band for wireless communications (31.8 GHz is available)



ECC Recommendation (18)01 on “Radio frequency channel/block arrangements for Fixed Service systems operating in the bands 130-134 GHz, 141-148.5 GHz, 151.5-164 GHz and 167-174.8 GHz”.

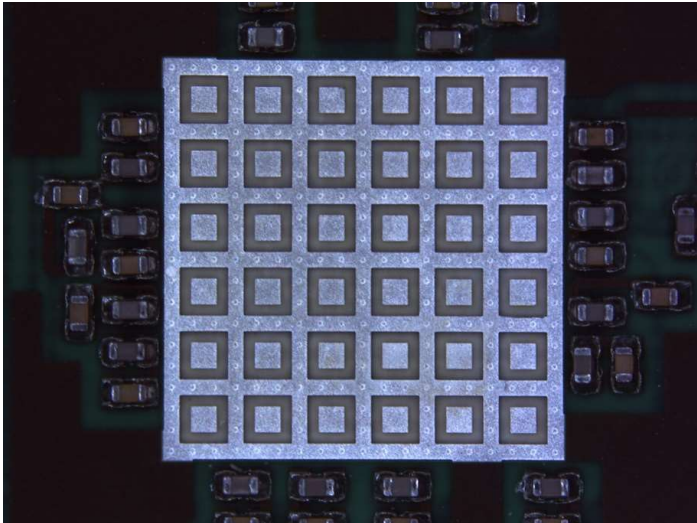


# DREAM architecture

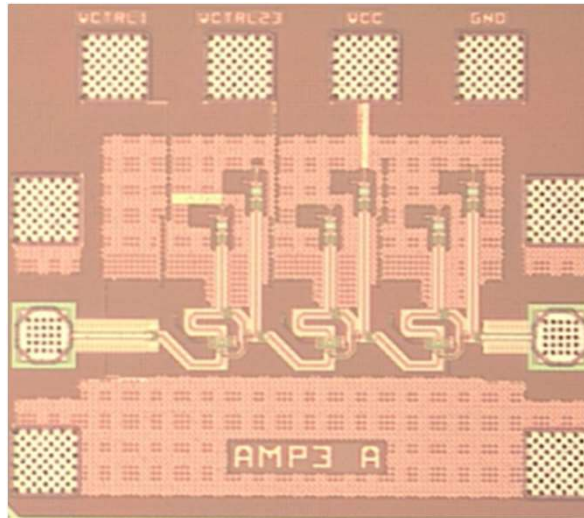




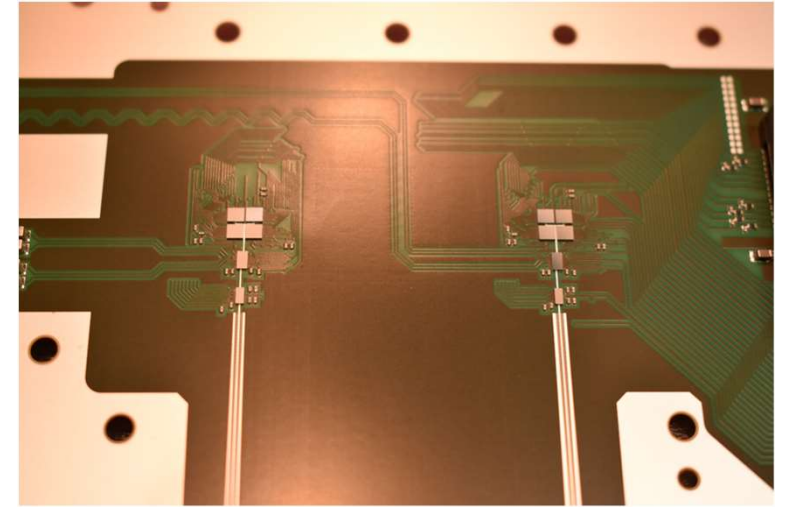
# DREAM technologies for DRAGON



D band active antenna arrays



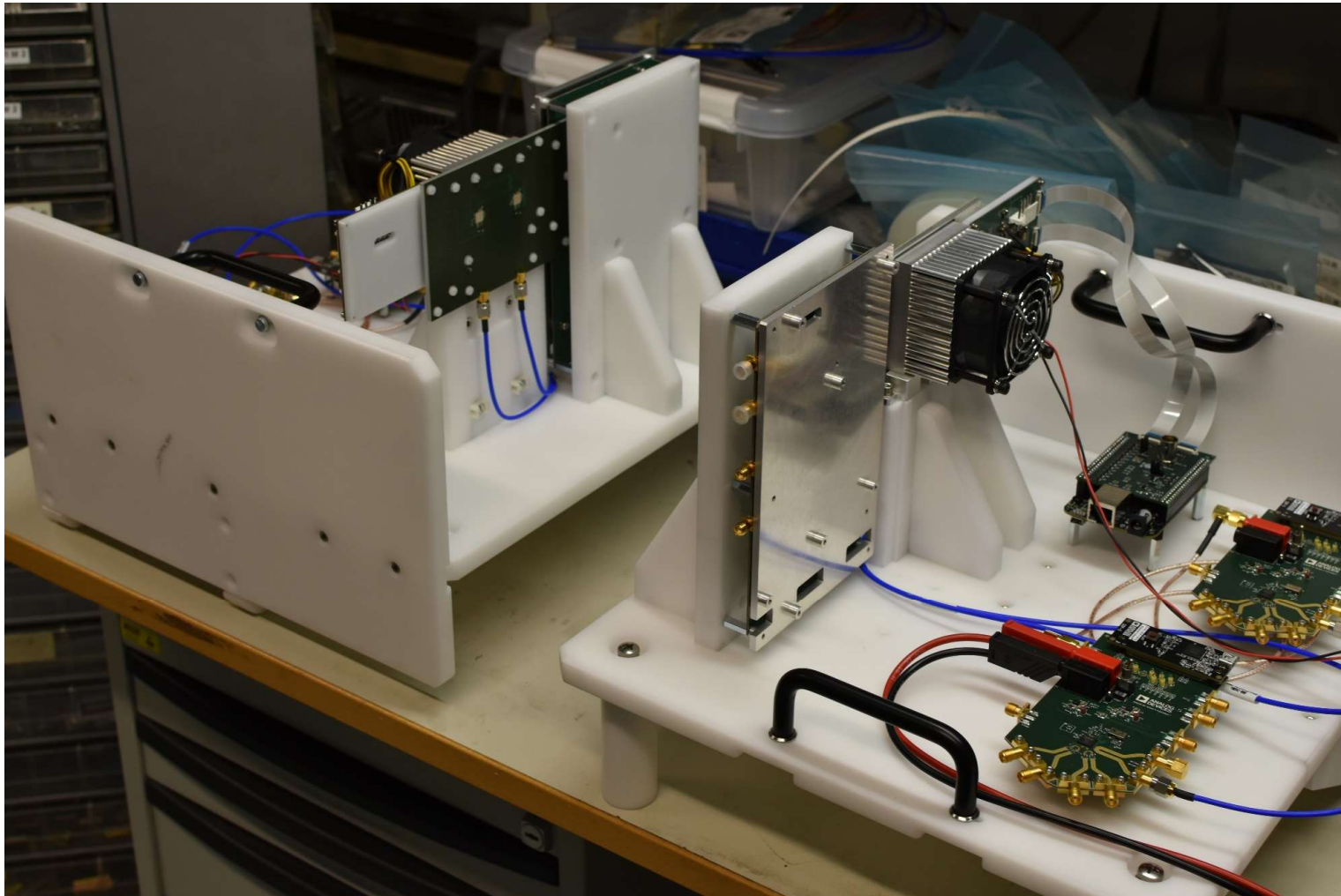
Highly integrated D-band transceiver analog front-end chip set in low-cost SiGe BiCMOS process



Low-cost integration technologies for D band radio systems based on advanced PCB technologies



# Demo of DREAM D band link



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# DRAGON objectives

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**On-field network demonstration of a wireless link at data rate up to 100 Gbs in D-band, based on:**

- low-cost SiGe BiCMOS transceiver analog front end derived from the chip set developed in the DREAM project;
- $\geq 1024$  element phased array active antenna;
- $\geq 256$ -QAM digital base band processor with Adaptive Modulation;
- Flexible Duplexing (fFDD), Full Duplexing (FD) and LoS-MIMO functionalities.



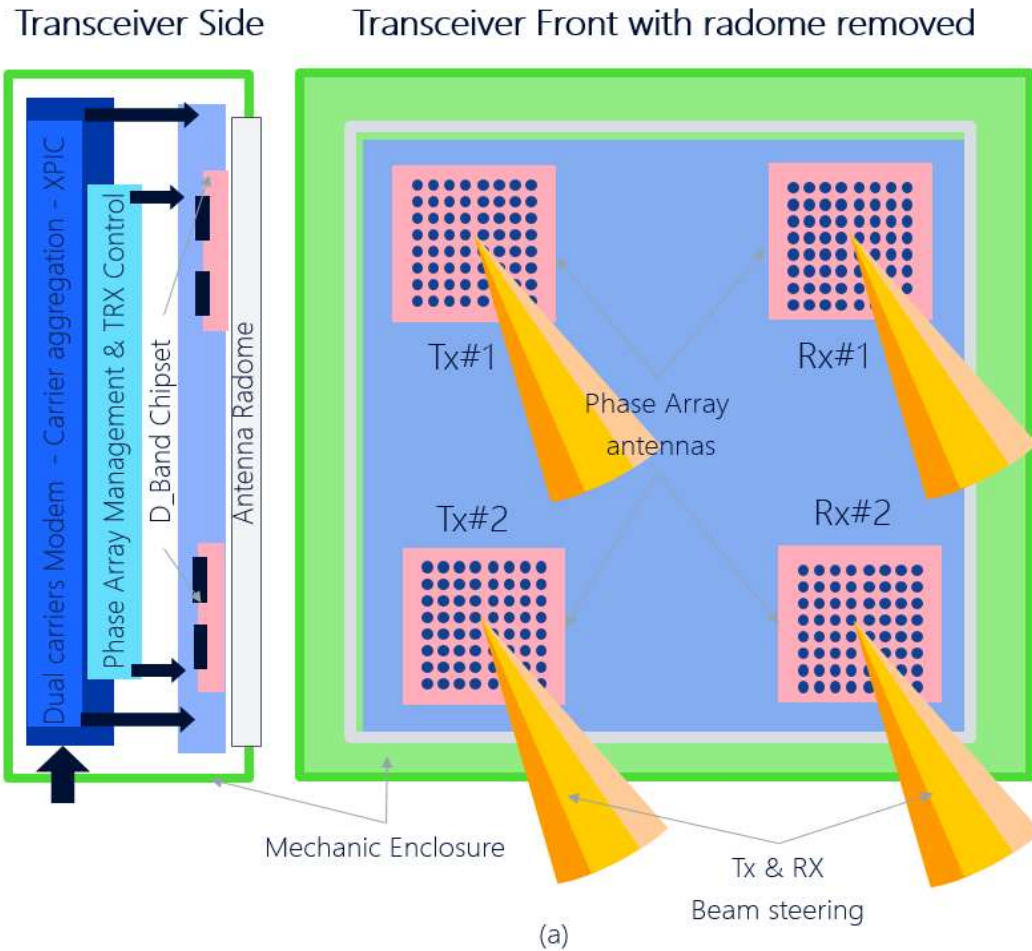


# DREAM & DRAGON

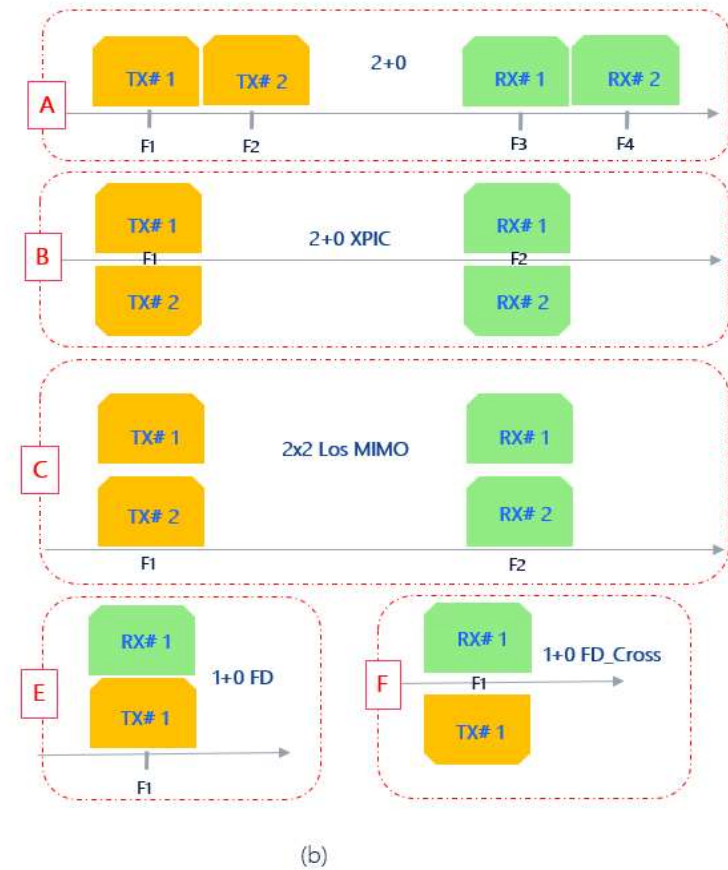
main features	DREAM	DRAGON
Active phased antenna array	✓	✓
Antenna element number	16	Up to 1024
Outdoor enclosure and Radome	-	✓
Antenna array processor	-	✓
Antenna numbers	2	4
Digital base band	-	✓
Modem	Out of the self	Advanced Dual carrier
Hop lengths	Up to 15m	> 1000m
ready for LoS MIMO	-	✓
Demonstrator	test lab	on field (5G network)



# D band transceiver with fine beam steering

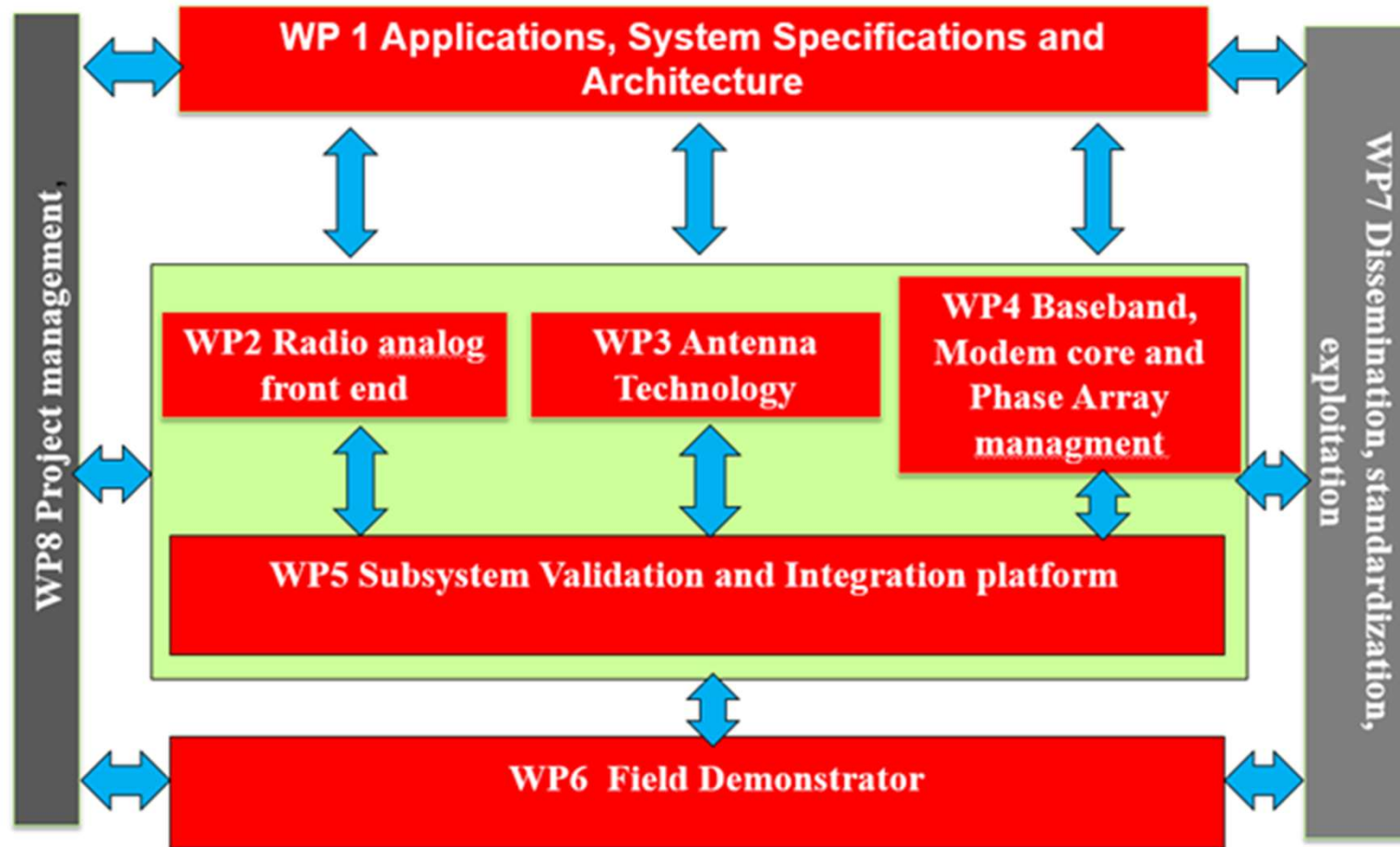


## Possible Frequency Planes





# Project Organization





# Partners

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<https://www.h2020-dragon.eu/>

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