



# **5G NR/ EN-DC Compliance Test Configurations**

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FCC

November 2019



# Overview

- 3GPP defines Multi-Radio Dual Connectivity (MR-DC) as a dual connectivity mode of operation that allows user equipment to utilize resources (connect) to two nodes with different radio access technology
- This presentation discusses scenarios when one of the nodes is a New Radio (NR) and the other is either NR or LTE (E-UTRA)
  - E-UTRA New Radio Dual Connectivity (EN-DC)
  - NR-NR DC



# Dual Connectivity

- Radio nodes may simultaneously transmit two technologies (LTE and NR)
- Additional combinations are introduced to the test configurations
  - For example, dual connectivity of LTE (1 DL/1UL) + one NR
  - FR2 always accompanied by LTE (Anchors)
    - All combinations defined in 3GPP TR 37.863
      - Not all combinations applicable to US operations
- Technologies may be subject to one or more rule parts!



# Dual Connectivity Test Configurations

- Test Frequencies
  - 3GPP compliant devices may follow 3GPP TR 38.508 recommendations to select low, mid and high channels
    - It covers operation in FR1, FR2 and EN-DC with NR operating in FR1 or FR2 (TS 36.508)
- Operating Bandwidth
  - All possible combinations of LTE and 5G NR shall be tested
- Modulation
  - Only worst case of each technology needs to be tested
- Other variables (RBs, SCS, etc.)
  - As applicable and available per technology



# Dual Connectivity General Guidance

- Simultaneous Transmission
  - RF Power
    - Total transmit power (in the applicable band) is subject to the limit defined by the rule part governing the band
    - In case of overlapping frequencies, MIMO rule may also apply!
  - OOB and Spurious Emission
    - Radiated Measurement- all transmitters must be transmitting
    - Conducted measurement- each port may be measured and summed (measure and sum) according to KDB Publication 662911
    - Band Edge- per applicable rule part
- In general, it is acceptable to determine worst case configuration of each technology and only include those worst cases in the combinations