**3GPP TSG-RAN WG4 Meeting # 111 R4-2410687**

**Fukuoka, Japan, May 20 – May 24, 2024**

**Agenda item:** 10.8.4

**Source:** CMCC

**Title:** WF on Rel-19 ATG UE requirements

**Document for:** Approval

# Introduction

This document captures the agreements on Rel-19 ATG UE RF requirements in RAN4#110bis meeting. The way forward in RAN4#110bis meeting is R4-2406594.

# R19 UE RF requirements

## intra-band contiguous CA

**Issue 2-1-1: BCS for DL CA\_n79C**

Agreement:

* Reuse the existing BCS table for ATG
* Clarify that uplink CA is not supported for ATG UE elsewhere for Rel-19
* FFS on whether BCS#4 and #5 are not supported for ATG UE for Rel-19

**Issue 2-1-2: whether/how to reflect operation band information in spec**

Agreement:

* The information that only DL CA is supported in Rel-19 for ATG can be reflected in the clause of operating band for ATG

**Issue 2-2: ATG Rx requirements applicability**

Agreement:

* Following requirements needs to be updated for ATG CA compared with TN CA.
  + Max input level
  + ACS testing case 2
* Following requirements can reuse legacy TN CA requirements
  + Blocking including in-band and out of band blocking, narrow-band blocking
  + REFSENSE
  + Spurious response
  + Intermodulation
* Following requirement is not applicable for ATG CA
  + No CA Rx Spurious emission
  + No CA narrow-band blocking
* Following single carrier requirement of ATG is enough and no need to define ATG CA specific requirements
  + diversity characteristics requirement

**Issue 2-3: max input level**

Agreement:

Table 3: Maximum input level for ATG with CA\_n79C

|  |  |  |  |
| --- | --- | --- | --- |
| Rx Parameter | Units | ATG UE Types | |
|  |  | Omni-directional antenna | Antenna array |
| Power in largest transmission bandwidth configuration CC, Plargest BW | dBm | -422 | -302 |
|  |  | -443 | -323 |
| Power in each other CC | dBm | Plargest BW +10\*log{(NRB,c\*SCSc)/(NRB,largest BW\*SCSlargest BW)} | |
| The applicable NR CA Bandwidth Class | MHz | **C** | |
| NOTE 1: The transmitter shall be set to 4 dB below PCMAX\_L,f,c at the minimum uplink configuration specified in Table 7.3.2-3 and 7.3F.2-3 for shared spectrum channel access operation with PCMAX\_L,f,c as defined in clause 6.2.4.  NOTE 2: Reference measurement channel is A.3.2.3 or A.3.3.3 for 64 QAM.  NOTE 3: Reference measurement channel is A.3.2.4 or A.3.3.4 for 256 QAM. | | | |

**Issue 2-4: ACS testing parameters for case 2**

Agreement:

* the principle of TN contiguous CA could be reused

## inter-band CA

**Issue 3-1: clarify the antenna type for each band for inter-band CA**

Agreement:

* No limitation on antenna types for ATG CA
* FFS on whether to assume omni-antenna type can be assumed for both band n3 and n39 in DL CA\_n3-n39
* FFS on whether new capability is needed for ATG CA

**Issue 3-2-1: whether to allow n39 UL for CA\_n3A-n39A**

Agreement:

* FFS on whether to allow n39 UL for CA\_n3A-n39A

**Issue 3-3: BCS for DL CA\_n3\_n39**

Agreement:

* FFS on BCS for DL CA\_n3\_n39

**Issue 3-4-1: ATG Rx requirements applicability**

Agreement:

* Following requirements needs further analysis:
  + delta RIB,
  + MSD,
  + Diversity requirements
    - FFS whether current ATG single carrier requirement is enough
* legacy inter-band CA requirements applies for following requirements while each CC shall meet the ATG UE requirement for single CC
  + REFSENSE
  + Max input level
  + ACS
  + in-band blocking
  + out of band blocking
    - FFS whether no OOB exception for CA\_n3A-n39A
  + spurious response
  + wide band intermodulation
  + spurious emissions
* Following requirements are not applicable
  + Narrow band blocking

## UL MIMO

**Issue 4-1-1: ULFPTx mode for UL-MIMO**

Agreement:

* FFS on whether ULFPTx mode for UL-MIMO is supported for ATG UE

**Issue 4-2-1: how to modify the NR UL MIMO requirement with ATG capability antennaArrayType-r18**

Agreement:

* if the legacy requirement for UL MIMO is defined as sum of measurements of all UE transmit antenna connectors, then for ATG UE with capability antennaArrayType-r18, the requirement should be defined as sum of all TAB connector including both polarization.
* If the legacy requirement for UL MIMO is defined as per antenna port or per layer, FFS

**Issue 4-2-2: maximum output power**

Agreement:

In principle agree on Option 1 and need refine the wording.

* Reuse the rated maximum output power reported by the ATG UE capability *maxOutputPowerATG-r18*, and consider the existing NR UL-MIMO requirement with some adaption in requirement description specific to ATG UE.
  + Detailed modification of NR UL MIMO requirement with ATG capability antennaArrayType is based on conclusion of issue 4-2-1

**Issue 4-2-3: configured transmitted power**

Agreement

* Configured transmitted power for UL MIMO is for each UE
* Reuse ATG single carrier tolerance requirement
* modify the NR UL MIMO requirement with ATG capability antennaArrayType-r18, detailed based on issue 4-2-1

**Issue 4-2-4: output power dynamic**

Agreement:

* Legacy NR UL MIMO requirements is baseline
  + modify the NR UL MIMO requirement with ATG capability antennaArrayType-r18, detailed based on issue 4-2-1

**Issue 4-2-5: transmit signal quality**

Agreement:

* Legacy NR UL MIMO requirements is baseline
  + modify the NR UL MIMO requirement with ATG capability antennaArrayType-r18, detailed based on issue 4-2-1

**Issue 4-2-6: whether to apply coherent UL MIMO requirement for ATG UE**

Agreement:

* FFS on whether to apply coherent UL MIMO requirement for ATG UE

**Issue 4-2-7: Output RF spectrum emissions**

Agreement:

* Legacy NR UL MIMO requirements is baseline
* modify the NR UL MIMO requirement with ATG capability antennaArrayType-r18, detailed based on issue 4-2-1

**Issue 4-3: receiver requirements**

Agreement:

* FFS on whether to have Rx requirements for UL-MIMO for ATG UE