**3GPP TSG RAN Meeting #104 RP-24xxxx**

Shanghai, China, June 17-20, 2024 (Revised from N/A)

**Source: Nokia**

**Title: New Rel-19 WID on DC of x bands LTE inter-band CA (x=3,4,5) and 1 NR band**

**Document for: Approval**

**Agenda Item: 9.1.5**

3GPP™ Work Item Description

Information on Work Items can be found at <http://www.3gpp.org/Work-Items>
See also the [3GPP Working Procedures](http://www.3gpp.org/specifications-groups/working-procedures), article 39 and the TSG Working Methods in [3GPP TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm)

# Title: Rel-18 WID on DC of x bands LTE inter-band CA (x=3,4,5) and 1 NR band

## Acronym: TBD

## Unique identifier: TBD

|  |  |
| --- | --- |
| **This WID includes a Core part** | **X** |
| **This WID includes a Performance part** |  |

## Potential target Release: Rel-19

## 1 Impacts

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Affects:** | UICC apps | ME | AN | CN | Others (specify) |
| **Yes** |  | X |  |  |  |
| **No** | X |  | X | X | X |
| **Don't know** |  |  |  |  |  |

## 2 Classification of the Work Item and linked work items

### 2.1 Primary classification

This work item is a …

|  |  |
| --- | --- |
|  | Feature |
| X | Building Block |
|  | *Work Task* |
|  | Study Item |

### 2.2 Parent Work Item

|  |
| --- |
| Parent Work / Study Items  |
| Acronym | Working Group | Unique ID | Title (as in 3GPP Work Plan) |
| TBD | RAN4 | TBD | Rel-19 WID on DC of x bands LTE inter-band CA (x=3,4,5) and 1 NR band |

### 2.3 Other related Work Items and dependencies

*{List here other Work Items which relate to the proposed one, such as preceding SI or a preceding WI (e.g. if further enhancing a feature).}*

|  |
| --- |
| Other related Work Items (if any) |
| Unique ID | Title | Nature of relationship |
| TBD | Core part: Rel-18 WID on DC of x bands LTE inter-band CA (x=3,4,5) and 1 NR band | Child WID |
|  |  |  |

## 3 Justification

All new EN-DC and NE-DC configurations consisting of 4, 5 or 6 different bands DL with 2 different bands UL (3, 4 or 5 different LTE bands and 1 NR band) will be defined under this WI. New configurations still emerge from exiting bands and whenever new band is specified, it will create a potential for several new EN-DC and NE-DC configurations consisting of 4, 5 or 6 different bands DL with 2 different bands UL (3, 4 or 5 different LTE bands and 1 NR band).

The EN-DC and NE-DC configurations will be introduced in a release independent manner from Rel-15 based on TS 38.307. However, this requires no changes to TS 38.307.

The preconditions to introduce configurations of 4, 5 or 6 different bands DL with 2 different bands UL (3, 4 or 5 different LTE bands and 1 NR band) to Rel-18 specification is that the needed DL fallbacks and UL configurations have been completed which can be summarized as follows.

* Constituent LTE inter band CA including intra band CA for 3, 4 or 5 different bands DL with 1 band UL shall be completed and specified in advance (i.e all DL fallbacks).
* Each of the four paired EN-DC configurations of 1 LTE band including intra band CA + 1 NR band used in a certain 4, 5 or 6 different bands DL with 2 different bands UL shall be completed and specified in advance (i.e all UL configurations).

Example 1: If the following configurations is proposed as a 5 different bands DL with 2 bands UL,

|  |  |
| --- | --- |
| Downlink DC configuration | Uplink DC configuration |
| EN-DC\_1A-2A-3A-4A\_n5A | DC\_1A\_n5ADC\_2A\_n5ADC\_3A\_n5ADC\_4A\_n5A |

* LTE CA of CA\_1A-2A-3A-4A shall be completed and specified in advance.
* EN-DC of DC\_1A-2A-3A\_n5A, DC\_1A-2A-4A\_n5A, DC\_1A-3A-4A\_n5A, DC\_2A-3A-4A\_n5A shall be completed and specified in advance.
* EN-DC of DC\_1A\_n5A, DC\_2A\_n5A, DC\_3A\_n5A and DC\_4A\_n5A shall be completed and specified in advance.

Example 2: If the following configurations is proposed,

|  |  |
| --- | --- |
| Downlink DC configuration | Uplink DC configuration |
| NE-DC\_n5A\_1A-2A-3A-4A | DC\_n5A\_1ADC\_n5A\_2ADC\_n5A\_3ADC\_n5A\_4A |

* The corresponding EN-DC combination (i.e. EN-DC\_1A-2A-3A-4A\_n5A) shall be completed and specified in advance.
* NE-DC of DC\_n5A\_1A, DC\_n5A\_2A, DC\_n5A\_3A and DC\_n5A\_4A shall be completed and specified in advance.

Example 3: If the following configurations is proposed,

|  |  |
| --- | --- |
| Downlink DC configuration | Uplink DC configuration |
| EN-DC\_1C-2A-3A-4A\_n5C | DC\_1C\_n5CDC\_2A\_n5C |

* LTE CA of DL\_CA\_1C-2A-3A-4A\_UL\_CA\_1C shall be completed and specified in advance.
* EN-DC of DC\_1C\_n5C and DC\_2A\_n5C shall be completed and specified in advance.

**Request for additions of band combinations to this WI shall be provided using an agreed template and sent to the 3GPP\_TSG\_RAN\_WG4\_NR\_BANDS email reflector before a RAN4 Tdoc submission deadline and no new band combinations are allowed to be requested after the deadline except to correct the missing fallback and add more supporting companies for the proposed band combinations.**

**When a proponent requests a new band combination, all the next level fallback configurations shall be listed and recorded in the request template and the status (“New”, “Ongoing”, “Completed”) of all the fallback configurations shall be declared accurately and clearly. For “New” fallback configurations, the proponent shall ensure these fallback configurations are also requested together with the higher order band combination in the same meeting.**

**A band combination configuration can only be considered as completed when all of the fallback configurations are completed and specified in advance or at the same meeting. It is the responsibility of the proponent to ensure the status of all of the fallback mode configurations. Rapporteurs and other companies are encouraged to check the status of all of the fallback configurations once the higher order band combinations are declared as completed.**

## 4 Objective

### 4.1 Objective of SI or Core part WI or Testing part WI

* Specify the band-combination specific RF requirements for all listed EN-DC configurations consisting of 4, 5 or 6 different bands DL with 2 different bands UL (3, 4 or 5 different LTE bands and 1 NR band) including at least
	+ Applicable frequencies if necessary
	+ Applicable bandwidths and bandwidth sets if necessary
* Analyze combinations that have self-desensitization due to following reasons:
	+ TX Harmonic and/or intermodulation overlap of receive band
	+ TX signal overlap of receiver harmonic frequency
	+ TX frequency being in close proximity of one of the receive bands
	+ Any other identified reasons such that insufficient cross band isolation, harmonic mixing
* For the combination where self-desensitization exists, specify at least needed
	+ ∆TIB, c and ∆RIB, c
	+ Reference sensitivity exceptions including MSD test cases
* Add conformance testing in RAN5 specifications (to follow at a later stage)

of all REL-18 EN-DC configurations consisting of 4, 5 or 6 different bands DL with 2 different bands UL (3, 4 or 5 different LTE bands and 1 NR band) that fall into the category defined by the WI title.

**An overview of these EN-DC and NE-DC configurations is provided in the appended Excel sheet.**

### 4.2 Objective of Performance part WI

* None

## 5 Expected Output and Time scale

|  |
| --- |
| **New specifications** *{One line per specification. Create/delete lines as needed}* |
| Type  | TS/TR number | Title | For info at TSG#  | For approval at TSG# | Rapporteur |
|  |  |  |  |  |  |

|  |
| --- |
| **Impacted existing TS/TR** *{One line per specification. Create/delete lines as needed}* |
| TS/TR No. | Description of change  | Target completion plenary# | Remarks |
| *TS 38.101-3* | Add new DC band combinations and related RF core requirements | *RAN#109* | Core part |
|  |  |  |  |

## 6 Work item Rapporteur(s)

Johannes Hejselbaek, Nokia, johannes.hejselbaek@nokia.com

## 7 Work item leadership

*RAN WG4*

## 8 Aspects that involve other WGs

 *None*

## 9 Supporting Individual Members

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| --- |
| Supporting IM name |
| Nokia |
| [Samsung] |
| [Ericsson] |
| [CHTTL] |
| [ZTE] |
| [Huawei] |
| [HiSilicon] |
| [CATT] |
| [OPPO] |
| [vivo] |
| [Telecom Italia] |
| [SoftBank Corp.] |
| [Dish Network] |
| [AT&T] |
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