**3GPP TSG RAN5 Meeting #92-e Draft-R5-215765**

**Electronic Meeting, August 16 – 27, 2021**

**3GPP TSG RAN Meeting #93-e RP-21xxxx**

**Electronic Meeting, Sep 13 - 17, 2021**

**Source: Nokia, Apple Portugal**

**Title: Revised WID - UE Conformance Test Aspects for NR RF Requirement Enhancements for FR2**

**Document for: Endorsement**

**Agenda Item: 4.1**

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: UE Conformance Test Aspects for NR RF Requirement Enhancements for FR2

## Acronym: NR\_RF\_FR2\_req\_enh-UEConTest

## Unique identifier:

|  |  |  |
| --- | --- | --- |
| **This WID includes a Testing part** | | **X** |
| **and it addresses the following 3GPP work area:** | **Radio Access** | **X** |
| **Core Network** |  |
| **Services** |  |

Potential target Release: Rel-16.

## 1 Impacts

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Affects:** | UICC apps | ME | AN | CN | Others (specify) |
| **Yes** |  |  |  |  |  |
| **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) |
| NR\_RF\_FR2\_req\_enh | R4 | 830089 | NR RF requirement enhancements for frequency range 2 (FR2) |
| NR\_RF\_FR2\_req\_enh-Core | R4 | 830189 | Core part: NR RF requirement enhancements for FR2 |
| NR\_RF\_FR2\_req\_enh-Perf | R4 | 850073 | Perf. part: NR RF requirement enhancements for FR2 |

### 2.3 Other related Work Items and dependencies

|  |  |  |
| --- | --- | --- |
| Other related Work Items (if any) | | |
| Unique ID | Title | Nature of relationship |
|  |  |  |

## 3 Justification

RAN4 decided to postpone number of requirements for the basic Rel-15 NR features to Rel-16. For ensuring that these basic NR features and functionalities perform as intended, it is important to develop the UE RF requirements for FR2.

During WI (830089) “NR RF requirement enhancements for FR2” the following enhancements were introduced.

1. Beam correspondence: Requirements for SSB-based and CSI-RS based BC were developed. This allows network to efficiently deploy different beam widths for SSB and CSI-RS. This enables e.g. to deploy wider SSB based beams for idle mode UEs and narrower CSI-RS based beams for RRC connected mode UEs.
2. Inter-band DL CA: Requirements were developed for band combination CA\_n260-n261 based on independent beam management.
3. DL Intra-band CA BW Enhancement: New frequency separation classes Fs were introduced for up to 2400 MHz separation. Furthermore, frequency separation classes for DL-only spectrum Fsd were introduced. The DL-only frequency spectrum is the width of UE frequency spectrum available to network to configure DL CCs only, and it extends on one-side of the bidirectional spectrum in contiguous manner with no frequency gap between the two.
4. Non-contiguous intra-band uplink CA: Requirements were developed for n260 for up to three uplink sub-blocks.
5. MPR enhancements: Zero dB MPR range was extended to cover more allocations.
6. Output power boost when in-band emissions are suspended: 1 dB boost was introduced for QPSK modulation.
7. Multiband relaxation framework enhancement: Based on RAN5 LS MBR framework was modified. REL15 retains original MBR concept but introduced a relaxation cap. REL16 adopted new concept where relaxation defined per band basis.

Until RAN#90e, the core part of Rel-16 WI ‘NR RF requirement enhancements for FR2 ’ is 100% completed, and the performance part is 100% completed. It is justified to now start the work on the corresponding UE conformance test specifications in 3GPP RAN WG5 to meet the market requirements in time.

## 4 Objective

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

The objective of this work item is to define the UE conformance requirements corresponding to WID (830089) on NR RF requirement enhancements for FR2. This work item will cover RF conformance test specifications for NR RF requirement enhancements for FR2.

## 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# | Remarks |
|  |  |  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Impacted existing TS/TR** *{One line per specification. Create/delete lines as needed}* | | | |
| TS/TR No. | Description of change | Target completion plenary# | Remarks |
| TS 38.508-1 | Definition of common environment for FR2 enhancements. | TSG RAN#96  (Jun-22) |  |
| TS 38.508-2 | Introduction of physical implementation capabilities for FR2 enhancements. | TSG RAN#96  (Jun-22) |  |
| TS 38.521-2 | Introduction of RF requirements for FR2 enhancements. | TSG RAN#96  (Jun-22) |  |
| TS 38.521-3 | Introduction of RF requirements for EN-DC FR2 enhancements. | TSG RAN#96  (Jun-22) |  |
| TS 38.522 | Introduction of test applicability for FR2 enhancements. | TSG RAN#96  (Jun-22) |  |
| TR 38.903 | Derivation of test tolerances and measurement uncertainty for UE conformance test cases for FR2 enhancements. | TSG RAN#96  (Jun-22) |  |
| TR 38.905 | Derivation of test points for FR2 enhancements in radio transmission and reception UE conformance test cases. | TSG RAN#96  (Jun-22) |  |
|  |  |  |  |
|  |  |  |  |

## 6 Work item Rapporteur(s)

Säynäjäkangas, Tuomo (Nokia)

[tuomo.saynajakangas@nokia.com](mailto:tuomo.saynajakangas@nokia.com)

Mohan, Ashwin (Apple)

[ashwin\_mohan@apple.com](mailto:ashwin_mohan@apple.com)

## 7 Work item leadership

RAN5

## 8 Aspects that involve other WGs

None

## 9 Supporting Individual Members

|  |
| --- |
| Supporting IM name |
| Nokia |
| Nokia Shanghai Bell |
| Apple |
| AT&T |
| China Telecom |
| DISH Network |
| Ericsson |
| Fraunhofer |
| Huawei |
| HiSilicon |
| NTT DOCOMO |
| Orange |
| Rohde & Schwarz |
| T-Mobile USA |
| Verizon |
| ZTE |