**3GPP TSG RAN Meeting #102 RP-23xxxx**

**Edinburgh, Scotland, December 11-15, 2023**

## Status Report to TSG

**Agenda item:** 9.4.3.7

|  |  |
| --- | --- |
| **WI / SI Name** |  |
| included in this status report | Study Item: No | Core part: Yes | Performance part:Yes | Testing part:No |
| **Acronym** | NR\_700800900\_combo\_en |
| **Unique ID** | 991046 |
| **TSG Tdoc of latest approved WI/SI description (if any)** | RP-231450 |
| **Target Completion Date****(indicate if changed)** | Study Item:  | Core part: Dec/2023 | Performance part:  | Testing part:  |
| **Overall Completion level** | Study Item:  | Core part: 100% | Performance Part:  | Testing part:  |

Note: Overall completion level percentage numbers should use one of the colors below:

* xx%: Normal progress, no RAN plenary action needed
* xx%: Progress behind schedule, may need RAN plenary intervention. If so, SR should clearly define requested action
* xx%: Progress critically behind, RAN plenary shall intervene. SR should define requested action

**Source:**

|  |  |
| --- | --- |
| **Leading WG** | RAN4 |
| **Rapporteur** | **Name** | Shan Huiping |
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## 1 Work plan related evaluation

|  |  |
| --- | --- |
| **Do you want to modify the time budget for this WI/SI compared to what was endorsed at the last RAN meeting?** | No |

*If you answered No: Then please remove the Excel file from the zip file of this status report.*

*If you answered Yes: Then please fill out the attached Excel template to request a modification of the time budgets for your WI /SI. The Excel table has to be filled out for all affected RAN WGs and up to the target date of the WI/SI. The basis are the endorsed time budgets of the last RAN meeting. Please highlight all changes of the values.
 One time unit (TU) corresponds to ~ 2 hours in the meeting.
 If this status report covers a WI with Core and Performance part, then please have one line for each in the attached Excel table.
 Note: If no Excel table is attached, then this means no time budget change.*

**Additional explanations/motivations for the time budget changes in the attached Excel table:**

## 2. Detailed progress in RAN WGs since last TSG meeting (for all involved WGs)

## 2.1 RAN1

#### 2.1.1 Agreements

#### 2.1.2 Remaining Open issues

## 2.2 RAN2

#### 2.2.1 Agreements

#### 2.2.2 Remaining Open issues

## 2.3 RAN3

#### 2.3.1 Agreements

#### 2.3.2 Remaining Open issues

## 2.4 RAN4

#### 2.4.1 Agreements

**RAN4#108bis meeting (Oct. 2023)**

R4-2317790 Draft TS 38.101-1 big CR for NR\_700800900\_combo\_enh

[R4-2317587](file:///D%3A%5CRAN4%23108bis%5CDocs%5CR4-2317587.zip) Draft CR to TS38.101-1[R18] to add CA\_n5-n8

[R4-2316209](file:///D%3A%5CRAN4%23108bis%5CDocs%5CR4-2316209.zip) Draft CR for 38.101-1 to introduce CA\_n5-n105

[R4-2316210](file:///D%3A%5CRAN4%23108bis%5CDocs%5CR4-2316210.zip) Draft CR for 38.101-1 to introduce CA\_n28-n105

[R4-2317588](file:///D%3A%5CRAN4%23108bis%5CDocs%5CR4-2317588.zip) Draft CR to TS38.101-1R18 to add CA\_n26-n28 and CA\_n5-n28

[R4-2317589](file:///D%3A%5CRAN4%23108bis%5CDocs%5CR4-2317589.zip) WF on NR\_700800900\_combo\_enh

**CA\_ n26(2A)**

**Issue 1-1: Baseline RF architecture**

* Assume dual PA architecture only.

**Issue 1-2: Current MPR applicability for UL CA\_n26(2A)**

* Current 2PA MPR requirements can apply for UL CA\_n26(2A)

**Issue 1-3: NS\_12/ 13/ 14/ 15, NS\_100 applicability for UL CA\_n26(2A)**

* The following idea is the guideline for the discussion in next meeting.
* Define the CA NC NS\_12/13/14/15/100 with relaxed values for AMPR

UE is allowed to apply any backoff to meet emission requirements

**Issue 1-4: Coexistence requirements with neighboring bands**

* Companies are encouraged to study how to meet this requirement for UL NC CA.
* Max Channel BW per CC for this BCS is 15MHz

**Issue 1-5: MSD test points and value**

* The general approach/framework for 2UL/2DL FDD NC CA MSD will be discussed.
* The format in the following table can be considered as a starting point.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **CA configuration** | **PCC/SCC Bandwidth****(MHz)** | **PCC UL Fc (MHz)** | **SCC UL Fc (MHz)** | **UL PCC allocation****(LCRB)** | **UL SCC allocation****(LCRB)** | **PCC DL Fc (MHz)** | **SCC DL Fc (MHz)** | **PCC ΔRIBC (dB)** | **SCC ΔRIBC (dB)** | **Duplex mode** |
| CA\_n26(2A) | 5/5 | 816.5  | 839 | 12 (RBSTART = [0]) | 12(RBSTART = [3]) | 861.5  | 884 | TBD | TBD | FDD |

* The following principles can be considered and further discussed for the MSD requirement.
	+ - Channel allocation is 5MHz+5MHz
		- 15kHz SCS
		- Total of equally distributed RB is equivalent to the 10MHz UL configuration
		- PCC DL channel overlaps with the lowest order IMD product of the two CCs
		- RB start of each CC can be adjusted to better center the IMD product.

**CA\_ n5-n8**

**Issue 2-1: How to handle the outputs for 2U/2D CA\_n5-n8 in this WI**

* All the output of study about 2UL/2DL CA for CA\_n5-n8 can be captured in the TR 38.872 for future reference.

**Issue 2-2: How to add the UL restriction in 38.101 spec**

* The draft CR R4-2317587 focuses on the wording of the note and the RF requirements.
* If any new approach is agreed for the UL restriction note, it can be fixed later.

**CA\_n5-n28-n105**

**Issue 3-2: Tib/Rib and MSD for CA\_n5-n28-n105**

* The following Tib/Rib are agreed

**Table 7 ΔTIB,c and ΔRIB,c for CA\_n5-n28-n105**

|  |  |  |  |
| --- | --- | --- | --- |
| **Inter-band CA Configuration** | **NR Band** | **ΔTIB,c [dB]** | **ΔRIB,c [dB]** |
| CA\_n5A-n28A-n105A | n5 | 0.7 | 0.2 |
| n28 | 1.0 | 0.7 |
| n105 | 1.0 | 0.7 |

* The following MSD table can be a starting point for next meeting’s discussion

|  |  |
| --- | --- |
| Band / Channel bandwidth / NRB / Duplex mode | Source of IMD |
| NR CA band combination | NR band | UL Fc (MHz) | UL/DL BW (MHz) | UL CLRB | DL Fc (MHz) | MSD (dB) | Duplex mode |  |
| CA\_n5-n28-n105 | n5 | 845 | 5 | 25 | 890 | N/A | FDD | N/A |
|  | n28 | 740 | 5 | 25 | 795 | N/A | FDD | N/A |
|  | n105 | 686 | 5 | 25 | 635 | [22.9] | FDD | IMD3 |

**CA\_ n26-n28**

**Issue 5-1: Requirements related to the protection of the band 28/n28**

* The agreement is captured in the draft CR R4-2317588.

**RAN4#109 meeting (Nov. 2023)**

R4-2318464 Draft CR 38.101-1 to add DTV protection requirements for CA\_n5-n28 and CA\_n26-n28

R4-2321680 CR for capturing the output for 2UL/2DL CA\_n5-n8

R4-2321682 Draft CR for 38.101-1 to introduce UL CA\_n26(2A)

R4-2321681 Draft CR for 38.101-1 to introduce CA\_n5-n28-n105

R4-2319889 Draft CR for 38.101-1 to introduce CA\_n8-n20-n28

R4-2321679 TS 38.101-1 big CR for NR\_700800900\_combo\_enh

#### 2.4.2 Remaining Open issues

No open issues.

## 2.5 RAN5

#### 2.5.1 Agreements

#### 2.5.2 Remaining Open issues

#### 2.5.3 Remaining Open issues with cross-WG dependencies

## 2.6 RAN6

#### 2.6.1 Agreements

#### 2.6.2 Remaining Open issues

## 3. Detailed progress in SA/CT WGs since last TSG meeting (for all involved WGs)

## 3.1 SAx/CTs

#### 3.1.1 Agreements with cross-TSG impacts

#### 3.1.2 Remaining Open issues with cross-TSG impacts

## 4. References

**RAN4#108bis meeting**

R4-2315203 On CA\_n26(2A) ULCA Skyworks Solutions Inc.

R4-2315389 MSD analysis for UL CA\_n26(2A) Apple

R4-2315821 Draft CR for TS 38.101-1 on introduction of CA\_n28-n105 vivo

R4-2315822 Further discussion on CA\_n5-n8 vivo

R4-2315919 On CA\_n26-n28 Skyworks Solutions Inc.

R4-2316206 Discussion on RF requirements for CA\_n26(2A) Huawei, HiSilicon

R4-2316207 Draft CR for 38.101-1 to introduce CA\_n5-n8 Huawei, HiSilicon

R4-2316208 Draft CR for 38.101-1 to introduce CA\_n26-n28 Huawei, HiSilicon

R4-2316209 Draft CR for 38.101-1 to introduce CA\_n5-n105 Huawei, HiSilicon, Spark NZ

R4-2316210 Draft CR for 38.101-1 to introduce CA\_n28-n105 Huawei, HiSilicon, Spark NZ

R4-2316211 Discussion on RF requirements for CA\_n5-n28-n105 Huawei, HiSilicon, Spark NZ

R4-2317236 Topic summary for [108-bis][112] NR\_700800900\_combo\_enh Moderator (CATT)

R4-2317573 Considerations for UL CA\_n26(2A) Qualcomm France

R4-2317587 Draft CR to TS38.101-1[R18] to add CA\_n5-n8 ZTE Corporation

R4-2317588 Draft CR to TS38.101-1R18 to add CA\_n26-n28 and CA\_n5-n28 Skyworks Solutions Inc.., Huawei, ZTE

R4-2317589 WF on NR\_700800900\_combo\_enh CATT

**RAN4#109 meeting**

R4-2318121 Topic summary for [109][115] NR\_700800900\_combo\_enh Moderator (CATT)

R4-2318313 Discussion on the release independent for WI NR\_700800900\_combo\_enh CATT

R4-2318314 Release independent CR for NR\_700800900\_combo\_enh CATT

R4-2318419 MSD analysis for CA\_n5-n28-n105 Apple

R4-2318434 MSD analysis for UL CA\_n26(2A) Apple

R4-2318463 Adding DTV protection requirements for n5-n28 and n26-n28 NTT DOCOMO, INC., KDDI Corporation

[R4-2318464](file:///D%3A%5CRAN4%23109%5CDocs%5CR4-2318464.zip) Draft CR 38.101-1 to add DTV protection requirements for CA\_n5-n28 and CA\_n26-n28

[R4-2321680](file:///D%3A%5CRAN4%23109%5CDocs%5CR4-2321680.zip) CR for capturing the output for 2UL/2DL CA\_n5-n8

R4-2319885 Discussion on RF requirements for CA\_n26(2A) Huawei, HiSilicon

[R4-2321682](file:///D%3A%5CRAN4%23109%5CDocs%5CR4-2321682.zip) Draft CR for 38.101-1 to introduce UL CA\_n26(2A)

R4-2319887 Discussion on RF requirements for CA\_n5-n28-n105 Huawei, HiSilicon, Spark NZ

[R4-2321681](file:///D%3A%5CRAN4%23109%5CDocs%5CR4-2321681.zip) Draft CR for 38.101-1 to introduce CA\_n5-n28-n105

R4-2319889 Draft CR for 38.101-1 to introduce CA\_n8-n20-n28 Huawei, HiSilicon

R4-2320242 MSD for CA\_n5A-n28A-n105A Qualcomm France

R4-2320244 Considerations for UL CA\_n26(2A) Qualcomm France

R4-2320799 CA\_n26(2A) Murata Manufacturing Co Ltd.

R4-2320997 CA\_n26(2A) MSD Skyworks Solutions Inc.

[R4-2321679](file:///D%3A%5CRAN4%23109%5CDocs%5CR4-2321679.zip) TS 38.101-1 big CR for NR\_700800900\_combo\_enh CATT, China Telecom

 02.08.2023 minor adaptations for RAN #101

 26.04.2023 minor adaptations for RAN #100

 01.02.2023 minor adaptations for RAN #99

 27.10.2022 minor adaptations for RAN #98e

 01.08.2022 minor adaptations for RAN #97e

 21.05.2022 minor adaptations for RAN #96

 10.01.2022 minor adaptations for RAN #95e

 04.10.2021 minor adaptations for RAN #94e

 08.08.2021 minor adaptations for RAN #93e

 17.05.2021 minor adaptations for RAN #92e

 28.01.2021 minor adaptations for RAN #91e

 09.11.2020 minor adaptations for RAN #90e

 31.08.2020 minor adaptations for RAN #89e

 20.04.2020 minor adaptations for RAN #88e

 18.02.2020 minor adaptations for RAN #87e

 14.11.2019 minor adaptations for RAN #86

 18.08.2019 minor adaptations for RAN #85

 12.05.2019 minor adaptations for RAN #84

 27.02.2019 minor adaptations for RAN #83

 21.11.2018 completion levels with colours added (for RAN #82)

v04.81 31.07.2018 simplification of template and addition of cross-TSG aspects (for RAN #81)

v04.80 21.05.2018 minor adaptations for RAN #80

v04.79 26.02.2018 minor adaptations for RAN #79

v04.78 18.11.2017 minor adaptations for RAN #78

v04.77 06.08.2017 minor adaptations for RAN #77

v04.76 15.05.2017 minor adaptations for RAN #76

v04.75 31.01.2017 minor adaptations for RAN #75

v04.74 28.10.2016 minor adaptations for RAN #74

v04.73 01.09.2016 adaptations for RAN #73 (time units in extra Excel table, RAN6 reporting included)

v04.72 26.05.2016 adaptations for RAN #72 (introduction of NR & GERAN TUs)

v04.71 10.02.2016 minor adaptations for RAN #71

v04.70 30.10.2015 minor adaptations for RAN #70

v04.69 12.08.2015 minor adaptations for RAN #69

v04.68 21.05.2015 minor adaptations for RAN #68

v04.67 01.02.2015 minor adaptations for RAN #67

v04.66 16.11.2014 minor adaptations for RAN #66

v04.65 16.08.2014 minor adaptations for RAN #65

v04.64 22.05.2014 minor adaptations for RAN #64

v04.63 24.01.2014 restructuring for RAN #63 to cover Core & Perf. in one doc file

v03.62 11.11.2013 section 1.2.3 adapted for RAN #62

v03 11.08.2013 section 1.2.3 added on time budget

v02 07.05.2010 history added, some spelling corrections

v01 13.11.2009 First version of the template