**3GPP TSG-RAN WG4 Meeting # 101-e R4-211XXXX**

**Electronic Meeting, 1st – 12th November, 2021**

**Agenda item:** 5.6 and a few Items in 10

**Source:** Dominique Brunel (Skyworks Solutions Inc.)

**Title:** Draft initial Email discussion summary for [101b-e][105] NR\_Baskets\_Part\_1

**Document for:** Information

# Introduction

Email discussion for contributions submitted under agenda item 5.7 “Issues arising from basket WIs but not subject to block approval” for UE RF and NR-U intra-band contiguous ULCA, and additional documents submitted to NR band related band combination baskets that require discussion.

List of candidate target of email discussion for 1st round and 2nd round

* 1st round: Discussion and potential approval of CRs. Proposals for way forward.
* 2nd round: Finalization of CRs and way forwards.

Topics:

1. CA\_n5B and CA\_n7B MSD (AI 5.6.1)
2. LB-LB cases (AI 5.6.1)
3. UL configuration including intra-band ULCA (AI 5.6.1)
4. NR-U contiguous UL CA (AI 5.6.2)
5. Discussions on release independence and R17 specs (AI 10)
6. Documents moved from basket approval (AI 5.6.1)

# Topic #1: CA\_n5B and CA\_n7B

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| [**R4-2202039**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_101-bis-e/Docs/R4-2202039.zip)Intra-band CA REFSENS Ambiguity | Qualcomm Incorporated | **Proposal 1:** Remove contiguous CA\_n7B MSD test points in Table 7.3A.2.1-1 and remove Note 2.  **Proposal 2**: For CA\_n5B, remove non-contiguous 5MHz+15MHz MSD test point and only keep the 10MHz+10MHz MSD test point with MSD carrier change due to symmetry as shown and highlighted in Table 2.1-1.  Table 2.1-1: Potential changes to Table 7.3A.2.1-1 to capture CA\_n5B MSD.   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | CA configuration | SCS  (PCC/SCC)  (kHz) | Aggregated channel bandwidth (PCC+SCC) | UL PCC allocation  (LCRB) | UL SCC allocation  (LCRB) | PCC ΔRIBNC (dB) | SCC ΔRIBNC (dB) | Duplex mode | | ~~CA\_n5B~~ | ~~15/15~~ | ~~15MHz + 5MHz~~ | ~~15 (RBstart = 64)~~ | ~~5 (RBstart = 0)~~ | ~~29.7~~ | ~~23.6~~ |  | | ~~10MHz + 10MHz~~ | ~~10 (RBstart = 42)~~ | ~~10 (RBstart = 0)~~ | ~~26.1~~ | ~~30.8~~ | | CA\_n5B | 15/15 | 10MHz + 10MHz | 10 (RBstart = 0) | 10 (RBstart = 42) | 30.8 | 26.1 |  | | NOTE 1: All combinations of channel bandwidths defined in Table 5.5A.1-1.  ~~NOTE 2: The carrier centre frequency of PCC in the UL operating band is configured closer to the DL operating band.~~  NOTE 3: The transmitted power over both PCC and SCC shall be set to PUMAX as defined in subclause 6.2A.4. | | | | | | | |   **Proposal 3**: For CA\_n7B, choose MSD test point with no change in MSD value as shown highlighted in Table 2.1-2.  Table 2.1-2: Potential changes to Table 7.3A.2.1-1 to capture CA\_n7B MSD.   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | CA configuration | SCS  (PCC/SCC)  (kHz) | Aggregated channel bandwidth (PCC+SCC) | UL PCC allocation  (LCRB) | UL SCC allocation  (LCRB) | PCC ΔRIBNC (dB) | SCC ΔRIBNC (dB) | Duplex mode | | ~~CA\_n7B~~ | ~~15/15~~ | ~~40MHz + 10MHz~~ | ~~25 (RBstart = 191)~~ | ~~20 (RBstart = 132)~~ | ~~25~~ | ~~34~~ |  | | CA\_n7B | 15/15 | 10MHz + 40MHz | 9 (RBstart = 26) | 36 (RBstart = 180) | 34 | 25 |  | | NOTE 1: All combinations of channel bandwidths defined in Table 5.5A.1-1.  NOTE 3: The transmitted power over both PCC and SCC shall be set to PUMAX as defined in subclause 6.2A.4. | | | | | | | | |
| [**R4-2202028**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_101-bis-e/Docs/R4-2202028.zip)Corrections to Intra-band CA MSD for CA\_n5B and CA\_n7B | Skyworks Solutions Inc. | **Proposal:** For NR intra-band uplink CA MSD core requirements and MSD specifications, adopt the yellow highlighted text and Table 7.3A.2.1-1 changes.  **7.3A.2 Reference sensitivity power level for CA**  **7.3A.2.1 Reference sensitivity power level for Intra-band contiguous CA**  For intra-band contiguous carrier aggregation, the throughput of each component carrier shall be ≥ 95 % of the maximum throughput of the reference measurement channels as specified in Annexes A.2.2.2, A.3.2, and A.3.3 (with one sided dynamic OCNG Pattern OP.1 FDD/TDD for the DL-signal as described in Annex A.5.1.1/A.5.2.1) with parameters specified in Table 7.3.2-1, Table 7.3.2-2, and Table 7.3.2-3.  For UE(s) supporting one uplink carrier, the uplink configuration of the PCC shall be in accordance with Table 7.3.2-3 and the downlink PCC carrier center frequency shall be configured closer to uplink operating band than any of the downlink SCC center frequency.  For aggregation of two or more downlink FDD carriers with **~~one or~~** two uplink carriers, the reference sensitivity is defined only for the specific uplink and downlink test points which are specified in Table 7.3A.2.1-1. The requirements apply with all downlink carriers active. Unless given by Table 7.3.2-4, the reference sensitivity requirements shall be verified with the network signaling value NS\_01 (Table 6.2.3.1-1) configured.  Table 7.3A.2.1-1: Intra-band contiguous CA uplink configuration for reference sensitivity   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | CA configuration | SCS  (PCC/SCC)  (kHz) | Aggregated channel bandwidth (PCC+SCC) | UL PCC allocation  (LCRB) | UL SCC allocation  (LCRB) | PCC ΔRIBNC (dB) | SCC ΔRIBNC (dB) | Duplex mode | | CA\_n5B | 15/15 | 10MHz + 10MHz | **10 (RBstart = 0)** | **10 (RBstart = 42)** | **30.8** | **26.1** | FDD | | CA\_n7B | 15/15 | **10MHz + 40MHz** | **9 (RBstart = 26)** | **36 (RBstart = 180)** | **34** | **25** | FDD | | NOTE 1: All combinations of channel bandwidths defined in Table 5.5A.1-1.  NOTE 2: The carrier centre frequency of ~~P~~**SCC** in the UL operating band is configured closer to the DL operating band.  NOTE 3: The transmitted power over both PCC and SCC shall be set to PUMAX as defined in subclause 6.2A.4.  NOTE 4: The PCC allocation is same as Transmission bandwidth configuration NRB as defined in Table 5.3.2-1. | | | | | | | | |

## Open issues summary

### Sub-topic 1-1: 1 UL test points

**Issue 1-1: Removing 1UL test points**

Proposals

* Both contributions are in agreement that 1UL test point is redundant to 1CC case and can be removed if PCC and SCC are swapped.

Recommended WF

* Adopt text in R4-2202028 copied below and generate CR in round 2 if agreed

“**7.3A.2.1 Reference sensitivity power level for Intra-band contiguous CA**

For intra-band contiguous carrier aggregation, the throughput of each component carrier shall be ≥ 95 % of the maximum throughput of the reference measurement channels as specified in Annexes A.2.2.2, A.3.2, and A.3.3 (with one sided dynamic OCNG Pattern OP.1 FDD/TDD for the DL-signal as described in Annex A.5.1.1/A.5.2.1) with parameters specified in Table 7.3.2-1, Table 7.3.2-2, and Table 7.3.2-3.

For UE(s) supporting one uplink carrier, the uplink configuration of the PCC shall be in accordance with Table 7.3.2-3 and the downlink PCC carrier center frequency shall be configured closer to uplink operating band than any of the downlink SCC center frequency.

For aggregation of two or more downlink FDD carriers with **~~one or~~** two uplink carriers, the reference sensitivity is defined only for the specific uplink and downlink test points which are specified in Table 7.3A.2.1-1. The requirements apply with all downlink carriers active. Unless given by Table 7.3.2-4, the reference sensitivity requirements shall be verified with the network signaling value NS\_01 (Table 6.2.3.1-1) configured.”

### Sub-topic 1-2: 2UL test points and PCC/SCC position and CA\_n5B and CA\_n7B MSD

**Issue 1-2a: Swapping of PCC and SCC for intra-band contiguous UL CA**

Proposals

* Both contributions are in agreement that 2 UL test point should swap SCC and PCC positions which is consistent with LTE and allows 1UL case to be equivalent to 1CC REFSENS

Recommended WF

* Adopt “The carrier centre frequency of ~~P~~**SCC** in the UL operating band is configured closer to the DL operating band.” In NOTE 2

**Issue 1-2b: Modification of MSD test points for n5B and n7B**

* Proposals
  + Both contributions agree that swapping PCC/SCC does not change MSD value and only allocation changes is needed due to PCC/SCC swap. The only difference being the modification of NOTE 2.
* Recommended WF
  + Merged table from R4-2202039 and R4-2202028 copied below is adopted with modified NOTE 2 and can be captured in CR in round 2 if agreed:

Table 7.3A.2.1-1: Intra-band contiguous CA uplink configuration for reference sensitivity

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| CA configuration | SCS  (PCC/SCC)  (kHz) | Aggregated channel bandwidth (PCC+SCC) | UL PCC allocation  (LCRB) | UL SCC allocation  (LCRB) | PCC ΔRIBNC (dB) | SCC ΔRIBNC (dB) | Duplex mode |
| CA\_n5B | 15/15 | 10MHz + 10MHz | **10 (RBstart = 0)** | **10 (RBstart = 42)** | **30.8** | **26.1** | FDD |
| CA\_n7B | 15/15 | **10MHz + 40MHz** | **9 (RBstart = 26)** | **36 (RBstart = 180)** | **34** | **25** | FDD |
| NOTE 1: All combinations of channel bandwidths defined in Table 5.5A.1-1.  NOTE 2: The carrier centre frequency of ~~P~~**SCC** in the UL operating band is configured closer to the DL operating band.  NOTE 3: The transmitted power over both PCC and SCC shall be set to PUMAX as defined in subclause 6.2A.4.  NOTE 4: The PCC allocation is same as Transmission bandwidth configuration NRB as defined in Table 5.3.2-1. | | | | | | | |

## Companies views’ collection for 1st round

### Open issues

Sub topic 1-1

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| --- | --- |
| **Company** | **Comments** |
| XXX | Issue 1-1 Removing 1UL test points |
| XXX | Issue 1-1 Removing 1UL test points |

Sub topic 1-2

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX | Issue 1-2a Swapping of PCC and SCC for intra-band contiguous UL CA  Issue 1-2b Modification of MSD test points for n5B and n7B |
| XXX | Issue 1-2a Swapping of PCC and SCC for intra-band contiguous UL CA  Issue 1-2b Modification of MSD test points for n5B and n7B |

## Summary for 1st round

### Open issues

*Moderator tries to summarize discussion status for 1st round, list all the identified open issues and tentative agreements or candidate options and suggestion for 2nd round i.e. WF assignment.*

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| --- | --- |
|  | **Status summary** |
| **Sub-topic #1.1** | *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* |
| **Sub-topic #1.2** | *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* |

### CRs/TPs

*Moderator tries to summarize discussion status for 1st round and provides recommendation on CRs/TPs Status update*

*Note: The tdoc decisions shall be provided in Section 3 and this table is optional in case moderators would like to provide additional information.*

|  |  |
| --- | --- |
| **CR/TP number** | **CRs/TPs Status update recommendation** |
| XXX | *Based on 1st round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

## Discussion on 2nd round (if applicable)

## Summary on 2nd round (if applicable)

*Moderator tries to summarize discussion status for 2nd round and provided recommendation on CRs/TPs/WFs/LSs Status update suggestion*

|  |  |
| --- | --- |
| **CR/TP/LS/WF number** | **T-doc Status update recommendation** |
| XXX | *Based on 2nd round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

# Topic #2: LB-LB and LB-LB-LB cases

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| [**R4-2202035**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_101-bis-e/Docs/R4-2202035.zip)  Measurements for CA\_n29-n71 MSD | Skyworks Solutions Inc. | **Proposal 1**: For FDD-FDD, LB/LB CA combinations, cross-band isolation MSD should be evaluated assuming co-located gNB radio units. This implies that both the aggressor and the victim are operated at their respective REFSENS levels. This means that the aggressor UL RB configuration LCRB shall be configured according to the Table 7.3.2-3 specifications.  **Proposal 2:** For NR intra-band uplink CA MSD core requirements and MSD specifications, adopt the yellow highlighted text and Table 7.3A.2.1-1 changes.  Table 6.x.1.5-1: Reference sensitivity exceptions (MSD) due to cross band isolation for NR CA FR1   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | NR Band / Channel bandwidth of the affected DL band | | | | | | | | | | | | | | | | UL band | DL band | 5 MHz (dB) | 10 MHz (dB) | 15 MHz (dB) | 20 MHz (dB) | 25 MHz (dB) | 30 MHz (dB) | 40 MHz (dB) | 50 MHz (dB) | 60 MHz (dB) | 70  MHz  (dB) | 80 MHz (dB) | 90 MHz (dB) | 100 MHz (dB) | | n71 | n29 | 19.0 | 16.7 |  |  |  |  |  |  |  |  |  |  |  |   Table 6.x.1.5-2: Uplink configuration for reference sensitivity exceptions due to cross band isolation for NR CA FR1   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | NR Band / SCS / Channel bandwidth of the affected DL band | | | | | | | | | | | | | | | | | | UL band | DL band | SCS of UL band (kHz) | 5 MHz | 10 MHz | 15 MHz | 20 MHz | 25 MHz | 30 MHz | | 40 MHz | 50 MHz | 60 MHz | 70  MHz | 80 MHz | 90 MHz | 100 MHz | | n71 | n29 | 15 | 201 | 201 |  |  |  |  |  | |  |  |  |  |  |  | | NOTE 1: UL resource blocks shall be located as close as possible to the downlink operating band but confined within the transmission bandwidth configuration for the channel bandwidth (Table 5.3.2-1). The UL carrier shall be as close as possible to the downlink operating band. | | | | | | | | | | | | | | | | | |
| [**R4-2200706**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_101-bis-e/Docs/R4-2200706.zip)n29 MSD in CA\_n29-n71 | Nokia, Dish | Simulation input vs UL configuration |
| [**R4-2202037**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_101-bis-e/Docs/R4-2202037.zip)CA\_n29A-n71A MSD | Qualcomm Incorporated | **Observation 1**: As much as degradation of VSWR of 6:1 can be observed in band n29 with practical single band tuning optimized for band n71. Impact of TIS will be observed and could prevent device certification.  **Observation 2**: The ANT-TX attenuation is barely sufficient to meet the UE-UE coexistence TX emission requirement of -38dBm/MHz in 29DL especially for UEs implementing the 600M+ band, even though such a level degrades the secondary RX path from an MSD standpoint.  **Proposal 1**: Use crossband noise MSD and UL configuration as shown in Table 2.3-1 and 2.3-2.  Table 2.3-1: Reference sensitivity exceptions (MSD) due to cross band isolation for NR CA FR1   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | NR Band / Channel bandwidth of the affected DL band | | | | | | | | | | | | | | | | UL band | DL band | 5 MHz (dB) | 10 MHz (dB) | 15 MHz (dB) | 20 MHz (dB) | 25 MHz (dB) | 30 MHz (dB) | 40 MHz (dB) | 50 MHz (dB) | 60 MHz (dB) | 70  MHz  (dB) | 80 MHz (dB) | 90 MHz (dB) | 100 MHz (dB) | | n71 | n29 | [15.2] | [15.2] |  |  |  |  |  |  |  |  |  |  |  |   Table 2.3-2: Uplink configuration for reference sensitivity exceptions due to cross band isolation for NR CA FR1   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | NR Band / SCS / Channel bandwidth of the affected DL band | | | | | | | | | | | | | | | | | UL band | DL band | SCS of UL band (kHz) | 5 MHz | 10 MHz | 15 MHz | 20 MHz | 25 MHz | 30 MHz | 40 MHz | 50 MHz | 60 MHz | 70  MHz | 80 MHz | 90 MHz | 100 MHz | | n71 | n29 | 15 | 20 | 20 |  |  |  |  |  |  |  |  |  |  |  | |
| [**R4-2202036**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_101-bis-e/Docs/R4-2202036.zip)  Measurements for CA\_n5-n28 MSD | Skyworks Solutions Inc. | **Proposal 1**: For FDD-FDD, LB/LB CA combination, cross-band isolation MSD should be evaluated assuming co-located gNB radio units. This implies that both the aggressor and the victim are operated at their respective REFSENS levels. This means that the aggressor UL RB configuration LCRB shall be configured according to the Table 7.3.2-3 specifications.  **Proposal 2:** For NR intra-band uplink CA MSD core requirements and MSD specifications, adopt the yellow highlighted text and Table 7.3A.2.1-1 changes.  Table 6.x.1.5-1: Reference sensitivity exceptions (MSD) due to cross band isolation for NR CA FR1   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | NR Band / Channel bandwidth of the affected DL band | | | | | | | | | | | | | | | | UL band | DL band | 5 MHz (dB) | 10 MHz (dB) | 15 MHz (dB) | 20 MHz (dB) | 25 MHz (dB) | 30 MHz (dB) | 40 MHz (dB) | 50 MHz (dB) | 60 MHz (dB) | 70  MHz  (dB) | 80 MHz (dB) | 90 MHz (dB) | 100 MHz (dB) | | n5 | n28 | 17.5 | 15.8 | 14.0 | 11.7 |  | 2.9 |  |  |  |  |  |  |  |   Table 6.x.1.5-2: Uplink configuration for reference sensitivity exceptions due to cross band isolation for NR CA FR1   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | NR Band / SCS / Channel bandwidth of the affected DL band | | | | | | | | | | | | | | | | | UL band | DL band | SCS of UL band (kHz) | 5 MHz | 10 MHz | 15 MHz | 20 MHz | 25 MHz | 30 MHz | 40 MHz | 50 MHz | 60 MHz | 70  MHz | 80 MHz | 90 MHz | 100 MHz | | n5 | n28 | 15 | 201 | 201 | 201 | 201 |  | 201 |  |  |  |  |  |  |  | | NOTE 1: UL resource blocks shall be located as close as possible to the downlink operating band but confined within the transmission bandwidth configuration for the channel bandwidth (Table 5.3.2-1). The UL carrier shall be as close as possible to the downlink operating band. | | | | | | | | | | | | | | | | |
| [**R4-2202038**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_101-bis-e/Docs/R4-2202038.zip)  MSD for DC\_20A-38A\_n8A | Skyworks Solutions Inc. | **Proposal:** Adopt the following MSD test points for DC\_20-38\_n8   | NR or E-UTRA Band / Channel bandwidth / NRB / MSD | | | | | | | | | --- | --- | --- | --- | --- | --- | --- | --- | | EN-DC  Configuration | EUTRA or NR band | UL Fc  (MHz) | UL/DL BW  (MHz) | UL  LCRB | DL Fc (MHz) | MSD  (dB) | IMD order | | DC\_20A-38\_n8A | n8 | 885 | 5 | 25 | 930 | N/A | N/A | | 20 | 846 | 5 | 25 | 805 | 17.4 | IMD3 | | 38 | 2575 | 5 | 25 | 2575 | N/A | N/A | | DC\_20A-38\_n8A | n8 | 885 | 5 | 25 | 930 | N/A | N/A | | 20 | 840 | 5 | 25 | 799 | N/A | N/A | | 38 | 2610 | 5 | 25 | 2610 | 21.1 | IMD3 | |
| [**R4-2201565**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_101-bis-e/Docs/R4-2201565.zip) TP for TR 38.717-02-01 to include CA\_n20-n67 | Ericsson, BT plc | Moderator Note: not for block approval, moved from #107, No cross band MSD is assessed  R4-2201566 TP for TR 38.717-03-01 to include CA\_n1-n20-n67 Ericsson, BT plc  R4-2201568 TP for TR 38.717-03-01 to include CA\_n3-n20-n67 Ericsson, BT plc  R4-2201567 TP for TR 38.717-03-02 to include CA\_n1-n20-n67 Ericsson, BT plc  R4-2201569 TP for TR 38.717-03-02 to include CA\_n3-n20-n67 Ericsson, BT plc  Are pending the 2 band fallback agreement |
|  |  |  |

## Open issues summary

### Sub-topic 2-1: CA\_n29-n71

**Issue 2-1a: Co-location assumption for LB-LB cases**

Proposals

* R4-2202035 proposes that co-location is assumed for LB-LB cases and thus UL allocation should be similar to REFSENS case. It should be noted that MSD vs UL allocation are in agreement between the 3 contributions and that R4-2202037 and R4-2202035 use the same UL allocation

Recommended WF

* Discuss proposal and provide as guideline for LB-LB cases if agreed

**Issue 2-1b: MSD for CA\_n29-n71**

Proposals

* R4-2202037 and R4-2202035 use the same UL allocation but have slightly different MSD values
* R4-2202037 points at antenna tuning issues already discussed in the past but that should be fully understood by proponents of LB-LB cases.

Recommended WF

* Discuss MSD values based on R4-2202037 and R4-2202035

### Sub-topic 2-2: CA\_n5-n28

**Issue 2-2: MSD for CA\_n5-n28**

Proposals

* R4-2202036 proposes new MSD values based on measurement compared to assessment done during last meeting.

Recommended WF

* Discuss MSD values based on R4-2202037 and last meeting values

### Sub-topic 2-3: CA\_n5-n28

**Issue 2-3: MSD for CA\_n20-n67**

Proposals

* The current TP does not assess the LB-LB cross band isolation MSD.

Recommended WF

* Based on expert experience and existing LB-LB evaluations, tentative MSD is assessed

### Sub-topic 2-3: CA\_n18-n28 and DC CA\_n18-n28

**Issue 2-4: MSD for CA\_n18-n28 and DC\_18\_n28**

Proposals

* Current LB-LB cross band MSD in [] in the spec seems optimistic when compared to similar IMD cases (for example CA\_n29-n71)

Recommended WF

* Based on expert experience and existing LB-LB evaluations, tentative corrected MSD is assessed

### Sub-topic 2-5: DC\_20A-38A\_n8A

**Issue 2-5: MSD for DC\_20A-38A\_n8A**

Proposals

* IMD3 test points and MSD are proposed based on reusing DC\_7A-20A\_n8A

Recommended WF

* Agree MSD and generate TP/CR if agreed

## Companies views’ collection for 1st round

### Open issues

Sub topic 2-1

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX | Issue 2-1a Co-location assumption for LB-LB cases  Issue 2-1b MSD for CA\_n29-n71 |
| XXX | Issue 2-1a Co-location assumption for LB-LB cases  Issue 2-1b MSD for CA\_n29-n71 |

Sub topic 2-2

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX | Issue 2-2 MSD for CA\_n5-n28 |
| XXX | Issue 2-2 MSD for CA\_n5-n28 |

Sub topic 2-3

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| --- | --- |
| **Company** | **Comments** |
| XXX | Issue 2-2 MSD for CA\_n29-n67 |
| XXX | Issue 2-2 MSD for CA\_n29-n67 |

Sub topic 2-4

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| --- | --- |
| **Company** | **Comments** |
| XXX | Issue 2-2 MSD for CA\_n18-n28 and DC\_18\_n28 |
| XXX | Issue 2-2 MSD for CA\_n18-n28 and DC\_18\_n28 |

Sub topic 2-5

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| --- | --- |
| **Company** | **Comments** |
| XXX | Issue 2-3 MSD for DC\_20A-38A\_n8A |
| XXX | Issue 2-3 MSD for DC\_20A-38A\_n8A |

## Summary for 1st round

### Open issues

*Moderator tries to summarize discussion status for 1st round, list all the identified open issues and tentative agreements or candidate options and suggestion for 2nd round i.e. WF assignment.*

|  |  |
| --- | --- |
|  | **Status summary** |
| **Sub-topic #2.1** | *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* |
| **Sub-topic #2.2** | *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* |
| **Sub-topic #2.3** | *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* |
| **Sub-topic #2.4** | *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* |
| **Sub-topic #2.5** | *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* |

### CRs/TPs

*Moderator tries to summarize discussion status for 1st round and provides recommendation on CRs/TPs Status update*

*Note: The tdoc decisions shall be provided in Section 3 and this table is optional in case moderators would like to provide additional information.*

|  |  |
| --- | --- |
| **CR/TP number** | **CRs/TPs Status update recommendation** |
| XXX | *Based on 1st round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

## Discussion on 2nd round (if applicable)

## Summary on 2nd round (if applicable)

*Moderator tries to summarize discussion status for 2nd round and provided recommendation on CRs/TPs/WFs/LSs Status update suggestion*

|  |  |
| --- | --- |
| **CR/TP/LS/WF number** | **T-doc Status update recommendation** |
| XXX | *Based on 2nd round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

# Topic #3: UL configuration including intra-band ULCA

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| [**R4-2202034**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_101-bis-e/Docs/R4-2202034.zip)Triple beat B3 MSD evaluation for DC\_3A\_n41C | Skyworks Solutions Inc. | Moderator Note: based on draft revision in #105 folder (link below), official Tdoc will be given at start of the meeting, I will update when available  [R4-22xxxxx rev of R4-2202034 Triple beat B3 MSD evaluation for DC\_3A\_n41C.docx](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_101-bis-e/Inbox/Drafts/%5B101-bis-e%5D%5B105%5D%20NR_Baskets_Part_1/Round%201/R4-22xxxxx%20rev%20of%20R4-2202034%20Triple%20beat%20B3%20MSD%20evaluation%20for%20DC_3A_n41C.docx)  **Observation**:   * **For PC3 operation, forward TB IMD dominates over the reverse TB IMD for PCB isolations <= 70dB;** * **The worst case PC3 B3 5MHz MSD is approximately 12dB for 32dB rejection of the TB product by n41 BPF. In previous work [1], the same level of MSD was found, but the MSD was dominated by the LNA contribution, not by the PA.** * **The reverse TB IMD may reach the same level as the FWD TB at 65dB PCB isolation when n41 Tx power level is increased from 20dBm to approximately 21.5dBm. For PC2 operation, it is therefore expected that the PA reverse IMD may become an important MSD contributor; In [1], MSD for PC2 DC\_3A\_n41C is estimated at close to 20dB and is dominated by LNA contribution.**   **Proposal: Interested companies are encouraged to further study the FDD band MSD due to triple beat IMD vs PCB isolation and TDD band filter rejection, in particular:**   * **Further study both the FDD and the TDD PAs forward and reverse TB IMD contribution;** * **Further study the LNA TB IMD contribution;** * **Further study the FDD band MSD for PC3 and PC2 EN-DC operation.** |

## Open issues summary

### Sub-topic 3-1

**Issue 3-1:**

Proposals

* Interested companies are encouraged to further study the FDD band MSD due to triple beat IMD vs PCB isolation and TDD band filter rejection, in particular:
  + Further study both the FDD and the TDD PAs forward and reverse TB IMD contribution;
  + Further study the LNA TB IMD contribution;
  + Further study the FDD band MSD for PC3 and PC2 EN-DC operation.

Recommended WF

* Discuss provided results and assumptions in order to build a plan (in a WF) to create a stable framework for triple beat MSD in R17. Alternatively we may have to discuss having such framework in the scope of RAN4 R18 topics (associated to 3Tx)

## Companies views’ collection for 1st round

### Open issues

Sub topic 3-1

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX | Issue 3-1 |
| XXX | Issue 3-1 |

## Summary for 1st round

### Open issues

*Moderator tries to summarize discussion status for 1st round, list all the identified open issues and tentative agreements or candidate options and suggestion for 2nd round i.e. WF assignment.*

|  |  |
| --- | --- |
|  | **Status summary** |
| **Sub-topic #3.1** | *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* |

### CRs/TPs

*Moderator tries to summarize discussion status for 1st round and provides recommendation on CRs/TPs Status update*

*Note: The tdoc decisions shall be provided in Section 3 and this table is optional in case moderators would like to provide additional information.*

|  |  |
| --- | --- |
| **CR/TP number** | **CRs/TPs Status update recommendation** |
| XXX | *Based on 1st round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

## Discussion on 2nd round (if applicable)

## Summary on 2nd round (if applicable)

*Moderator tries to summarize discussion status for 2nd round and provided recommendation on CRs/TPs/WFs/LSs Status update suggestion*

|  |  |
| --- | --- |
| **CR/TP/LS/WF number** | **T-doc Status update recommendation** |
| XXX | *Based on 2nd round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

# Topic #4: NR-U contiguous ULCA

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| [**R4-2202022**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_101-bis-e/Docs/R4-2202022.zip)  NR-U Contiguous UL-CA Measurements | Skyworks Solutions Inc. | **Proposal: Based on these observations, we propose to adopt:**   * **3.0dB MPR for all QPSK DFT-s-OFDM waveforms except for WB configuration [1111]+[1000] with full RB allocation for which [4.0]dB MPR is proposed; and** * **4.0 MPR for all QPSK CP-OFDM waveforms except for WB configuration [1111]+[1000] with full RB allocation for which [5.5]dB MPR is proposed.** |

## Open issues summary

### Sub-topic 4-1

**Issue 4-1: MPR for NRU contiguous UL CA**

Proposals

* 3.0dB MPR for all QPSK DFT-s-OFDM waveforms except for WB configuration [1111]+[1000] with full RB allocation for which [4.0]dB MPR is proposed; and
* 4.0 MPR for all QPSK CP-OFDM waveforms except for WB configuration [1111]+[1000] with full RB allocation for which [5.5]dB MPR is proposed.

Recommended WF

* Discuss measurement results and proposed MSD in terms of allocation types and values

## Companies views’ collection for 1st round

### Open issues

Sub topic 4-1

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX | Issue 4-1 MPR for NRU contiguous UL CA |
| XXX | Issue 4-1 MPR for NRU contiguous UL CA |

## Summary for 1st round

### Open issues

*Moderator tries to summarize discussion status for 1st round, list all the identified open issues and tentative agreements or candidate options and suggestion for 2nd round i.e. WF assignment.*

|  |  |
| --- | --- |
|  | **Status summary** |
| **Sub-topic #4.1** | *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* |

### CRs/TPs

*Moderator tries to summarize discussion status for 1st round and provides recommendation on CRs/TPs Status update*

*Note: The tdoc decisions shall be provided in Section 3 and this table is optional in case moderators would like to provide additional information.*

|  |  |
| --- | --- |
| **CR/TP number** | **CRs/TPs Status update recommendation** |
| XXX | *Based on 1st round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

## Discussion on 2nd round (if applicable)

## Summary on 2nd round (if applicable)

*Moderator tries to summarize discussion status for 2nd round and provided recommendation on CRs/TPs/WFs/LSs Status update suggestion*

|  |  |
| --- | --- |
| **CR/TP/LS/WF number** | **T-doc Status update recommendation** |
| XXX | *Based on 2nd round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

# Topic #5: Discussions on release independence and R17 specs Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| [**R4-2200698**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_101-bis-e/Docs/R4-2200698.zip)Working procedures for updating release independence specification | Nokia, Nokia Shanghai Bell | Proposal: RAN4 selects in RAN4#101-bis-e either option A or option B as a way forward for updating the TS 38.307  Option A: When new feature is introduced only the open release of 38.307 needs an update.  Option B: When new feature is introduced all releases of 38.307 starting from release the feature in question is release independent from are updated. |
| [**R4-2201440**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_101-bis-e/Docs/R4-2201440.zip)Discussion on the working procedure for introducing release independent features | CHTTL | Proposal 1: RAN4 to discuss and select one of the options for updating the release independent specifications, TS 36.307 and TS 38.307.  Option A: When a new feature is introduced only the latest release of release independent spec needs to be updated.  Option A-1: In any case, only the open release of release independent spec needs to be updated.  Option A-2: The latest release of release independent spec refers to the release which the new feature is introduced in. (i.e. CR to the frozen release might be needed when the release independent issue is missed to be resolved when the new feature is introduced, or when CR implementation errors occur in the previous release.)  Option B: When a new feature is introduced, all of the releases of release independent spec are updated, starting from the release which the feature is release independent from. |
| [**R4-2201804**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_101-bis-e/Docs/R4-2201804.zip)Discussion on the Rel-17 specifications: 25-series and 34-series | Huawei | Proposal 1: mark 25-series specifications as “inhibit upgrade”.  Proposal 2: mark 34-series specifications as “inhibit upgrade”. |

## Open issues summary

### Sub-topic 5-1: Release indenpendent specifications

**Issue 5-1: updating the release independent specifications, TS 36.307 and TS 38.307.**

Proposals

* R4-2200698
  + Option A: When new feature is introduced only the open release of 38.307 needs an update.
  + Option B: When new feature is introduced all releases of 38.307 starting from release the feature in question is release independent from are updated.
* R4-2201440
  + Option A: When a new feature is introduced only the latest release of release independent spec needs to be updated.
    - Option A-1: In any case, only the open release of release independent spec needs to be updated.
    - Option A-2: The latest release of release independent spec refers to the release which the new feature is introduced in.
  + Option B: When a new feature is introduced, all of the releases of release independent spec are updated, starting from the release which the feature is release independent from.

Recommended WF

* Option B is common to both proposals, this is a potential consensus but options should be discussed in round 1

### Sub-topic 5-1: 25-series and 34-series

**Issue 5-2: 25-series and 34-series.**

Proposals

* Mark 25-series and 34-series specifications as “inhibit upgrade”.

Recommended WF

* Given the low or inexistent activity on above specification, let’s try to approve in round 1

## Companies views’ collection for 1st round

### Open issues

Sub topic 5-1

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX | Issue 5-1 TS 36.307 and TS 38.307 |
| XXX | Issue 5-1 TS 36.307 and TS 38.307 |

Sub topic 5-2

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX | Issue 5-2 25-series and 34-series |
| XXX | Issue 5-2 25-series and 34-series |

## Summary for 1st round

### Open issues

*Moderator tries to summarize discussion status for 1st round, list all the identified open issues and tentative agreements or candidate options and suggestion for 2nd round i.e. WF assignment.*

|  |  |
| --- | --- |
|  | **Status summary** |
| **Sub-topic #5.1** | *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* |
| **Sub-topic #5.2** | *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* |

### CRs/TPs

*Moderator tries to summarize discussion status for 1st round and provides recommendation on CRs/TPs Status update*

*Note: The tdoc decisions shall be provided in Section 3 and this table is optional in case moderators would like to provide additional information.*

|  |  |
| --- | --- |
| **CR/TP number** | **CRs/TPs Status update recommendation** |
| XXX | *Based on 1st round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

## Discussion on 2nd round (if applicable)

## Summary on 2nd round (if applicable)

*Moderator tries to summarize discussion status for 2nd round and provided recommendation on CRs/TPs/WFs/LSs Status update suggestion*

|  |  |
| --- | --- |
| **CR/TP/LS/WF number** | **T-doc Status update recommendation** |
| XXX | *Based on 2nd round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

# Topic #6: Documents moved from basket approval

Moderator Note: LB-LB cases moved from #106/107 have been put in Topic 2 with other LB-LB cases. This part is for any other cases if any.

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
|  |  |  |
|  |  |  |
|  |  |  |

## Open issues summary

### Sub-topic 6-1

**Issue 6-1:**

Proposals

* xxxx

Recommended WF

* xxxx

## Companies views’ collection for 1st round

### Open issues

Sub topic 6-1

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX | Issue 6-1 |
| XXX | Issue 6-1 |

### CRs/TPs comments collection

*Major close to finalize WIs and Rel-15 maintenance, comments collections can be arranged for TPs and CRs. For Rel-16 on-going WIs, suggest to focus on open issues discussion on 1st round.*

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
|  | Company A |
| Company B |
|  |

## Summary for 1st round

### Open issues

*Moderator tries to summarize discussion status for 1st round, list all the identified open issues and tentative agreements or candidate options and suggestion for 2nd round i.e. WF assignment.*

|  |  |
| --- | --- |
|  | **Status summary** |
| **Sub-topic #6.1** | *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* |
| **Sub-topic #6.2** | *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* |

### CRs/TPs

*Moderator tries to summarize discussion status for 1st round and provides recommendation on CRs/TPs Status update*

*Note: The tdoc decisions shall be provided in Section 3 and this table is optional in case moderators would like to provide additional information.*

|  |  |
| --- | --- |
| **CR/TP number** | **CRs/TPs Status update recommendation** |
| XXX | *Based on 1st round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

## Discussion on 2nd round (if applicable)

## Summary on 2nd round (if applicable)

*Moderator tries to summarize discussion status for 2nd round and provided recommendation on CRs/TPs/WFs/LSs Status update suggestion*

|  |  |
| --- | --- |
| **CR/TP/LS/WF number** | **T-doc Status update recommendation** |
| XXX | *Based on 2nd round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

# Recommendations for Tdocs

## 1st round

**New tdocs**

|  |  |  |
| --- | --- | --- |
| **Title** | **Source** | **Comments** |
| WF on … | YYY |  |
| LS on … | ZZZ | To: RAN\_X; Cc: RAN\_Y |
|  |  |  |

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| [**R4-2202039**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_101-bis-e/Docs/R4-2202039.zip) | Intra-band CA REFSENS Ambiguity | Qualcomm Incorporated | Agreeable, Revised, Merged, Postponed, Not Pursued |  |
| [**R4-2202028**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_101-bis-e/Docs/R4-2202028.zip) | Corrections to Intra-band CA MSD for CA\_n5B and CA\_n7B | Skyworks Solutions Inc. |  |  |
| [**R4-2202035**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_101-bis-e/Docs/R4-2202035.zip) | Measurements for CA\_n29-n71 MSD | Skyworks Solutions Inc. |  |  |
| [**R4-2202036**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_101-bis-e/Docs/R4-2202036.zip) | Measurements for CA\_n5-n28 MSD | Skyworks Solutions Inc. |  |  |
| [**R4-2202038**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_101-bis-e/Docs/R4-2202038.zip) | MSD for DC\_20A-38A\_n8A | Skyworks Solutions Inc. |  |  |
| [**R4-2200706**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_101-bis-e/Docs/R4-2200706.zip) | n29 MSD in CA\_n29-n71 | Nokia, Dish |  |  |
| [**R4-2202037**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_101-bis-e/Docs/R4-2202037.zip) | CA\_n29A-n71A MSD | Qualcomm Incorporated |  |  |
| [**R4-2202034**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_101-bis-e/Docs/R4-2202034.zip) | Triple beat B3 MSD evaluation for DC\_3A\_n41C (revision pending) | Skyworks Solutions Inc. |  |  |
| [**R4-2202022**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_101-bis-e/Docs/R4-2202022.zip) | NR-U Contiguous UL-CA Measurements | Skyworks Solutions Inc. |  |  |
| [**R4-2200698**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_101-bis-e/Docs/R4-2200698.zip) | Working procedures for updating release independence specification | Nokia, Nokia Shanghai Bell |  |  |
| [**R4-2201440**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_101-bis-e/Docs/R4-2201440.zip) | Discussion on the working procedure for introducing release independent features | CHTTL |  |  |
| [**R4-2201804**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_101-bis-e/Docs/R4-2201804.zip) | Discussion on the Rel-17 specifications: 25-series and 34-series | Huawei |  |  |
| [**R4-2201565**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_101-bis-e/Docs/R4-2201565.zip) | TP for TR 38.717-02-01 to include CA\_n20-n67 | Ericsson, BT plc |  |  |

Notes:

1. Please include the summary of recommendations for all tdocs across all sub-topics incl. existing and new tdocs.
2. For the Recommendation column please include one of the following:
   1. CRs/TPs: Agreeable, Revised, Merged, Postponed, Not Pursued
   2. Other documents: Agreeable, Revised, Noted
3. For new LS documents, please include information on To/Cc WGs in the comments column
4. Do not include hyper-links in the documents

## 2nd round

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-210xxxx | CR on … | XXX | Agreeable, Revised, Merged, Postponed, Not Pursued |  |
| R4-210xxxx | WF on … | YYY | Agreeable, Revised, Noted |  |
| R4-210xxxx | LS on … | ZZZ | Agreeable, Revised, Noted |  |
|  |  |  |  |  |

Notes:

1. Please include the summary of recommendations for all tdocs across all sub-topics.
2. For the Recommendation column please include one of the following:
   1. CRs/TPs: Agreeable, Revised, Merged, Postponed, Not Pursued
   2. Other documents: Agreeable, Revised, Noted
3. Do not include hyper-links in the documents

# Annex

Contact information

|  |  |  |
| --- | --- | --- |
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|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

Note:

1. Please add your contact information in above table once you make comments on this email thread.
2. If multiple delegates from the same company make comments on single email thread, please add you name as suffix after company name when make comments i.e. Company A (XX, XX)