3GPP TSG-RAN WG4 Meeting # 98-e draft R4-2103922

Electronic Meeting, Jan. 25-Feb. 5, 2021

**Agenda item:** 4.3,4.6, 7.4.6,7.4.7,11.11.4

**Source:** Moderator (ZTE Corporation)

**Title:** Email discussion summary for [98e] [303] NR\_EMC

**Document for:** Information

# Introduction

For the RAN4 [98e] [303] NR\_EMC, the main topics are about NR UE EMC, NR BS EMC, IAB EMC and NR repeaters EMC including agenda items 4.3, 4.6, 7.4.6, 7.4.7 and 11.11.4. Therefore, the discussions will separate into four parts:

Topic #1: Agenda item 4.3: UE EMC

Topic #2: Agenda item 4.6: NR BS EMC

Topic #3: Agenda item 7.4.6&7.4.7: IAB EMC

Topic #4: Agenda item11.11.4: NR repeaters EMC

# Topic #1: UE EMC

*Main technical topic overview. The structure can be done based on sub-agenda basis.*

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| **[R4-2100890](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2100890.zip)** | Samsung | Title: CR to TS38.124 on radiated emissions (Rel-15 Cat F CR)  ***Reason for changes:*** The radiated emission frequency range below 30MHz of NR is not align with those of E-UTRA and UTRA  ***Summary of change:*** Removal of the radiated emission requirements below 30MHz, which will be guaranteed its compliance by the conducted emission requirements |
| R4-2100891 | Samsung | Mirror CR for [R4-2100890](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2015100.zip). |
| **[R4-2101872](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2101872.zip)** | Xiaomi | Title: on FR2 UE EMC requirement  **Observation 1: FR2 UE EMC requirements is not captured in current TS 38.124.**  **Proposal: To complete NR FR2 UE EMC requirement under Rel-15 maintenance agenda.**  **Observation 2: FR2 UE EMC requirements can be finished by June 2021 with limit time consuming for each meeting.** |
| **[R4-2102398](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2102398.zip)** | Huawei, HiSilicon, Bureau Veritas | Title: CR for TS 38.124: Correction of FR1 radiated spurious emissions (Rel-15 Cat F CR)  ***Reason for changes:***  There are several problems in radiated spurious emissions:   1. The frequency range 9kHz~30MHz is not testable for radiated measurement 2. Measurement uncertainty for 12.75~26GHz is missing 3. Table number in NOTE below table 8.2.5-1 is incorrect.   ***Summary of change:***   1. Remove test frequency range 9kHz~30MHz. 2. Mark measurement uncertainty for 12.75~26GHz as TBD. 3. Correct the table numbers in NOTE below table 8.2.5-1 is incorrect. |
| R4-2102399 | Huawei, HiSilicon, Bureau Veritas | Mirror CR for [R4-2102](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2015100.zip)399. |
| **[R4-2102576](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2102576.zip)** | Huawei | Title: CR to TS 38.124: correction of the lower frequency range of the RSE, Rel-15 (Rel-15 Cat F CR)  ***Reason for changes:***  Now it was observed that 9kHz lower limit was kept in the EMC spec for RSE is obviously not aligned with SM.329, nor with other UE EMC specifications. Lower spurious range limit for RSE is corrected back to 30 MHz.  ***Summary of change:***  Lower frequency limit of the radiated spurious emissions requirements changed to 30MHz. |
| R4-2102577 | Huawei | Mirror CR for [R4-2102](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2015100.zip)576. |

## Open issues summary

### Sub-topic 1-1

**Issue 1-1: Whether the single carrier NR FR2 UE EMC requirement needs to be included in current TS38.124?**

* Proposals
  + Option 1: Yes
  + Option 2: No
* Recommended WF
  + TBA

**Issue 1-2: If Option 1 (Yes) for issues 1-1, how to capture the single carrier NR FR2 UE EMC requirement in current TS38.124?**

* Proposals
  + Option 1: Under Rel-15 maintenance agenda item
  + Option 2: Under umbrella EMC WID
* Recommended WF
  + TBA

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
| Ericsson | Sub topic 1-1: Option 1  Sub topic 1-2: Option 2, considering it will take some time to discuss and align proposals.  ….  Others: |
| Xiaomi | Subtopic 1-1  Issue 1-1:  Option1. As pointed out in our paper, there is no guideline for FR2 UE EMC test while as it is known to all the there is existing FR2 UE on the market. So we need to have all these FR2 single carrier requirement at least in the spec.  Issue 1-2:  We don’t have strong opinion on this issue. However, option 1 is slightly preferred since we can start the work a little bit earlier and it will also shrink the objectives of the umbrella WID. |
| ZTE | Sub topic 1-1: Option 1  Sub topic 1-2:  Basically both Option 1 and Option 2 are ok for us. However, option 1 is slightly preferred.  The EMC requirements for FR2 UE mainly focus on radiated emissions, narrow band responses and exclusion bands. Basically, there is no need to add additional contents in other chapters for FR2 UE EMC. |
| Huawei | Sub topic 1-1: we are not against it. However, it is proposed to circulate this topic (or the new WID for EMC) offline among UE vendors to collect more views, and potentially more interest in the EMC WID enhancements. Capturing new features as Rel-15 maintenance may be seen as not preferred way (RAN4 leadership guidance). An alternative approach could be that proponents share draft CR offline after this meeting – if it is straightforward we approve it next RAN4 meeting. If it is not straightforward – we stop the discussion and wait for the Rel-17 EMC WI.  Sub topic 1-2: Option 2 |
| Samsung | Sub topic 1-1: Option 1  Sub topic 1-2: no strong view but Option 2 is slightly preferred considering the time line aspect and it is also beneficial to attract more UE vendors’ attention if FR2 EMC will be handled in EMC WID with explicit objective. |

### 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** |
| **[R4-2100890](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2100890.zip)** | Ericsson: The idea of covering the radiated emissions requirements below 30 MHz with the conducted test was mentioned in a previous meeting, and we agree with that point. |
| Xiaomi: The frequency range has been listed as one of the study objectives of the EMC WID. However, if we can settle down with limit effort it is quite encouraged to do so. We are ok with the modification while it seems some modification is needed to merge Samsung and Huawei’s CR. |
| ZTE: CR is OK. There is a similar CR(R4-21023986) from Huawei. |
| Huawei: agree with the modification, but there are some corrections missing. Overlap with Huawei correction CR in R4-2102398. |
| Samsung: thanks for companies’ support on our proposed change. Since there is overlap with Huawei’s CR which addresses more changes, we are fine to merge our CR to Huawei’s as long as our proposed change is adopted. |
| **[R4-2102398](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2102398.zip)** | Ericsson: As the paper submitted by Samsung, this contribution also touches the issue of the emissions below 30 MHz, which we agree to correct. To be discussed the measurement uncertainty limit definition. |
| ZTE: CR is OK. There is a similar CR(R4-2100890) from Samsung. |
| Huawei: still, some corrections from R4-2102576 are missing. |
| Samsung: Since Huawei’s CR addresses more changes, we are fine to merge our CR to Huawei’s as long as our proposed change is adopted. |
| **[R4-2102576](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2102576.zip)** | Moderator note: there was an overlap of the CRs identified(2398). Huawei will ask Kai-Erik to mark R4-2102576/77 as “not pursued/withdrawn” |
| Huawei: to be marked as “not pursued/withdrawn” for Rel-15 and Rel-16, respectively. |
|  |

## 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#1** | *Tentative agreements:*  ***Issue 1-1: Whether the single carrier NR FR2 UE EMC requirement needs to be included in current TS38.124?***  *- All companies agree to include it in current TS38.124*  ***Issue 1-2: If Option 1 (Yes) for issues 1-1, how to capture the single carrier NR FR2 UE EMC requirement in current TS38.124?***  *- Option 1: Under Rel-15 maintenance agenda item, Xiaomi, ZTE*  *- Option 2: Under umbrella EMC WID: Ericsson, ZTE, Huawei, Samsung.*  *Meanwhile, two companies suggest to collect more views among more UE vendors’*  *Candidate options:*  *Recommendations for 2nd round:*  *Focus on the WF and recommend the proponent to collect more views among more UE vendor.* |

*Recommendations on WF/LS assignment*

|  |  |  |
| --- | --- | --- |
|  | **WF/LS t-doc Title** | **Assigned Company,**  **WF or LS lead** |
| #1 | WF on single carrier NR FR2 UE EMC requirement | Xiaomi |

### CRs/TPs

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

|  |  |
| --- | --- |
| *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”* |
| *[R4-2100890](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2100890.zip)*  *(Cat F CR)* | *not pursued* |
| *R4-2100891*  *(Mirror CR for 0890)* | *To be withdraw.* |
| *[R4-2102398](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2102398.zip)* | *To be revised (Source: Huawei, HiSilicon, Bureau Veritas, Samsung)* |
| *[R4-2102576](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2102576.zip)*  *(Cat F CR)* | *not pursued* |
| *R4-2102577*  *(Mirror CR for 2576)* | *To be withdraw.* |

## Discussion on 2nd round (if applicable)

|  |  |
| --- | --- |
| **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”* |
| *R4-2103771*  *(revised from R4-2102398)* | ZTE: First, a minor comment on the CR cover: ‘R4’ needs to be filled in ‘source to TSG’.  Second, we are not sure why the note under Table 8.2.4-1 is deleted? Meanwhile, in the same table, we feel confusion on the corrections for the Note 3 and Note 4. It should be n41 and NR CA configuration specified in 38.101-1, and ENDC configuration specified in 38.101-3....  Ericsson: We share the same opinion on the Note deletion expressed by ZTE.  Samsung: we see different view on the additional change in the revised CR. At least the group get consensus that the frequency range below 30MHz should be removed which is also proposed in our CR R4-2100890. We are fine to go with R4-2100890 in case the revised CR is not agreeable. This issue has already affected the verification test in industry, so we hope that progress can be made in this meeting. Thank you.  Huawei: the note under table 8.2.4-1 was introduced last meeting as clarification for the introduced modifications, aiming to align the outdated tables in TS 38.124 with the UE RF spec – but the lower frequency limit was overlooked. As we correct the lower limit back to 30MHz, then this table is no longer aligned with UE RF and there is no need for such note. Having such note will only create confusions.  For the note 3 and note 4 corrections: those notes are taken from TS 38.101-1, Table 6.5.3.1-2 as clarification, e.g. to motive different emission level of -25 dBm.  All in all agree with Samsung: the most important modification is to correct the lower frequency limit.  ZTE2: Ok with the clarification |
| *R4-2103770* | Title： WF on single carrier NR FR2 UE EMC requirement |
| Xiaomi: For the WF, we capture the two issues discussed above. For the first page, it is to capture the agreement that companies shown similar understanding that the single carrier FR2 UE EMC requirements need to be captured. For the second page, it is to capture the potential WF on how to capture the requirements. From our understanding, we see most companies agree to finish the work in future EMC umbrella WID. We can accept the idea, however, as long as there will be still two more RAN4 meetings (April and May), we think we can do more than just waiting for the new WID comes. Hence we have provided option 2a as:  Option 2a: Further analyze the impact of single carrier NR FR2 UE EMC on TS 38.124 and make it clear the objectives in RAN4#98-bis and RAN4#99 meeting.  Hope this option 2a is acceptable to all the companies  ZTE: For Option 1 and Option 2, we hope we can achieve the agreements in this meeting, since if we select option 2, then the objectives for the umbrella EMC WID needs to be updated in next RAN plenary meeting. It seems the majority views are Option 2, that’s also fine to us.  For option 2a, do you mean do more studies/analysis in advance for the NR FR2 UE EMC on TS38.124 no matter whether the umbrella EMC WID will be approved or not in next RAN plenary meeting? In our understanding, if we go with umbrella EMC WID, we think the related work can only be started after the umbrella EMC WID be approved. Otherwise, we are not sure which agenda is appropriate for the Tdoc.  BTW, how about the other UE vendor’s view? Any information to share?  Xiaomi: Thanks ZTE for the comments. If the majority view is option 2, we are fine. And the corresponding WID update will be submitted in March RAN plenary meeting as adding one more objective as FR2 UE EMC single carrier requirements for the core part. Hope this can be acceptable to all companies.  Ericsson: Thanks Xiaomi for providing the WF. As mentioned before, we support the idea of including this topic within the WID. Agree with ZTE on that it is better to wait for the approval of the EMC WID to discuss related work.  A comment aside, in the CR updating spurious emissions, there is a proposal to add the MU for the range 12.75 to 26 GHz, with a TBD value. Is this something you are considering addressing it in the WID?  Xiaomi：Thanks Ericsson for the comment. Initially we mention the range of spurious emission is actually want to do some modification as cutting the 9kHz to 30MHz. For the 12.75 to 26GHz, we think it needs further discussion and so far we believe as it is TBD we think it is ok for us.  Huawei: agree with ZTE and Ericsson. WF v1 looks ok. |

## 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”* |
| *R4-2103770* | *To be approved* |
| *R4-2103771*  *(revised from R4-2102398)* | *To be approved.* |
| *R4-2102399*  *(mirror CR)* | *To be approved.* |

# Topic #2: NR BS EMC

*Main technical topic overview. The structure can be done based on sub-agenda basis.*

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| **[R4-2100354](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2100354.zip)** | Ericsson | Title: CR to TS 38.113 on Performance criteria for transient phenomena, Release 15 (Rel-15 Cat F CR)  ***Reason for changes:***  Performance criteria for transient phenomena is updated to reflect alignment both with TS 37.113 MSR EMC (which includes also NR) standard and ETSI considerations.  ***Summary of change:***  Updates the performance criteria for transient phenomena to reflect alignment both with TS 37.113 MSR EMC (which includes also NR) standard and ETSI considerations. |
| R4-2100355 | Ericsson | Mirror CR for [R4-21003](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2015100.zip)54. |
| **[R4-2102178](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2102178.zip)** | ZTE Corporation | Title: CR to TS 38.113: Radiated emission test method (Rel-15 Cat F CR)  ***Reason for changes:***  The description about the highest measurement frequency in 8.2.1.2 is inconsistent with table 8.2.1.3-1.  There are some repetitive descriptions about RMS measurement.  ***Summary of change:***  Add some description about the highest measurement frequency.  Delete one description about RMS measurement. |
| R4-2102179 | ZTE Corporation | Mirror CR for [R4-2102](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_97_e/Docs/R4-2015100.zip)178. |

## Open issues summary

N/A

## Companies views’ collection for 1st round

N/A

### 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** |
| **[R4-2100354](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2100354.zip)** | Huawei: this was discussed last time – not sure why this is resubmitted as no further arguments for motivation were received. We are further checking internally. |
| Ericsson: As summarized in the cover of the contribution, the idea is to align the performance criteria for transient phenomena with TS 37.113 (which includes also NR) standard and ETSI considerations. In both cases, MSR standard and ETSI it has not been necessary to specify a performance criteria but leave it open (operation as intended with no loss of user control functions or stored data). We consider that is also important that the criteria for single RAT and MSR go hand-in-hand. |
| Huawei: there is still confusion, as in the other specification 38.175 the legacy based approach is proposed, which is contrary to the proposal in R4-2100354. We would suggest to include such topic into the EMC umbrella WID: it is impacting many EMC specifications and we would prefer to agree on the common approach first, before going to CRs. |
| **[R4-2102178](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2102178.zip)** | Ericsson: In our view, the description of the highest measurement frequency is OK, however we think the text on RMS measurement should be kept. |
| Xiaomi: We think the RMS is needed since it is for field strength method and substitution method respectively.  Nokia: It is not clear why the following sentence is deleted: “Unless otherwise stated, all measurements are done as mean power (RMS)”?  The wording for the proposed text should be improved and aligned with 38.104. |
| ZTE:Response to companies’ view:  The reason for deleting the RMS sentence is just because there ate two RMS sentences in this subclause. Therefore we delete one to avoid duplicated texts. |
| Huawei: same comment as Ericsson. The WI code shall be NR\_newRAT-Perf, not NR\_newRAT-Core. |

## 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#1** | *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* |

*Suggestion on WF/LS assignment*

|  |  |  |
| --- | --- | --- |
|  | **WF/LS t-doc Title** | **Assigned Company,**  **WF or LS lead** |
| #1 |  |  |

### CRs/TPs

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

|  |  |
| --- | --- |
| **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”* |
| *[R4-2100354](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2100354.zip)* | *Return to* |
| *[R4-2102178](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2102178.zip)* | *To be revised* |

## Discussion on 2nd round (if applicable)

|  |  |
| --- | --- |
| **CR/TP/LS/WF number** | **T-doc Status update recommendation** |
| *[R4-2100354](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2100354.zip)* | ZTE: agree with the CR.  Huawei: we have seen zero feedback to motivate this modification. We keep repeating the same question for second meeting. This CR introduces misalignment among specifications, with no good motivation provided. |
| *R4-2103772*  *(Revised from [R4-2102178](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2102178.zip))* | *Ericsson: Agree with the CR.*  *Huawei: ok* |

## 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”* |
| *[R4-2100354](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2100354.zip)* | *Not pursued* |
| *R4-2103772*  *(Revised from [R4-2102178](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2102178.zip))* | *To be approved* |

# Topic #3: IAB EMC

*Main technical topic overview. The structure can be done based on sub-agenda basis.*

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| **[R4-2100356](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2100356.zip)** | Ericsson | Proposal 1: To reuse the Exclusion Band Size values defined for NR BS exclusion bands (receiver and transmitter) in the IAB EMC specification.  Proposal 2: To include two alternatives (with and without spatial exclusion) for the definition of the receiver exclusion bands for RI testing of IAB nodes.  Proposal 3: To agree on the companion CR to TS 38.175 [5] on exclusion bands. |
| **[R4-2100357](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2100357.zip)** | Ericsson | CR to TS 38.175 on Exclusion Bands, based on 2100356. |
| **[R4-2100358](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2100358.zip)** | Ericsson | Proposal 1: To include the spatial exclusion concept under the Radiated Immunity considerations for EMC IAB specification TS 38.175.  Proposal 2: To agree on the companion CR to TS 38.175 [4] adding spatial exclusion to Radiated Immunity testing. |
| **[R4-2100359](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2100359.zip)** | Ericsson | CR to TS 38.175 on Spatial Exclusion for IAB EMC Radiated Immunity test, based on 2100358. |
| **[R4-2100360](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2100360.zip)** | Ericsson | CR to TS 38.175 on IAB EMC test configuratins and performance requirements  ***Reason for change:***  Introduction of performance requirements in IAB EMC specification is required to complete the EMC IAB standard.  ***Summary of change:***  Introduction of performance requirements in IAB EMC specification TS 38.175. |
| **[R4-2102177](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2102177.zip)** | ZTE | CR to TS 38.175: Performance criteria for IAB  ***Reason for change:***  The performance criteria for IAB need to be added.  ***Summary of change:***  Add performance criteria for IAB requirements |
| **[R4-2102578](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2102578.zip)** | Huawei | **Proposal 1:** if application of the spatial exclusion causes lack of EMC RI testing directions for IAB in the horizontal domain, the EUT shall be tested at the top and bottom directions, if technically feasible.  **Proposal 2:** further study both white box and black box approaches for the determination of the IAB arrays boresights.  **Proposal 3:** for the white box approach, introduce necessary manufacturer’s declarations into the IAB conformance testing specification. Further study in the RF session is required.  **Proposal 4:** Further study on the selection/activation of the IAB’s arrays for the purposes of EMC RI testing.  **Proposal 5**: send LS to IEC to describe challenges in RAN4 for the EMC RI test setup for IAB, and ask for guidance, or IEC spec updates. Timing of the LS is FFS. |
| **[R4-2102581](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2102581.zip)** | Huawei | CR to TS 38.175: Spatial Exclusion for EMC RI test for IAB, based on 2102578. |

## Open issues summary

In last meeting, how to define the exclusion band size for IAB notes EMC testing were discussed, and company provided the CR to remove the [] and keep two alternatives (with and without spatial exclusion) but without the figure. However, comments were received that the figure should be included together and also more time to check how the spatial exclusion is actually defined for IAB.

For IAB EMC performance, it was agreed in R4-2017445:

*For the sections of 4.5, 6.1 and 6.2*

*- Waiting for the outcomes of IAB RF discussion (i.e. TS38.174).*

### Sub-topic 3-1

**Issue 3-1: How to define IAB receiver exclusion band?**

* Proposals
  + Tentative agreements: Remove [], i.e. Reuse the values of NR BS and include two alternatives (with and without spatial exclusion) (R4-2100356, R4-2102581)
* Recommended WF
  + TBA

**Issue 3-2: Whether or not include exclusion zone (spatial exclusion) for Radiated Immunity testing of IAB nodes?**

* Proposals
  + Tentative agreements: Yes. (R4-2100356, R4-2102581)
* Recommended WF
  + TBA

**Issue 3-3: If application of the spatial exclusion, whether the challenges indicated in R4-2102578 are existed in RAN4?**

* Proposals
  + Option 1. Yes, the challenges are existed (R4-2102578)
  + Option 2. No, no challenges, reuse the NR BS EMC methods. (R4-2100358)
  + Option 3. Others.
* Recommended WF
  + TBA

**Issue 3-4: If Option 1 (Yes) for issue 3-3, how to select of the EMC RI testing directions?**

* Proposals
  + Option 1:
    - Proposal 1: if application of the spatial exclusion causes lack of EMC RI testing directions for IAB in the horizontal domain, the EUT shall be tested at the top and bottom directions, if technically feasible.
  + Option 2. Others.
* Recommended WF
  + TBA

**Issue 3-5: If Option 1 (Yes) for issue 3-3, how to determinate the IAB antenna array locations?**

* Proposals
  + Option 1:
    - Proposal 2: further study both white box and black box approaches for the determination of the IAB arrays boresights.
    - Proposal 3: for the white box approach, introduce necessary manufacturer’s declarations into the IAB conformance testing specification. Further study in the RF session is required.
  + Option 2. Others.
* Recommended WF
  + TBA

**Issue 3-6: If Option 1 (Yes) for issue 3-3, how to select/activate the IAB’s arrays for the EMC RI testing?**

* Proposals
  + Option 1:
    - Proposal 4: Further study on the selection/activation of the IAB’s arrays for the purposes of EMC RI testing.
  + Option 2. Others.
* Recommended WF
  + TBA

**Issue 3-7: If the issues 3-4/3-5/3-6 are valid in RAN4 EMC RI testing, then whether or not set a LS to IEC?**

* Proposals
  + Option 1: Yes, send LS to IEC to describe challenges in RAN4 for the EMC RI test setup for IAB, and ask for guidance, or IEC spec updates. Timing of the LS is FFS.
  + Option 2. Others.
* Recommended WF
  + TBA

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
| Ericsson | Sub topic 3-1: Our proposal is to remove [] and implement the two alternatives, with and without exclusion bands.  Sub topic 3-2: Yes to spatial exclusion.  Sub-topic 3-3: we think that the principles of NR BS can be reused in the IAB scenario. Not sure about adding top and bottom sides during the test. This could open a new scenario where regulators might start asking for additions to the RI testing.  Sub-topic 3-4: This could open a new scenario where regulators might start asking for additions to the RI testing.  Sub-topic 3-5: If the option is to go for NR BS scenario approach the need for additional studies could be skipped.  Sub-topic 3-6: If the option is to go for NR BS scenario approach the need for additional studies could be skipped.  Sub-topic 3-7: We might need an additional discussion on the scope and expectations with the LS submission.  Others: |
| ZTE | Sub topic 3-1: Option 1  Sub topic 3-2: Option 1  Sub topic 3-3: Option 2  Sub topic 3-7: Option 2  Chapter 7 of the IEC61000-4-3 describes: If the equipment is designed to be mounted in a panel, rack or cabinet, it shall be tested in this configuration.  The table-top equipment can apply interference to each side, but the floor-standing equipment is obviously not applicable for each side.The base station is usually installed on a pole or wall. So we should use a pole to perform RI test for the base station.Obviously, electromagnetic interference cannot be applied to the top and bottom of the base station with a pole. |
| Huawei | Sub topic 3-1: remove [], only if the methodology solution is agreed. Otherwise using the spatial exclusion for the IAB testing is considered to be not testable.  Sub topic 3-2: yes, spatial exclusion to be considered for RI testing. See 3-1: spatial exclusion is already in the spec in []  Sub-topic 3-3: we have not seen any argument to confirm that BS approach can be used for IAB for RI testing. We agree with most observations in R4-2100358. However R4-2100358 does not explain how to perform the actual test. This is addressed in R4-2102578. Therefore: Option 1. If we have no consensus this meeting, we suggest to aim for WF on the testability of the RI with the consideration of spatial exclusion for IAB. This WF can include topics of 3-4 to 3-7.  Sub-topic 3-4: Option 1: it was motivated for the case where no other testing direction would be available. Other proposals are welcome.  Sub-topic 3-5: Option 1. Other proposals are welcome. We may get some insights from the RF conformance discussions this meeting, as well.  Sub-topic 3-6: Option 1. Other proposals are welcome.  Sub-topic 3-7: we can first wait for the conclusions of the first round and then come back to this potential LS topic. |
| Ericsson | We would propose to remove the [] for the exclusion bands. The figure we propose could be used as a generic description of the intention of protecting the radiating face of the IAB node during the test.Some text might be kept in [] waiting for the WF results. Based on a WF on testability outcome we can detail the way to address the testing scenario for the spatial exclusion case. |
| Huawei | @Ericsson: we have not seen good motivation showing that the BS approach works for the IAB node, especially for the case depicted in Huawei analysis. Probably [] from the frequency exclusions can be removed, but it does not solve the overall testing topic. If we conclude that spatial exclusion is not working for IAB, we will have to trigger even more CRs – this is not the preferred way of working. |

### 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** |
| **[R4-2100357](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2100357.zip)** | Nokia: This CR is somewhat similar to R4-2102581. |
| Huawei: those correction are to be treated together with the test method in 9.2.2. Definition of the spatial exclusion is missing.  Refer to Huawei CR in R4-2102581. |
| Ericsson: This Tdoc could be used to only remove the [] for the no-spatial exclusion scenario. |
| **[R4-2100359](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2100359.zip)** | ZTE: We prefer to use the same figure as Figure 9.2.2-1 in TS38.113, i.e. using ‘EUT’ in the figure. |
| Huawei: those correction are to be treated together with related corrections in section 4. The proposed figure does not work for the common IAB node design of 3 antenna arrays at 120deg’s.  Refer to Huawei CR in 4-2102581. |
| Ericsson: the figure we are proposing tries to mention that the exclusion zone is associated to the radiating faces of IAB nodes, which we think must be protected during the Radiated Immunity test. This could be used as a generic example. Details on how to run the test might be included after the WF. |
| **[R4-2100360](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2100360.zip)** | Nokia: This CR is similar to R4-2102177 |
| ZTE: For Chapter 4.5, it should be needed to wait for the progress of TS38.174. For Contents of 6.1 & 6.2, we also include the contents in R4-2102177 but some difference between this two CRs.We agree with the revision of Clause 9. |
| Huawei:  For 6.1 on perf criteria: this section was removed on the other Ericsson CR for the MSR EMC: we would like to understand why this approach in not aligned here and what is the reason for different approached for the MSR EMC and IAB EMC specs.  6.2: EUT vs. IAB: terminology to be used consistently.  Refer to ZTE CR in R4-2102177 where the content is more complete.  Ericsson: Agree with waiting for TS 38.174 input to define 4.5. We can work together with ZTE in aligning the contributions according to the outcome of this discussion. See also comments on **[R4-2100354](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2100354.zip).** |
| **[R4-2102177](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2102177.zip)** | Ericsson: We have similar contribution, but we also cover some additional corrections to the performance criteria. In our view, the idea is to keep a simplified approach.  ZTE: Refer to comments for 0360. |
| Nokia: Refer to the comments for R4-2100360. |
| Huawei: we need to clarify what is meant by “communication link” as in case of IAB this is not obvious anymore. |
| **[R4-2102581](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2102581.zip)** | Ericsson: We agree on keeping the spatial exclusion concept, however we think that NR BS approach works well for the IAB node. |
| Nokia: Refer to comments for R4-2100357 |
| ZTE: Same view with Ericsson. |
| Huawei: @Ericsson: refer to the discussion points in 3.2 |

## 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#1** | *Tentative agreements:*  *1: Remove [] for IAB receiver exclusion band.*   1. *Include exclusion zone (spatial exclusion) for Radiated Immunity testing of IAB nodes*   *For the application of the spatial exclusion:*  *-- Two companies (Ericsson, ZTE) think the principles of NR BS can be reused in the IAB scenario for RI testing*  *-- One company (Huawei) think there are some challenges (indicated in R4-2102578) for IAB EMC RI testing, and a LS is needed to IEC.*  *Some CRs are pending on this agreement*  *Candidate options:*  *Recommendations for 2nd round:*  *Focus on the WF* |

*Recommendations on WF/LS assignment*

|  |  |  |
| --- | --- | --- |
|  | **WF/LS t-doc Title** | **Assigned Company,**  **WF or LS lead** |
| #1 | WF on IAB EMC RI testing with spatial exclusions | Huawei |

### CRs/TPs

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

|  |  |
| --- | --- |
| **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”* |
| *[R4-2100357](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2100357.zip)* | *Not pursued* |
| *[R4-2100359](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2100359.zip)* | *Not pursued* |
| *[R4-2100360](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2100360.zip)* | *To be revised (Source: Ericsson, ZTE)* |
| *[R4-2102177](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2102177.zip)* | *Not pursued* |
| *[R4-2102581](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2102581.zip)* | *Not pursued* |

## Discussion on 2nd round (if applicable)

|  |  |
| --- | --- |
| **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”* |
| *R4-2103774*  *Revised from [R4-2100360](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2100360.zip)* | ZTE: we agree with the revision.  Huawei:  Comparing to TS 38.113, tables for Performance criteria for transient phenomena for IAB are missing, i.e. content is not the same as for contiguous phenomena, i.e. Performance criteria is different among those sections. Such modification of the approach is not well motivated. Refer to comments to *[R4-2100354](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2100354.zip).*   * Table 6.1-2: editorial: correct cell boarders in column “Bearer information data rate for IAB-DU” * Align wording: sometimes IAB is used, sometimes EUT. |
| *R4-2103773* | *Title: WF on IAB EMC RI testing with spatial exclusions* |
| ZTE: In our understanding, the issues in WF#1~5 are based on the challenges confirmed by companies. However, according to the 1st round discussion, two companies think the challenges are not existed and the current NR BS RI testing can be reused for IAB RI testing. Therefore, we think reusing the current NR BS RI testing should be alternative and be reflected in the WF.  Ericsson: As expressed by ZTE, we consider that the alternative of reusing NR BS RI testing should be included in the WF.  Huawei: agree – removal was not intended. I will update the wording accordingly.  ZTE2: Revision looks fine. |

## 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”* |
| *R4-2103774*  *Revised from [R4-2100360](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2100360.zip)* | *Not pursued* |
| *R4-2103773* | *To be approved* |

# Topic #4: NR repeaters EMC

*Main technical topic overview. The structure can be done based on sub-agenda basis.*

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| **[R4-2100361](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2100361.zip)** | Ericsson | Proposal 1: Not defining an EMC specification but extending the scope of current NR EMC specification for RF repeater.  Proposal 2: To rely on CISPR/IEC and ETSI recommendations to define the NR RF Repeaters EMC requirements.  Proposal 3: Discuss the changes and additions needed to update TS 38.113 scope incorporating RF Repeaters. |
| **[R4-2102180](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2102180.zip)** | ZTE Corporation | Proposal on the skeleton of NR Repeaters EMC |
| **[R4-2102181](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2102181.zip)** | ZTE Corporation | **Proposal 1:** The core parts of NR repeaters EMC TS can be performed firstly referring to the TS 38.113 spec and can be improved together with RF standard of NR repeaters. |
| **[R4-2102579](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_98_e/Docs/R4-2102579.zip)** | Huawei | **Proposal 1**: EMC requirements for Rel-17 NR Repeater can be easily captured as the updated to the Rel-17 version of the TS 38.113 (NR BS EMC), following the approach in TS 36.113 for E-UTRA. |

## Open issues summary

In last RAN #90-e meeting, a new WID(RP-202927) on NR Repeaters was approved, where a new TS for NR repeaters EMC was included.

In this section, we only focus on the technical identification of the EMC parameters/requirements to be considered for NR repeaters, especially for NR TDD repeaters. Here we use TS38.113 and TS36.113 sections as starting point. Sub-topic 4-1

**Issue 4-1: Whether the test condition of LTE repeaters EMC (i.e. clause 4.4 in TS36.113) can be directly reused to NR repeaters EMC (especially for TDD) ?**

* Proposals
  + Option 1: Yes
  + Option 2: No
* Recommended WF
  + TBA

**Issue 4-2: Whether the Performance assessment and Performance criteria of LTE repeaters EMC (i.e. clauses 5.5, 6.5 and 6.6 in TS36.113) can be directly reused to NR repeaters EMC (especially for TDD) ?**

* Proposals
  + Option 1: Yes
  + Option 2: No
* Recommended WF
  + TBA

**Issue 4-3: Whether NR BS EMC requirements (i.e. clauses 7, 8 and 9 in TS38.113) can be applied for NR repeaters EMC including FDD and TDD?**

* Proposals
  + Option 1: Yes, but some small corrections are needed on top of the current sub-clauses
  + Option 2: No, some new sub-clauses may be needed
* Recommended WF
  + TBA

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
| Ericsson | Sub topic 4-1, 4-2 and 4.3: Our initial view is that reusing EMC test conditions, performance assessment is possible by following the approach followed with LTE. However, it would be good to bring new elements for the discussion, especially for the companies interested on developing an opposite approach. |
| Xiaomi | Current NR repeater is kind of called “lite-IAB” and we believe it is not totally the same as legacy LTE repeaters with more beam-forming mechanism considered. Hence we think it might be good to further study before deciding reusing anything from LTE. |
| Nokia, Nokia Shanghai Bell | At the moment, it is difficult to decide what requirements/conditions can be reused from TS 38.113 and 36.113 without knowing the definition of NR repeater. Is the NR repeater similar to LTE repeater? It is worth differentiating a repeater from a relay. Furthermore, the EMC specification work might depend on the outcome of repeater RF discussions. |
| ZTE | Sub topic 4-1: Option 2  Sub topic 4-2: Option 2  Sub topic 4-3: Option 1  The most important chapters for EMC spec are clause 1 Scope, clause 4 Test conditions, clause 5 Performance assessment and clause 6 Performance criteria. The other chapters are similar for mostly product EMC standards.  For NR Repeater, we need to consider TDD NR operation bands, which is greatly different from FDD in RF, which means the LTE FDD repeater requirements cannot be used directly. During EMC tests, the signal configuration and test setup for LTE Repeater are very simple. It only need to input one signal and measure its Gain. Therefore, LTE Repeater can be regarded as a supplementary device of LTE BS, so TS36.113 can includes the requirements of repeater easily. But for TDD repeater, some other aspects should be considered, such as DL-UL configurations etc. And we think it is unclear so far how to set the signal and which should be measured for NR TDD repeaters.  Although the demodulation is not taken into account for NR Repeater, however, the beamforming capability may need to be considered in future. Its features are similar to 1-H, 1-O and 2-O. The 1-H signal configuration can be arranged through conductive. However, the 1-O and 2-O NR Repeater signal configuration must be implemented through OTA. It can be foreseen that the Test configuration and Performance criteria requirements are more complexity than NR IAB.  Therefore, the core contents of EMC TS such as Test conditions and performance criteria of NR Repeater are quite different from those of NR BS, also considering the future proofing aspect. It is recommended to maintain the agreements in last RAN plenary meeting, i.e. generate a new EMC TS for NR repeater. |
| Huawei | R4-2102579 lists all the aspects of the 36.113, where BS and repeater related text differs. Delta is small. For potential TDD specifics: those are expected not to cause any mayor issues. There is not good motivation for separate specification.  Issue 4-1: there was no single argument raised why it could not be reused. The question shall not be whether it can be DIRECTLY reused (it shall also refer to 38.113, not 36.113). The question shall be what is the motivation to have separate EMC specification.  Issue 4-2: same as 4-1  Issue 4-3: option 1.  @Xiaomi: according to the current WID on NR repeaters, there is no beamforming considered. Rel-17 WID on NR repeater has nothing to do with the IAB – this is basic L1 repeater with no “smart” features included. We would like to hear more motivation behind this IAB comparison.  @Ericsson: what is meant by “opposite approach”? |
| Ericsson | @Huawei, opposite approach means “creating a new spec”.  In our view, and as we have presented in different occasions, there are EMC requirements and tests that are device-agnostic (ESD, Voltage dips, etc.), that could be reused from other specifications. Of course, there is also elements that need to be considered only after the RF discussions are completed. We propose a WF where we can clearly identify the technical elements that will be incorporated in the EMC evaluation of NR repeaters. This might include an analysis of the potential new features that NR repeater will bring. |

### 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#1** | *Tentative agreements:*  *Some technical issues were discussed in 1st round. Comparing with LTE FDD repeater(36.113):*   1. *One company(ZTE) think test condition and Performance assessment and Performance criteria in TS36.113 cannot be directly used for NR repeater, especially for TDD.* 2. *Three companies (Xiaomi, Nokia, Ericsson) think it might be good to further study before deciding reusing anything from LTE considering NR repeater is not the same with LTE repeater, also pending on the repeater RF discussion.* 3. *One company (Huawei) would like to know what is the motivation to have separate EMC specification.*   *In addition, Ericsson think some EMC requirements and tests that are device-agnostic (ESD, Voltage dips, etc.), that could be reused from other specifications.*  *Candidate options:*  *Recommendations for 2nd round:*  *Focus on the WF where we can clearly identify the technical elements that will be incorporated in the EMC evaluation of NR repeaters* |

*Recommendations on WF/LS assignment*

|  |  |  |
| --- | --- | --- |
|  | **WF/LS t-doc Title** | **Assigned Company,**  **WF or LS lead** |
| #1 | WF on NR repeaters EMC | ZTE |

### CRs/TPs

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

|  |  |
| --- | --- |
| **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)

|  |  |
| --- | --- |
| **CR/TP/LS/WF number** | **T-doc Status update recommendation** |
| *R4-2103879* | *Title: WF for NR repeater EMC requirements* |
| Nokia: Comments are provided in the WF, which are uploaded. The open issues captured in the WF depend on the outcome of repeater RF discussions as well as what requirements are.  ZTE; Thanks Nokia’s comments. We have made some corrections in slide 4 to reflect Nokia’s comments, where we list the detail EMC requirements, which are uploaded. More comments are welcome.  Ericsson: Agree with Nokia on the need for aligning the EMC discussion on Repeaters with the decisions made in the RF forum. We think this adjustment is done in the new version.  Huawei: significant revision was shared already. |

## 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”* |
| *R4-2103879* | *To be approved* |