**3GPP TSG-RAN WG4 Meeting # 112 R4-2412821**

**Maastricht, NL, 19th ‒ 23rd August, 2024**

**Agenda item:** 8.2.6

**Source:** Moderator (Ericsson)

**Title:** Topic summary for [112][119] FS\_NR\_IMT\_part1

**Document for:** Information

# Introduction

This moderator summary covers the general aspects, 4400-4800 and 7125-8400GHz aspects of the IMT parameters study.

According to the WI schedule, RAN4 should aim to send an LS to ITU-R on 7125-8400GHz parameters during RAN4#112, and hence discussion should focus on finalizing the parameters and LS.

# Topic #1: General aspects

Two groups of proposals have been submitted to the general aspects Agenda Item relating to consideration of other services and the timescale for completion of the LS responses.

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2411307 | Korea testing laboratory | The frequency ranges for IMT-2030 or 6G have been already utilized for various radio services. Therefore, interferences caused by sharing frequency bands can affect the radio service performance. As a result, we should consider such interferences when parameters for IMT-2030 or 6G are determined. |
| R4-2411520 | Qualcomm | Note: Proposal 1 on the timing of the response is considered in this thread. The other proposals on Zero forcing impact are suggested to be discussed in the other thread on “other issues”.  **Proposal 1: RAN4 to respond to WP5D on the generic questions (i.e., Frequency range agnostic) captured in WP5D LS by the RAN4#113 meeting.** |
| R4-2411874 | Ericsson | In our view, it is best for the industry and ITU-R to keep to the time schedule. However, since ITU-R need advanced warning of any delay, for contingency purposes it would be good to discuss the need for early communication of work plan extension to ITU-R WP 5D and how to include the information in scheduled LS responses. |

## Open issues summary

### Sub-topic 1-1 Other services

**Issue 1-1: Taking into account other services**

* Proposals
  + Option 1: Take into account non-3GPP services that share the frequencies when deciding the IMT-2030 parameters (Korea Testing Laboratory)
    - Further discussion needed on how
  + Option 2: In 3GPP focus on interferences towards 3GPP systems
* Recommended WF
  + Discuss how and where services that share the frequencies should be taken into account

### Sub-topic 1-2 timescale for responding on other issues

**Issue 1-2: Timescale for responding on other issues**

* Proposals
  + Option 1: Respond by RAN4#113 on other issues (Qualcomm)
  + Option 2: Discuss whether there is a need to inform ITU-R that the response on other issues might occur later than RAN4#113 (Ericsson)
* Recommended WF
  + TBA

Spark: the completion of IMT parameters should be done by Feb 2025. That is regulation deadline.

Apple: Respect to 5D timeline, in principle we should make decision on December.

Qualcomm: similar view as Apple.

CATT: for other issues, they are not easy. We suggest following the work plan. We can add the check point in the Oct meeting.

Nokia: RAN plenary set target by December.

# Topic #2: 4GHz topics

The parameters for 4400-4800 GHz were finalized at RAN4#111 and an LS was sent to ITU-R. The parameters were documented in the TR. Under this agenda item, two correction TPs were submitted.

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2415287 | Nokia | Corrections to 4GHz TP:   * Change “figure” to “table” * Clarify power control dynamic range is based on PC3 |
| R4-2413278 | Huawei, Hi-Silicon | Corrections to 4GHz TP: Add full list of bandwidths for ACLR requirement description |

## Open issues summary

**Issue 2-1: TP R4-2415287**

* Proposals
  + Option 1: Agree TP (Nokia)
  + Option 2: Revise TP (Provide details of what needs to be revised)
  + Option 3: Don’t agree TP
* Recommended WF
  + TBA

**Issue 2-2: TP R4-2413278**

* Proposals
  + Option 1: Agree TP (Huawei)
  + Option 2: Revise TP (Provide details of what needs to be revised)
  + Option 3: Don’t agree TP
* Recommended WF
  + TBA

# Topic #3: 8GHz LS reply

This agenda item considers the 7125-8400 parameters, for which a reply LS should be sent in this meeting. The topic is split into general aspects, BS parameters and UE parameters. For clarity, all parameters are captured as “issues”, even where they are agreed in previous meetings, in order to keep all agreements in the same place. Already agreed parameters do not need further discussion at the meeting, even though listed.

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2411090 | CATT | **Observation 1: The sub-array size does not have big impacts on DL throughputs with different array configurations.**  **Observation 2: For antenna array configurations with 8 x 16 and 8 x 8, the DL throughput difference is around 10% at 30dB ACIR with a sub-array size of 3.**  **Proposal 1: Not to mention wider channel bandwidth than 100MHz in the second reply LS.**  **Proposal 2: Quote formula of RBs \* SCS without number of RBs in the reply LS for typical signal bandwidth.**  **Proposal 3: Accept ΔfOBUE as 100 MHz considering the limited time and if no other issues identified.**  **Proposal 4: Set sub-array size as 3.**  **Proposal 5: Set antenna array configuration as 8 x 8.**  **Proposal 6: Confirm the tentative agreements on UE maximum output power, i.e., 23dBm in the reply LS, and other power classes captured in TR.** |
| R4-2411141 | Apple | TP on UE parameters |
| R4-2411193 | Ericsson | Proposals for 8GHz parameters |
| R4-2411194 | Ericsson | Draft LS reply |
| R4-2411518 | Qualcomm | Observation 1: 3GPP has been studying flexible duplexing (i.e., SBFD) at the gNB in Rel-18 and Rel-19 and it is desired to document such progress in this SI TR (i.e., TR 38.922).  Proposal 1: RAN4 to agree on TDD as a baseline duplexing for 7125 – 8400 MHz frequency range and capture the following text in TR 38.922.  “*There is no defined 3GPP band for the 7125 - 8400 MHz frequency range, however, it is adjacent to existing TDD band n104 (6425 – 7125 MHz). Similar to the 4400 – 4800 MHz frequency range, SBFD can be a candidate duplexing method for this frequency range. To provide timely response to WP5D regarding the requested RF parameters, RAN4 assumed TDD as a baseline duplexing for the 7125 – 8400 MHz frequency range. The core requirements for Rel-19 SBFD work item can be tracked through the list of impacted specs captured in [SBFD\_WID].”*  Observation 2: Based on adjacent channel coexistence simulations, ACIR requirements (i.e., BS/ UE ACLR and ACS) based on 100MHz channel bandwidth can be reused for higher channel bandwidth values (e.g., 200MHz).  Proposal 2: RAN4 to reply in the LS to WP5D that 100MHz is a typical value and that higher channel bandwidths are not precluded for the 7125 – 8400 MHz frequency range. Additional information on the channel bandwidth consideration for this range should be captured in TR 38.922.  Observation 3: As signal bandwidth depends on CHBW and SCS, no need to specify a fixed signal bandwidth but rather mention its dependency on SCS and number of RBs.  Proposal 3: RAN4 to respond to WP5D on the signal bandwidth with the Quote formula of RBs \* SCS without number of RBs.  Proposal 4: RAN4 to adopt the n104 unwanted emission mask for both the AAS and non-AAS BS.  Observation 4: To determine the BS Rx sensitivity, RAN4 need to agree on the requirement type (i.e., conducted or radiated) as well as other parameters (e.g., Antenna gain, Noise Figure, implementation margin).  Proposal 5: RAN4 to mention the BS Rx sensitivity only in TR 38.922 and mentioned “to be specified” in the LS to WP5D.  Proposal 6: RAN4 to consider PC3 (i.e., 23 dBm) as a typical output power and to capture higher output powers in TR 38.922.  Observation 5: Based on adjacent channel coexistence simulations, ACIR requirements (i.e., BS/ UE ACLR and ACS) based on 23 dBm UE maximum output power can be reused for 26 dBm UE maximum output power scenarios.  Proposal 7: RAN4 to agree on 56 dBm as UE power dynamic range. |
| R4-2412068 | vivo | Proposal 1: For the signal bandwidth, similar format as 4400-4800 can be used, i.e., Signal bandwidth = NRB x SCS x 12 and the NRB and SCS is refer to the TS38.101-1.  Proposal 2: In the reply LS, only provide 23dBm as typical value for MOP. Other powers are not precluded and can be recorded in TR.  Observation 1: UE can benefit from lower ACLR to reduce the MPR and a achieve better UL performance, which is also good for the coverage.  Proposal 3: Use the co-existence outcome from TR 38.921 as the ACLR/ACS value, i.e., 26 dB ACLR/32dB ACS for UE in 7125-8400 MHz.  Observation 2: There are different reasons behind each NF value, it is hard to do the down selection.  Proposal 4: Provide a range of NF in the reply LS, e.g., 9-13 dB.  Proposal 5: The SINR operation range in 4400-4800MHz LS can be used for 7125-8400MHz.  Proposal 6: To match with 100MHz typical channel bandwidth, the REFSENS of 100MHz in n104 is used in reply LS.  Proposal 7: For the UE blocking response in 7125-8400MHz, reuse the requirement of n104. |
| R4-2412137 | Samsung | Observation 1: For 8 GHz, frequency range of 7125-8400 MHz, it was agreed that existing n104 requirements should be a baseline for future discussions.  Observation 2: Most parameters were discussed and reached agreements based on existing parameters of n104.  Observation 3: Supplementary text/note may not affect the result/process of the sharing study in WP 5D as long as the parameter has a single typical value/scheme in the LS.  Observation 4: Non-technical subjective debate can happen anytime and anywhere in ITU-R regardless of the ‘confusing’ or ‘uncertain’ information from 3GPP.  Observation 5: There is no need to limit any possibilities of larger channel bandwidth introduction in the future by ourselves as long as we have a single typical value there for ITU-R.  Proposal 1: It would be better to describe the possibilities of wider channel bandwidths both in the TR and LS.  Proposal 2: It is preferred to quote directly in MHz based on 100 MHz for n104 (Option 3) rather than other indirect options since the current spec does not support the new frequency of 8 GHz range.  Proposal 3: Other options such as 8x16x3 would also be fine for the sake of progress.  Proposal 4: 23 dBm should be adopted in the LS for the typical maximum output power of normal UE.  Proposal 5: Taking into account observations and proposals for the tricky but resolvable remaining issues above, it is better for RAN4 to send out 8 GHz parameters in this meeting. |
| R4-2412565 | MEdiatek | Proposal 1: RAN4 to consider Option 1 for the UE ACLR, which is 26dB for PC3.  Proposal 2: RAN4 to agree that capture 23 dBm as the typical maximum output power in the LS to the ITU. It was also agreed that other output powers are not precluded and should refer to the TR, capturing 20 dBm, 23 dBm, 26 dBm, and higher power classes in the TR.  Proposal 3: RAN4 to consider 13dB as the UE NF value.  Proposal 4: RAN4 to consider the sensitivity for the UE as “to be specified”.  Proposal 5: RAN4 to consider 31dBc as the UE ACS value. |
| R4-2412588 | Nokia | Proposal 1: Use band n104 unwanted emission mask and delta\_obue for AAS and non-AAS BS.  Proposal 2: Adopt 8x16 (Sub Array size 4) as BS antenna array. |
| R4-2412710 | ZTE | Proposal 1: for carrier bandwidth and transmission bandwidth configuration, reuse NR channel bandwidth and transmission bandwidth configuration as baseline (e.g. 100MHz for 30kHz SCS as typical value) for IMT-2020, and indicate the potential lager channel bandwidth for IMT-2030 in TR.  Proposal 2: to define f\_OBUE as 100MHz and f\_OOBB requirement as 200MHz of BS type 1-H for 7125-8400MHz;  Proposal 3: regarding BS antenna array for 7125-8400MHz, propose to follow the previous reply LS R4-2103104 to WP5D on 6425-10500MHz.  Proposal 4: at least PC3 and PC2 should be supported for 7125-8400MHz; PC1.5 is also preferred.  Proposal 5: propose 56dB/59dB/62dB power dynamic range for PC3/PC2/PC1.5 respectively according to the -33dBm/100MHz minimum transmission power.  Proposal 6: reuse the same ACLR and SEM requirement for band n104 for 7125-8400MHz instead of referring to TR 38.921.  Proposal 8: reuse the same ACS requirements for band n104 for 7125-8400MHz instead of referring to TR 38.921.  Proposal 9: for IBB and OOBB requirements, not reuse the existing band requirement for band n104 and further discuss the exact requirement for it. |
| R4-2412967 | Google | Proposal 1: Considering the RF hardware technology for 6G may be more advanced than 5G NR, it would be suitable not to specify specific RB number with SCS in the reply LS without more detailed discussion. Hence, for signal bandwidth on the frequency range 7125 to 8400 MHz, it is proposed to quote formula of RBs \* SCS without specifying the number of RBs.  Proposal 2: It is preferred not to introduce HPUE but only to apply 23 dBm (PC3) and 20 dBm (PC5) to the frequency range for 7125 to 8400 MHz. Considering the last meeting tentative agreement has already captured 20 dBm (PC5) in the TR, it can be compromised that 20 dBm (PC5) is not included as the UE typical maximum output power in the reply LS. Hence, it is proposed to confirm the last meeting tentative agreement on the UE maximum out power for the frequency range 7125 to 8400 MHz. |
| R4-2413279 | Huawei | Proposal 1: It is proposed to not to mention wider channel bandwidths in the reply LS.  Proposal 2: Describe 200 MHz as a potential wider channel bandwidth in the TR  Proposal 3: Option 2 is adopted: quote formula of RBs \* SCS without number of RBs  Proposal 4: n104 unwanted emissions including ΔfOBUE definition are used for the frequency range 7125 to 8400 MHz.  Proposal 5: 26 dB ACLR for PC3 UE  Proposal 6: For the purpose of co-existence analysis, the UE maximum/typical output power for the considered frequency ranges could be 23 dBm.  Proposal 7: Follow n104 noise figure (12dB)  Proposal 8: The blocking characteristic specified in clause 7.6 of TS 38.101-1 [4] for frequency larger than 3300 MHz could be applied for the range.  Proposal 9: The antenna characteristics for IMT in 7125 to 8400 MHz is proposed in following Table 2.2-1. |
| R4-2413280 | Huawei | TP on BS parameters |
| R4-2411519 | Qualcomm | TP on UE parameters |
| R4-2411948 | Nokia | Proposal 1: In addition to 100 MHz, 200 MHz is also mentioned as a typical maximum channel bandwidth for 7125 – 8400 MHz in LS.  Proposal 2: 200-400 MHz is considered as typical maximum channel bandwidth for 14800 – 15350 MHz.  Proposal 3: Typical signal bandwidth for 100 MHz channel bandwidth is assumed 273 RB with 30 kHz SCS for 7125 – 8400 MHz. For wider channel bandwidth such as 200 MHz, 273 RB with 60 kHz SCS can be assumed as tentative agreement.  Proposal 4: It is proposed that NF=10 dB for 7125 – 8400 MHz and NF=11 dB for 14800 – 15350 MHz in the reply LS to WP5D.  Proposal 5: ACLR 30dB is proposed for PC3 and 31dB (n104) for PC2 for 7125 – 8400 MHz. It is TBD for 14800-15350 MHz.  Proposal 6: It is proposed to formally agree the tentative agreement in RAN4#111 to capture 23 dBm as typical maximum output power in the LS to ITU and refer to TR for other power classes. |

## Open issues summary

### Sub-topic 3-1 General issues

This topic considers general issues that apply to both BS and UE.

**Issue 3-1: Duplex mode**

**Previous agreement:**

Do not include SBFD in the LS, but add information in the TR. Add a reference to the TR in the LS

* Proposals
  + Option 1: Capture the following text in the TR (Qualcomm, TP R4-2411519)

**“**There is no defined 3GPP band for the 7125 - 8400 MHz frequency range, however, it is adjacent to existing TDD band n104 (6425 – 7125 MHz). Similar to the 4400 – 4800 MHz frequency range, SBFD can be a candidate duplexing method for this frequency range. The core requirements for Rel-19 SBFD work item can be tracked through the list of impacted specs captured in [6]. To provide a timely response to WP5D regarding the requested RF parameters, RAN4 assumed TDD as a baseline duplexing for the 7125 – 8400 MHz frequency range.***.”***

* Recommended WF
  + TBA

**Issue 3-2: Typical channel bandwidth**

**Previous agreement:**

* Mention 100MHz as typical bandwidth in the LS
  + FFS whether to mention wider bandwidths may be possible in future in the LS

Describe other possibilities for bandwidth in the TR, mentioning that additional specification effort needed for >100MHz

* Proposals
  + Option 1: Do not mention bandwidth larger than 100MHz in the LS (CATT, ZTE, Huawei)
  + Option 2: Mention that larger bandwidths may be used in the future in both the TR and LS (Ericsson, Qualcomm, Samsung)
  + Option 3: Specifically mention 200MHz as the maximum channel bandwidth in the TR (Huawei)
  + Option 4: Specifically mention 200MHz as a typical example of maximum bandwidth in the LS (alongside 100MHz as typical bandwidth) (Nokia)
* Recommended WF
  + TBA

**Issue 3-3: Typical signal bandwidth**

**Previous discussion:**

Outcome of discussion (Not agreed):

Option 1: 273 RB, 30k SCS as 38.104

Option 2: Quote formula of RBs \* SCS without number of RBs

Option 3: Directly quote the signal bandwidth in MHz

* Proposals
  + Option 1: Quote formula of RBs \* SCS without number of RBs (CATT, Apple, Ericsson, Qualcomm, vivo, Google, Huawei)
  + Option 2: Directly quote the signal bandwidth in MHz (Samsung)
  + Option 3: Specifically state 273RB with 30kHz SCS for 100MHz CBW and 273RB with 60kHz SCS for 200MHz CBW (Nokia)
* Recommended WF
  + TBA

**Issue 3-4: SINR operating range**

Previous agreement:

SINR operating range

* To be discussed further
* Proposals
  + Option 1: Same as 4GHz response (Ericsson, vivo)

### Sub-topic 3-2: BS related parameters

*This sub-topic considers BS parameters*

**Issue 3-5: BS output power**

* Proposals
  + Option 1: Refer to AAS/non-AAS in 38.104 (Ericsson, in proposed LS reply)
  + Option 2: TBA
* Recommended WF
  + Option 1

**Issue 3-6: Power dynamic range**

* Proposals
  + Option 1: 0dB (Ericsson)
  + Option 2: TBA
* Recommended WF
  + Option 1

**Issue 3-7: Emissions mask**

**Previous agreement:**

* AAS BS:
  + Use n104 unwanted emissions mask
  + [Aim to use 100MHz for delta\_obue, conclude feasibility until RAN4#112]
* Non-AAS BS:
  + [n104 unwanted emissions mask for IMT response]
* Double check on whether there are any concerns towards sharing by RAN4#112 and in case concerns are identified, consider n96 if needed to resolve concerns
* Proposals
  + Option 1: Use n104 and 100MHz delta\_fobue (CATT, Ericsson, Nokia, ZTE, Huawei)
  + Option 2: Use n104 (Qualcomm)
  + Option 3: Add “for AAS and non-AAS” (Ericsson)
* Recommended WF
  + Clarify that Qualcomm are also OK with the delta\_f\_OBUE
  + Clarify whether to add “for AAS and non-AAS” as the applicability

**Issue 3-8: Noise figure**

**Previous agreement:**

* Follow 38.820, i.e., 6dB WA, 11dB MR, 14dB LA for noise figure of BS
* Follow previous agreement (included here for clarity)

**Issue 3-9: Sensivitity**

**Previous agreement:**

* Agree on option 1. (As for n104 in 38.104)
* Capture it in the TR only.
* Proposals
  + Option 1: Capture in TR only (Qualcomm) (Captured in the previous agreement already)
* Recommended WF
  + As previous agreement

**Issue 3-10: ACLR**

Previous agreement:

ACLR

* BS
  + Use n104
* Follow previous agreement (included here for clarity)

**Issue 3-11: Spurious emission**

Previous agreement:

Spurious Emissions

* BS:
  + Use n104

Follow previous agreement (included here for clarity)

**Issue 3-12: Blocking response**

Previous agreement:

Blocking response

* BS:
  + Follow n104
    - Discuss ΔfOOB
* Proposals
  + Option 1: 200MHz for delta\_f\_oobb (ZTE)

**Issue 3-13: ACS**

Previous agreement:

Issue 2-12 ACS

* BS:
  + Follow n104 (42dB)

Follow previous agreement (included here for clarity)

**Issue 3-14: BS antenna parameters**

The most significant issue to clarify for the BS parameters is the sub-array and array size. Many of the other parameters are dependent on these things.

**Previous discussion:**

|  |  | **~~Rural macro~~**  **~~(If it’s available)~~**  **~~Parameters proposed by ZTE~~** | **Suburban macro** | **Urban macro** | **Urban small cell (outdoor)/Micro cell** | **Indoor  (small cell)** |
| --- | --- | --- | --- | --- | --- | --- |
| **1** | **Base station antenna characteristics** | | | | | |
| 1.6 | Antenna array configuration (Row × Column) (Note 4) | ~~8 × 8 elements~~ | Option 1: 8 × 16 (Nokia, Ericsson, Huawei, Spark)  Option 2: 8 x 8 (ZTE, Samsung) | Option 1: 8 × 16 (Nokia, Ericsson, Huawei, Cable Labs)  Option 2: 8 x 8 (ZTE, Samsung) | 8 × 8 | 4 × 4 |
| 1.7a | Number of element rows in sub-array, *Msub* |  | Option 1: 4 (Nokia, Spark, Cable Labs, Charter)  Option 2: 3 (Ericsson, Huawei, Samsung) | Option 1: 4 (Nokia, Spark, Cable Labs, Charter)  Option 2: 3 (Ericsson, Huawei, Samsung) | N/A | N/A |

**Previous agreement:**

* Remove the rural macro scenario from the table.
* non-AAS can be used for Urban small cell/Micro cell scenario
* non-AAS can be used for indoor scenario
* FFS on where to capture the above two bullets
* Proposals on sub-array size
  + Option 1: Set sub-array size 3 (CATT, Ericsson, Samsung, Huawei)
  + Option 2: Set sub-array size 4 (Nokia)
* Recommended WF
  + TBA
* Proposals on array size
  + Option 1: Set array size 8\*8 (CATT)
  + Option 2: Array size 8\*16 for sub-urban and urban macro, 8\*8 for urban small cell/micro (Ericsson, Huawei (Huawei also possibly 4\*8), Nokia (with sub-array size 4 for sub-urban and urban macro))
  + Option 3: 8\*16 is OK (Samsung, ZTE (not clear on ZTE sub-array size))
* Recommended WF
  + (Array size and sub-array size are listed separately here, but are not really independent. Agree sub-array size first then array size).
* Proposal on indoor
  + Option 1: For indoor small cell, consider non-AAS only (Huawei)
* Recommended WF
  + TBA

### Sub-topic 3-2: UE related parameters

This sub-topic considers UE parameters

**Issue 3-15: UE output power**

**Tentative agreement:**

* Capture 23dBm as typical maximum output power in the LS to ITU.
  + Other output powers are not precluded and refer to TR
* Capture 20dBm, 23dBm, 26dBm, and higher power classes in TR
* Proposals
  + Option 1: Confirm the tentative agreement (CATT, Ericsson, Qualcomm, vivo, mediatek, Google ?, Nokia)
  + Option 2: 23dBm is typical power (Samsung, Huawei)
  + Option 3: Support PC2, PC1, preferable PC1.5 (ZTE) (Not quite clear whether in the TR only or also the LS?)
* Recommended WF
  + To be clarified:
    - Should the LS mention other powers possibility and refer to the TR ?
    - Or only the TR mention other powers possibility, not the LS ?

**Issue 3-16: Power dynamic range**

Previous agreement:

Power dynamic range (UE)

* Use n104, as appropriate for maximum output power
* Proposals
  + Option 1: 56dB for 100MHz assuming 23dBm (Apple, Ericsson, Qualcomm, ZTE)
  + Option 2: Also 59, 62dB for PC2, PC1.5 (ZTE)
* Recommended WF
  + - The proposals are in line with the previous agreement and depend on the output power.

**Issue 3-17: Emissions mask**

Previous agreement:

Spectrum mask

* UE:
  + n104 as basis for emissions levels
* Follow previous agreement (included here for clarity)

**Issue 3-18: ACLR**

Previous agreement:

ACLR

* UE
  + Option 1: 26dB, 27dB (study) for PC3
  + Option 2: 30dB (n104) for PC3, 31dB (n104) for PC2
* Proposals
  + Option 1: n104, i.e., 30dB (Ericsson, ZTE, Nokia)
  + Option 2: 26dB (previous study value) (vivo, Mediatek, Huawei)
* Recommended WF

**Issue 3-19: Spurious emission**

Previous agreement:

Spurious Emissions

* UE:
  + Use n104
* Follow previous agreement (included here for clarity)

**Issue 3-20: Noise figure**

Previous agreement:

Noise Figure

* UE
  + Option 1: Follow n104 noise figure (12dB)
  + Option 2: Be consistent with information sent previously IMT-2020 28GHz, e.g. 10dB
  + Option 3: Be consistent with Previous LS to ITU-R on 6, 10GHz, NF was 9-13dB
* Proposals
  + Option 1: Follow n104, 12dB (Ericsson, Huawei)
  + Option 2: Reply with a range, 9-13dB (vivo)
  + Option 3: 13dB (mediatek)
  + Option 4: 10dB (Nokia)

**Issue 3-21: Sensitivity**

Previous agreement:

Sensitivity

* To be discussed further
* Proposals:
  + Option 1: State “To be specified”, refer to n104 in TR (Ericsson)
  + Option 2: n104 sensitivity in LS (vivo)
  + Option 3: State “to be specified” in LS (mediatek)
  + Option 4: Do not mention any value (Huawei)
* Recommended WF
  + Check whether we can write “to be specified” in the LS
  + Check whether to add a reference to n104 sensitivity in the TR and in the LS

**Issue 3-22: Blocking and spurious response**

Previous agreement: No previous agreement (FFS)

* Proposals
  + Option 1: Ericsson: Follow 38.101-1 for NR bands with FDL\_low ≥ 3300 MHz and FUL\_low ≥ 3300 MHz (Tables 7.6.2-2 and 7.6.2-4, 7.6.3-2 and 7.6.3-4 and 7.7-2) (Ericsson, vivo, Huawei)
  + Option 2: Do not use n104, discuss further (ZTE)

**Issue 3-23: ACS**

Previous agreement:

Issue 2-12 ACS

* UE:
  + Follow n104 or follow previous studies
* Proposals
  + Option 1: As n104, 33dB (Ericsson, ZTE)
  + Option 2: 32dB (previous study TR) (vivo)
  + Option 3: 31dB (mediatek)

# Worksplit for TP and WF

The following worskplit has been discussed offline between interested companies. Moderator proposes to follow the worksplit:

|  |  |
| --- | --- |
| **Item** | **Company** |
| TP for 4GHz parameters | Ericsson (done) |
| TP for 8GHz BS parameters | Huawei |
| TP for 8GHz UE parameters | Apple |
| TP for 15GHz BS RF parameters | CATT |
| TP for 15GHz BS Antenna parameters | ZTE |
| TP for 15GHz UE RF parameters | Samsung |
| TP for 15GHz UE Antenna parameters | MTK |
| TP for 15GHz simulation parameters | Nokia (including further revisions at RAN4#112 etc.) |
| TP for 15GHz simulation results | Samsung |
| TP for other issues (MIMO modelling) | Nokia/Spark |
| TP for other issues (Adjacent channel modelling) | CATT |
| TP on BS antenna model (done) | Ericsson |
| RAN4#110bis WF on 4GHz (done) | Ericsson |
| RAN4#110bis WF on 8 and 15GHz (done) | CATT |
| RAN4#111 WF (done) | Ericsson |
| RAN4#112 WF on 8GHz BS parameters | Huawei |
| RAN4#112 WF on 8GHz UE parameters | Vivo |
| RAN4#112 WF on 15GHz BS parameters | ZTE |
| RAN4#112 WF on 15GHz UE parameters | Qualcomm |
| RAN4#112bis WF on 15GHz BS parameters | ZTE |
| RAN4#112 WF on 15GHz UE parameters | Qualcomm |
| RAN4#113 WF on 15GHz BS parameters | ZTE |
| RAN4#113 WF on 15GHz UE parameters | Qualcomm |
| RAN4#112 WF on other issues (MIMO) | Nokia/Spark |
| RAN4#112bis WF on other issues (MIMO) | Nokia/Spark |
| RAN4#113 WF on other issues (MIMO) | Nokia/Spark |