**3GPP TSG-RAN WG4 Meeting #110 R4-2401105**

**Athens, Greece, 26 Feb – 1 March, 2024**

**Agenda item:** 12.4

**Source:** Moderator (Ericsson)

**Title:** Topic summary for [110][146] ITU\_WP5D\_LSReply

**Document for:** Information

# Introduction

This email thread is focused on the following topics under AI 12.

1. LS on Parameters of terrestrial component of IMT for sharing and compatibility studies in the frequency bands 4 400-4 800 MHz, 7 125-8 400 MHz and 14.8-15.35 GHz from ITU-R WP5D (R2-2311440)

# Topic #1: LS on Parameters of terrestrial component of IMT for sharing and compatibility studies from ITU-R WP5D ([R2-2311440](http://www.3gpp.org/ftp//tsg_ran/WG2_RL2/TSGR2_123bis/Docs//R2-2311440.zip))

ITU-R WP5D seeks support from external organization in its effort of determining system characteristics and parameters for IMT systems in the following frequency bands:

* 4 400-4 800 MHz,
* 7 125-8 400 MHz and
* 14.8-15.35 GHz

The technical and operational characteristics needed for sharing and compatibility studies should generally be available from WP5D by 31 Dec 2024 (could be extended to 1st July 2025 if necessary). WP 5D kindly asks for initial response on this information by June 2024 meeting of WP 5D, deadline for inputs is 13th June 2024 (1600 UTC).

## Companies’ contributions summary

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| **T-doc number** | **Company** | **Proposals / Observations** |
| [R4-2400572](http://www.3gpp.org/ftp//tsg_ran/WG4_Radio/TSGR4_110/Docs//R4-2400572.zip) | Qualcomm Incorporated | Proposal 1: To at least enable technical discussion in RAN4 by allocating an agenda in RAN4 for input. RAN should also discuss with separate submissions whether to agree study item to enable this work or enable WG level work under dedicated RAN task. The amount of work might suggest that proper TU allocation is required.Proposal 2: Invite RAN to open a dedicated study item to address the questions.Technical discussion: Forward-looking items to consider: * Duplex method including SBFC
* Wider channel bandwidth
* UE max output power
* Impact on EIRP from larger MIMO

Frequency range discussion: * 4 400 - 4 800 MHz: “Easiest” range, with band n79 defined.
* 7.125 - 8.4 GHz: New range, notes that it is adjancent to n104.
* 14.8 - 15.35 GHz: New range that may need most discussions.
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| [R4-2401878](http://www.3gpp.org/ftp//tsg_ran/WG4_Radio/TSGR4_110/Docs//R4-2401878.zip) | CMCC | Proposal 1: For 4400-4800MHz, WP-5D could reuse previous 3-6GHz parameters that RAN4 sent for WRC-23 preparation. Besides, the sub-array antenna model is based on testing of commercial BS and could reflect latest AAS pattern information.Proposal 2: the suggestions for 7125-8400MHz related parameters (table 1) are listed as below (Table 1 in [R4-2401878](http://www.3gpp.org/ftp//tsg_ran/WG4_Radio/TSGR4_110/Docs//R4-2401878.zip)) as starting point which is the same as what is defined for band n104.Proposal 3: the legacy sub-array antenna modelling in TR 38.803 is still applicable for the band 7125-8400MHz. |
| [R4-2402142](http://www.3gpp.org/ftp//tsg_ran/WG4_Radio/TSGR4_110/Docs//R4-2402142.zip) | Huawei, HiSilicon | Observation 1: for the frequency bands 4 400-4 800 MHz, which is part of 3GPP FR1 and the RF parameters are specified in TS 38.104 for BS and TS 38.101-1 for UE, the IMT parameters are covered in previous LS [2] and [3], i.e. IMT-2020 technology-related and deployment-related parameters and antenna characteristics for small cell in [2], and antenna characteristics for Macro in [3].Observation 2: for 7 125-8 400 MHz, RAN4 should discuss whether the RF parameter can be deduced from the previous Rel-17 SI and whether the antenna model and parameters for bands between 6425 and 10500 MHz in [2] can be reused.Observation 3: for 14.8-15.35 GHz, RAN4 need further study to response WP5D.Observation 4: RAN4 can only provide the parameters for IMT-2020 within Rel-19 time frame.Proposal: To reply WP5D LS in time, it is proposed to identify the scope of RAN4 study at Athens meeting and make a plan for April and May RAN4 meetings. |
| [R4-2402248](http://www.3gpp.org/ftp//tsg_ran/WG4_Radio/TSGR4_110/Docs//R4-2402248.zip) | Spark NZ, Nokia | **Proposed draft LS to TSG RAN with action:**ACTION: RAN WG4 acknowledges the receipt of LS from ITU-R WP5D and proposes to the RAN#103 meeting a likely date for a response to ITU-R WP5D. |
| [R4-2402483](http://www.3gpp.org/ftp//tsg_ran/WG4_Radio/TSGR4_110/Docs//R4-2402483.zip) | Ericsson | Observations on the new frequency ranges:**4400 to 4800 MHz****References to previous studies:** RF parameters can be extracted from BS RF core specification TS 38.104 [1]. Antenna parameters can be extracted from TR 38.803, subclause 5.2.3.2.4 [2].**Required studies:** None.**7125 to 8400 MHz****References to previous studies:** Technology feasibility have been studied in TR 38.820 [3]. RF parameters for 6 and 10 GHz is provided in TR 38.921 [4] and can be used indicative starting point.**Required studies:** Evaluate relevance of information in TR 38.820 [3] using larger array antenna and TR 38.921 [4]. Decide on relevant antenna parameters.**14800 to 15350MHz****References to previous studies:** Technology feasibility have been studied in TR 38.820 [3].**Required studies:** Evaluate relevance in TR 38.820 [3] using larger array antenna. Decide on relevant antenna parameters. Based on relevant RF parameters and antenna parameters decide if adjacent channel coexistence evaluation is needed.**Conclusion:** RAN4 need to prepare the Rel-19 BS RF agenda to include work related to find proper and relevant RF parameters and antenna assumptions for requested frequency regions.**Proposed draft LS to TSG RAN, including:**Parameters attached for the frequency range 4 400 to 4 800 MHz can be sent to ITU-R WP5D immediately.ANNEX 1: Technology- and deployment-related parametersANNEX 2: Antenna characteristics |
| [R4-2402511](http://www.3gpp.org/ftp//tsg_ran/WG4_Radio/TSGR4_110/Docs//R4-2402511.zip) | ZTE Corporation | Observation 1: in order to provide the Reply LS to WP5D, to approve one SID from 2024, Mar to 2024, Dec at least is necessary to enable the thorough study from coexistence study, BS/UE RF requirements.Proposal 1: for 4400-4800MHz frequency range, the parameters of terrestrial network of IMT could refer to the previous ITU-R WP5D Reply LS RP-210037. |
| [R4-2402575](http://www.3gpp.org/ftp//tsg_ran/WG4_Radio/TSGR4_110/Docs//R4-2402575.zip) | Skyworks Solutions Inc. | The input contributes primarily on the system, transmitter and the RF front-end performance-impacted receiver. UE parameters are proposed for discussion in Table 1 of the input for all three frequency ranges, corresponding to items 1 through 5.4 in Table 1 of the Example template in the LS. |

## Open issues summary

### Sub-topic 1-1: Work planning and response to TSG RAN

Items to consider for planning the work on responding to the LS.

Open issues and candidate options/proposals before meeting:

**Issue 1-1-1: RAN4 work planning**

* Proposals
	+ Proposal 1: Identify the scope of a RAN4 study at RAN4#110.
	+ Proposal 2: Enable technical discussions in RAN4 through Rel-19 BS RF agenda item, for finding RF parameters and antenna assumptions for the requested frequency ranges.
* Recommended WF
	+ Identify the scope of the work as preparation for TSG RAN. Plan for a dedicated agenda item starting RAN4#109bis.

**Issue 1-1-2: Response to TSG RAN on work planning**

* Proposals
	+ Proposal 1: Invite RAN to open a dedicated Work item. (Draft proposal in [R4-2402484](http://www.3gpp.org/ftp//tsg_ran/WG4_Radio/TSGR4_110/Docs//R4-2402484.zip))
	+ Proposal 2: Propose to TSG RAN that RAN#103 is a likely day for response to WP5D.
* Recommended WF
	+ These are ultimately issues for TSG RAN consideration. A first response by RAN#103 may be possible, but RAN4 should identify the final date for full response (RAN4#113?).

**Issue 1-1-3: Response to TSG RAN on technical parameters**

* Proposals
	+ Option 1: Respond with full set of parameters for 4400-4800 MHz. no parmeters for other ranges at this time.
	+ Option 2: Respond without giving any parameters at this time.
* Recommended WF
	+ If RAN4 can agree on the set of parameters for 4400-4800 MHz, they should be sent to TSG RAN for further consideration.

### Sub-topic 1-2: Frequency ranges

Starting point and planned work for each of the three frequency ranges

Open issues and candidate options before meeting:

**Issue 1-2-1: 4400 to 4800 MHz**

* Proposals
	+ Proposal 1: Re-use existing 3-6 GHz parameters.
	+ Proposal 2: Parameters can be extracted from RF core specs TS 38.104 and antenna parameters from TR 38.803.
	+ Proposal 3: Parameters for IMT could refer to previous LS reply in [RP-210037](http://www.3gpp.org/ftp//tsg_ran/TSG_RAN/TSGR_91e/Docs//RP-210037.zip).
	+ Proposal 4: Noting that it is adjacent to band n79, re-use existing parameters with possible modifications to be worked out.
* Recommended WF
	+ If it can be agreed that no modifications are needed, the existing parameters for 3-6 GHz can be used, as indicated in Proposals 1 to 3 above. (Related to Issue 1-1-3.)

**Issue 1-2-3: 7125 to 8400 MHz**

* Proposals
	+ Proposal 1: Study parameters noting that it is adjacent to band n104 as starting point.
	+ Proposal 2: Legacy sub-array antenna modelling in TR.803 is still applicable in this range.
	+ Proposal 3: Technology feasibility was studied in TR 38.820. Base RF parameters on TR 38.921 as starting point. Study relevance of TR 38.921 using larger antenna arrays.
* Recommended WF
	+ Discuss and combine the above three proposals as starting point for study.

**Issue 1-2-3: 14800 to 15350 MHz**

* Proposals
	+ Proposal 1: Technology feasibility was studied in TR 38.820. Study relevance of TR 38.921 using larger antenna arrays.
	+ Proposal 2: New frequency range, further studies needed for a response.
* Recommended WF
	+ Base work on above proposals. This will be the most time consuming item, and will set the time for the final response to WP5D.