**3GPP TSG-RAN WG4 Meeting # 96-e R4-200XXXX**

**Electronic Meeting, 17 – 21 Aug., 2020**

**Agenda item:** 10.24

**Source:** Hisashi Onozawa (Nokia)

**Title:** Email discussion summary for [96e][135] NR\_47GHz\_Band

**Document for:** Information

# Introduction

New work item (RP-201232): introduction of NR 47 GHz band by T-Mobile USA and Dish Network was approved in RAN#88-e. This is the first RAN4 meeting to kick off the work item. The work plan, TR, and initial analysis of requirements are going to be discussed.

# Topic #1: Workplan and TR structure

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| [**R4-2010520**](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_96_e/Docs/R4-2010520.zip)Workplan for Introduction of NR 47 GHz band | Nokia, Nokia Shanghai Bell |

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| **Meeting** | **RF** |
| RAN4#96-eAugust 2020 | **Discussions on*** Regulatory backgrounds
* Table of contents of TR
* Band plan, Band number, and System parameters
* Initial discussion on RF, Demod, and RRM requirements

**Expected Agreements on** * Workplan
* TR structure
 |
| RAN4#97-eOctober 2020 | **Discussions on*** System parameters
* Coexistence requirements (such as 3GPP band coexistence)
* UE RF requirement
	+ Band specific Tx/Rx requirements such as EIRP/EIS requirement including spherical coverage and Multi-band relaxations
* BS RF requirement
	+ Band specific Tx/Rx requirements
* RRM requirements
* UE Demod requirements
* BS conformance requirements
* draft CRs

**Expected Agreements on** * Completed TPs to TR on the above topics.
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| RAN4#98March 2021 | **Discussions on*** Remaining issues from RAN4#97-e

**Expected Agreements on** * Final draft TR
* All CRs (to TS 38.101-2, TS 38.133, TS 38.104, TS 38.141-2, TS 38.101-4)
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| [**R4-2010445**](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_96_e/Docs/R4-2010445.zip)TR 38xxx Introduction of NR Band 26x (47Ghz band) | Ericsson | ContentsForeword1 Scope2 References3 Definitions of terms, symbols and abbreviations3.1 Terms3.2 Symbols3.3 Abbreviations 4 Background5 NR Frequency band definition6 Channel numbering and channel bandwidth7 Configurations for intra-band contiguous CA8 RF requirements8.1 UE specific8.1.1 Transmitter characteristics8.1.2 Receiver characteristics8.2 BS specific8.2.1 Transmitter characteristics8.2.2 Receiver characteristics9 RRM9.1 Frequency bands grouping9.2 Conditions for RRM requirements applicability for operating bands9.2.1 Minimum SSB\_RP values for Rx Beam Peak angle of arrival9.2.2 Minimum SSB\_RP values for angle of arrival within Spherical coverageAnnex A (informative): Change history |

## Open issues summary

The discussion is open to suggest improvement or modification to the work plan and TR structure if any.

### Sub-topic 1-1 Workplan

Sub-topic 1-1: Please leave the first round comments in 1.3.1 to the proposed work plan.

### Sub-topic 1-2 Draft TR

Sub-topic 1-2: Please leave the first round comments in 1.3.1 to the proposed TR structure.

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX | Sub topic 1-1: WorkplanSub topic 1-2: Draft TR….Others: |

### CRs/TPs comments collection

N/A

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

*Recommendations on WF/LS assignment*

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

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

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| **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*

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| --- | --- |
| **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: Reguratory requirements

## Companies’ contributions summary

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| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| [**R4-2009957**](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_96_e/Docs/R4-2009957.zip) | Apple | Observation 1: The Max EIRP requirement of 43 dBm for Power Class 3 defined in TS38.101-2 is applicable to the new 47 GHz band.Observation 2: The general NR spectrum emission mask for FR2 is aligned with the FCC regulation.Observation 3: RAN4 should study whether A-MPR is needed for UEs operating in the new 47 GHz band to comply with the FCC requirement of unwanted emissions power in the band 50.2-50.4 GHz shall not exceed −20 dBW/200 MHz.Observation 4: FCC does not define unwanted emission limits for FSS protection in the 48.2 – 50.2 GHz frequency range beyond the general emission maks.Observation 5: There exists the potential for the FCC to take further action to define emission requirements for the protection of FSS in 24.75-25.25 GHz, 47.2-48.2 GHz, and 50.4-51.4 GHz frequency ranges.Observation 6: At this time, only regional regulations provided by the FCC are available for the new 47 GHz band.Proposal 1: Companies are encouraged to reach a common understanding of the regulatory requirements for the new 47 GHz band.Proposal 2: RAN4 should discuss how to define general and regional emission requirements in a way that can allow for future extensions of the requirements to additonal regions.Moderator: UE RF issues are treated in Topic 4. |
| [**R4-2010447**](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_96_e/Docs/R4-2010447.zip)47GHz band - Regulatory overview – Band plan - System parameters | Ericsson | Regulatory overview; no particular proposal.Moderator: System parameters are treated in Topic 3. |
| [**R4-2010521**](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_96_e/Docs/R4-2010521.zip)Regulatory Background of 47 GHz band | Nokia | Observation 1: There is no specific coexistence requirement in RR for the BS and UE to protect other services in terms of the scope of 3GPP work.Observation 2: The band can be reused outside of even if additional coexistence requirement is introduced in future using the network signaling mechanism.Observation 3: The general emission requirements for 47.2 – 48.2 GHz in FCC are aligned with the requirements of band n260 and n261.

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| --- | --- |
| Channel arrangement | 47.2-47.3 GHz; 47.3-47.4 GHz; 47.4-47.5 GHz; 47.5-47.6 GHz; 47.6-47.7 GHz; 47.7-47.8 GHz; 47.8-47.9 GHz; 47.9-48.0 GHz; 48.0-48.1 GHz; and 48.1-48.2 GHz |
| Power limit (EIRP) | Base station +75 dBm/100MHzMobile station +43 dBmTransportable station +55 dBm |
| Unwanted emissions | +5 dBm/MHz (within 10% of channel bandwidth separation)+13 dBm/MHz (outside more than 10% of channel bandwidth apart) |

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## Open issues summary

The overview of regulatory requirement is presented in three contributions above. Other than IMT identification by ITU-R, only available regulations up to date are the FCC rules.

### Sub-topic 2-1 Max EIRP and unwanted emissions

Sub-topic 2-1: There seems to be the common understanding in Apple and Nokia papers that the maximum EIRP and spectrum emission mask are aligned with existing FR2 band requirement.

Further discussion on UE power class and BS can be made in Topic 4 and 5 (UE and BS RF.)

In this sub-topic, only regulatory issue will be discussed if there is a different view from Apple and Nokia.

### Sub-topic 2-2 Coexistence with FSS

Sub-topic 2-2: Apple points out FSS coexistence requirement, where general mask works except −20 dBW/200 MHz for 50.2-50.4 GHz. It should be discussed if A-MPR should be defined or not. In order to support regulations possibly specified by FCC and/or other regulators later , the band should be specified with flexibility to include such future extension.

Please indicate if there is a different view from Apple.

A-MPR value and NS framework can be discussed in Topic 4 (UE RF).

### Sub-topic 2-3 Additional regulations

Sub-topic 2-3: Although there are no available regulations than FCC, it seems agreeable to specify this band as a global band and support regulations possibly made in future.

NS and A-MPR can be further discussed in topic 4 (UE RF). however, if there is anything to discuss on this issue, please leave comments in 2.3.1.

### Sub-topic 2-4 Others

Sub-topic 2-4: If something is not covered above, please propose a new issue.

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX | Sub topic 2-1: Sub topic 2-2:Sub topic 2-3:Sub topic 2-4:….Others: |

### CRs/TPs comments collection

N/A

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

*Suggestion on WF/LS assignment*

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

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

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| **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*

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| **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: Band and system parameters

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| [**R4-2010447**](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_96_e/Docs/R4-2010447.zip) | Ericsson |

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| --- | --- | --- |
| NR *operating band* | Uplink (UL) and Downlink (DL) *operating band*BS transmit/receiveUE transmit/receiveFUL,low – FUL,highFDL,low – FDL,high | Duplex mode |
| n262 | 47200 MHz – 48200 MHz | TDD |

|  |
| --- |
| NR band / SCS / *BS channel bandwidth* |
| NR Band | SCSkHz | 50 MHz | 100 MHz | 200MHz | 400 MHz |
| n262 | 60 | Yes | Yes | Yes |  |
| 120 | Yes | Yes | Yes | Yes |

|  |  |  |
| --- | --- | --- |
| NR *operating band* | ΔFRaster(kHz)  | Uplink and Downlinkrange of NREF(First – <Step size> – Last) |
| n262 | 60 | 2399166 – <1> – 2415832 |
| 120 | 2399167 – <2> – 2415831 |

|  |  |  |  |
| --- | --- | --- | --- |
| NR *operating band* | SS Block SCS | SS Block pattern(note) | Range of GSCN(First – <Step size> – Last) |
| n262 | 120 kHz | Case D | 23586 – <1> – 23641 |
| 240 kHz | Case E | 23588 – <2> – 23640 |

 |
| [**R4-2010522**](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_96_e/Docs/R4-2010522.zip) | Nokia |

|  |  |  |  |
| --- | --- | --- | --- |
| **Band number** | **UL** | **DL** | **Duplex mode** |
| n262 | 47.2 – 48.2 GHz | 47.2 – 48.2 GHz | TDD |

|  |  |
| --- | --- |
| NR band | Channel bandwidth |
| Band number | data SCS(kHz) | 50 MHz | 100 MHz | 200 MHz | 400 MHz |
| n262 | 60 | Yes | Yes | Yes |  |
| 120 | Yes | Yes | Yes | Yes |

|  |  |  |
| --- | --- | --- |
| NR Operating Band | ΔFRaster (kHz) | Uplink and DownlinkRange of NREF(First – <Step size> – Last) |
| n262 | 60 | 2399166 – <1> – 2415832 |
| 120 | 2399167 – <2> – 2415831 |

|  |  |  |  |
| --- | --- | --- | --- |
| NR Operating Band | SS Block SCS | SS Block pattern1 | Range of GSCN(First – <Step size> – Last) |
| n262 | 120 kHz | Case D | 23586 – <1> – 23641 |
| 240 kHz | Case E | 23588 – <2> – 23640 |
| NOTE 1: SS Block pattern is defined in subclause 4.1 in TS 38.213. |

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## Open issues summary

The proposed system parameters by the two contributions are all aligned.

The proposed band number, channel bandwidths, channel raster and sync raster seem to be agreeable.

### Sub-topic 3-1 System parameters

Sub-topic 3-1: Please leave comments in 3.3.1 if there is any different view from the proposed system parameters.

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX | Sub topic 3-1: ….Others: |

### CRs/TPs comments collection

N/A

## 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*

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

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

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| --- | --- |
| **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*

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| **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: UE RF requirement

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

## Companies’ contributions summary

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| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| [**R4-2009957**](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_96_e/Docs/R4-2009957.zip)Preliminary views on the new 47 GHz band | Apple | Moderator: Potential Band specific requirements are picked up from the paper. CA and UL MIMO requirement are excluded as they seem to be reusable from non CA requirement.

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| --- | --- |
| **Clause** | **Potential work scope for 47 GHz** |
| 6.2.1 UE maximum output power | mmWave array EM sim, NW performance sim, multi-band framework |
| 6.2.3 UE maximum output power with additional requirements | TBD whether NS values specific to 47 GHz band are needed |
| 6.5.2.3 Adjacent channel leakage ratio | New round of coexistence simulations if ACLR from n260 cannot be reused |
| 6.5.3.1 Spurious emission band UE co-existence | Requirements protecting the new band and existing bands are needed |
| 6.5.3.2 Additional spurious emissions | TBD whether NS values specific to the 47 GHz band are needed |
| 6.6 Beam correspondence | Beam correspondence tolerance sim |
| 7.3.2 Reference sensitivity power level | Determine common assumption on UE receiver noise figure, reuse mmWave array sim and multi-band framework |
| 7.3.4 EIS spherical coverage | Reuse mmWave array sim and multi-band framework |
| 7.5 Adjacent channel selectivity | New round of coexistence simulations if ACS from n260 cannot be reused |
| 7.6.2 In-band blocking | Analyze IBB scenario for the 47 GHz band and define new requirements |

Proposal 3: The big CR introducing requirements for the new 47 GHz band shall only be agreed after all of the requirements are understood with agreement on corresponding parameters and values, including single-carrier requirements, CA aspects, and the multi-band relaxation framework.Moderator: Regulations are treated in Topic 2. |
| [**R4-2010523**](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_96_e/Docs/R4-2010523.zip)UE RF requirements for 47 GHz band | Nokia | It is found that the general requirement as well as the band specific UE RF requirements can be aligned with the requirement for 39 GHz bands, i.e. band n259 and n260.***Observation 1: The further study is needed for the following UE RF requirements taking into account of transmitter/receiver and antenna array characteristics of 47 GHz band.**** ***Peak EIRP***
* ***EIRP spherical coverage***
* ***Reference sensitivity***
* ***EIS spherical coverage***
 |
| [**R4-2011455**](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_96_e/Docs/R4-2011455.zip)Discussion on 48G RF components | Qualcomm Incorporated | We shared preliminary expectations for array gain, PA performance and LNA noise figure at 48G, as extrapolated from existing FR2 bands. Based on these somewhat crude estimates, peak EIRP capability at 48G may be suppressed from n258 value by about 9.5 dB, based on the following observations:* array gain can be between 4 and 6 dB lower at 48G than in n258
* PA will be between 3.5 and 5.5 dB less capable at 48G, compared to n258

Similarly REFSENS at 48G may degrade from n258 values by about 11 dB, based on the following observations:* array gain can be between 4 and 6 dB lower at 48G than in n258
* NF degrades at 48G by a factor between 5.5 and 6.5 dB from its value at n258

It may be possible for UEs to improve on antenna design relative to these estimates, but there may be limitations in technology that limit IC performance for commercially viable processes.Network design would benefit from early consideration of effects similar to the extrapolated estimates listed in this contribution.  |
| [**R4-2010446**](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_96_e/Docs/R4-2010446.zip)Requirement overview for 47 GHz frequency band | Ericsson | Proposal 2:RAN4 should consider the bands n259/n260 UE and RRM requirements also for 47 GHz band, similar to BS approach.Moderator: BS RF and RRM are treated in Topic 5 and 6. |

## Open issues summary

### Sub-topic 4-1 Coexistence simulation

New round of coexistence simulation is proposed by Apple, while Nokia paper mentions that ACLR/ACS is already informed to ITU-R. Ericsson in general seems to propose to reuse n260 requirement.

Subtopic 4-1: Coexistence simulation

Issue 4-1-1: Whether if a new coexistence simulation is needed?

Issue 4-1-2: If needed, what parameter has to be changed from existing simulation assumption? Is there any conflict with WRC-19 if the parameters are changed?

### Sub-topic 4-2 Maximum output power and power reduction

Qualcomm indicates up to 9.5 dB suppression from n260 may be expected. Both Apple and Nokia seem to suggest new simulations for 47GHz to derive peak EIRP and EIRP spherical coverage.

Nokia points out power class 1, 2, 3 and 4 are the scope of the work item.

There seems no proposal to have different MPR than the existing one.

Issue 4-2-1: Do we need a simulation campaign for deriving peak EIRP/EIS?

Issue 4-2-2: Are all power class 1, 2, 3 and 4 simulated?

Issue 4-2-3: What is the UE model/parameter for simulations. What is different from n260?

Issue 4-2-4: Can we confirm that no MPR study is needed for 47 GHz? (i.e., to reuse existing MPR.)

### Sub-topic 4-3 NS and A-MPR

Apple proposes to study A-MPR.

Issue 4-3-1: Do we need A-MPR for FSS protection (if the regulatory requirement is confirmed.)

Issue 4-3-2: Any proposed NS framework for FSS protection?

Issue 4-3-3: Is there any other NS and A-MPR to be studied?

### Sub-topic 4-4 Other transmitter requirement if any

Sub-topic 4-4: There seems no band specific issue in other Tx requirement (for a single CC). Please provide your view if different.

### Sub-topic 4-5 Refsens and EIS spherical coverage

Qualcomm paper indicates up to 11 dB degradation from n260 may be expected. Both Apple and Nokia seem to suggest new simulations for 47GHz to derive REFSENS and EIS spherical coverage.

Issue 4-5-1: Do we need a simulation campaign for deriving REFSENS/EIS spherical coverage?

Issue 4-5-2: Are all power class 1, 2, 3 and 4 simulated?

Issue 4-5-3: What is the UE model/parameter (in particular for the receiver) for simulations. What is different from n260? NF is already communicated to ITU-R. Can we change it?

### Sub-topic 4-6 In-band blocking and other receiver requirements

IBB analysis is proposed by Apple. Nokia propose reusing n260 requirement.

Issue 4-6-1: Can we reuse n260 IBB? If not, how to specify IBB? Is it the same as ACS?

### Sub-topic 4-7 Beam Correspondence

Apple proposes a simulation for beam correspondence tolerance requirement.

Sub-topic 4-7: Please provide you view if it is different from Apple.

### Sub-topic 4-8 Multiband relaxation

Apple proposed to define the multi band relaxation framework. Nokia proposed MBR the same as n260.

Sub-topic 4-8:

Issue 4-8-1: Is MBR framework is required?

Issue 4-8-2: Can we reuse n260 MBR? if not, what should be specified?

### CA requirement

Potential Band specific UL-MIMO requirements are taken from Apple paper.

|  |  |
| --- | --- |
| **Clause** | **Potential work scope for 47 GHz** |
| 6.2A.1 UE maximum output power for CA | Reuse requirements from 6.2.1 under CA configuration |
| 6.2A.3 UE maximum output power with additional requirements for CA | TBD whether NS values specific to 47 GHz band are needed |
| 6.5A.2.3 Adjacent channel leakage ratio for CA | Reuse requirements from 6.5.2.3 under CA configuration |
| 6.5A.3.1 Spurious emission band UE co-existence for CA | Requirements protecting the new band and existing bands are needed |
| 6.5A.3.2 Additional spurious emissions for CA | TBD whether NS values specific to the 47 GHz band are needed |
| 7.3A.2 Reference sensitivity power level for CA | Reuse requirements from 7.3.2 under CA configuration |
| 7.6A.2 In-band blocking for CA | Analyze IBB scenario for the 47 GHz band and define new requirements |

Sub-topic 4-9: Please provide if there is a different view.

### UL MIMO requirement

Potential Band specific UL-MIMO requirements are taken from Apple paper. The requirements are proposed to be reused from non-MIMO requirement.

|  |  |
| --- | --- |
| **Clause** | **Potential work scope for 47 GHz** |
| 6.2D.1 UE maximum output power for UL-MIMO | Reuse requirements from 6.2.1 under UL-MIMO configuration |
| 6.2D.3 UE maximum output power with additional requirements for UL- MIMO | Reuse requirements from 6.2.3 under UL-MIMO configuration |
| 6.5D.2.3 Adjacent channel leakage ratio for UL-MIMO | Reuse requirements from 6.5.2.3 under UL-MIMO configuration |
| 6.5D.3.1 Spurious emission band UE co-existence for UL-MIMO | Reuse requirements from 6.5.3.1 under UL-MIMO configuration |
| 6.5D.3.2 Additional spurious emissions for UL-MIMO | TBD whether NS values specific to the 47 GHz band are needed |
| 7.3D Reference sensitivity for UL-MIMO | Reuse requirements from 7.3.2 under UL-MIMO configuration |
| 7.6D Blocking characteristics for UL-MIMO | Reuse requirements from 7.6.2 under UL-MIMO configuration |

Sub-topic 4-10: Please provide if there is a different view.

## Companies views’ collection for 1st round

### Open issues

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| --- | --- |
| **Company** | **Comments** |
| XXX | Sub topic 4-1: Issue 4-1-1Issue 4-1-2Sub topic 4-2:Issue 4-2-1Issue 4-2-2Issue 4-2-3Issue 4-2-4Sub topic 4-3:Issue 4-3-1Issue 4-3-2Issue 4-3-3Sub topic 4-4:Sub topic 4-5:Issue 4-5-1Issue 4-5-2Issue 4-5-3Sub topic 4-6:Issue 4-6-1Sub topic 4-7:Sub topic 4-8:Issue 4-8-1:Issue 4-8-2:Sub topic 4-9:Sub topic 4-10:Others: |

### CRs/TPs comments collection

N/A

## 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”* |

## 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: BS RF requirement

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| [**R4-2010446**](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_96_e/Docs/R4-2010446.zip)Requirement overview for 47 GHz frequency band | Ericsson | Observation 1:Extensive feasibility and co-existence studies have already been performed for 45GHz proxy frequency to specify the existing FR2 bands.Proposal 1:For new 47 GHz band, adopt the RF requirements from band n260 to the largest extend possible and add additional requirements if global and regional regulation would require.Moderator: UE RF and RRM are treated in Topic 4 and 6. |
| [**R4-2011412**](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_96_e/Docs/R4-2011412.zip)BS RF requirements for 47 GHz band | Nokia | This contribution provides the summary of expected changes to 38.104 and 38.141-2. It is proposed to agree on the proposal 1 below. Furthermore, companies are encouraged to provide their views on above mentioned test requirements and test tolerances to be applicable up to 48.2GHz.**Proposal 1: Introduce the following step frequencies for defining the radiated Tx/Rx spurious emission limits for n262:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Operating band | Fstep,1(GHz) | Fstep,2(GHz) | Fstep,3(GHz) | Fstep,4(GHz) | Fstep,5(GHz) | Fstep,6(GHz) |
| n262 | 37.2 | 45.2 | 45.7 | 49.7 | 50.2 | 58.2 |

 |

## Open issues summary

Two paper summarizes the impact to BS requirements.

### Sub-topic 5-1 BS core requirement

Subtopic 5-1: Ericsson paper considers that BS requirement for 47GHz requirement can be largely reused from n260 requirement. Nokia paper also assumes generic requirement is ready for 47GHz. We would like to collect views in 6.3.1.

### Sub-topic 5-2 BS conformance requirement

Subtopic 5-2: Nokia paper summarize the spec impacts to TS 38.141-2. Please indicate if they are acceptable. Please also indicate if there are more impacts.

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX | Sub topic 5-1: Sub topic 5-2:….Others: |

### CRs/TPs comments collection

N/A

## 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”* |

## 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: RRM requirement

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| [**R4-2010446**](http://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_96_e/Docs/R4-2010446.zip)Requirement overview for 47 GHz frequency band | Ericsson | Proposal 2:RAN4 should consider the bands n259/n260 UE and RRM requirements also for 47 GHz band, similar to BS approach.Moderator: BS and UE RF are treated in Topic 4 and 5. |

## Open issues summary

### Sub-topic 6-1

Subtopic 6-1: RRM requirement

Ericsson paper considers that RRM requirement for 47GHz requirement can be largely reused from n260 requirement. We would like to collect views in 6.3.1.

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX | Sub topic 6-1: ….Others: |

### CRs/TPs comments collection

N/A

## 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”* |

## 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”* |