**3GPP TSG-RAN WG4 Meeting #98-e *R4-210xxxx***

Electronic meeting, January 25th – February 5th, 2021

**Agenda item:** 9.29

**Source:** Moderator (Ericsson)

**Title:** Email discussion summary for [98e][127] NR\_n85

**Document for:** Information

# Introduction

The new WI to introduce NR band n85 re-farmed LTE band 85 was agreed in last RAN#90e meeting.

This agenda item will handle all contributions related to this WI:

* BS RF requirements discussion.
* UE RF requirements discussion

# Topic #1: BS RF

This topic is aiming to agree on the proposed updates of BS RF specifications when introducing band n85.

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2102171 | Ericsson | **Proposal: Agree with the changes listed in this contribution.** |
| R4-2102509 | Huawei | **Proposal 1**: Operation band n85 is introduced  **Proposal 2**: Channel bandwidth is introduced  **Proposal 3**: Channel raster and NR-ARFCN are introduced.  **Proposal 4**: synchronization raster entries for n85: |

## Open issues summary

### Sub-topic 1-1

Sub-topic description: n85 band system parameters.

**Issue 1-1: n85 band system parameters.**

* Proposals:
  + Option 1: Band n85 shall be defined as below (Huawei, Ericsson)
    - Band definition:

|  |  |  |  |
| --- | --- | --- | --- |
| NR *operating band* | Uplink (UL) *operating band* BS receive / UE transmit  FUL,low – FUL,high | Downlink (DL) *operating band* BS transmit / UE receive  FDL,low – FDL,high | Duplex mode |
| n85 | 698 MHz – 716 MHz | 728 MHz – 746 MHz | FDD |

* + - CBW

| NR band / SCS / *BS channel bandwidth* | | | | | | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| NR Band | SCS  kHz | 5 MHz | 10 MHz | 15 MHz | 20 MHz | 25 MHz | 30 MHz | 40 MHz | 50 MHz | 60 MHz | 70 MHz | 80 MHz | 90 MHz | 100 MHz |
|  | 15 | Yes | Yes |  |  |  |  |  |  |  |  |  |  |  |
| n85 | 30 |  | Yes |  |  |  |  |  |  |  |  |  |  |  |
|  | 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |

* + - Channel arrangement

|  |  |  |  |
| --- | --- | --- | --- |
| NR *operating band* | ΔFRaster  (kHz) | Uplink  range of NREF  (First – <Step size> – Last) | Downlink  range of NREF  (First – <Step size> – Last) |
| n85 | 100 | 139600 – <20> – 143200 | 145600 – <20> – 149200 |

|  |  |  |  |
| --- | --- | --- | --- |
| NR *operating band* | SS Block SCS | SS Block pattern (NOTE 1) | Range of GSCN  (First – <Step size> – Last) |
| n85 | 15 kHz | Case A | 1826 – <1> – 1858 |

* Recommended WF
  + Agree with this proposal.

### Sub-topic 1-2

Sub-topic description: n85 band Tx requirements.

**Issue 1-2: n85 band Tx requirements.**

* Proposals:
  + Option 1: Tx requirements updates when introducing band n85, more details in R4-2102171: (Ericsson)
    - Output power: no update
    - OBUE: n85 shall be added to the list of bands mentioned for Wide Area cat A and cat B option 1 limits for bands below 1GHz, in clauses 6.6.4.2.1 and 6.6.4.2.2
    - Spurious: Band n85 limits shall be added to the coexistence spurious emissions limits, table 6.6.5.2.3-1 as mentioned R4-2102171.
* Recommended WF
  + Agree with this proposal.

### Sub-topic 1-3

Sub-topic description: n85 band Rx requirements.

**Issue 1-2: n85 band Rx requirements.**

* Proposals:
  + Option 1: No impact on Rx requirements when introducing band n85. (Ericsson)
* Recommended WF
  + Agree with this proposal.

## Companies views’ collection for 1st round

### Open issues

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

### CRs/TPs comments collection

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
|  | *NA* |
|  |
|  |
|  |  |
|  |
|  |

## 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:* |

*Recommendations 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 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)

## Summary on 2nd round (if applicable)

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

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

# Topic #2: UE RF

This topic is aiming to agree on the proposed updates of UE RF specifications when introducing band n85.

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2102172 | Ericsson | **Proposal: Agree with the changes listed in this contribution.** |
| R4-2102509 | Huawei | **Proposal 1**: Operation band n85 is introduced  **Proposal 2**: Channel bandwidth is introduced  **Proposal 3**: Channel raster and NR-ARFCN are introduced.  **Proposal 4**: synchronization raster entries for n85:  **Proposal 5**: UE Tx and Rx frequency separation is introduced.  **Proposal 6**: UE maximum output power is introduced.  **Proposal 7**: Two antenna port reference sensitivity QPSK PREFSENS: |

## Open issues summary

### Sub-topic 2-1

Sub-topic description: n85 band system parameters.

**Issue 2-1: n85 band system parameters.**

* Recommended WF
  + Shall be aligned with Issue 1-1.

### Sub-topic 2-2

Sub-topic description: n85 band Tx requirements.

**Issue 2-2: n85 band Tx requirements.**

* Proposals:
  + Option 1: Tx requirements updates when introducing band n85: (Huawei, Ericsson)
    - UE Tx and Rx frequency separation is introduced.

| **NR Operating Band** | **TX – RX  carrier centre frequency separation** |
| --- | --- |
| n85 | 16 MHz |

* + - UE MOP: 23dBm shall be added to table 6.2.2-1 for n85.
    - A-MPR: NS\_06 information in table 6.2.3.1-1 shall be udpated:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Network signalling label | Requirements (clause) | NR Band | Channel bandwidth (MHz) | Resources blocks (*N*RB) | A-MPR (dB) |
| NS\_06 | 6.5.2.3.4 | n12 | 5, 10, 15 |  | N/A |
|  | n14, n85 | 5,10 |  |  |

And n85 shall be added to table 6.2.3.1-1A.

* + - Spurious coex: Band n85 shall be added to table 6.5.3.2-1.
* Recommended WF
  + Agree with this proposal.

### Sub-topic 2-3

Sub-topic description: n85 band Rx requirements.

**Issue 2-2: n85 band Rx requirements.**

* Proposals:
  + Option 1: Tx requirements updates when introducing band n85: (Huawei, Ericsson)
    - REFSENS values and RB allocations:

| Operating band / SCS / Channel bandwidth / Duplex-mode | | | | | | | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Operating Band | SCS kHz | 5  MHz (dBm) | 10  MHz (dBm) | 15  MHz (dBm) | 20  MHz (dBm) | 25  MHz (dBm) | 30 MHz (dBm) | 40  MHz (dBm) | 50  MHz (dBm) | 60  MHz (dBm) | 70  MHz (dBm) | 80  MHz (dBm) | 90  MHz (dBm) | 100 MHz (dBm) | Duplex Mode |
| n85 | 15 | -97.0 | -93.8 |  |  |  |  |  |  |  |  |  |  |  | FDD |
| 30 |  | -94.1 |  |  |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |

| Operating band / SCS / Channel bandwidth / Duplex mode | | | | | | | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Operating Band | SCS kHz | 5  MHz | 10  MHz | 15  MHz | 20  MHz | 25 MHz | 30 MHz | 40  MHz | 50  MHz | 60  MHz | 70  MHz | 80  MHz | 90  MHz | 100 MHz | Duplex Mode |
| n85 | 15 | 20 | 20 |  |  |  |  |  |  |  |  |  |  |  | FDD |
| 30 |  | 10 |  |  |  |  |  |  |  |  |  |  |  |
| 60 |  |  |  |  |  |  |  |  |  |  |  |  |  |

And n85 shall be added in table 7.3.2-4, with NS\_06.

* + - In-band blocking: n85 shall be added in table 7.6.2-2.
    - Out of band blocking: n85 shall be added in table 7.6.3-2
    - Narrow band blocking: n85 shall be added in table 7.6.4-1
* Recommended WF
  + Agree with this proposal.

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
| Nokia | Sub topic 2-2: Tx to Rx separation is 30 MHz for n85  Sub topic 1-2:  Sub topic 1-3:  Others: |

### CRs/TPs comments collection

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
|  | *NA* |
|  |
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## Summary for 1st round

### Open issues

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|  |  |
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*Recommendations 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 provides recommendation on CRs/TPs Status update*

|  |  |
| --- | --- |
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## Discussion on 2nd round (if applicable)

## Summary on 2nd round (if applicable)

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|  |  |
| --- | --- |
| **CR/TP/LS/WF number** | **T-doc Status update recommendation** |
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