**3GPP TSG-RAN WG4 Meeting # 97-e R4-201xxxx**

Electronic Meeting, 2-13 Nov., 2020

**Agenda item:** 10.25

**Source:** Moderator (Huawei)

**Title:** Email discussion summary for [97e][128] NR\_n13

**Document for:** Information

# Introduction

The scope of this email discussion is to discuss the contributions submitted at agenda 10.25 to specify a new NR FDD operating band n13.

The target of 1st round is to discuss the potential agreements on A-MPR values and comments collection for the CRs for n13.

# Topic #1: A-MPR for NS\_07

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2014902 | Apple Inc. | This paper presents A-MPR values for NS\_07 requirements. |
| R4-2011801(it was approved in RAN4#96-e) | Qualcomm, Huawei | The A-MPR for NS\_07 was tentatively agreed with [] for further confirmation. |

## Open issues summary

### Sub-topic 1-1

**Issue 1-1: A-MPR for NS\_07**

* Proposals
	+ Option 1: the A-MPR proposed in R4-2014902

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Waveform | Modulation | A1 | A2 | A3 | A4 |
| Outer / Inner | Outer / Inner | Outer / Inner | Outer / Inner |
| DFT-s-OFDM | PI/2 BPSK | 14 | 9 | 6 | 3 |
| QPSK | 14 | 9 | 6 | 3 |
| 16QAM | 14 | 9 | 6 | 3 |
| 64QAM | 14 | 9 | 6 | 3 |
| 256QAM | 14 | 9 | 6 | 3 |
| CP-OFDM | QPSK | 15 | 10 | 7 | 3 |
| 16QAM | 15 | 10 | 7 | 3 |
| 64QAM | 15 | 10 | 7 | 3 |
| 256QAM | 15 | 10 | 7 | 3 |

* + Option 2: the A-MPR tentatively agreed in WF R4-2011801

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Modulation/Waveform | A1 | A2 | A3 | A4 |
| Outer/Inner | Outer/Inner | Outer/Inner | Outer/Inner |
| DFT-s-OFDM PI/2 BPSK | 12 | 9 | 6 | 3 |
| DFT-s-OFDM QPSK | 12 | 9 | 6 | 3 |
| DFT-s-OFDM 16 QAM | 12 | 9 | 6 | 3 |
| DFT-s-OFDM 64 QAM | 12 | 9 | 6 | 3 |
| DFT-s-OFDM 256 QAM | 12 | 9 | 6 | 3 |
| CP-OFDM QPSK | 14 | 10 | 7 | 3 |
| CP-OFDM 16 QAM | 14 | 10 | 7 | 3 |
| CP-OFDM 64 QAM | 14 | 10 | 7 | 3 |
| CP-OFDM 256 QAM | 14 | 10 | 7 | 3 |

Note: the only difference between Option 1 and 2 is the value for A1.

* Recommended WF
	+ TBD

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
| Qualcomm | Option 1 is too aggressive for the amount of backoff. Based on the LTE total back-off, the DFTsOFDM waveform should have no more than 13dB. See table below:

|  |  |
| --- | --- |
| Back off of LTE Vs NR |  |
|  | MPR | AMPR | T.B.O. |
| NR | 1 | 13 | 13 |
| LTE | 1 | 12 | 13 |

This average can be obtained by taking the average of all the company's original proposal as follows:

|  |  |  |
| --- | --- | --- |
| Averaging (ceiling function) and company comparison |  |  |
|  |  |  | Apple |  |  |  |  |
|  |  | LBM | HBM | QCOM | HW | LTE (MPR+AMPR) | Avg |
| DFTS | QPSK | 11 | 14 | 12 | 12 | 13 | 13 |
| CP | QPSK | 10.5 | 15 | 13 | 14 |  | 14 |

Qualcomm's view of the back off should be as follows:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Modulation/Waveform | A1 | A2 | A3 | A4 |
| Outer/Inner | Outer/Inner | Outer/Inner | Outer/Inner |
| DFT-s-OFDM PI/2 BPSK | 13 | 9 | 6 | 3 |
| DFT-s-OFDM QPSK | 13 | 9 | 6 | 3 |
| DFT-s-OFDM 16 QAM | 13 | 9 | 6 | 3 |
| DFT-s-OFDM 64 QAM | 13 | 9 | 6 | 3 |
| DFT-s-OFDM 256 QAM | 13 | 9 | 6 | 3 |
| CP-OFDM QPSK | 14 | 10 | 7 | 3 |
| CP-OFDM 16 QAM | 14 | 10 | 7 | 3 |
| CP-OFDM 64 QAM | 14 | 10 | 7 | 3 |
| CP-OFDM 256 QAM | 14 | 10 | 7 | 3 |

. |
| Huawei | We agree with the compromised approach. The average of companies’ proposal is a good way forward. |
| Apple | We are fine with averaging the proposals and the compromised proposal from Qualcomm. |
| Verizon | We agree to use the approved R4-2011801 as the proposal. The new proposal from Apple is too aggressive.  |
| Huawei | It seems most of companies are ok with the compromised approach. Question to Verizon, is it fine to the compromised proposal from Qualcomm. |
| Verizon | To Huawei: No, we are not ok with the compromised proposal, but agree the R4-2011801 as baseline. |

## 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**  |
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*Recommendations on WF/LS assignment*

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

## 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*

# Topic #2: CRs for n13 introduction

## Companies’ contributions summary

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| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2015682 | Huawei, HiSilicon | CR to TS 38.101-1: introduction of NR band n13 |
| R4-2015683 | Huawei, HiSilicon | CR to TS 38.133: introduction of NR band n13 |
| R4-2015684 | Huawei, HiSilicon | CR to TS 38.104: introduction of NR band n13 |
| R4-2015685 | Huawei, HiSilicon | CR to TS 38.141-1: introduction of NR band n13 |
| R4-2015686 | Huawei, HiSilicon | CR to TS 38.141-2: introduction of NR band n13 |
| R4-2015687 | Huawei, HiSilicon | CR to TS 36.104: introduction of NR band n13 |
| R4-2015688 | Huawei, HiSilicon | CR to TS 36.141: introduction of NR band n13 |
| R4-2015689 | Huawei, HiSilicon | CR to TS 37.104: introduction of NR band n13 |
| R4-2015690 | Huawei, HiSilicon | CR to TS 37.141: introduction of NR band n13 |
| R4-2015691 | Huawei, HiSilicon | CR to TS 37.105: introduction of NR band n13 |
| R4-2015692 | Huawei, HiSilicon | CR to TS 37.145-1: introduction of NR band n13 |
| R4-2015693 | Huawei, HiSilicon | CR to TS 37.145-2: introduction of NR band n13 |

## Companies views’ collection for 1st round

### CRs/TPs comments collection

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| --- | --- |
| **CR/TP number** | **Comments collection** |
| R4-2015682 | Huawei: it depends on the discussion of A-MPR. |
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| R4-2015683 |  |
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| R4-2015684 | Ericsson: is there a good reason why OBUE for cat B option 1 was not added?Huawei: based on our understanding, band 13 is used in American countries. Hence only cat A OBUE requirements are needed. |
|  |
|  |
| R4-2015685 | Ericsson: is there a good reason why OBUE for cat B option 1 was not added? |
| Huawei: based on our understanding, band 13 is used in American countries. Hence only cat A OBUE requirements are needed. |
|  |
| R4-2015686 | Ericsson: is there a good reason why OBUE for cat B option 1 was not added? |
| Huawei: based on our understanding, band 13 is used in American countries. Hence only cat A OBUE requirements are needed. |
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| R4-2015687 |  |
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| R4-2015688 |  |
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| R4-2015689 |  |
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| R4-2015690 |  |
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| R4-2015691 |  |
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| R4-2015692 |  |
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| R4-2015693 |  |
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## Summary for 1st round

### 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**  |
|  |  |

## 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*