**3GPP TSG-RAN WG4 Meeting # 97-e-Bis R4-200XXXX**

**Electronic Meeting, 2 – 13 November, 2020**

**Agenda item:** 7.4.2

**Source:** Moderator (Qualcomm)

**Title:** Email discussion summary for [97e][308] NR\_IAB\_RF\_Maintenance

**Document for:** Information

# Introduction

This e-mail discussion is treating documents related to the maintenance of IAB RF specifications. There are multiple CRs for TS 38.174, TR 38.809 and also some discussion documents related to EVM testing, power control testing.

List of candidate target of email discussion for 1st round and 2nd round

* 1st round:
  + Tx EVM
  + Sensitivity and dynamic range requirements
  + In-band selectivity and blocking requirements
  + Tx Power related requirements
  + Unwanted emissions
  + Others
* 2nd round: TBA

# Topic #1: Tx EVM

The IAB-MT Tx EVM measurement procedure and some editorial CRs are discussed in this thread.

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2014388 | CATT | **Proposal: IAB-MT EVM measurement process refers UE R15 specification.**  Detailed text proposal given in the paper also. |
| R4-2015207 | Nokia, Nokia Shanghai Bell | **Proposal 1:** **Single EVM-% is sufficient and there is no need to specify different requirements for different UL channels, i.e. only average EVM level is specified.**  **Proposal 2: DFT-s-OFDM should not be mandated to use for IAB conformance test.**  **Proposal 3: Usage of PT-RS should be enabled in Tx EVM conformance test for IAB-MT to be aligned with Tx EVM test for gNB.** |
| R4-2016137 | ZTE Corporation | **Proposal 3: to reuse** **UE EVM testing procedures without spectrum flatness, in-band emission, LO leakage and IQ-imbalance requirements and remove DFT-s-OFM signals for IAB-MT.**  For IAB-DU, its testing signal is defined in test models in TS 38.141, however testing signals for IAB-MT should follow the uplink configuration defined in TS 38.508 and TS 38.521. In addition, it should be known that DFT-s-OFDM PI/2 BPSK should be removed as IAB-MT is not necessary to support that feature. |

## Open issues summary

EVM measurements procedures are still open, there are several proposals that are discussed below.

### Sub-topic 1-1

IAB-MT Tx EVM measurement procedure

**Issue 1-1: EVM Measurement procedure**

* Proposals
  + Option 1: Re-use Rel.15 UE EVM testing procedures without spectrum flatness, in-band emission, LO leakage and IQ-imbalance requirements and remove DFT-s-OFM signals for IAB-MT(R4-2014388, R4-2016137)
  + Option 2: Re-use BS test procedure and use single requirement for all channels, remove DTS-s-OFDM (R4-2015207)
* Recommended WF
  + Adopt Option 1. The IAB-MT is transmitting signals just like a UE and the BS receiver is the same for IAB-MTs and UEs so same requirements and test procedure should be followed

### Sub-topic 1-2

Whether PT-RS should be used in the test or not

**Issue 1-2:** Whether PT-RS should be used in test

* Proposals
  + Option 1: Yes
  + Option 2: No
* Recommended WF
  + Adopt Option 2. This inline with the proposed WF for issue 1-1 and since the IAB-MT will track the DL signals, it is expected that frequency error is within certain bounds

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX | Sub topic 1-1:  Sub topic 1-2:  ….  Others: |
| ZTE | Sub-topic 1-1:  At least testing signals should be based from UE testing configuration, and test up between UE and BS could be further discussed to check whether existing BS testup could be reused for IAB-MT.  Sub-topic 1-2: For PT-RS configuration, further clarifications on why IAB-MT could track DL signals and then the expected freq error is within certain bounds, we think PT-RS is purely based on RF component VCO and PLL phase noise, it seems that PT-RS for CPE is still needed for IAB-MT  If to follow the BS PT-RS configruation, then pattern 4 should be used. |
| CATT | **Issue 1-1: EVM Measurement procedure**  Although following BS structure maybe the high level direction, we still think IAB-MT EVM test procedure should follow UE. The difference of BS of UE is the difference of UL and DL, we don’t think DL signal EVM test procedure can apply to IAB-MT Tx signal.  **Issue 1-2:** Whether PT-RS should be used in test  Clarification is needed if the proposal is for DL signal or UL signal. Generally, we’re ok with the idea. But it should be noticed that currently no PTRS is configured at least for FR2 UE. R4-2011491 raised the issue but not approved. |
| Ericsson | Issue 1-1: Option 2. Depending on the IAB conformance testing framework, as the BS test structure is agreed to be used for IAB-MT in GTW session, the BS EVM test procedure can be used.  Issue 1-2: we prefer FFS/TBD option. We propose to have more technical discussion around this before RAN4 make a decision, the PT-RS signal is for FR2 and in BS EVM test for FR2, the PTRS is reflected in EVM test. |
| Samsung | Issue 1-1:  Even though IAB-MT supports UE functionality the Donor will still aware certain link is with UE or IAB-MT. And IAB is recognized more like a network node in this release. For IAB-MT it’s assumed that the data to serve more UEs connected to IAB-DU. It may not be treated equal priority as normal UE.  Issue 1-2:  Do not see the issue to consider PTRS in EVM test condition for FR2. |

### CRs/TPs comments collection

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| R4-2014386 | Company A |
| Samsung: for sub-clause 6.5.2 the shift due to mistake of sub-clause allocation is needed. Either way is acceptable. However for sub-clause 9.2 the re-numbering existing sub-clause seems not recommended by spec drafting rules. |
| Ericsson: ok as the BS structure was agreed in GTW session. |
| R4-2015435 | ZTE： could be merged with R4-2014386, no strong opinions on that |
| Company B |
| Ericsson :ok |
| R4-2016082 | ZTE： could be merged with R4-2014386, no strong opinions on that |
|  |
| Ericsson :ok |
| R4-2016255 | ZTE： could be merged with R4-2014386, no strong opinions on that |
|  |
|  |
| R4-2016139 (sections 6.5 and 9.6) |  |
|  |
| Ericsson: seem not necessary to combine 1-O and 2-O into one requirement. But no strong opinion. |
| R4-2014387 | ZTE： could be merged with R4-2014386, no strong opinions on that |
| CATT: This is draft CR for TS 38.809. R4-2014386 is for TS 38.174. |
| Ericsson: may be better rewording to “the principle of setting EVM frame structure for the IAB-MT can be reused from BS EVM frame structure.” i.e downlink need to change to uplink. |
| R4-2016263 | ZTE: replace should with could,this will give some implementation flexibility, |
| CATT: If “could” is used, does it mean the requirement is optional? |
| Ericsson: The concerned paragraph states deriving the IAB-MT FE using the DL signal, this is one implementation, we need consider the implementation flexibility. |

## 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:* |

*Recommendations on WF/LS assignment*

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|  | **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: Sensitivity and dynamic range requirements

Editorial CRs were submitted for this agenda, companies should provide comments in the CRs/TPs section

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
|  |  |  |

## Open issues summary

There are a lot of fixes proposed for the specifications, companies to provide comments to the proposed changes directly.

### Sub-topic 2-1

### Open issues

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

### CRs/TPs comments collection

*Major close to finalize WIs and Rel-15 maintenance, comments collections can be arranged for TPs and CRs. For Rel-16 on-going WIs, suggest to focus on open issues discussion on 1st round.*

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| R4-2015436 | ZTE: fine with that, it’s also aligned with our proposal |
| Company B |
| Ericsson: ok |
| CR-2016254 | ZTE: fine to further discuss and not sure any difference from 5 directions? |
| Company B |
|  |
| R4-2016083 (changes to section 10.2) | ZTE: fine with that. |
|  |
| Ericsson: Ok, terminology need to be combined with other papers. |
| R4-2016139 (sections 7.2, 7.3, 10.2, 10.3, 10.4) | Samsung: in this CR there are several [] of reference TS38.141-1/2 removed, for which the extreme and normal condition seems still under discussion in perf part. Even it is going to reuse definition in TS38.141-1/2 the reference# may be [21] or [22] rather than [6]. |
|  |
|  |
| R4-2016262 | ZTE: fine with that. |
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## 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: In-band selectivity and blocking requirements

Editorial CRs were submitted for this agenda, companies should provide comments in the CRs/TPs section

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
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## Open issues summary

There are a lot of fixes proposed for the specifications, companies to provide comments to the proposed changes directly*.*

### Sub-topic 3-1

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
|  |  |

### CRs/TPs comments collection

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| R4-2015437 | ZTE: 5MHz for IAB-MT should be removed, in addition,freq offset for ACS requirement has been define i think. |
| Company B |
| Ericsson:ok |
| R4-2016252 | ZTE: fine to remove 5MHz for IAB-MT |
| Company B |
|  |
| R4-2016139 (“big CR” – see section 7.4 ,10.5) |  |
|  |
|  |
| R4-2016261 | ZTE: fine with that. |
|  |
|  |
| R4-2014752 | ZTE: fine with that. |
|  |
| Ericsson : ok |

## 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:* |

*Recommendations on WF/LS assignment*

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| --- | --- | --- |
|  | **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 #4: Tx Power related requirements

A single paper is discussing the relative PC test. Some editorial CRs are included in the CRs/TPs sections, companies are invited to provide comments directly there.

## Companies’ contributions summary

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| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2016137 | ZTE | **Proposal 1: to** **reuse the existing relative power tolerance requirement in TS 38.101-1/2 for IAB-MT.**  **Proposal 2: to reuse the existing aggregated power tolerance requirement in TS 38.101-1/2 for IAB-MT.** |

## Open issues summary

The relative and aggregate power tolerance are still open, the proposals are discussed in sub-topics 4-1 and 4-2.

There are a lot of fixes proposed for the specifications, companies to provide comments to the proposed changes directly*.*

### Sub-topic 4-1

*Sub-topic description:*

*Open issues and candidate options before e-meeting:*

**Issue 1-1: Relative Power Tolerance**

* Proposals
  + Option 1: reuse the existing relative power tolerance requirement in TS 38.101-1/2 for IAB-MT
* Recommended WF
  + Agree option 1

### Sub-topic 4-2

*Sub-topic description*

*Open issues and candidate options before e-meeting:*

**Issue 1-2: Aggregate Power Tolerance**

* Proposals
  + Option 1: reuse the existing aggregated power tolerance requirement in TS 38.101-1/2 for IAB-MT
* Recommended WF
  + Agree option 1

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX | Sub topic 4-1:  Sub topic 4-2:  ….  Others: |
| CATT | It seems they’re also discussed in thread [310]. We already commented in [310]. |
| Samsung | Issue 1-1/2: Clarification needed regarding moderator recommendation. Does that mean we will stick to exiting requirement in TS38.174 or it is suggested to update the power control tolerance? |

### CRs/TPs comments collection

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| R4-2016257 | Company A |
| Company B |
|  |
| R4-2016139 (section 6.2, 6.3, 6.4, 9.2, 9.3, 9.4) | Company A |
| Company B |
| Ericsson: 9.2.4, the title change may not reflect the original intention. |
| R4-2016264 |  |
|  |
|  |

## 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:* |

*Recommendations on WF/LS assignment*

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| --- | --- | --- |
|  | **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 #5: Unwanted emissions

Editorial CRs were submitted for this agenda, companies should provide comments in the CRs/TPs section

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
|  |  |  |

## Open issues summary

There are a lot of fixes proposed for the specifications, companies to provide comments to the proposed changes directly

### Sub-topic 5-1

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
|  |  |

### CRs/TPs comments collection

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| R4-2016258 | ZTE: fine to remove 5MHz for IAB-MT, however this table is also applied for IAB-DU. |
| Company B |
|  |
| R4-2016139 (section 6.6, 9.7) | Company A |
| Company B |
|  |
| R4-2016265 | ZTE: fine with that. |
|  |
|  |

## 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:* |

*Recommendations on WF/LS assignment*

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

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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 #6: Others

Editorial CRs were submitted for this agenda, companies should provide comments in the CRs/TPs section

## Companies’ contributions summary

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
|  |  |  |

## Open issues summary

There are a lot of fixes proposed for the specifications, companies to provide comments to the proposed changes directly*.*

### Sub-topic 6-1

*Sub-topic description:*

## Companies views’ collection for 1st round

### Open issues

|  |  |
| --- | --- |
| **Company** | **Comments** |
| XXX | Sub topic 6-1:  Sub topic 6-2:  ….  Others: |

### CRs/TPs comments collection

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| R4-2015438 | ZTE: fine with that. |
| Company B |
| Ericsson:ok |
| R4-2016253 | ZTE: editorial corrections is fine for us. |
| Company B |
|  |
| R4-2016139 (all other sections not explicitly stated for Topics 1-5) |  |
|  |
|  |
| R4-2016256 | ZTE: fine with that. |
| Samsung: for F.2 text other than “TBD” should be added to avoid empty sub-clause which may be voided at last. |
|  |

## 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:* |

*Recommendations on WF/LS assignment*

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| --- | --- | --- |
|  | **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”* |