**3GPP TSG RAN meeting #90e RP-20xxxx**

**Electronic Meeting, 7-11 December 2020**

**Agenda item:** TBA

**Source:** Email discussion moderator (Intel)

**Title:** Report from Email Discussion [90E][43][60GHz\_OTA]

**Document for:** Discussion and decision

# Introduction

This document provides as summary of the following email discussion during RAN#90-e:

**[90E][43][60GHz\_OTA]**

Goal: Generate an agreeable way forward.

Input contributions covered: 2661

# Discussion

## Background

The following summarizes the key observations and proposals listed in RP-202661:

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| ***Observation #1: OTA test methods are used as a baseline approach for NR mmWave test methodology for RF, RRM, and Demodulation testing.***  ***Observation #2: The existing mmWave OTA UE test methods are applicable to FR2 frequency bands and their extension to carrier frequencies above 52.6 GHz should be further studied***  **Proposal #1: Further study and define NR 52.6-71GHz OTA test methods within the Rel-17 timeframe**   * + **Option 1: Initiate a separate SI in parallel with NR 52.6 – 71 GHz WI**   + **Option 2: Extend the scope of the NR 52.6 – 71 GHz WI to cover the testability aspects**   **Proposal #2: Consider the following SI/WI objectives to enable NR 52.6-71GHz OTA test methods**   * + *Study and define the over the air (OTA) test methods for UE RF, RRM, and demodulation requirements for the 52.6GHz-71GHz frequency range [RAN4]*     - *Extend the applicability of the FR2 OTA test methods in TR 38.810 wherever possible*     - *Identify any changes needed, including general testing and calibration, permitted test methods, multi-path fading propagation conditions, measurement applicability criteria.*     - *Target device types: Handheld UE, laptop, tablet, FWA, vehicular mounted device; other UE types not precluded.* |

## Initial round

### Open issues

The following questions are proposed to be discussed in the initial round:

* Question #1: Whether to further study and define NR 52.6-71GHz OTA test methods within the Rel-17 timeframe
* Question #2: How to organize the NR 52.6-71GHz OTA test methods studies within the Rel-17 timeframe
  + Option 1: Initiate a separate SI to study NR 52.6-71GHz OTA test methods
  + Option 2: Extend the scope of the NR 52.6 – 71 GHz WI to cover the testability aspects
  + Option 3: other options?
* Question #3: Candidate study objectives
  + *Option 1: Study and define the over the air (OTA) test methods for UE RF, RRM, and demodulation requirements for the 52.6GHz-71GHz frequency range [RAN4]*
    - *Extend the applicability of the FR2 OTA test methods in TR 38.810 wherever possible*
    - *Identify any changes needed, including general testing and calibration, permitted test methods, multi-path fading propagation conditions, measurement applicability criteria.*
    - *Target device types: Handheld UE, laptop, tablet, FWA, vehicular mounted device; other UE types not precluded.*
    - *Utilize free space testing configuration for test methods definition.*

### Companies views’ collection

**Question #1: Whether to further study and define NR 52.6-71GHz OTA test methods within the Rel-17 timeframe?**

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| **Company** | **Comments** |
| Qualcomm | Q1: some study is definitely needed as there is a gap in testing for this frequency range. |
| ZTE | It is fine to study in Rel-17 timeframe if TU allowed, however this work should be started until RF core requirements is stable, otherwsie it seems no base are upon for further discussion. |
| Intel | Support to study in Rel-17. Agree with QC that there will be gap in case the test methods are not defined and RAN4 core requirements and RAN5 conformance requirements cannot be defined.  To ZTE: the work can start in May 2020 or later once some progress is made with RF requirements definition. |
| Huawei, HiSilicon | Before rushing to study in Rel-17 for 52.6-71GHz OTA test methods, we need to have a better understanding whether existing test framework for FR2 can be reused for 52.6-71GHz, which should be based on available RF requirements. However, requirements are not studied yet. |
| Ericsson | Test methods are clearly needed for the UE (and also the BS). For the BS, our understanding is that developing test methodologies is already part of the performance part of the WI, where the BS conformance spec is written. For the UE if it makes sense to roll together with other OTA issues a SI could make sense. No need to link the UE work in any way with the BS, but regarding timing, considering RAN4 workload it could make sense to start this work at the same time the performance part of the WI starts (which is when the corresponding BS work starts too). |
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**Question #2: How to organize the NR 52.6-71GHz OTA test methods studies within the Rel-17 timeframe**

* **Option 1: Initiate a separate SI to study NR 52.6-71GHz OTA test methods**
* **Option 2: Extend the scope of the NR 52.6 – 71 GHz WI to cover the testability aspects**
* **Option 3: other options?**

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| **Company** | **Comments** |
| Qualcomm | Q2: Option 3: We believe there are also other OTA testing issues arising from different WIs, there should be a broader discussion on how we handle all of them. Each could be handled in its own WI/SI (basically Option 2 applied independently to each item), however this might not be the most efficient way. Considering that OTA discussions are mainly handled by the same delegates, it should be discussed whether a study item handling all OTA issues in one release should be used. This could be an ongoing SI in which topics are added and concluded one by one. Such handling would offer a wholistic approach which would be very important to achieve a unified testing discussion. Divergence in terms of testing solutions/methodologies would be very harmful for the eco-system. |
| ZTE | Option 2 is more preferred as this 52.6-71GHz OTA test method should be similar as the existing FR2 OTA test.  Given QC’s comments, we are also fine to put all FR2 OTA testing issues in one umbrella SI as OTA delegates should be same for different topics. |
| Intel | Prefer Option 1 to have a separate SI. The SI scope aims to define test methods for RF/RRM/Demod requirements. We assume that the work can progress during the Rel-17 Performance stage. So, in case we add objectives to the WI, there is a risk that the whole WI Core part should be extended in case the test methods work is incomplete by the Core part completion deadline.  We are also OK to put all mmWave OTA testing aspects in one umbrella SI. In this case it makes sense to extend the objectives of Rel-17 FR2 Test Methods enhancements SI. |
| Huawei, HiSilicon | Option 2. The test methods are relevant to the RF requirements specified in the WI. Once the requirements are available, the test methods can be studied. |
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**Question 3: Candidate study objectives**

* ***Option 1: Study and define the over the air (OTA) test methods for UE RF, RRM, and demodulation requirements for the 52.6GHz-71GHz frequency range [RAN4]***
  + ***Extend the applicability of the FR2 OTA test methods in TR 38.810 wherever possible***
  + ***Identify any changes needed, including general testing and calibration, permitted test methods, multi-path fading propagation conditions, measurement applicability criteria.***
  + ***Target device types: Handheld UE, laptop, tablet, FWA, vehicular mounted device; other UE types not precluded.***
  + ***Utilize free space testing configuration for test methods definition.***

Companies are encouraged to share views on the candidate objectives of the studies and whether proposed Option 1 objectives are acceptable.

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| **Company** | **Comments** |
| Qualcomm | Q3: we mainly agree with the bullets, we believe that FWA and vehicular mounted device can be de-prioritize, at least for now. |
| ZTE | Just wondering in 52.6-71GHz, are we going to define so many device types? If not, we need to consider so many use cases here? |
| Intel | Support the objectives.  We are fine to prioritize handheld UE, laptop, tablet type of devices. FWA and vehicular mounted devices can be treated with the 2nd priority. |
| Huawei, HiSilicon | As commented for Q2, it’s too early to consider the detailed objectives as no RF requirements are specified yet. |
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### Summary and recommendation for further discussion

## Intermediate round

## Fine-tuning round

# Conclusion

Based on the email discussion, the following are proposed:

* TBD