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

**Electronic Meeting, 2 – 13 Nov., 2020**

**Agenda item:** 14

**Source:** Apple (moderator)

**Title:** Email discussion summary of FR2 fallback

**Document for:** Information

# Introduction

In RAN 89e, a WF (RP-201538) for FR2 fallback, co-sourced by 18 companies including 16 operators was discussed as follow

* *UE must support all the fallback band combinations*
* *UE conformance requirements w.r.t. the fallback band combinations are relaxed:*
  + *The fallback band combinations fulfilling both the following conditions are exempt from requirements:*
    - *consists of multiple sub-blocks*
    - *has at least one sub-block comprising a contiguous CA combination (i.e. a letter B, C, D, …).*
* *The UE shall comply to all regulatory requirements for all supported band combinations, i.e. including for all fallback band combinations.*

*Detailed wording proposed for TS38.101-2/3 includes*

* *For FR2 intra-band CA combinations with multiple subblocks, where at least one of the subblocks consists of a contiguous CA combination, there are no RF performance requirements for the fallbacks with multiple subblocks, where at least one of the subblocks consists of a contiguous CA combination. Requirements in other specifications are not affected.*
* *NOTE: The above is an exception with regards to compliance to RF performance requirements. The exception applies to fallback band combinations consisting of multiple subblocks where at least one of the subblocks consists of a contiguous CA combination. The exception does not apply to other band combinations.*

Meanwhile, concerns are raised in WF (RP-202095) that

*‘No performance requirement’ is a blank check to UEs:*

1. *Missing explicit list of RF requirements that will not be met by UEs under fallback conditions.*
2. *No consideration for legacy UEs that are designed to a higher standard (meets all RF requirements for all fallbacks)*

Suggested CR wording include

*For A terminal which supports CA or DC configurations, which include FR2 intra-band CA combinations with multiple subblocks, where at least one of the subblocks consists of a contiguous CA combination, RF requirements of sub-sections [7.5A and 7.6A] are waived for the fallbacks with multiple subblocks, where at least one of the subblocks consists of a contiguous CA combination.*

As a conclusion in RAN#90e, it was documented in chairman notes that

*Interested companies will work offline on a list of requirements to be waived; this list will be provided to RAN #90e to solve the problem.*

Pre-RAN#90e offline email discussion is summarized as

*On the list of exempt requirements for DL*

* *OK to waive the following DL requirements with respect to FR2 aspect for qualified FR2 fallback BC (Ericsson, Intel, AT&T, Apple)*
  + *38.101-2: 7.5A, 7.5D, 7.6A, 7.6D*
  + *38.101-3: 7.5A, 7.5B, 7.6A, 7.6B*
* *No strong concerns observed from other companies on the set of exempt requirements except the signaling to distinguish UE with and without requirement waiving.*

*On the list of exempt requirements for UL*

* *Concern to waive the UL requirements for qualified FR2 fallback BC (Ericsson, Qualcomm, Verizon, Nokia, Intel, AT&T)*
* *Support to waive some of UL requirements based on the market needs and existing band combinations (Apple)*

*On the signaling to differentiate UE with/without the waived requirements for qualified FR2 fallback BC*

* *No need for such signaling since it has been concluded infeasible for NW not to configure fallback based on the UE capability (Ericsson, Apple)*
* *It is beneficiary to have such signaling (Qualcomm, Nokia, Verizon, Intel)*

# Remaining issues for FR2 fallback

## Tdocs in RAN#90e

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| --- | --- | --- |
| **T-doc number** | **Title** | **Company** |
| RP-202555 | Offline discussion summary of FR2 fallback | Apple |
| RP-202556 | WF on FR2 fallback (placeholder) | Apple |
| RP-202511 | FR2 CA fallback behaviour: Achieving consistency across WGs | Qualcomm Incorporated |
| RP-202574 | Motivation for the simplification of handling of fallbacks for FR2 CA | Apple |
| RP-202575 | CR to 38.101-2 on handling of fallbacks for FR2 CA | Apple |
| RP-202576 | CR to 38.101-2 on handling of fallbacks for FR2 CA | Apple |
| RP-202577 | CR to 38.101-3 on handling of fallbacks for FR2 CA | Apple |
| RP-202578 | CR to 38.101-3 on handling of fallbacks for FR2 CA | Apple |

## Open issues summary

***General assumptions and agreements on FR2 fallback***

* *UE must support being configured with all the fallback band combinations and NW is not restricted to configure any fallback*
* *The UE shall comply to all regulatory requirements for all supported band combinations, i.e. including for all fallback band combinations.*
* *The qualified fallback band combinations, which can be exempt from the identified requirements, should fulfill both of the following conditions* 
  + *consist of multiple sub-blocks*
  + *have at least one sub-block comprising a contiguous CA combination (i.e. a letter B, C, D, …).*

***Open issues : On FR2 fallback related exempt requirements and signaling***

Based on the discussion in previous RAN plenary and pre-RAN#90e email discussion, the follow options are provided

**Option 1 (both DL and UL with signaling):**

* The UE RF requirements in clauses 7.5A, 7.5D, 7.6A, 7.6D in TS38.101-2 and 7.5A, 7.5B, 7.6A, 7.6B in TS38.101-3 of only the highest order combination apply for its qualified fallbacks
* , the UE RF requirements in clauses 6.4A.2.3, 6.4D.2, 6.5A, and 6.5D in TS38.101-2 and 6.4A.2, 6.4B.2.4, 6.4B.2.5, 6.5A, and 6.5B in TS38.101-3 of only the highest order combination apply for its qualified fallbacks
* Signaling is introduced to differentiate UE with/without the applying the highest order combination related requirements for qualified FR2 fallback BC

**Option 2 (both DL and UL without signaling):**

* The UE RF requirements in clauses 7.5A, 7.5D, 7.6A, 7.6D in TS38.101-2 and 7.5A, 7.5B, 7.6A, 7.6B in TS38.101-3 of only the highest order combination apply for its qualified fallbacks
* , the UE RF requirements in clauses 6.4A.2.3, 6.4D.2, 6.5A, and 6.5D in TS38.101-2 and 6.4A.2, 6.4B.2.4, 6.4B.2.5, 6.5A, and 6.5B in TS38.101-3 of only the highest order combination apply for its qualified fallbacks
* Signaling is introduced to differentiate UE with/without the applying the highest order combination related requirements for qualified FR2 fallback BC

**Option 3: (DL only without signaling)**

* The UE RF requirements in clauses 7.5A, 7.5D, 7.6A, 7.6D in TS38.101-2 and 7.5A, 7.5B, 7.6A, 7.6B in TS38.101-3 of only the highest order combination apply for its qualified fallbacks
* No signaling is needed

**Option 4: (DL only with signaling):**

* The UE RF requirements in clauses 7.5A, 7.5D, 7.6A, 7.6D in TS38.101-2 and 7.5A, 7.5B, 7.6A, 7.6B in TS38.101-3 of only the highest order combination apply for its qualified fallbacks
* Signaling is introduced to differentiate UE with/without the applying the highest order combination related requirements for qualified FR2 fallback BC

## Companies views’ collection

### Open Issue: List of exempt requirements for FR2 fallback band combinations, which fulfill the conditions specified in Topic#2

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

## Summary for the initial round discussion

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|  | **Status summary after the initial round email discussion** |
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