**3GPP TSG RAN WG1 #110bis-e R1-22xxxxx**

**E-meeting, October 10th – 19th, 2022**

**Agenda item: 7.1**

**Source: Moderator (xiaomi)**

**Title: Summary of email discussion on RSRP of the downlink pathloss reference for PRACH power control**

**WI: NR\_newRAT-Core**

**Document for: Discussion and Decision**

# 1 Introduction

This document collects company views on a RAN1#110bis-e submitted CR attempting to clarify whether the RSRP of the downlink pathloss reference for PRACH power control is L1 RSRP or L3 RSRP especially in idle/inactive states.

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| **TDoc** | **Title** | **Source** | **Release** | **Spec** | **Version** | **Related WIs** | **CR category** |
| [**R1-2209254**](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_110b-e/Docs/R1-2209254.zip) | Corrections on the RSRP of the downlink pathloss reference for PRACH power control | xiaomi | [**Rel-15**](https://portal.3gpp.org/desktopmodules/Release/ReleaseDetails.aspx?releaseId=190) | [**38.213**](https://portal.3gpp.org/desktopmodules/Specifications/SpecificationDetails.aspx?specificationId=3215) | 15.16.0 | [**NR\_newRAT-Core**](https://portal.3gpp.org/desktopmodules/WorkItem/WorkItemDetails.aspx?workitemId=750167) | F |

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| ***Reason for change:*** | In clause 7.4 of TS 38.213, it describes that the pathloss of PRACH is calculated by the UE in dB as *referenceSignalPower* - higher layer filtered RSRP in dBm, where the higher layer filtered RSRP configuration is defined in TS 38.331. And, the higher layer filtering, i.e., L3 filtering, is defined as follows according to clause 5.5.3.2 of TS 38.331:***F*n = (1 – *a*)\**F*n-1 + *a*\**M*n**Where, ***a*** = 1/2(***ki***/4), and ***ki*** is the *filterCoefficient* for the corresponding measurement quantity of the i:th *QuantityConfigNR* in *quantityConfigNR-List*, and *i* is indicated by *quantityConfigIndex* in *MeasObjectNR*However, since *MeasObjectNR* is only configured in the RRC connected state, the *filterCoefficient* can’t be obtained in RRC idle/inactive state and the L3 filtering can’t be applied for the pathloss determination of PRACH. Even though the default value fc4 is configured for *filterCoefficient*, our RAN2 colleagues believe that the idle/inactive state can’t use a default value of the connected state. Besides, for RSRP measurements for random access procedure, it has been discussed in RAN2 NR AdHoc 1807 meeting and the following agreement was achieved:**For the purpose of Random Access the UE uses unfiltered L1 measurements for RSRP.**Thus, we propose to change the “higher layer filtered RSRP” in clause 7.4 of TS 38.213 to “L1 RSRP” for the calculation of pathloss for PRACH.  |
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| ***Summary of change:*** | Change ‘higher layer filtered RSRP’ in Clause 7.4 to ‘L1 RSRP’ for the pathloss determination of PRACH channel |
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| ***Consequences if not approved:*** | Misalignment between TS 38.213 and TS 38.331 |

**The proposed change and the corresponding paragraph:**

**<Unchanged parts omitted>**

* 7.4 Physical random access channel

A UE determines a transmission power for a physical random access channel (PRACH), , on active UL BWP  of carrier  of serving cell  based on DL RS for serving cell  in transmission occasion  as

  [dBm],

where  is the UE configured maximum output power defined in [8-1, TS 38.101-1], [8-2, TS38.101-2] and [38.101-3] for carrier  of serving cell  within transmission occasion ,  is the PRACH target reception power *PREAMBLE\_RECEIVED\_TARGET\_POWER* provided by higher layers [11, TS 38.321] for the active UL BWP  of carrier  of serving cell , and  is a pathloss for the active UL BWP  of carrier  based on the DL RS associated with the PRACH transmission on the active DL BWP of serving cell  and calculated by the UE in dB as *referenceSignalPower* – L1 RSRP in dBm, where RSRP is defined in [7, TS 38.215]. If the active DL BWP is the initial DL BWP and for SS/PBCH block and CORESET multiplexing pattern 2 or 3, as described in Clause 13, the UE determines  based on the SS/PBCH block associated with the PRACH transmission.

**<Unchanged parts omitted>**

# 2 Company views

**Please provide company comments to the table below**

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| **Company** | **Comment** |
| Xiaomi | As a proponent we support this CR. |
| Huawei, HiSilicon | OK. For the cover page of the CR, suggest to add the part of “**Isolated Impact Analysis**” for review as well. In our understanding, it is not expected to impact on gNB/UE implementation by the CR.  |
| OPPO | We are fine with the CR. |
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