**3GPP TSG-WG4 Meeting #111R4-2408890**

**Fukuoka City, Fukuoka , Japan, 20th – 24th May, 2024**

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| *CR-Form-v12.3* |
| **CHANGE REQUEST** |
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|  | **38.133** | **CR** |  | **rev** |  | **Current version:** | **18.5.0** |  |
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| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
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| ***Proposed change affects:*** | UICC apps |  | ME | **x** | Radio Access Network |  | Core Network |  |

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| ***Title:***  | Draft CR to 38.133 on new 2AoA setup for multi-Rx chain DL reception in Rel-18 FR2 HST |
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| ***Source to WG:*** | Samsung, Nokia, Qualcomm, Ericsson |
| ***Source to TSG:*** |  |
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| ***Work item code:*** | NR\_HST\_FR2\_enh-Perf |  | ***Date:*** | 2024-05-09 |
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| ***Category:*** | ***B*** |  | ***Release:*** | Rel-18 |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)…Rel-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19) Rel-20 (Release 20)* |
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| ***Reason for change:*** | 1. The AoA setup for FR2 RRM test case was not specified for FR2 PC6 UE with multi-Rx
2. In RAN4 #110-bis meeting, the following alignments on new 2AoA setup were achieved:
	1. The necessity. The necessity of defining a new 2AoA setup for multi-Rx chain DL reception in Rel-18 FR2 HST was verified. And the new 2AoA setup with 1 AoA in Rx beam peak direction, 1 in non Rx beam peak is needed
	2. The applicability. The new 2AoA setup is to support the SSB based L1-RSRP measurement test on FR2-1 PC6 UEs supporting *SimultaneousReceptionFR2HST-r18* in Rel-18.
	3. Spec. impact. The new 2AoA setup shall be defined as new sub-Clause (s) in A.3.15.4 according to the RF requirements defined in Section 7.3K.6 TS 38.101-2.
3. The agreements obtained in R4-2406412 are copied as below

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| Issue 1-1-1 AoA setup for multi-Rx chain DL reception in Rel-18 FR2 HST* Agreement:
	+ Necessity: It is necessary to define a new 2AoA setup for multi-Rx chain DL reception in Rel-18 FR2 HST.
		- The new 2AoA setup for FR2 HST RRM test cases is: 1 AoA in Rx beam peak direction, 1 in non Rx beam peak
		- The new 2AoA setup is applicable to support the SSB based L1-RSRP measurement test on FR2-1 PC6 UEs supporting *SimultaneousReceptionFR2HST-r18*
	+ How to design: Define the new 2AoA setup in new sub-Clause (s) in A.3.15.4 based on the RF requirements defined in Section 7.3K.6 TS 38.101-2.
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| ***Summary of change:*** | Define a new 2AoA setup for multi-Rx chain DL reception in Rel-18 FR2 HST |
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| ***Consequences if not approved:*** | 1. The existing AoA setup 1,2,3,4 for FR2 RRM test case in the current Spec. A 3.15 are not applicable to FR2 PC6 UE with multi-Rx in Rel-18
2. PC6 RRM TC for SSB based L1-RSRP measurement on FR2-1 PC6 UEs supporting SimultaneousReceptionFR2HST-r18 cannot be completed
3. RAN5 testing cannot be done with the incorrect AoA setup in Rel-18 FR2 HS
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| ***Clauses affected:*** | (new)A.3.15.4.X |
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|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** | **X** |  |  Test specifications | TS/TR ... CR ... 38.533 |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
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| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

<< Start of change >>

### A.3.15.4 Setup 4: 2 AoAs, 1 AoA in Rx beam peak direction, 1 in non Rx beam peak

#### A.3.15.4.1 Setup 4a: 2 AoAs, 1 AoA in Rx beam peak direction, 1 in non Rx beam peak without change in direction

There are 2 active probes in the test. The DL signals, and noise if applicable, are transmitted from the two active probes. One probe is aligned to the UE Rx beam peak direction as defined in TS 38.101-2 [19]. The second is aligned to a direction (AoA) which is from the set of directions corresponding to the EIS spherical coverage percentile of the DUT as defined in clause 7.3.4 of TS 38.101-2 [19] for each UE power class. The direction (AoA) of the non Rx beam peak signal shall not be changed between test iterations.

#### A.3.15.4.2 Setup 4b: 2 AoAs, 1 AoA in Rx beam peak direction, 1 in non Rx beam peak with change in direction

There are 2 active probes in the test. The DL signals, and noise if applicable, are transmitted from the two active probes. One probe is aligned to the UE Rx beam peak direction as defined in TS 38.101-2 [19]. The second is aligned to a direction (AoA) which is from the set of directions corresponding to the EIS spherical coverage percentile of the DUT as defined in clause 7.3.4 of TS 38.101-2 [19] for each UE power class.

For UE power class 3, the relative angular offset between the directions (AoAs) of the 2 active probes shall be changed for each test iteration, within the probe alignment described above. The applicable set of relative angular offsets between the 2 active probes is given in Table 3.15.3-1 for each UE power class.

#### A.3.15.4.X Setup 4c: 2 AoAs, 1 AoA in Rx beam peak direction, 1 in non Rx beam peak for power class 6 UE supporting simultaneous reception from multiple directions

There are 2 active probes in the test. The DL signals, and noise if applicable, are transmitted from the two active probes. One probe is aligned to the UE Rx beam peak direction as defined in TS 38.101-2 [19]. The second is aligned to a direction (AoA) which is from the set of directions corresponding to the 2AoA spherical coverage requirement for simultaneous reception from multiple directions as defined in clause 7.3K.6 of TS 38.101-2 [19] for power class 6.

For power class 6 supporting simultaneous reception from multiple directions, the angular separation between the directions (AoAs) of the 2 active probes is 150°, and the direction (AoA) of the non Rx beam peak signal shall not be changed between test iterations. The applicable set of relative angular offsets between the 2 active probes is given in Table 3.15.X-1 for UE power class 6 supporting simultaneous reception from multiple directions.

Table A.3.15.X-1: Set of relative angular offsets between active probes for PC6 supporting simultaneous reception from multiple directions

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| UE Power class | Relative angular offset between active probes |
| 6 | 150° |

<< End of change >>