**3GPP TSG-RAN WG4 Meeting #111 R4-240xxxx**

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 on L1-RSRP RRM requirements in R18 LTM |
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| ***Source to WG:*** | vivo |
| ***Source to TSG:*** | R4 |
|  |  |
| ***Work item code:*** | NR\_Mob\_enh2-Core |  | ***Date:*** | 2024-05-13 |
|  |  |  |  |  |
| ***Category:*** | F |  | ***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-16 (Release 17)Rel-17 (Release 18)Rel-18 (Release 19)Rel-19 (Release 20)* |
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| ***Reason for change:*** | 1. Re-submit endored version of R4-24065132. Capture the refined wording of ‘Consequence if not approved’ for 39-3-1/2/3/4/5/6, based on the agreed UE feature table in R4-2406680 |
|  |  |
| ***Summary of change:*** | 1. Re-submit endored version of R4-24065132. Capture the refined wording of ‘Consequence if not approved’ for 39-3-1/2/3/4/5/6, based on the agreed UE feature table in R4-2406680 |
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| ***Consequences if not approved:*** | 1. Endorsed version of R4-2406513 is not agreed.3. The UE behaviour regarding restrictions on measurement based on UE capabilities is not reflected in spec. |
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| ***Clauses affected:*** | 9.14.1, 9.14.2, 9.14.4, 9.15.1, 9.15.4 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** | **X** |  |  Test specifications | TS 38.533  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
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| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** | R4-2406513 |

<Start of Change #1>

## 9.14 Intra-frequency L1-RSRP measurements for neighbor cell

### 9.14.1 Introduction

A measurement is defined as an SSB based intra-frequency L1-RSRP measurement provided the centre frequency of the SSB of the serving cell and the centre frequency of the SSB of the neighbour cell are the same, and the subcarrier spacing of the two SSBs are also the same.

When configured with [*LTM-CSI-ResourceConfig-r18*] by the network, the UE shall be able to perform L1-RSRP measurements of configured measurement resources from a neighbor cell, with the measurement resources configured as SSBs of the neighbor cell.

If the number of resources/cells, including the number of resources/cells configured for L1-RSRP measurement in 9.14 exceeds the UE capability specified in 9.14.4, it is up to UE implementation on how to choose cells/SSB to measure, and the cells whose TCI state(s) are in the active TCI state list shall be prioritized.

The UE shall report the measurement quantity and send periodic, semi-persistent or aperiodic reports, according to the higher layer parameter [*reportConfigType-r18*] of each reporting setting[*LTM-CSI-ReportConfig-r18*].

### 9.14.2 Requirements Applicability

The requirements in the clause 9.14 are applicable to FR1 and FR2-1 for LTM.

The requirements in clause 9.14 apply, provided for the SSB from the neighbor cell configured for intra-frequency L1-RSRP measurement, the following conditions are met:

- The cell is known

- The SSB configured for intra-frequency L1-RSRP measurement is on the same carrier frequency of SSB configured for L3 intra-frequency measurement.

- The SSB resources configured for L1-RSRP measurements are measurable.

An SSB resource configured for L1-RSRP for neigbor cell shall be considered measurable when for each relevant SSB the following conditions are met:

- L1-RSRP related side conditions given in clause [10.1.19] for FR1 and [10.1.20] for FR2-1, respectively, for a corresponding band,

- SSB\_RP and SSB Ês/Iot according to Annex [B.2.4.1] for a corresponding band.

The cell is considered as known if the following conditions are met in this requirement:

- The UE has performed L3 measurement on the target cell during the last 5 seconds, and

- The SSB from the target cell configured for L1 measurement remains detectable according to the cell identification requirements specified in clause 9.2.

Otherwise, the cell is unknown.

Unchanged sections omitted

### 9.14.4 Number of SSB frequency layers, number of cells and number of SSBs

For UE supporting *[45-1 in RAN1 feature list]* but not supporting *[39-2 in RAN4 feature list]*, UE shall support performing LTM L1-RSRP measurements on NL1, outside\_gap SSB frequency layers, where NL1, outside\_gap is defined as the number of intra-frequency SSB layers as indicated in [39-3-1].

For UE supporting *[45-1 in RAN1 feature list]* and *[39-2 in RAN4 feature list]*, UE shall support performing LTM L1-RSRP measurements on NL1, outside\_gap SSB frequency layers, where NL1, outside\_gap is defined as the number of intra-frequency SSB layers plus inter-frequency without gaps SSB layers as indicated in [39-3-1].

For each intra-frequency layer,

* If UE has reported NNeigh\_Cell in [39-3-2], the UE shall be capable of performing L1-RSRP measurements for at least NNeigh\_Cell neighbor cells.
* If UE has reported Nmax\_SSB in [39-3-5], the UE shall be capable of performing L1-RSRP measurements for at least Nmax\_SSB SSB resources including serving cell SSBs and neighbour cell SSBs.

If UE has reported NTotal\_Cell in [39-3-3], the UE shall be capable of performing L1-RSRP measurements for at least NTotal\_Cell cells, including serving cells and neighbor cells, across all frequency layers of intra-frequency and inter-frequency without measurement gaps.

If UE has reported NSSB\_within\_slot in [39-3-4], the UE shall be capable of performing L1-RSRP measurements for at least NSSB\_within\_slot SSBs for serving cells and neighbor cells within a slot, across all frequency layers of intra- and inter-frequency without gap L1-RSRP measurement.

If UE has reported NTotal\_SSB in [39-3-6], the UE shall be capable of performing L1-RSRP measurements for at least NTotal\_SSB SSBs for serving cells and neighbor cells, across all frequency layers of intra- and inter-frequency without gap L1-RSRP measurement.

For L1-RSRP measurement on neighbour cell, UE measures only one intra-frequency layer on each FR2 band in CA scenario, where this single intra-frequency layer shall be the same frequency layer that UE performs L3 intra-frequency layer in that FR2 band.

<End of Change #1>

<Start of Change #2>

### 9.15.1 Introduction

A L1-RSRP measurement is defined as an inter-frequency L1-RSRP measurement provided it is not defined as an intra- frequency L1-RSRP measurement according to clause 9.14.

For UE supporting *ltm-InterFreqMeasGap-r18*, when measurement gaps are configured, the UE shall be able to perform inter-frequency L1-RSRP measurements of SSBs from inter-frequency neighbor cells if SSBs are outside active BWPs. The UE shall measure SSB resources within the *LTM-CSI-ResourceConfig-r18* settings configured for L1-RSRP measurement on inter-frequency neighbor cells with measurement gaps according to UE capability specified in 9.15.4. If the number of resources configured exceeds the UE capability specified in 9.15.4, it is up to UE implementation on how to choose resources to measure, and the cell(s) whose TCI state(s) are in the active TCI state list shall be prioritized.

For UE supporting *[39-2 in RAN4 feature list]*, the UE shall perform inter-frequency L1-RSRP measurements of SSBs from inter-frequency neighbor cells if SSBs are within active BWPs. The UE shall measure SSB resources within the *LTM-CSI-ResourceConfig-r18* settings configured for L1-RSRP measurement on inter-frequency neighbor cells without measurement gaps. If the number of resources exceeds the UE capability specified in 9.14.4, it is up to UE implementation on how to choose resources to measure, and the cell(s) whose TCI state(s) are in the active TCI state list shall be prioritized.

The UE shall report the measurement quantity (*reportQuantity*) and send periodic, semi-persistent or aperiodic reports, according to the higher layer parameter *reportConfigType-r18*of each reporting setting *LTM-CSI-ReportConfig-r18*.

Unchanged sections omitted

### 9.15.4 Number of cells and number of SSB

For UE supporting *ltm-InterFreqMeasGap-r18*, UE shall support performing LTM L1-RSRP measurements on NL1, inter\_with\_gap SSB frequency layers, while NL1, inter\_with\_gap is the number of SSB frequency layers as indicated in [39-3-1].

For each inter-frequency layer, during each layer 1 measurement period,

* If UE has reported NNeigh\_Cell\_inter in [39-3-2] capability, the UE shall perform L1-RSRP measurements for at least NNeigh\_Cell neighbor cells.
* If UE has reported Nmax\_SSB\_inter in [39-3-5] capability, the UE shall perform L1-RSRP measurements for at least Nmax\_SSB SSB resources including serving cell SSBs and neighbour cell SSBs.

<End of Change #2>