**3GPP TSG-RAN WG4 Meeting #104-e *R4-22xxxxx***

Draft

**Electronic Meeting, 15 – 26 August, 2022**

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| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **37.104** | **CR** | **<>** | **rev** |  | **Current version:** | **15.17.0** |  |
|  | | | | | | | | |
| *For* [***HELP***](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 |  | Radio Access Network | **X** | Core Network |  |

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| ***Title:*** | Big CR for TS 37.104 Maintenance (Rel-15, CAT F) | | | | | | | | | |
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| ***Source to WG:*** | MCC, Ericsson | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_newRAT-Core | | | | |  | ***Date:*** | | | 2022-08-31 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***Release:*** | | | Rel-15 |
|  | *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 can be 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 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | This big CR merges the multiple endorsed draft CRs. The reason for change in each endorsed draft CR is copied below.  **R4-2213583 draft CR to 37.104 on narrowband blocking correction**  Interfering RB center frequency offsets for narrowband blocking requirement take into account RB positions which are not aligned with the 3MHz interfering signal.  **R4-2214793 draft CR to TS37.104[R15]\_Correction on the CA nominal channel spacing**  This CR has been passed, but the specification does not reflect this CR, the passed CR number is R4-2008393. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | The summary of change in each endorsed draft CR is copied below.  **R4-2213583 draft CR to 37.104 on narrowband blocking correction**  Interfering RB center frequency offsets are corrected to align with the 3MHz interfering signal.  **R4-2214793 draft CR to TS37.104[R15]\_Correction on the CA nominal channel spacing**  Adding the texts to include the cases where no common μ is defined for NR operating bands with 15 kHz channel raster. | | | | | | | | |
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| ***Consequences if not approved:*** | | The consequences if not approved for each endorsed draft CR are copied below.  **R4-2213583 draft CR to 37.104 on narrowband blocking correction**  Narrowband blocking requirement would be defined incorrectly.  **R4-2214793 draft CR to TS37.104[R15]\_Correction on the CA nominal channel spacing**  The cases where no common μ is defined are excluded in the spec. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | **R4-2213583 draft CR to 37.104 on narrowband blocking correction**  7.4.2  **R4-2214793 draft CR to TS37.104[R15]\_Correction on the CA nominal channel spacing**  4.6.1A | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | |  | | |
| ***affected:*** | | **X** |  | Test specifications | | | | TS 37.141 | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | |  | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

### 4.6.1A CA Channel spacing

In E-UTRA for contiguously aggregated carriers the channel spacing between adjacent component carriers shall be multiple of 300 kHz.

The nominal channel spacing between two adjacent aggregated E-UTRA carriers is defined as follows:



where BWChannel(1) and BWChannel(2) are the channel bandwidths of the two respective E-UTRA component carriers according to Table 5.6-1 with values in MHz. The channel spacing for intra-band contiguous carrier aggregation can be adjusted to any multiple of 300 kHz less than the nominal channel spacing to optimize performance in a particular deployment scenario.

In NR for intra-band contiguously aggregated carriers, the channel spacing between adjacent component carriers shall be multiple of least common multiple of channel raster and sub-carrier spacing.

The nominal channel spacing between two adjacent aggregated NR carriers is defined as follows:

For NR operating bands with 100 kHz channel raster:



For NR operating bands with 15 kHz channel raster:



with



where BWChannel(1) and BWChannel(2) are the *BS channel bandwidths* of the two respective NR component carriers according to Table 5.3.3-1 and 5.3.3-2 in TS38.104 [17] with values in MHz, μ0 the largest μ value among the subcarrier spacing configurations supported in the operating band for both of the channel bandwidths according to Table 5.3.5-1 and Table 5.3.5-2 in TS38.104 [17] and *GBChannel(i)* the minimum guard band for channel bandwidth *i* according to Table 5.3.3-1 and Table 5.3.3-2 in TS38.104 [17] for the said μ value, with μ as defined in TS 38.211. In case there is no common μ value for both of the channel bandwidths, μ0=1 is selected for NR *operating bands* with 15 kHz channel raster and *GBChannel(i)* is the minimum guard band for channel bandwidth i according to Table 5.3.3-1 in TS38.104 [17] for *μ*=1 with *μ* as defined in TS 38.211.

In NR the channel spacing for intra-band contiguous carrier aggregation can be adjusted to any multiple of least common multiple of channel raster and sub-carrier spacing less than the nominal channel spacing to optimize performance in a particular deployment scenario.

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*End of change\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*Next changed section\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

### 7.4.2 General narrowband blocking minimum requirement

For the general narrowband blocking requirement, the interfering signal shall be an E-UTRA 1RB signal as specified in Annex A.

The requirement is applicable outside the Base Station RF Bandwidth or Radio Bandwidth. The interfering signal offset is defined relative to the Base Station RF Bandwidth edges or Radio Bandwidth edges.

For BS operating in non-contiguous spectrum, the requirement applies in addition inside any sub-block gap, in case the sub-block gap size is at least 3 MHz. The interfering signal offset is defined relative to the sub-block edges inside the sub-block gap.

For BS capable of multi-band operation, the requirement applies in addition inside any Inter RF Bandwidth gap in case the gap size is at least 3 MHz. The interfering signal offset is defined relative to the Base Station RF Bandwidth edges inside the Inter RF Bandwidth gap.

For the wanted and interfering signal coupled to the base station antenna input, using the parameters in Table 7.4.2‑1, the following requirements shall be met:

- For any E-UTRA carrier, the throughput shall be ≥ 95% of the maximum throughput of the reference measurement channel defined in TS 36.104 [4], subclause 7.2.

- For any UTRA FDD carrier, the BER shall not exceed 0.001 for the reference measurement channel defined in TS 25.104 [2], subclause 7.2.

- For any UTRA TDD carrier, the BER shall not exceed 0.001 for the reference measurement channel defined in TS 25.105 [3], subclause 7.2.

- For any GSM/EDGE carrier, the conditions are specified in TS 45.005 [5], Annex P.2.1.

- For any NB-IoT carrier, the throughput shall be ≥ 95% of the maximum throughput of the reference measurement channel defined in TS 36.104 [4], subclause 7.2.

- For any NR carrier, the throughput shall be ≥ 95% of the maximum throughput of the reference measurement channel defined in TS 38.104 [17], subclause 7.2.

Table 7.4.2-1: Narrowband blocking requirement

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Base Station Type | RAT of the carrier | Wanted signal mean power [dBm]  (Note 1,2,7) | Interfering signal mean power [dBm] | Interfering RB (Note 3) centre frequency offset from the Base Station RF Bandwidth edge or sub-block edge inside a gap [kHz] |
| Wide Area BS | NR, E-UTRA, NB-IoT (Note 4) UTRA and GSM/EDGE | PREFSENS + x dB | -49 | ±(240 +m\*180),  m=0, 1, 2, 3, 4, 9, 14  (Note 5)  ±(550 +m\*180),  m=0, 1, 2, 3, 4 (Note 6) |
| Medium Range BS | -44 |
| Local Area BS | -41 |
| NOTE 1: PREFSENS depends on the RAT, the BS class and on the channel bandwidth, see subclause 7.2.  NOTE 2: “x” is equal to 6 in case of NR, E-UTRA or UTRA wanted signals and equal to 3 in case of GSM/EDGE wanted signal. “x” is specified in Table 7.4.2-2 for NB-IoT.  NOTE 3: Interfering signal (E-UTRA 3MHz) consisting of one resource block positioned at the stated offset, the channel bandwidth of the interfering signal is located adjacently to the Base Station RF Bandwidth edge.  NOTE 4: For NB-IoT, the mentioned desensitized values consider only one NB-IoT PRB in the guard band, which is placed adjacent to the E-UTRA PRB edge as close as possible (i.e., away from edge of channel bandwidth).  NOTE 5: Applicable for *channel bandwidths* equal to or below 20 MHz.  NOTE 6: Applicable for *channel bandwidths* above20 MHz.  NOTE 7: 7.5 kHz shift is not applied to the wanted signal of NR.  NOTE 8: Void | | | | |