**3GPP WG RAN4 RAN4#96-e *R4-200xxxx***

**Toulouse, France, Aug 17- Aug 28 2020**

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| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.307** | **CR** | **XXXX** | **rev** | **-** | **Current version:** | **16.3.0** |  |
|  | | | | | | | | |
| *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:*** | 7.5 kHz UL shift for LTE/NR spectrum sharing in Band 38/n38 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Vodafone | | | | | | | | | |
| ***Source to TSG:*** | RAN WG 4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_n38\_LTE\_38\_coex-Core | | | | |  | ***Date:*** | | |  |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | | REL-17 |
|  | *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-12 (Release 12)* *Rel-13 (Release 13) Rel-14 (Release 14) Rel-15 (Release 15) Rel-16 (Release 16)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | Introduce 7.5 kHz uplink shift for spectrum sharing solutions in Band 38/n38. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Section 5.4 and B.4.7 added for UL 7.5KHz shift in n38 band. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | There would be uplink interference when attempting FDM-based spectrum sharing using 15 kHz SCS NR with LTE. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | Section 5.4 and Annex B.4.7 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **x** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  | **x** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **x** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

**<Unchanged parts are omitted>**

## 5.2 Additional NR CA configurations for NR frequency range 1

### 5.2.1 Intraband CA

Requirements for a Rel-16 UE for additional NR intraband CA configurations within FR1 compared to TS 38.101-1 of Rel-16 [2] are introduced via this clause.

Table 5.2.1-1: NR intraband CA within FR1

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Feature | DL/UL | CA BW Class | Duplex-mode | Release  independent from | requirements to be fulfilled  (see 38.307 of the REL in which the CA configuration was introduced) |
| Intra-band contiguous CA configurations within FR1 | DL | C, D, E, F, G, H, I, J, K, L | TDD | Rel-15 | Table B.4.2-1 |
| UL | A | TDD | Rel-15 |

### 5.2.2 Interband CA

Requirements for a Rel-16 UE for additional NR interband CA configurations within FR1 compared to TS 38.101-1 of Rel-16 [2] are introduced via this clause.

Table 5.2.2-1: NR interband CA within FR1

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Feature | DL/UL | Maximum number of bands | number of CCs | CA BW Classes | Duplex-mode | Release  independent from | requirements to be fulfilled  (see 38.307 of the REL in which the CA configuration was introduced) |
| Inter-band CA configurations within NR FR1 | DL | 2 | 2 | A | TDD, FDD, SDL and TDD | Rel-15 | Table B.4.2-1 |
| UL | 2 | 2 | A | TDD, FDD and TDD | Rel-15 |

## 5.3 Additional NR SUL configurations for NR frequency range 1

Requirements for a Rel-16 UE for additional NR SUL configurations within FR1 compared to TS 38.101-1 of Rel-16 [2] are introduced via this clause.

Table 5.3-1: NR SUL within FR1

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Feature | DL/UL | number of bands | number of CCs | CA BW Classes | Duplex-mode | Release  independent from | requirements to be fulfilled  (see 38.307 of the REL in which the SUL configuration was introduced) |
| Inter-band SUL configurations within NR FR1 | DL | 1 | 1 | A | TDD | Rel-15 | Table B.4.3-1 |
| UL | 2 | 2 | A | TDD and SUL | Rel-15 |

## 5.4 UL 7.5KHz shift for TDD band n38

Requirements for a Rel-17 UE for UL 7.5KHz shift for TDD band n38 within FR1 compared to TS 38.101-1 of Rel-17 [2] are introduced via this clause. For Band n38, UL shift is only applicable to uplink transmissions using a 15 kHz SCS.

Table 5.3-2: UL 7.5KHz shift for band n38 in FR1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Feature | DL/UL | Duplex-mode | Release  independent from | requirements to be fulfilled  (see 38.307 of the REL in which the configuration was introduced) |
| 7.5KHz UL shift for band n38 in FR1 | UL | TDD | Rel-15 | Table B.4.7-1 |

**<Unchanged parts are omitted>**

# B.4 Common UE RF requirements

## B.4.1 Common UE RF requirements for a release independent band

The requirements and test cases listed in Table B.4.1-1 are specified in REL-16 version of TS 38.101-1 [2] or TS 38.101-2 [3].

Table B.4.1-1: Common UE RF requirements for a release independent band

|  |  |
| --- | --- |
| Clause / Clause | Description |
| 5.2 | Operating bands |
| 5.3 | UE Channel bandwidth |
| 5.4 | Channel arrangement |
| 6.2 | Transmitter power |
| 6.3 | Output power dynamics |
| 6.4 | Transmit signal quality |
| 6.5 | Output RF spectrum emissions |
| 6.6 of [3] | Beam correspondence |
| 7.3 | Reference sensitivity |
| 7.4 | Maximum input level |
| 7.5 | Adjacent Channel Selectivity |
| 7.6 | Blocking characteristics |
| 7.7 of [2] | Spurious response |
| 7.8 of [2] | Intermodulation characteristics |
| 7.9 | Spurious emissions |
| NOTE: A UE which supports any FR2 band introduced in release N, where N > 15, shall meet the requirements according to the FR2 UE multi-band relaxation factors defined in Table 6.2.1.3-4 of the release N version of [3] for all FR2 bands which it supports. | |

## B.4.2 Common UE RF requirements for CA configurations within NR frequency range 1 or NR frequency range 2

The requirements and test cases listed in Table B.4.2-1 are specified in in REL-16 version of TS 38.101-1 [2] or TS 38.101-2 [3].

Table B.4.2-1: Common UE RF requirements for a release independent intra-band contiguous CA configurations within NR frequency range 1 or NR frequency range 2

|  |  |
| --- | --- |
| Clause | Description |
| 5.2A | Operating bands for CA |
| 5.3A | UE channel bandwidth for CA |
| 5.4A | Channel arrangement for CA |
| 6.2A | Transmitter power for CA |
| 6.3A | Output power dynamics for CA |
| 6.4A | Transmit signal quality for CA |
| 6.5A | Output RF spectrum emissions for CA |
| 6.6A of [3] | Beam correspondence for CA |
| 7.3A | Reference sensitivity for CA |
| 7.4A | Maximum input level for CA |
| 7.5A | Adjacent Channel Selectivity for CA |
| 7.6A | Blocking characteristics for CA |
| 7.7A of [2] | Spurious response for CA |
| 7.8A of [2] | Intermodulation characteristics for CA |
| 7.9A of [2] | Spurious emissions for CA |

## B.4.3 Common UE RF requirements for SUL

The requirements and test cases listed in Table B.4.3-1 are specified in REL-16 version of TS 38.101-1 [2].

Table B.4.3-1: Common UE RF requirements for a release independent SUL

|  |  |
| --- | --- |
| Clause | Description |
| 5.2 | Operating bands |
| 5.2C | Operating band combination for SUL |
| 5.4.2.1 | NR-ARFCN and channel raster (7.5kHz frequency shift for SUL) |
| 5.5C | Configurations for SUL |
| 6.2C | Transmitter power for SUL |
| 6.4.2.2 | Carrier leakage (7.5 kHz shift with the carrier frequency.) |
| 7.3.3 | ΔRIB,c |
| 7.3C | Reference sensitivity for SUL |
| 7.6C | Blocking characteristics for SUL |

## B.4.4 Common UE RF requirements for interband CA configurations between NR frequency range 1 and NR frequency range 2

The requirements and test cases listed in Table B.4.4-1 are specified in in REL-16 version of TS 38.101-3 [4].

Table B.4.4-1: Common UE RF requirements for a release independent interband CA configurations between NR frequency range 1 and NR frequency range 2

|  |  |
| --- | --- |
| Clause | Description |
| 5.2A | Operating bands for CA |
| 5.3A | UE channel bandwidth for CA |
| 5.4A | Channel arrangement for CA |
| 6.2A | Transmitter power for CA |
| 6.3A | Output power dynamics for CA |
| 6.4A | Transmit signal quality for CA |
| 7.3A | Reference sensitivity for CA |
| 7.4A | Maximum input level for CA |
| 7.5A | Adjacent Channel Selectivity for CA |
| 7.6A | Blocking characteristics for CA |
| 7.7A | Spurious response for CA |
| 7.9A | Spurious emissions for CA |

## B.4.5 Common UE RF requirements for Inter-band NR-DC configurations between frequency range 1 and frequency range 2

The requirements and test cases listed in Table B.4.5-1 are specified in in REL-16 version of TS 38.101-3 [4].

Table B.4.5-1: Common UE RF requirements for a release independent Inter-band NR-DC configurations between frequency range 1 and frequency range 2

|  |  |
| --- | --- |
| Clause | Description |
| 4.2 | Applicability of minimum requirements |
| 5.2B | Operating bands for DC |
| 6.2B.5 | Configured output power for NR-DC |

## B.4.6 Common UE RF requirements for NR interworking between NR and E-UTRA

The requirements and test cases listed in Table B.4.6-1 are specified in in REL-16 version of TS 38.101-3 [4].

Table B.4.6-1: Common UE RF requirements for a release independent NR interworking between NR and E-UTRA

|  |  |
| --- | --- |
| Clause | Description |
| 4.2 | Applicability of minimum requirements |
| 5.2B | Operating bands for DC |
| 5.3B | UE channel bandwidth for DC |
| 5.4B | Channel arrangement for DC |
| 6.2B | Transmitter power for DC |
| 6.3B | Output power dynamics for DC |
| 6.4B | Transmit signal quality for DC |
| 7.3B | Reference sensitivity level for DC |
| 7.4B | Maximum input level for DC in FR1 |
| 7.5B | Adjacent Channel Selectivity for DC in FR1 |
| 7.6B | Blocking characteristics for DC in FR1 |
| 7.7B | Spurious response for DC in FR1 |
| 7.8B | Intermodulation characteristics for DC in FR1 |
| 7.9A | Spurious emissions for CA in FR1 |

## B.4.7 Common UE RF requirements for UL 7.5KHz shift for TDD band n38

The requirements and test cases listed in Table B.4.7-1 are specified in REL-17 version of TS 38.101-1 [2]. For Band n38, UL shift is only applicable to uplink transmissions using a 15 kHz SCS.

Table B.4.7-1: Common UE RF requirements for UL 7.5KHz shift for TDD Band n38

|  |  |
| --- | --- |
| Clause | Description |
| 5.4.2.1 | NR-ARFCN and channel raster (7.5kHz frequency shift for TDD band n38) |

**<Unchanged parts are omitted>**