**3GPP TSG RAN WG1 #119** **R1-241xxxx**

Orlando, USA, November 18th – 22nd4, 2024

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| *CR-Form-v12.2* |
| **DRAFT CHANGE REQUEST** |
|  |
|  | **38.213** | **CR** |  | **rev** |  | **Current version:** | **18.4.0** |  |
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| *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 | **X** | Radio Access Network | **X** | Core Network |  |

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| ***Title:***  | Rel-18 editorial corrections for TS 38.213 |
|  |  |
| ***Source to WG:*** | Samsung |
| ***Source to TSG:*** | R1 |
|  |  |
| ***Work item code:*** | NR\_newRAT-Core, TEI18, NR\_MIMO\_evo\_DL\_UL-Core, NR\_pos\_enh2-Core, NR\_MC\_enh-Core, NR\_NTN\_enh-Core, NR\_Mob\_enh2-Core, NR\_SL\_enh2-Core, Netw\_Energy\_NR-Core |  | ***Date:*** | 2024-11-29 |
|  |  |  |  |  |
| ***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 16)Rel-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19)* |
|  |  |
| ***Reason for change:*** | 1. Misaligned parameter names with TS 38.331 v18.3.0 in Clauses 4.2, 7.1.1, 7.3.1, 8.2, 9, 9.2.5, 9.2.6, and 16.4.
2. RAN1#110bis agreement that TAG ID can be indicated by absolute TA command for multi-DCI based multi-TRP operation with two TA is not captured in Clause 4.2.
3. Update needed for placeholder specification reference in Clause 7.5.
4. Incorrect new line in Clause 7.7.1.
5. Unclear RO validation procedure based on *TDD-UL-DL-ConfigCommon* in Clause 8.1.
6. Redundant text and wrong formatting of text in Clause 11.5.
7. Use of DCI format 0\_3 and applicability to interlaced resource allocation are missing in description for dormant BWP indication in Clause 12.
8. Misaligned parameter names with TS 38.331 v18.3.0 in Clause 8.1.
9. Typo in using ‘and’/’or’ in Clause 9.1.2.1.
10. The case of DCI format 1\_3 indicating PUCCH Cell switching is missing in Clause 9.1.3.1.
11. Ambiguous application of timeline requirements of N symbol from the last symbol of a PDCCH in Clause 9.1.4.
12. Ambiguous activation/deactivation time for cell DTX/DRX in Clause 11.5.
13. Typo in applying a “not” in Clause 12.
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|  |  |
| ***Summary of change:*** | 1. Align parameter names with TS 38.331 v18.3.0 in Clauses 4.2, 7.1.1, 7.3.1, 8.2, 9, 9.2.5, and 16.4.
2. Capture that TAG ID can be indicated by absolute TA command in Clause 4.2.
3. Update placeholder specification reference in Clause 7.5.
4. Merge applicable text in same paragraph in Clause 7.7.1.
5. Clarify that RO validation procedure based on *TDD-UL-DL-ConfigCommon* is per cell in Clause 8.1.
6. Remove redundant text and fix formatting of text in Clause 11.5.
7. Capture DCI format 0\_3 and applicability to interlaced resource allocation in description for dormant BWP indication in Clause 12.
8. Align parameter name with TS 38.331 v18.3.0 in Clause 8.1.
9. Correct the typo in using ‘and’/’or’ in Clause 9.1.2.1.
10. Capture that DCI format 1\_3 can also indicate PUCCH Cell switching in Clause 9.1.3.1.
11. Clarify that timeline requirements of N symbol from the last symbol of a PDCCH apply only for a DCI format that does not schedule any PDSCH reception in Clause 9.1.4.
12. Clarify that activation/deactivation of cell DTX/DRX starts from the first slot that does not begin before the start of slot m+d in Clause 11.5.
13. Change “are not equal to” to “not all bits of the block are equal to” in Clause 12.
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|  |  |
| ***Consequences if not approved:*** | Ambiguous/incorrect/incomplete specifications. |
|  |  |
| ***Clauses affected:*** | 4.2, 7.1.1, 7.3.1, 7.5, 7.7.1, 8.1, 8.2, 9, 9.1.2.1, 9.1.3.1, 9.1.4, 9.2.5, 9.2.6, 11.5, 12, 16.4 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  |  |  Other core specifications  | TS/TR ... CR ... |
| ***affected:*** |  |  |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  |  |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

\*\*\* Unchanged text is omitted \*\*\*

4.2 Transmission timing adjustments

A UE can be provided a value of a timing advance offset for a serving cell by *n-TimingAdvanceOffset* for the serving cell. If for a serving cell the UE is provided two coresetPoolIndex values 0 and 1 for first and second CORESETs, or is not provided coresetPoolIndex value for first CORESETs and is provided coresetPoolIndex value of 1 for second CORESETs, the UE can be provided first and second values by *n-TimingAdvanceOffset* and *n-TimingAdvanceOffset2* for transmissions with first and second spatial filters associated with first and second TCI states for the first and second CORESETs, respectively. A UE can be provided a second value for transmissions with second spatial domain filters corresponding to second TCI states or to second SS/PBCH block receptions associated with *physCellId* different from *physCellId* for the serving cell in addition to a first value for transmissions with first spatial domain filters corresponding to first TCI states or to first SS/PBCH block receptions associated with *physCellId* for the serving cell. The first and second values correspond to first and second TAGs indicated in respective MAC RARs or in an absolute timing advance command MAC CE [11, TS 38.321] having an association indicated by *tag-Id-ptr* with first and second joint TCI states provided by *dl-OrJointTCI-StateList* or first and second UL TCI states provided by *ul*-*TCI-State-List*. If the UE is not provided *n-TimingAdvanceOffset* for a serving cell, the UE determines a default value of the timing advance offset for the serving cell as described in [10, TS 38.133].

\*\*\* Unchanged text is omitted \*\*\*

For operation with single TAG on a serving cell, if two adjacent slots overlap due to a TA command or due to update of or , when applicable, the latter slot is reduced in duration relative to the former slot. The UE does not change during an actual time domain window for a PUSCH or a PUCCH transmission [6, TS 38.214]. If the UE is not provided *sTx-2Panel* and operates with two TAGs on a serving cell, the UE does not expect transmissions associated with different TAGs to overlap unless the UE indicates *overlapUL-TransReduction*; if the UE indicates *overlapUL-TransReduction*, the UE reduces in duration a latter transmission using a first TAG to avoid overlapping with a former transmission using a second TAG.

\*\*\* Unchanged text is omitted \*\*\*

If the received downlink timing changes and is not compensated or is only partly compensated by the uplink timing adjustment without timing advance command as described in [10, TS 38.133], the UE changes accordingly. If a UE operates with two TAGs on an active UL BWP of a serving cell, the UE expects that a difference between a first downlink timing associated with a first TAG and a second downlink timing associated with a second TAG is not larger than the CP length for the active UL BWP unless the UE indicates *rxTimingDiff*. If a UE indicates *posUE-TA-AutoAdjustment*, and transmits SRS based on a configuration by *SRS-PosResourceSet* in *SRS-PosRRC-InactiveValidityAreaConfig* in RRC\_INACTIVE state,

- if the UE is provided *autonomousTA-AdjustmentEnabled*, the UE may autonomously update at cell reselection as described in [10, TS 38.133]

- if the UE is not provided *autonomousTA-AdjustmentEnabled*, the UE maintains the of a last serving cell prior to the release of a dedicated RRC connection [11, TS 38.321].

For operation with single TAG on a serving cell, if two adjacent slots overlap due to a TA command or due to update of or , when applicable, the latter slot is reduced in duration relative to the former slot. The UE does not change during an actual time domain window for a PUSCH or a PUCCH transmission [6, TS 38.214]. If the UE is not provided *enableSTx2PofMDCI* and operates with two TAGs on a serving cell, the UE does not expect transmissions associated with different TAGs to overlap unless the UE indicates *overlapUL-TransReduction* [18, TS 38.306]; if the UE indicates *overlapUL-TransReduction*, the UE reduces in duration a latter transmission using a first TAG to avoid overlapping with a former transmission using a second TAG.

\*\*\* Unchanged text is omitted \*\*\*

7.1.1 UE behaviour

\*\*\* unchanged text omitted \*\*\*

- is a downlink pathloss estimate in dB calculated by the UE using reference signal (RS) index for the active DL BWP, as described in clause 12, of carrier of serving cell

- If the UE is not provided *PUSCH-PathlossReferenceRS* and *enableDefaultBeamPL-ForSRS*,or before the UE is provided dedicated higher layer parameters, the UE calculates

- using a RS resource from an SS/PBCH block with same SS/PBCH block index as the one the UE uses to obtain *MIB*, or using the SS/PBCH block the UE acquired the time and frequency synchronization for a secondary cell.

- if the UE is provided *RACH-LessHO* in *ReconfigurationWithSync* [12. TS 38.331], using a RS resource from an SS/PBCH block with same SS/PBCH block index as the one with same quasi co-location properties as for PDCCH receptions for scheduling an initial PUSCH transmission, as described in Clause 10.1, in *controlResourceSetZero* provided in *ServingCellConfigCommon* of *ReconfigurationWithSync*

\*\*\* unchanged text omitted \*\*\*

- If the UE is provided two SRS resource sets in *srs-ResourceSetToAddModList* or *srs-ResourceSetToAddModListDCI-0-2* with *usage* set to 'nonCodebook', is provided *SRI-PUSCH-PowerControl*, and a DCI format scheduling the PUSCH transmission includes two SRI fields, the UE obtains a mapping from *sri-PUSCH-PowerControlId* in *SRI-PUSCH-PowerControl* between a set of values for

- the first SRI field value and the values provided by *sri-PUSCH-ClosedLoopIndex*, and determines the value that is mapped to the first SRI field value corresponding to the first SRS resource set with *usage* set to 'nonCodebook', and

- the value, associated with the second SRI field value corresponding to Tables 7.3.1.1.2-28/29/30/31 of [5, TS 38.212] for a same number of layers as indicated by the first SRI field value, and the value(s) provided by *sri-PUSCH-ClosedLoopIndex*, and determines the value that is mapped to the value corresponding to the second SRS resource set with *usage* set to 'nonCodebook'

- If the UE is provided two SRS resource sets in *srs-ResourceSetToAddModList* or *srs-ResourceSetToAddModListDCI-0-2* with *usage* set to 'codebook' or 'nonCodebook', is provided *SRI-PUSCH-PowerControl*, and a DCI format scheduling the PUSCH transmission does not include an SRI field

- If the UE is provided *twoPUSCH-PC-AdjustmentStates*

- the UE determines for the PUSCH transmission corresponding to the first SRS resource set with usage set to 'codebook' or 'nonCodebook', and for the PUSCH transmission corresponding to the second SRS resource set with usage set to 'codebook' or 'nonCodebook'

- else

- the UE determines for the PUSCH transmission

- If the UE is provided two SRS resource sets in *srs-ResourceSetToAddModList* or *srs-ResourceSetToAddModListDCI-0-2* with *usage* set to 'codebook' or 'nonCodebook', and is provided *twoPUSCH-PC-AdjustmentStates*

\*\*\* unchanged text omitted \*\*\*

### 7.3.1 UE behaviour

\*\*\* unchanged text omitted \*\*\*

- is a downlink pathloss estimate in dB calculated by the UE, as described in clause 7.1.1 in case of an active DL BWP of a serving cell , using RS resource indexed in a serving or non-serving cell for SRS resource set [6, TS 38.214]. A configuration for RS resource index associated with SRS resource set is provided by *pathlossReferenceRS-Pos*

- if a *ssb-IndexServing* is provided, *referenceSignalPower* is provided by *ss-PBCH-BlockPower*

- if a *ssb-Ncell* is provided, *referenceSignalPower* is provided by *ss-PBCH-BlockPower-r16*

- if a *dl-PRS* is provided, *referenceSignalPower* is provided by *dl-PRS-ResourcePower*

 If the UE is in the RRC\_CONNECTED state and determines that the UE is not able to accurately measure , or the UE is not provided with *pathlossReferenceRS-Pos*, the UE calculates using a RS resource obtained from the SS/PBCH block of the serving cell that the UE uses to obtain *MIB*. If the UE is in the RRC\_INACTIVE state, is not provided *SRS-PosRRC-InactiveValidityAreaConfig*, and determines that the UE is not able to accurately measure , the UE does not transmit SRS for the SRS resource set.

 The UE may indicate a capability for a number of pathloss estimates that the UE can simultaneously maintain for all SRS resource sets provided by *SRS-PosResourceSet* in addition to the up to four pathloss estimates that the UE maintains per serving cell for PUSCH/PUCCH transmissions and for SRS transmissions configured by *SRS-Resource*.

If a UE transmits SRS based on a configuration by *SRS-PosResourceSet* outside initial UL BWP of carrier *f* of serving cell *c* in RRC\_INACTIVE state, the active UL BWP *b* refers to the BWP configuration provided by *bwp-NUL* or *bwp-SUL* in *SRS-PosRRC-InactiveConfig* for the corresponding carrier.

If a UE transmits SRS on multiple SRS resources for positioning bandwidth aggregation according to *linkage* [6, TS 38.214], the UE calculates using the same values of , , and for each of the multiple SRS resources.

If a UE transmits SRS based on a configuration by *SRS-PosResourceSet* in *SRS-PosRRC-InactiveValidityAreaConfig* in RRC\_INACTIVE state [12, TS 38.331], the active UL BWP *b* refers to the BWP provided by *bwp-NUL* or *bwp-SUL* in *SRS-PosRRC-InactiveValidityAreaConfig*. If the UE is not provided *pathlossReferenceRS-Pos* in *SRS-PosResourceSet*, or if the UE is provided *pathlossReferenceRS-Pos* in *SRS-PosResourceSet* and the UE cannot accurately measure the pathloss RS provided in *pathlossReferenceRS-Pos*, the UE calculates using an RS resource from an SS/PBCH block with same index as the one the UE used to obtain *MIB*; otherwise, the UE uses the RS indicated by *pathlossReferenceRS-Pos* to calculate .

If a RedCap UE transmits SRS with frequency hopping outside the active UL BWP of carrier of serving cell in RRC\_CONNECTED state based on a configuration by *SRS-PosResourceSet*, the active UL BWP refers to the BWP provided by *bwp* in *SRS-PosTx-Hopping*.

If a RedCap UE transmits SRS with frequency hopping outside the initial UL BWP of carrier of serving cell in RRC\_INACTIVE state based on a configuration by *SRS-PosResourceSet*, the active UL BWP refers to the BWP provided by *bwp* in *SRS-PosTx-Hopping*.

\*\*\* unchanged text omitted \*\*\*

## 7.5 Prioritizations for transmission power reductions

For single cell operation with two uplink carriers or for operation with carrier aggregation or for operation with a candidate cell configured by *LTM-Config*, if a total UE transmit power for PUSCH or PUCCH or PRACH or SRS transmissions on serving cells or on a candidate cell, if any, in a frequency range in a respective transmission occasion would exceed , where is the linear value of in transmission occasion as defined in [8-1, TS 38.101-1] for FR1 and [8-2, TS 38.101-2] for FR2, the UE allocates power to PUSCH/PUCCH/PRACH/SRS transmissions according to the following priority order (in descending order) so that the total UE transmit power for transmissions on serving cells or on a candidate cell, if any, in the frequency range is smaller than or equal to for that frequency range in every symbol of transmission occasion . If the UE transmits SRS on multiple SRS resources according to Clause 6.2.1.4 of [6, TS 38.214], the UE allocates power so that all REs of the SRS transmission have same power.

\*\*\* Unchanged parts are omitted \*\*\*

### 7.7.1 Type 1 PH report

\*\*\* Unchanged parts are omitted \*\*\*

If the UE determines that a Type 1 power headroom report for an activated serving cell is based on a reference PUSCH transmission then, for PUSCH transmission occasion on active UL BWP of carrier of serving cell ,

- if for the active UL BWP of carrier of serving cell , the UE is provided

*- twoPHRMode,*

- two SRS resource sets in *srs-ResourceSetToAddModList* or *srs-ResourceSetToAddModListDCI-0-2* with usage set to 'codebook' or 'nonCodebook',

- *dl-OrJointTCI-StateList* or *TCI-UL-State* and is indicated a first TCI-State or TCI-UL-State and a second TCI-State or TCI-UL-State, and

- *multipanelSchemeSDM* or *multipanelSchemeSFN*

the UE computes the Type 1 power headroom report associated with the k-th TCI-State or TCI-UL-State as

 [dB]

- else, the UE computes the Type 1 power headroom report as

 [dB]

where and are computed assuming MPR=0 dB, A-MPR=0 dB, P-MPR=0 dB. TC = 0 dB. MPR, A-MPR, P-MPR and TC are defined in [8-1, TS 38.101-1], [8-2, TS 38.101-2], [8-3, TS 38.101-3] and [8-5, TS 38.101-5]. The remaining parameters are defined in clause 7.1.1 and, if *ul-powerControl* is not provided, and are obtained using and *p0-PUSCH-AlphaSetId* *=* 0, is obtained using *pusch-PathlossReferenceRS-Id =* 0, and . If *ul-powerControl* is provided and the UE is indicated one TCI-State or TCI-UL-State, and are obtained by *p0AlphaSetforPUSCH* associated with the indicated *TCI-State* or *TCI-UL-State*, is obtained by PL-RS associated with the indicated *TCI-State* or *TCI-UL-State*. If *ul-powerControl* is provided and the UE is indicated a first TCI-State or TCI-UL-State and a second TCI-State or TCI-UL-State, and for are obtained by *p0AlphaSetforPUSCH* associated with the *k*-th indicated *TCI-State* or *TCI-UL-State*, is obtained by PL-RS associated with the *k*-th indicated *TCI-State* or *TCI-UL-State*. If *ul-powerControl* is provided, and if UE is indicated a first *TCI-State* or *TCI-UL-State* and a second *TCI-State* or *TCI-UL-State*, and if UE is not provided *twoPHRmode*, and for are obtained by *p0AlphaSetforPUSCH* associated with the first indicated *TCI-State* or *TCI-UL-State*, is obtained by PL-RS associated with the first indicated *TCI-State* or *TCI-UL-State*. If the activated serving cell is an SCell and parameter *preambleReceivedTargetPower* is not configured for the cell, then the parameter *preambleReceivedTargetPower* configured for the primary cell is applied, where the parameter refers to the one configured for the non-supplementary uplink carrier if the primary cell is configured with two uplink carriers.

If a UE is configured with two UL carriers for a serving cell and the UE determines a Type 1 power headroom report for the serving cell based on a reference PUSCH transmission, the UE computes a Type 1 power headroom report for the serving cell assuming a reference PUSCH transmission on the UL carrier provided by *pusch-Config*. If the UE is provided *pusch-Config* for both UL carriers, the UE computes a Type 1 power headroom report for the serving cell assuming a reference PUSCH transmission on the UL carrier provided by *pucch-Config*. If *pucch-Config* is not provided to the UE for any of the two UL carriers, the UE computes a Type 1 power headroom report for the serving cell assuming a reference PUSCH transmission on the non-supplementary UL carrier.

\*\*\* Unchanged text is omitted \*\*\*

## 8.1 Random access preamble

\*\*\* Unchanged text is omitted \*\*\*

For paired spectrum or supplementary uplink band all PRACH occasions are valid.

For unpaired spectrum,

- if a UE is not provided *tdd-UL-DL-ConfigurationCommon* for a cell, a PRACH occasion for the cell in a PRACH slot is valid if it does not precede a SS/PBCH block in the PRACH slot and starts at least symbols after a last SS/PBCH block reception symbol, where is provided in Table 8.1-2 and, if *channelAccessMode* = "*semiStatic*" is provided, does not overlap with a set of consecutive symbols before the start of a next channel occupancy time where the UE does not transmit [15, TS 37.213]

- the candidate SS/PBCH block index of the SS/PBCH block corresponds to the SS/PBCH block index provided by *ssb-PositionsInBurst* in *SIB1* or in *ServingCellConfigCommon* or in *SSB-MTC-AdditionalPCI* corresponding to the cell*,* as described in clause 4.1

- for each of the candidate cells configured by *LTM-Config*, if a UE is not provided *ltm-TDD-UL-DL-ConfigurationCommon*, a PRACH occasion in a PRACH slot is valid if it does not precede a SS/PBCH block in the PRACH slot and starts at least symbols after a last SS/PBCH block reception symbol, where is provided in Table 8.1-2

- the SS/PBCH block index of the SS/PBCH block corresponds to the SS/PBCH block index provided by *ssb-PositionsInBurst* in *LTM-SSB-Config* for each of the candidate cells

- if a UE is provided *tdd-UL-DL-ConfigurationCommon* for a cell, a PRACH occasion for the cell in a PRACH slot is valid if

- it is within UL symbols, or

- it does not precede a SS/PBCH block in the PRACH slot and starts at least symbols after a last downlink symbol and at least symbols after a last SS/PBCH block symbol, where is provided in Table 8.1-2, and if *channelAccessMode* = "*semiStatic*" is provided, does not overlap with a set of consecutive symbols before the start of a next channel occupancy time where there shall not be any transmissions, as described in [15, TS 37.213]

- the candidate SS/PBCH block index of the SS/PBCH block corresponds to the SS/PBCH block index provided by *ssb-PositionsInBurst* in *SIB1* or in *ServingCellConfigCommon* or in *SSB-MTC-AdditionalPCI* corresponding to the cell, as described in clause 4.1

- for each of the candidate cells configured by *LTM-config*, if a UE is provided *ltm-tdd-UL-DL-ConfigurationCommon*, a PRACH occasion in a PRACH slot is valid if

- it is within UL symbols, or

- it does not precede a SS/PBCH block in the PRACH slot and starts at least symbols after a last downlink symbol and at least symbols after a last SS/PBCH block symbol, where is provided in Table 8.1-2

- the SS/PBCH block index of the SS/PBCH block corresponds to the SS/PBCH block index provided by *ssb-PositionsInBurst* in *LTM-SSB-Config* for each of the candidate cells.

For preamble format B4 [4, TS 38.211], .

\*\*\* Unchanged text is omitted \*\*\*

## 8.2 Random access response - Type-1 random access procedure

\*\*\* Unchanged text is omitted \*\*\*

If the UE attempts to detect the DCI format 1\_0 with CRC scrambled by the corresponding RA-RNTI in response to a PRACH transmission initiated by a PDCCH order that triggers a contention-free random access procedure for the SpCell [11, TS 38.321], the UE may assume that the PDCCH that includes the DCI format 1\_0 and the PDCCH order have same DM-RS antenna port quasi co-location properties. If the UE attempts to detect the DCI format 1\_0 with CRC scrambled by the corresponding RA-RNTI in response to a PRACH transmission initiated by a PDCCH order that triggers a contention-free random access procedure for a secondary cell, or if the UE is configured with *tag2-Id* for the SpCell and the CORESET where the UE receives the PDCCH order that triggers a contention-free random access procedure for the SpCell is not associated with the physical cell ID for the serving cell, the UE may assume the DM-RS antenna port quasi co-location properties of the CORESET associated with the Type1-PDCCH CSS set for receiving the PDCCH that includes the DCI format 1\_0 and the PDSCH scheduled by the DCI format 1\_0.

\*\*\* Unchanged text is omitted \*\*\*

9 UE procedure for reporting control information

\*\*\* Unchanged text is omitted \*\*\*

For the remaining of this clause, when a UE

- is not provided *coresetPoolIndex* or is provided *coresetPoolIndex* with a value of 0 for first CORESETs, and is provided *coresetPoolIndex* with a value of 1 for second CORESETs, on active DL BWPs of serving cells, and

- is provided *sTx-2Panel*

the UE separately determines and resolves time overlapping among first PUSCH transmissions that use respective first spatial domain filters corresponding to first *TCI-State* or *TCI-UL-State* associated with the first CORESETs, and among second PUSCH transmissions that use respective second spatial domain filters corresponding to second *TCI-State* or *TCI-UL-State* associated with the second CORESETs.

\*\*\* Unchanged text is omitted \*\*\*

The UE determines the PUSCH for UCI multiplexing by applying the following procedure on the candidate PUSCHs as described in this clause:

- If the UE is provided *sTx-2Panel*, is provided *ackNackFeedbackMode* = *separate*, and would multiplex UCI that includes HARQ-ACK information in a PUSCH, candidate PUSCHs for the UCI multiplexing are the ones associated with same *coresetPoolIndex* value as for a PUCCH transmission with the HARQ-ACK information.

- If the candidate PUSCHs that include first PUSCHs that are scheduled by DCI formats and second PUSCHs configured by respective *ConfiguredGrantConfig* or *semiPersistentOnPUSCH*, and the UE would multiplex UCI in one of the candidate PUSCHs, and the candidate PUSCHs fulfil the conditions in clause 9.2.5 for UCI multiplexing, the UE multiplexes the UCI in a PUSCH from the first PUSCHs.

- If the UE would multiplex UCI in one of the candidate PUSCHs and the UE does not multiplex aperiodic CSI in any of the candidate PUSCHs, the UE multiplexes the UCI in a PUSCH of the serving cell with the smallest *ServCellIndex* subject to the conditions in clause 9.2.5 for UCI multiplexing being fulfilled. If the UE transmits more than one PUSCHs in the slot on the serving cell with the smallest *ServCellIndex* that fulfil the conditions in clause 9.2.5 for UCI multiplexing, the UE multiplexes the UCI in the earliest PUSCH that the UE transmits in the slot. If the UE is provided *sTx-2Panel*, is provided *ackNackFeedbackMode* = *joint* or the UCI does not include HARQ-ACK information, and the UE would transmit two PUSCHs in the slot that start at a same symbol on the serving cell with smallest *ServCellIndex* and fulfil the conditions in clause 9.2.5 for UCI multiplexing, the UE multiplexes the UCI in the PUSCH from the two PUSCHs associated with CORESETs that the UE is not provided *coresetPoolIndex* or is provided *coresetPoolIndex* with a value of 0.

\*\*\* Unchanged text is omitted \*\*\*

#### 9.1.2.1 Type-1 HARQ-ACK codebook in physical uplink control channel

\*\*\* Unchanged text is omitted \*\*\*

Set – index of a DL slot overlapping with an UL slot

Set to a number of DL slots overlapping with UL slot if *subslotLengthForPUCCH* is provided for the HARQ-ACK codebook; otherwise,

while

if *pdsch-TimeDomainAllocationListForMultiPDSCH* and *timeDomainHARQ-BundlingType1* are provided for serving cell

;

;

elseif *pdsch-TimeDomainAllocationListForMultiPDSCH* is provided and *timeDomainHARQ-BundlingType1* is not provided for serving cell

;

else

Set to the set of rows

end if

Set to the cardinality of

Set – index of row in set

if slot starts at a same time as or after a slot for an active DL BWP change on serving cell or an active UL BWP change on the serving cell of PUCCH transmission if the UE is provided *pucch-sSCellDyn* or *pucch-sSCellDynDCI-1-2* or *pucch-sSCellDynDCI-1-3*, or an active UL BWP change on the PCell if the UE is not provided *pucch-sSCellDyn* and *pucch-sSCellDynDCI-1-2* and *pucch-sSCellDynDCI-1-3,* and slot is before the slot for the active DL BWP change on serving cell or the active UL BWP change on the serving cell of PUCCH transmission where is a DL slot with a smallest index among DL slots overlapping with UL slot , or *subslotLengthForPUCCH* is provided for the HARQ-ACK codebook and slot overlaps with UL slot , ,

;

else

\*\*\* Unchanged text is omitted \*\*\*

#### 9.1.3.1 Type-2 HARQ-ACK codebook in physical uplink control channel

\*\*\* Unchanged text is omitted \*\*\*

Set to the number of PDCCH monitoring occasion(s)

while

Set – serving cell index: lower indexes correspond to lower RRC indexes of corresponding cell

while

if PDCCH monitoring occasion is before an active DL BWP change on serving cell or an active UL BWP change on the serving cell of PUCCH transmission if the UE is provided *pucch-sSCellDyn* or *pucch-sSCellDynDCI-1-2* or *pucch-sSCellDynDCI-1-3*, or an active UL BWP change on the PCell if the UE is not provided *pucch-sSCellDyn* and *pucch-sSCellDynDCI-1-2* and *pucch-sSCellDynDCI-1-3,* and the active DL BWP change is not triggered in PDCCH monitoring occasion , and the PUCCH transmission starts at or after a slot for the active DL BWP change or the active UL BWP change

;

else

\*\*\* Unchanged text is omitted \*\*\*

Set to the number of PDCCH monitoring occasions

while

if *harq-ACK-SpatialBundlingPUCCH* is not provided,

while

if PDCCH monitoring occasion is before an active UL BWP change on the serving cell of PUCCH transmission if the UE is provided *pucch-sSCellDyn* or *pucch-sSCellDynDCI-1-2* or *pucch-sSCellDynDCI-1-3*, or an active UL BWP change on the PCell if the UE is not provided *pucch-sSCellDyn* and *pucch-sSCellDynDCI-1-2* and *pucch-sSCellDynDCI-1-3*, and the PUCCH transmission with the HARQ-ACK information starts at or after a slot for the active UL BWP change

;

else

if there is a PDSCH reception on serving cell that is scheduled by a DCI format scheduling more than one PDSCHs that provide respective more than one transport blocks with enabled HARQ-ACK information on respective more than one serving cells, where the DCI format is associated with a PDCCH reception in PDCCH monitoring occasion and *c* is the smallest serving cell index among the more than one serving cells

\*\*\* Unchanged text is omitted \*\*\*

else

while

if PDCCH monitoring occasion is before an active UL BWP change on the serving cell of PUCCH transmission if the UE is provided *pucch-sSCellDyn* or *pucch-sSCellDynDCI-1-2* or *pucch-sSCellDynDCI-1-3*, or an active UL BWP change on the PCell if the UE is not provided *pucch-sSCellDyn* and *pucch-sSCellDynDCI-1-2* and *pucch-sSCellDynDCI-1-3*, and the PUCCH transmission with the HARQ-ACK information starts at or after a slot for the active UL BWP change

;

else

if there is a PDSCH reception on serving cell that is scheduled by a DCI format scheduling more than one PDSCHs that provide respective more than one transport blocks with enabled HARQ-ACK information on respective more than one serving cells, where the DCI format is associated with a PDCCH reception in PDCCH monitoring occasion and *c* is the smallest serving cell index among the more than one serving cells

\*\*\* Unchanged text is omitted \*\*\*

9.1.4 Type-3 HARQ-ACK codebook determination

\*\*\* Unchanged text is omitted \*\*\*

HARQ process numbers for each indicated serving cell from the entry in *pdsch-HARQ-ACK-EnhType3ToAddModList* corresponding to the *pdsch-HARQ-ACK-EnhType3Index* value. If the DCI format does not include the enhanced Type 3 codebook indicator field, the *pdsch-HARQ-ACK-EnhType3Index* value is provided by the value of

- the MCS field for transport block 1 if the DCI format is DCI format 1\_1,

- the MCS field if the DCI format is DCI format 1\_2,

- the MCS field for transport block 1 of a serving cell with smallest index among the one or more serving cells if the DCI format is DCI format 1\_3.

The UE is expected to provide HARQ-ACK information in response to the request for the Type-3 HARQ-ACK codebook after symbols from the last symbol of a PDCCH providing the DCI format without scheduling any PDSCH reception, where the value of is provided in clause 10.2 by replacing "SPS PDSCH release" with "DCI format".

If a UE multiplexes HARQ-ACK information in a PUSCH transmission, the UE generates the HARQ-ACK codebook as described in this clause except that *harq-ACK-SpatialBundlingPUCCH* is replaced by *harq-ACK-SpatialBundlingPUSCH*.

\*\*\* Unchanged text is omitted \*\*\*

9.2.5 UE procedure for reporting multiple UCI types

\*\*\* Unchanged text is omitted \*\*\*

A UE that

- is not provided *coresetPoolIndex* or is provided *coresetPoolIndex* with a value of 0 for first CORESETs on active DL BWPs of serving cells, and

- is provided *coresetPoolIndex* with a value of 1 for second CORESETs on active DL BWPs of the serving cells, and

- is provided *ackNackFeedbackMode* = *separate*

does not expect a PUCCH or a PUSCH transmission triggered by a detection of a DCI format in a PDCCH received in a CORESET from the first CORESETs to overlap in time with a PUCCH or a PUSCH transmission triggered by a detection of a DCI format in a PDCCH received in a CORESET from the second CORESETs if the UE is not provided *sTx-2Panel*; else, if the UE is provided *sTx-2Panel*, the UE does not expect to transmit a PUCCH that includes HARQ-ACK information and is associated with either the first or the second CORESETs to overlap with a PUSCH transmission associated with either the second or the first CORESETs and not overlap with a PUSCH transmission associated with either the first or the second CORESETs, respectively.

\*\*\* Unchanged text is omitted \*\*\*

### 9.2.6 PUCCH repetition procedure

A UE that does not have dedicated PUCCH resource configuration and indicates a capability to transmit with repetitions a PUCCH with HARQ-ACK information [11, TS 38.321], determines a number of slots for repetitions of a PUCCH transmission with HARQ-ACK information based on an indication by *numberOfMsg4HARQ-ACK-Repetitions*. If *numberOfMsg4HARQ-ACK-Repetitions* provides more than one values, the DAI field in a DCI format 1\_0 with CRC scrambled by a TC-RNTI scheduling a PDSCH reception that includes a UE contention resolution identity indicates from the more than one values. The UE transmits any PUCCH with repetitions over slots before dedicated PUCCH resource configuration is provided. The UE transmits each repetition of the PUCCH using frequency hopping as described in Clause 9.2.1.

\*\*\* Unchanged text is omitted \*\*\*

## 11.5 Adaptation of cell operation

\*\*\* Unchanged text is omitted \*\*\*

When a UE not provided with *cellSpecificKoffset* receives in slot on the active DL BWP of a first serving cell a PDCCH providing DCI format 2\_9 that indicates a change in activation or deactivation of a current cell DTX operation or cell DRX operation for a second serving cell, the UE operates on the second serving cell according to the indicated cell DTX operation or cell DRX operation starting from the first slot on the active DL BWP or on the active UL BWP of the second serving cell, respectively, that does not begin before the beginning of the slot on the active DL BWP of the first serving cell where is a number of slots for the SCS of the active DL BWP of the first serving cell in Table 11.5-1.

When a UE provided with *cellSpecificKoffset* receives in slot on the active DL BWP of a serving cell a PDCCH providing DCI format 2\_9 that indicates a change in activation or deactivation of a current cell DTX operation for the serving cell, the UE operates on the serving cell according to the indicated cell DTX operation starting from the first slot on the active DL BWP that does not begin before the beginning of the slot on the active DL BWP of the serving cell, where is a number of slots for the SCS of the active DL BWP of the serving cell in Table 11.5-1.

When a UE provided with *cellSpecificKoffset* receives in slot on the active DL BWP of a serving cell a PDCCH providing DCI format 2\_9 that indicates a change in activation or deactivation of a current cell DRX operation for the serving cell, the UE operates on the serving cell according to the indicated cell DRX operation starting from slot on the active UL BWP where is a number of slots for the SCS of the active DL BWP of the cell in Table 11.5-1, is the *cellSpecificKoffset*,  *and* are the SCS configurations of the active DL BWP and the active UL BWP of the cell, respectively.

Table 11.5-1: Minimum time gap value

|  |  |
| --- | --- |
| **SCS (kHz)** | **Number of slots**  |
| 15 | 3 |
| 30 | 6 |
| 60 | 12 |
| 120 | 24 |
| 480 | 96 |
| 960 | 192 |

\*\*\* Unchanged text is omitted \*\*\*

# 12 Bandwidth part operation

\*\*\* Unchanged text is omitted \*\*\*

The UE does not expect to be scheduled by a DCI format 0\_3/1\_3 to transmit/receive a PUSCH/PDSCH on an activated SCell, if:

- the DCI format 0\_3/1\_3 indicates an active DL BWP provided by *dormantBWP-Id* for the activated SCell, and

- *resourceAllocation* = *resourceAllocationType0* and not all bits of a block of the frequency domain resource assignment field associated with the activated SCell in the DCI format 0\_3/1\_3 are equal to 0, or

- *resourceAllocation* = *resourceAllocationType1* and not all bits of a block of the frequency domain resource assignment field associated with the activated SCell in the DCI format 0\_3/1\_3 are equal to 1, or

- *resourceAllocation = dynamicSwitch* and not all bits of a block of the frequency domain resource assignment field associated with the activated SCell in the DCI format 0\_3/1\_3 are equal to either 0 or 1, or

- *useInterlacePUCCH-PUSCH* is provided and not all bits of a block of the frequency domain resource assignment field associated with the serving cell in the DCI format 0\_3 are equal to 1 for or not all bits of the block are equal to 0 for .

If a bandwidth part indicator field is configured in a DCI format and indicates an UL BWP or a DL BWP different from the active UL BWP or DL BWP, respectively, the UE shall

\*\*\* Unchanged text is omitted \*\*\*

## 16.4 UE procedure for transmitting PSCCH

A UE can be provided a number of symbols in a resource pool, by *sl-TimeResourcePSCCH*, starting from

- *sl*-*StartingSymbolFirst*+1or *sl-StartingSymbolSecond*+1in a slot without PSFCH symbols, or *sl*-*StartingSymbolFirst*+1 in a slot with PSFCH symbols, if *sl*-*StartingSymbolFirst* and *sl*-*StartingSymbolSecond* are provided for the SL-BWP

- *sl-StartSymbol*+1, otherwise

and a number of PRBs in the resource pool, by *sl-FreqResourcePSCCH*, starting from the lowest PRB index of the lowest sub-channel index, in an RB-set with a lowest index if applicable, of the associated PSSCH for a PSCCH transmission with a SCI format 1-A. For operation with shared spectrum channel access,

- if *sl-TransmissionStructureForPSCCHandPSSCH* = *'interlaceRB'*, the PRBs for PSCCH are within the sub-channel with the lowest index and within the RB-set with the lowest index among the RB-set(s) for the associated PSSCH transmission,

- if *sl-TransmissionStructureForPSCCHandPSSCH* = *'contiguousRB'*, the PRBs for PSCCH are within the sub-channel with the lowest index in the RB-set with the lowest index among the RB-set(s) for the associated PSSCH transmission, and all PRBs in the sub-channel overlapping with intra-cell guard band [6, TS 38.214] are not used for PSCCH.

\*\*\* Unchanged text is omitted \*\*\*