**3GPP TSG RAN WG1 #120bis** **R1-25xxxxx**

**Wuhan, China, April 7th – 11th, 2025**

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| *CR-Form-v12.2* | | | | | | | | |
| **DRAFT CHANGE REQUEST** | | | | | | | | |
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|  | **38.213** | **CR** |  | **rev** |  | **Current version:** | **18.6.0** |  |
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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:*** | Introduction of enhancements of network energy savings for NR | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Samsung | | | | | | | | | |
| ***Source to TSG:*** |  | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | Netw\_Energy\_NR\_enh-Core | | | | |  | ***Date:*** | | | 2025-04-23 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | B |  | | | | | ***Release:*** | | | Rel-19 |
|  | *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)* | |
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| ***Reason for change:*** | | Introduction of enhancements of network energy savings for NR. | | | | | | | | |
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| ***Summary of change:*** | | Introduction of enhancements of network energy savings for NR. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | No support of enhancements of network energy savings for NR. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 4.4 (new), 8.1, 10.1, 11.5, 11.6 (new), 23 (new) | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | | **X** |  | Other core specifications | | | | TS 38.211, TS 38.212, TS 38.321, TS 38.331 | | |
| ***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 \*\*\*

## 4.4 Activation/deactivation of SS/PBCH block transmissions on a secondary cell

A UE can be indicated, by [*od-ssb-config*] [12, TS 38.331] or by a [first] MAC CE [11, TS 38.321], activation of transmission for SS/PBCH blocks in a configured DL BWP of an SCell [19, TS 38.300]. The UE can be indicated, by a [third] MAC CE, adaptation of parameters for the activated transmission of SS/PBCH blocks when the SCell is activated. A number of half frames with transmission of SS/PBCH blocks is indicated by the [first or third] MAC CE from values provided by *od-ssb-nrofBurst*, if provided; otherwise, the transmission of the SS/PBCH blocks occurs until it is deactivated by a [second] MAC CE [11, TS 38.321], where

- the physical cell identity of the SS/PBCH blocks is indicated by *od-ssb-physCellId*, if provided; otherwise, by *physCellId* in *ServingCellConfigCommon*

- the indexes of transmitted SS/PBCH blocks are indicated by the [first or the third] MAC CE from candidate values provided by *od-ssb-PositionsInBurst*, if provided; otherwise, by *ssb-PositionsInBurst*

- the frequency location of the SS/PBCH blocks is indicated by *od-absoluteFrequencySSB*, if provided; otherwise, by *absoluteFrequencySSB*

- the SCS configuration of the SS/PBCH blocks is indicated by *od-ssbSubcarrierSpacing*, if provided; otherwise, by *ssbSubcarrierSpacing*

- the power of the SS/PBCH blocks is indicated by *od-ss-PBCH-BlockPower*, if provided; otherwise, by *ss-PBCH-BlockPower*

- the periodicity of the transmission of the SS/PBCH blocks are indicated by the [first or third] MAC CE from candidate values by *od-ssb-Periodicity*

- the half frames for the transmission of the SS/PBCH blocks are determined based on an indication by the [first or third] MAC CE

- the transmission of the SS/PBCH blocks is in frames with SFN determined from , where is the periodicity for the transmission of the SS/PBCH blocks, and is the indicated SFN offset by the [first or third] MAC CE from candidate values by *od-ssb-sfn-Offset*, if provided; else, . An index of a half frame with transmission of the SS/PBCH blocks in a corresponding frame is indicated by the [first or third] MAC CE from candidate values by *od-ssb- halfFrameIndex*, if provided; else the index is 0

When the activation or adaptation of the SS/PBCH blocks transmission is by the [first or the third] MAC CE, respectively, [and with reference to slots of a configured DL BWP for the SS/PBCH blocks transmission,] the UE expects that the transmission of the SS/PBCH blocks according to the indicated parameters starts from a first slot including the candidate SS/PBCH block occasion corresponding to the first transmitted SS/PBCH block index and located in a first half frame within the half frames for the transmissions of the SS/PBCH blocks, that is at least slots after slot , where is a slot when a PDSCH reception providing the [first or the third] MAC CE ends, respectively, is a slot indicated for PUCCH transmission with HARQ-ACK information for the PDSCH reception as described in clause 9.2.3, and is a number of slots per subframe for the SCS configuration of the PUCCH transmission as defined in [4, TS 38.211].

When the activation of transmission for the SS/PBCH blocks is by *od-ssb-config*, the UE expects that the transmission of the SS/PBCH blocks [starts at the next half frame with transmission of the SS/PBCH blocks].

When the deactivation of the SS/PBCH blocks transmission is by the [second] MAC CE, [and with reference to slots of the configured DL BWP for the SS/PBCH blocks transmission,] the UE expects that the transmission of the SS/PBCH blocks according to the indicated parameters terminates from

- a slot , if the slot is not within a first slot to a last slot with activated transmission of SS/PBCH blocks in a half frame, where , is a slot when a PDSCH reception providing the [second] MAC CE ends, is a slot indicated for PUCCH transmission with HARQ-ACK information for the PDSCH reception as described in clause 9.2.3, and is a number of slots per subframe for the SCS configuration of the PUCCH transmission as defined in [4, TS 38.211]

- the first slot including the candidate SS/PBCH block corresponding to the last transmitted SS/PBCH block index that is not earlier than the slot , if the slot is within a first slot to a last slot with activated transmission of SS/PBCH blocks in a half frame

When the UE is not provided *absoluteFrequencySSB* for the SCell, the UE does not expect the transmission of the SS/PBCH blocks provided by *od-ssb-config* to be deactivated while the SCell is activated.

When a first SS/PBCH block in a configured DL BWP can be used to obtain SIB1 and a frequency location of the first SS/PBCH block, provided by *absoluteFrequencySSB*, corresponds to the GSCN of a synchronization raster entry, the UE expects:

- a frequency location of a second SS/PBCH block, provided by *od-absoluteFrequencySSB,* to be different from the frequency location of the first SS/PBCH block and not to correspond to the GSCN of a synchronization raster entry

- frequency resources of the second SS/PBCH block not to overlap with frequency resources of the first SS/PBCH block

- the second SS/PBCH block to be within the configured DL BWP as the first SS/PBCH block

When a first SS/PBCH in a configured DL BWP cannot be used to obtain SIB1, the UE expects

- a same frequency location for a second SS/PBCH block, provided by *od-ssb-config*, and for the first SS/PBCH block, provided by *absoluteFrequencySSB*

- a same PBCH payload, other than the SFN index and the half frame index, for the first SS/PBCH block and for the second SS/PBCH block with same SS/PBCH block index as the first SS/PBCH block

The UE may assume that a first SS/PBCH block with center frequency provided by *absoluteFrequencySSB* and a second SS/PBCH block provided by *od-ssb-config* are quasi co-located with respect to Doppler shift, Doppler spread, average gain, average delay, delay spread and, when applicable, spatial RX parameters, when they have a same SS/PBCH block index.

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

## 8.1 Random access preamble

Physical random access procedure for a UE is triggered upon request of a PRACH transmission by higher layers or by a PDCCH order or LTM Cell Switch Command MAC CE in clause 6.1.3.75 [11, TS 38.321] for a cell. A configuration by higher layers for a PRACH transmission includes the following:

- A configuration for PRACH transmission on the cell [4, TS 38.211].

- A preamble index, a preamble SCS, , a corresponding RA-RNTI when applicable [11, TS 38.321], and a PRACH resource for the cell.

- A number of preamble repetitions for the PRACH transmission if the UE would transmit the PRACH with repetitions.

A UE transmits a PRACH on a cell using the selected PRACH format with transmission power ,as described in clause 7.4, on the indicated PRACH resource or on a determined set of resources using a same spatial filter in case of preamble repetitions.

For Type-1 random access procedure, a UE can be provided, by *addl-RACH-Config-Adaptation* [in *RACH-ConfigCommon*], parameters for determining time resources and frequency resources for PRACH transmission [4, TS 38.211]. When a PRACH occasion associated with *addl-RACH-Config-Adaptation* has same frequency resource and same time resource as a PRACH occasion [in the *RACH-ConfigCommon*] that is not associated with *addl-RACH-Config-Adaptation*, the former PRACH occasion is not valid and is not considered in the procedures in this clause.

For PRACH occasions associated with *addl-RACH-Config-Adaptation* [in *RACH-ConfigCommon*], the UE can be additionally provided a PRACH mask index, by *prach-SubsetMask-Index-Adaptation*, if provided, that indicates one or more association periods per association pattern periods according to Table 8.1-0, where is provided by *KforAPPForPRACHsubsetMask*. Table 8.1-0: Mapping of mask index to association periods per *Kmask* association pattern periods

|  |  |
| --- | --- |
| Mask Index | Association periods (APs) per association pattern periods (APPs) |
| 0 | First half of APs in APPs |
| 1 | First quarter of APs in APPs |
| 2 | First eighth of APs in APPs |
| 3 | First sixteenth of APs in APPs |

Valid PRACH occasions associated with *addl-RACH-Config-Adaptation*, and additionally associated with *prach-SubsetMask-Index-Adaptation*, if provided, are activated for PRACH transmission based on an indication in a DCI format 1\_0 with CRC scrambled by a P-RNTI [or a C-RNTI] [5, TS 38.212]. For activation by DCI format 1\_0 with CRC scrambled by the P-RNTI, the PRACH occasions are available for a duration provided by *validity-DurationForAddlRACHAdaptation*, starting from the first frame of the SI modification period [12, TS 38.331] that includes a PDCCH monitoring occasion where the UE receives a PDCCH providing the DCI format 1\_0 with CRC scrambled by the P-RNTI.

For Type-1 random access procedure, a UE is provided a number of SS/PBCH block indexes associated with one PRACH occasion and a number of contention based preambles per SS/PBCH block index per valid PRACH occasion either by *ssb-perRACH-OccasionAndCB-PreamblesPerSSB* or by *ssb-perRACH-OccasionAndCB-PreamblesPerSSB-r19*.

For Type-2 random access procedure with common configuration of PRACH occasions with Type-1 random access procedure, a UE is provided a number of SS/PBCH block indexes associated with one PRACH occasion by *ssb-perRACH-OccasionAndCB-PreamblesPerSSB* and a number of contention based preambles per SS/PBCH block index per valid PRACH occasion by *msgA-CB-PreamblesPerSSB-PerSharedRO*. The PRACH transmission can be on a subset of PRACH occasions associated with a same SS/PBCH block index within an SSB-RO mapping cycle for a UE provided with a PRACH mask index by *msgA-SSB-SharedRO-MaskIndex* according to [11, TS 38.321].

For Type-2 random access procedure with separate configuration of PRACH occasions with Type-1 random access procedure, a UE is provided a number of SS/PBCH block indexes associated with one PRACH occasion and a number of contention based preambles per SS/PBCH block index per valid PRACH occasion by *msgA-SSB-PerRACH-OccasionAndCB-PreamblesPerSSB* when provided; otherwise, by *ssb-perRACH-OccasionAndCB-PreamblesPerSSB*.

For a random access procedure associated with a feature combination indicated by *FeatureCombinationPreambles*, a UE is provided a number of SS/PBCH block indexes associated with one PRACH occasion by *ssb-perRACH-OccasionAndCB-PreamblesPerSSB* or *msgA-SSB-PerRACH-OccasionAndCB-PreamblesPerSSB* when provided and a number of contention based preambles per SS/PBCH block index per valid PRACH occasion by *startPreambleForThisPartition* and *numberOfPreamblesPerSSB-ForThisPartition*. The PRACH transmission can be on a subset of PRACH occasions associated with a same SS/PBCH block index within an SSB-RO mapping cycle for a UE provided with a PRACH mask index by *ssb-SharedRO-MaskIndex* according to [11, TS 38.321].

For Type-1 random access procedure, or for Type-2 random access procedure with separate configuration of PRACH occasions from Type 1 random access procedure, if , one SS/PBCH block index is mapped to consecutive valid PRACH occasions and contention based preambles with consecutive indexes associated with the SS/PBCH block index per valid PRACH occasion start from preamble index 0. If , contention based preambles with consecutive indexes associated with SS/PBCH block index , , per valid PRACH occasion start from preamble index where is provided by *totalNumberOfRA-Preambles* for Type-1 random access procedure, or by *msgA-TotalNumberOfRA-Preambles* for Type-2 random access procedure with separate configuration of PRACH occasions from a Type 1 random access procedure, and is an integer multiple of .

For Type-2 random access procedure with common configuration of PRACH occasions with Type-1 random access procedure, if , one SS/PBCH block index is mapped to consecutive valid PRACH occasions and contention based preambles with consecutive indexes associated with the SS/PBCH block index per valid PRACH occasion start from preamble index . If , contention based preambles with consecutive indexes associated with SS/PBCH block index , , per valid PRACH occasion start from preamble index , where is provided by *totalNumberOfRA-Preambles* for Type-1 random access procedure.

For link recovery, a UE is provided SS/PBCH block indexes associated with one PRACH occasion by *ssb-perRACH-Occasion* in *BeamFailureRecoveryConfig*. For a dedicated RACH configuration provided by *RACH-ConfigDedicated*, if *cfra* is provided, a UE is provided SS/PBCH block indexes associated with one PRACH occasion by *ssb-perRACH-Occasion* in *occasions*. For the PRACH transmission on a candidate cell [38.213, clause 21], a UE is provided SS/PBCH block indexes associated with one PRACH occasion by *ssb-PerRACH-Occasion-r18* in *EarlyUL-SyncConfig*. If , one SS/PBCH block index is mapped to consecutive valid PRACH occasions. If , all consecutive SS/PBCH block indexes are associated with one PRACH occasion.

SS/PBCH block indexes provided by *ssb-PositionsInBurst* in *SIB1* or in *ServingCellConfigCommon* or in *SSB-MTC-AdditionalPCI* or in *LTM-SSB-Config* are mapped to valid PRACH occasions in the following order where the parameters are described in [4, TS 38.211]. The mapping of SS/PBCH block indexes to valid PRACH occasions is separate for valid PRACH occasions determined by [*RACH-ConfigCommon*] and for valid PRACH occasions determined by *addl-RACH-Config-Adaptation*.

- First, in increasing order of preamble indexes within a single PRACH occasion

- Second, in increasing order of frequency resource indexes for frequency multiplexed PRACH occasions

- Third, in increasing order of time resource indexes for time multiplexed PRACH occasions within a PRACH slot

- Fourth, in increasing order of indexes for PRACH slots

An association period, starting from frame 0, for mapping SS/PBCH block indexes to PRACH occasions is the smallest integer number in the set determined by the PRACH configuration period according to Table 8.1-1 such that SS/PBCH block indexes are mapped at least once to the PRACH occasions within the association period, where a UE obtains from the value of *ssb-PositionsInBurst* in *SIB1* or in *ServingCellConfigCommon* or in *SSB-MTC-AdditionalPCI* or in *LTM-SSB-Config*. If after an integer number of SS/PBCH block indexes to PRACH occasions mapping cycles within the association period there is a set of PRACH occasions or PRACH preambles that are not mapped to SS/PBCH block indexes, no SS/PBCH block indexes are mapped to the set of PRACH occasions or PRACH preambles. An association pattern period includes one or more association periods and is determined so that a pattern between PRACH occasions and SS/PBCH block indexes repeats at most every 160 msec. PRACH occasions not associated with SS/PBCH block indexes after an integer number of association periods, if any, are not used for PRACH transmissions.

Table 8.1-1: Mapping between PRACH configuration period and SS/PBCH block to PRACH occasion association period

|  |  |
| --- | --- |
| PRACH configuration period (msec) | Association period (number of PRACH configuration periods) |
| 10 | {1, 2, 4, 8, 16} |
| 20 | {1, 2, 4, 8} |
| 40 | {1, 2, 4} |
| 80 | {1, 2} |
| 160 | {1} |

For a PRACH transmission by a UE triggered by a PDCCH order or an LTM cell switch command MAC CE, the PRACH mask index field, if the value of the random access preamble index field is not zero, indicates the PRACH occasion for the PRACH transmission where the PRACH occasions are associated with the SS/PBCH block index indicated by the SS/PBCH block index field of the PDCCH order or the LTM cell switch command MAC CE and, if any, a cell indicator field in PDCCH order [5, TS 38.212] or a Target Configuration ID field in LTM cell switch command MAC CE [11, TS 38.321] indicates a cell for the PRACH transmission. If the UE is provided by *cellSpecificKoffset*, the PRACH occasion is after slot where is the slot of the UL BWP for the PRACH transmission that overlaps with the end of the PDCCH order reception assuming , and is the SCS configuration for the PRACH transmission. If the PDCCH reception for the PDCCH order includes two PDCCH candidates from two linked search space sets based on *searchSpaceLinkingId*, as described in clause 10.1, the last symbol of the PDCCH reception is the last symbol of the PDCCH candidate that ends later. The PDCCH reception includes the two PDCCH candidates also when the UE is not required to monitor one of the two PDCCH candidates as described in clauses 10 (except clause 10.4), 11.1, 11.1.1 and 17.2.

For a PRACH transmission triggered by higher layers, if *ssb-ResourceList* is provided, the PRACH mask index is indicated by *ra-ssb-OccasionMaskIndex* which indicates the PRACH occasions for the PRACH transmission where the PRACH occasions are associated with the selected SS/PBCH block index.

The PRACH occasions are mapped consecutively per corresponding SS/PBCH block index. The indexing of the PRACH occasion indicated by the mask index value is reset per mapping cycle of consecutive PRACH occasions per SS/PBCH block index. The UE selects for a PRACH transmission the PRACH occasion indicated by PRACH mask index value for the indicated SS/PBCH block index in the first available mapping cycle.

For the indicated preamble index, the ordering of the PRACH occasions is

- First, in increasing order of frequency resource indexes for frequency multiplexed PRACH occasions

- Second, in increasing order of time resource indexes for time multiplexed PRACH occasions within a PRACH slot

- Third, in increasing order of indexes for PRACH slots

For a PRACH transmission with preamble repetitions, a set consists of valid PRACH occasions that are consecutive in time, use same frequency resources, and are associated with same one or more SS/PBCH block index(es), and each SS/PBCH block index is associated with same preamble indexes in all valid PRACH occasions within the set.

For a PRACH transmission triggered by higher layers, if *ssb-ResourceList* is provided, the PRACH mask index is indicated by *ra-ssb-OccasionMaskIndex* which indicates the PRACH occasions for the PRACH transmission where the PRACH occasions are associated with the selected SS/PBCH block index.

The PRACH occasions are mapped consecutively per corresponding SS/PBCH block index. The indexing of the PRACH occasion indicated by the mask index value is reset per mapping cycle of consecutive PRACH occasions per SS/PBCH block index. The UE selects for a PRACH transmission the PRACH occasion indicated by PRACH mask index value for the indicated SS/PBCH block index in the first available mapping cycle.

For the indicated preamble index, the ordering of the PRACH occasions is

- First, in increasing order of frequency resource indexes for frequency multiplexed PRACH occasions

- Second, in increasing order of time resource indexes for time multiplexed PRACH occasions within a PRACH slot

- Third, in increasing order of indexes for PRACH slots

For a PRACH transmission with preamble repetitions, a set consists of valid PRACH occasions that are consecutive in time, use same frequency resources, and are associated with same one or more SS/PBCH block index(es), and each SS/PBCH block index is associated with same preamble indexes in all valid PRACH occasions within the set.

For a PRACH transmission with preamble repetitions, a time period, starting from frame 0, is the smallest integer number of association pattern periods such that at least one set of valid PRACH occasions for each of the SS/PBCH block indexes can be determined within the time period for all configured number of preamble repetitions for each supported feature combination provided in each *RACH-ConfigCommon*. The set(s) of valid PRACH occasions for each configured number of preamble repetitions repeats every time period.

Within a time period, for set(s) of valid PRACH occasions for a PRACH transmission with preamble repetitions

- the first valid PRACH occasion of the first set is the first valid PRACH occasion

- the first valid PRACH occasion of subsequent sets, if any, is determined according to an ordering of valid PRACH occasions

- first, in increasing order of frequency resource indexes for frequency multiplexed PRACH occasions

- second, in increasing order of time resource indexes for time multiplexed PRACH occasions

where, for each frequency resource index for frequency multiplexed PRACH occasions

- the first valid PRACH occasion of the first set is the first valid PRACH occasion

- the first valid PRACH occasion of subsequent sets, if any,

- is after *msg1-RepetitionTimeOffsetROGroup* consecutive valid PRACH occasions in time from the first valid PRACH occasion of the previous set, where each PRACH occasion is associated with same SS/PBCH block index(es) and each SS/PBCH block index is associated with same preambles, if *msg1-RepetitionTimeOffsetROGroup* is provided

- is after the PRACH occasions for the previous set, if *msg1-RepetitionTimeOffsetROGroup* is not provided

For a PRACH transmission with preamble repetitions in CFRA procedure, *msg1-RepetitionTimeOffsetROGroup* is determined by the *FeatureCombinationPreambles* indicating *msg1-Repetitions* with same value as *msg1-RepetitionNum* provided by *RACH-ConfigDedicated*.

For a PRACH transmission triggered upon request by higher layers, a value of *ra-OccasionList* [12, TS 38.331], if *csirs-ResourceList* is provided, indicates a list of PRACH occasions for the PRACH transmission where the PRACH occasions are associated with the selected CSI-RS index indicated by *csi-RS*. The indexing of the PRACH occasions indicated by *ra-OccasionList* is reset per association pattern period.



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

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

## 10.1 UE procedure for determining physical downlink control channel assignment

- a Type3-PDCCH CSS set configured by

- *SearchSpace* in *PDCCH-Config* with *searchSpaceType* = *common* for DCI formats with CRC scrambled by INT-RNTI, SFI-RNTI, TPC-PUSCH-RNTI, TPC-PUCCH-RNTI, TPC-SRS-RNTI, CI-RNTI, cellDTRX-RNTI, or ssbPeriodicityIndication-RNTI and, only for the primary cell, C-RNTI, MCS-C-RNTI, CS-RNTI(s), or PS-RNTI, or

- *SearchSpace* in *pdcch-ConfigMulticast* for DCI formats with CRC scrambled by G-RNTI, or G-CS-RNTI, or

- *searchSpaceMCCH* and *searchSpaceMTCH* on a secondary cell for a DCI format 4\_0 with CRC scrambled by a MCCH-RNTI or a G-RNTI for broadcast, and

- a USS set configured by

- *SearchSpace* or by *SearchSpaceExt-v1800* in *PDCCH-Config* with *searchSpaceType* = *ue-Specific* for DCI formats with CRC scrambled by C-RNTI, MCS-C-RNTI, SP-CSI-RNTI, CS-RNTI(s), SL-RNTI, SL-CS-RNTI, SL Semi-Persistent Scheduling V-RNTI, or NCR-RNTI

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

## 11.5 Adaptation of cell operation

A UE configured for operation on a serving cell according to one or both of a cell DTX operation and a cell DRX operation by c*ellDTRX-DCI-Config* for the serving cell [11, TS 38.321], can be additionally provided by *dci-Format2-9* a Type3-PDCCH CSS set to monitor PDCCH for detection of DCI format 2\_9 with CRC scrambled by a cellDTRX-RNTI as described in clause 10.1 during Active Time [11, TS 38.321], and a location in DCI format 2\_9 by *positionInDCI-cellDTRX* of a cell DTX/DRX indication field for the serving cell and/or a NES-mode indication field for the PCell

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

## 11.6 Periodicity adaptation for reception of SS/PBCH blocks on a secondary cell

A UE can be provided, by *addl-ssb-Periodicity*, a set of periodicities for reception of SS/PBCH blocks on an SCell. [The SS/PBCH blocks do not include an SS/PBCH block that the UE can use to obtain SIB1 for the SCell.]

The UE can be additionally provided, by *dci-Format2-9*, a Type3-PDCCH CSS set to monitor PDCCH for detection of DCI format 2\_9 with CRC scrambled by a ssbPeriodicityIndication-RNTI as described in clause 10.1, and a location in DCI format 2\_9 by *positionInDCI-ssbPeriod* an SS/PBCH block reception periodicity indication field for the SCell [5, TS 38.212].

When a UE 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 periodicity for reception of SS/PBCH blocks on a second serving cell, the UE expects that the transmission of SS/PBCH blocks according to the indicated periodicity on the second serving cell starts from a slot on the second serving cell that includes the candidate SS/PBCH block occasion corresponding to the first transmitted SS/PBCH block provided by *ssb-PositionsInBurst* in a half frame and does not begin before the beginning of 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].

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

# 23 UE procedure to request SIB1 reception

Unless otherwise mentioned, the higher layer parameters in this clause and in referenced clauses are provided by *SIB1-RequestConfig* on a first cell.

A UE can be provided, by *NES\_CellId*, a physical cell identity of a second cell and an ARFCN by *ARFCN-ValueNR* for SS/PBCH block receptions on the second cell. When

- the UE receives an SS/PBCH block on the second cell, and

- for FR1 or for FR2 is indicated by the SS/PBCH block on the second cell, and

- conditions for PRACH transmission associated with the SS/PBCH block on the second cell are satisfied [12, TS 38.331],

the UE can transmit a PRACH associated with the SS/PBCH block on the second cell based on:

- a timing adjustment indicated by *n-TimingAdvanceOffset*, if provided, as described in Clause 4.2

- a power determined as described in Clause 7.4

- a procedure determined as in Clause 8.1 based on Type-1 random access procedure

where for determining the common resource block [4, TS 38.211] is provided by *k-ssb*.

In response to the PRACH transmission, the UE monitors PDCCH on the second cell to detect a DCI format 1\_0 with CRC scrambled by a corresponding RA-RNTI during a window controlled by *ra\_ResponseWindow*, as described in Clause 8.2. The UE monitors PDCCH according to a Type1-PDCCH CSS set provided by *ra-SearchSpace*, if provided; else provided by *SearchSpaceZero* as described in Clause 10.1.

If the UE identifies a RAPID associated with a corresponding PRACH transmission from the UE in a PDSCH reception scheduled by the DCI format 1\_0 with CRC scrambled by the RA-RNTI, the UE can be indicated by higher layers to monitor PDCCH on the second cell to detect a DCI format 1\_0 with CRC scrambled by the SI-RNTI according to a Type0-PDCCH CSS set provided by *SearchSpaceZero*. If the UE is provided *XYZ*, the UE monitors PDCCH only in monitoring occasions associated with the SS/PBCH block. The UE starts monitoring PDCCH to detect the DCI format 1\_0 with CRC scrambled by the SI-RNTI after a number of slots provided by *od-sib1-windowStartOffset* from the starting slot of the window controlled by *ra\_ResponseWindow*, and for a number of slots provided by *od-sib1-WindowDuration*.

[If the SS/PBCH block on the second cell indicates for FR1 or for FR2,] the UE is not required to monitor PDCCH on the second cell to detect the DCI format 1\_0 with CRC scrambled by the SI-RNTI prior to a reception of a PDSCH scheduled by the DCI format 1\_0 with CRC scrambled by the RA-RNTI.