**3GPP TSG RAN WG1 #114** **R1-230xxxx**

**Toulouse, France, August 21st – 25th, 2023**

|  |
| --- |
| *CR-Form-v12.2* |
| **DRAFT CHANGE REQUEST** |
|  |
|  | **38.213** | **CR** |  | **rev** |  | **Current version:** | **17.6.0** |  |
|  |
| *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)*.* |
|  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network |  | Core Network |  |

|  |
| --- |
|  |
| ***Title:***  | Introduction of BWP operation without restriction |
|  |  |
| ***Source to WG:*** | Samsung |
| ***Source to TSG:*** |  |
|  |  |
| ***Work item code:*** | BWP\_wor-Core |  | ***Date:*** | 2023-09-01 |
|  |  |  |  |  |
| ***Category:*** | B |  | ***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:*** | RAN#99 agreed the following (RP-230805)

|  |
| --- |
| The work item includes following objectives: * For Option A
	+ Study and specify if any clarifications of the existing requirements are needed, e.g., applicability of requirements, conditions of gap configuration etc. (RAN4)
* For Option B-1-1
	+ Specify support of BM/RLM/BFD based on SSB outside the active BWP without interruptions (RAN4, RAN2, RAN1)
* For Option C
	+ Specify support of BM/RLM/BFD based on NCD-SSB within active BWP for non-RedCap UEs (RAN4, RAN2, RAN1)
* For Option B-1-2
	+ Specify support of BM/RLM/BFD based on SSB outside the active BWP with interruptions with the following conditions (RAN4, RAN2, RAN1):
		- The UE shall be allowed to use B-1-2 only if there is no CSI-RS, no NCD SSB and no CD SSB configured for RLM/BM/BFD in the active BWP of the corresponding carrier(s) to be measured; and
		- UE shall support option (C) NCD-SSB (subject to IoDT availability).
	+ The interruption related requirements will be decided and specified in RAN4.
 |

 |
|  |  |
| ***Summary of change:*** |  Capture the above options B-1-1/B-1-2/C. |
|  |  |
| ***Consequences if not approved:*** | No support of BWP operation without restriction for options B-1-1/B-1-2/C. |
|  |  |
| ***Clauses affected:*** | 5, 11.1.1, 12 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  |  |  Other core specifications  |  |
| ***affected:*** |  |  |  Test specifications | TS/TR … CR …  |
| ***(show related CRs)*** |  |  |  O&M Specifications | TS/TR … CR …  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR’s revision history:*** |  |

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

# 5 Radio link monitoring

The downlink radio link quality of the primary cell is monitored by a UE for the purpose of indicating out-of-sync/in-sync status to higher layers. The UE is not required to monitor the downlink radio link quality in DL BWPs other than the active DL BWP, as described in clause 12, on the primary cell unless the UE indicates a capability [Option B-1-1] or [Option B-1-2] [18, TS 38.306]. If the active DL BWP is the initial DL BWP and for SS/PBCH block and CORESET multiplexing pattern 2 or 3, as described in clause 13, the UE is expected to perform RLM using the associated SS/PBCH block when the associated SS/PBCH block index is provided by *RadioLinkMonitoringRS*.

If the UE is configured with a SCG, as described in [12, TS 38.331], and the parameter *rlf-TimersAndConstants* is provided by higher layers and is not set to release, the downlink radio link quality of the PSCell of the SCG is monitored by the UE for the purpose of indicating out-of-sync/in-sync status to higher layers. The UE is not required to monitor the downlink radio link quality in DL BWPs other than the active DL BWP on the PSCell unless the UE indicates a capability [Option B-1-1] or [Option B-1-2] [18, TS 38.306].

A UE can be configured for each DL BWP of a SpCell [11, TS 38.321] with a set of resource indexes, through a corresponding set of *RadioLinkMonitoringRS*, for radio link monitoring by *failureDetectionResources*. The UE is provided either a CSI-RS resource configuration index, by *csi-RS-Index*, or a SS/PBCH block index, by *ssb-Index*. The UE can be configured with up to *RadioLinkMonitoringRS* for link recovery procedures, as described in clause 6, and for radio link monitoring. From the *RadioLinkMonitoringRS*, up to *RadioLinkMonitoringRS* can be used for radio link monitoring depending on as described in Table 5-1, wherein is as defined in clause 4.1, and up to two *RadioLinkMonitoringRS* can be used for link recovery procedures.

For operation with shared spectrum channel access, when a UE is provided a SS/PBCH block index by *ssb-Index*, the UE is expected to perform radio link monitoring using SS/PBCH block(s) in the discovery burst transmission window as described in clause 4.1, where the SS/PBCH block(s) have candidate SS/PBCH block index(es) corresponding to SS/PBCH block index provided by *ssb-Index*.

If the UE is not provided *RadioLinkMonitoringRS* and the UE is provided for PDCCH receptions TCI states that include one or more of a CSI-RS

- the UE uses for radio link monitoring the RS provided for the active TCI state for PDCCH reception if the active TCI state for PDCCH reception includes only one RS

- if the active TCI state for PDCCH reception includes two RS, the UE expects that one RS is configured with *qcl-Type* set to 'typeD' [6, TS 38.214] and the UE uses the RS configured with *qcl-Type* set to 'typeD' for radio link monitoring; the UE does not expect both RS to be configured with *qcl-Type* set to 'typeD'

- the UE is not required to use for radio link monitoring an aperiodic or semi-persistent RS

- For , the UE selects the RS provided for active TCI states for PDCCH receptions in CORESETs associated with the search space sets in an order from the shortest monitoring periodicity. If more than one CORESETs are associated with search space sets having same monitoring periodicity, the UE determines the order of the CORESET from the highest CORESET index as described in clause 10.1.

A UE does not expect to use more than *RadioLinkMonitoringRS* for radio link monitoring when the UE is not provided *RadioLinkMonitoringRS*.

Values of and for different values of are given in Table 5-1.

Table 5-1: and as a function of maximum number of SS/PBCH blocks per half frame

|  |  |  |
| --- | --- | --- |
|  |  |  |
| 4 | 2 | 2 |
| 8 | 6 | 4 |
| 64 | 8 | 8 |

For a CSI-RS resource configuration, *powerControlOffsetSS* is not applicable and a UE expects to be provided only ‘noCDM’ from *cdm-Type,* only ‘one’ and ‘three’ from *density*, and only ‘1 port’ from *nrofPorts* [6, TS 38.214].

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

### 11.1.1 UE procedure for determining slot format

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

For a set of symbols of a slot that are indicated as downlink/uplink by *tdd-UL-DL-ConfigurationCommon*, or *tdd-UL-DL-ConfigurationDedicated*, the UE does not expect to detect a DCI format 2\_0 with an SFI-index field value indicating the set of symbols of the slotas uplink/downlink, respectively, or as flexible.

For a set of symbols of a slot corresponding to SS/PBCH blocks with candidate SS/PBCH block indices corresponding to the SS/PBCH block indexes indicated to a UE by *ssb-PositionsInBurst* in *SIB1,* or by *ssb-PositionsInBurst* in *ServingCellConfigCommon*, as described in clause 4.1, or by *NonCellDefiningSSB* or, if the UE is not provided *dl-OrJointTCI-StateList*, by *ssb-PositionsInBurst* in *SSB-MTCAdditionalPCI* associated to physical cell ID with active TCI states for PDCCH or PDSCH, or for a set of symbols of a slot corresponding to SS/PBCH blocks configured for L1 beam measurement/reporting, the UE does not expect to detect a DCI format 2\_0 with an SFI-index field value indicating the set of symbols of the slotas uplink.

For a set of symbols of a slot corresponding to a valid PRACH occasion and symbols before the valid PRACH occasion, as described in clause 8.1, the UE does not expect to detect a DCI format 2\_0 with an SFI-index field value indicating the set of symbols of the slotas downlink.

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

# 12 Bandwidth part operation

If the UE is configured with a SCG, the UE shall apply the procedures described in this clause for both MCG and SCG

- When the procedures are applied for MCG, the terms 'secondary cell', 'secondary cells', 'serving cell', 'serving cells' in this clause refer to secondary cell, secondary cells, serving cell, serving cells belonging to the MCG respectively.

- When the procedures are applied for SCG, the terms 'secondary cell', 'secondary cells', 'serving cell', 'serving cells' in this clause refer to secondary cell, secondary cells (not including PSCell), serving cell, serving cells belonging to the SCG respectively. The term 'primary cell' in this clause refers to the PSCell of the SCG.

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

If a UE is provided by *firstActiveDownlinkBWP-Id* a first active DL BWP and by *firstActiveUplinkBWP-Id* a first active UL BWP on a carrier of a secondary cell, the UE uses the indicated DL BWP and the indicated UL BWP as the respective first active DL BWP on the secondary cell and first active UL BWP on the carrier of the secondary cell.

If a UE is provided *NonCellDefiningSSB* in *BWP-DownlinkDedicated* for an active DL BWP, the UE assumes that the active DL BWP includes the SS/PBCH blocks provided by *NonCellDefiningSSB*. The SS/PBCH blocks provided by *NonCellDefiningSSB* and the SS/PBCH blocks that the UE used to obtain SIB1 have same QCL properties if they have a same index*.* Unless otherwise stated, handling of overlapping between downlink receptions or uplink transmissions and the SS/PBCH blocks provided by *NonCellDefiningSSB* is same as handling of overlapping between downlink receptions or uplink transmissions and the SS/PBCH blocks provided by *ssb-PositionsInBurst* in *SIB1* or in *ServingCellConfigCommon*.

A UE does not expect to monitor PDCCH when the UE performs RRM measurements [10, TS 38.133] over a bandwidth that is not within the active DL BWP for the UE.

# 13 UE procedure for monitoring Type0-PDCCH CSS sets