**3GPP TSG-RAN WG2 Meeting #129 R2-2500xxx**

**Athens, Greece, 17th – 21st Feb. 2025**

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| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **38.300** | **CR** | **xxxx** | **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:*** | Correction on BWP operation without restriction for DC case | | | | | | | | | |
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| ***Source to WG:*** | vivo[, Qualcomm Incorporated, Guangdong Genius] | | | | | | | | | |
| ***Source to TSG:*** | R2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_BWP\_wor-Core | | | | |  | ***Date:*** | | | 2025-02-07 |
|  |  | | | |  | |  | | |  |
| ***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 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-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)  Rel-20 (Release 20)* | |
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| ***Reason for change:*** | | In TS 38.306, the current field description for *ncd-SSB-BWP-Wor-r18* only mentions the Bandwidth of UE-specific RRC configured BWP may not include bandwidth of the CORESET#0 (if CORESET#0 is present) and CD-SSB for PCell/PSCell (if configured). For PSCell case, the current wording may not be clear enough on whether it includes the case for CD-SSB-less PSCell, e.g. when the UE is configured only with the initial BWP which contains NCD-SSB, and there is no UE-specific BWP or other NCD-SSB; or when NCD-SSB is associated with both initial BWP and UE specific BWP, and UE’s active BWP is the initial BWP. In this way, the current specification may be mis-interpreted as *ncd-SSB-BWP-Wor-r18* is not applicable for the case that PSCell’s initial BWP or the active BWP is associated with NCD-SSB.  According to RAN4 specifcation, UE will not measure NCD-SSB unless UE supports *ncd-SSB-BWP-Wor-r18* in this case. Thus, it is clear that *ncd-SSB-BWP-Wor-r18* is also applicable for the case that PSCell’s initial BWP or the active BWP is associated with NCD-SSB.  In order to avoid any mis-interpretation on the current field decription for *ncd-SSB-BWP-Wor-r18* in TS 38.306, it is better to add the corresponding clarifcation for Pcell/PSCell in stage-2 specification: For Pcell, bandwidth of UE-specific RRC configured BWP needs not include bandwidth of the CORESET#0 (if CORESET#0 is present) and CD-SSB. For PSCell (if configured), bandwidth of UE-specific RRC configured BWP needs not include bandwidth of the CORESET#0 (if CORESET#0 is present) and SSB indicated by *absoluteFrequencySSB* (either CD-SSB or NCD-SSB). | | | | | | | | |
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| ***Summary of change:*** | | Add the clarifcation in the stage-2 specifcation for BWP operation without restriction: For the case that UE performs RLM/BM/BFD and RRM measurements and measurements for RA resource selection inside the active DL BWP based on NCD-SSB within active BWP, bandwidth of UE-specific RRC configured BWP needs not include bandwidth of the CORESET#0 (if CORESET#0 is present) and CD-SSB for Pcell, and bandwidth of UE-specific RRC configured BWP needs not include bandwidth of the CORESET#0 (if CORESET#0 is present) and CD-SSB/NCD-SSB for PSCell (if configured).  **Impact analysis**  Impacted 5G architecture options:  MR-DC  Impacted functionality  *ncd-SSB-BWP-Wor*  Inter-operability:   1. If the network is implemented according to the CR and the UE is not, there is no inter-operability issue. 2. If the UE is implemented according to the CR and the network is not, there is no inter-operability issue. | | | | | | | | |
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| ***Consequences if not approved:*** | | It is not clear whether *ncd-SSB-BWP-Wor-r18* is applicable for the case that PSCell’s initial BWP or the active BWP is associated with NCD-SSB. | | | | | | | | |
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| ***Clauses affected:*** | | 5.2.4 | | | | | | | | |
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|  | | **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:*** | |  | | | | | | | | |

Start of change

5.2.4 Synchronization signal and PBCH block

The Synchronization Signal and PBCH block (SSB) consists of primary and secondary synchronization signals (PSS, SSS), each occupying 1 symbol and 127 subcarriers, and PBCH spanning across 3 OFDM symbols and 240 subcarriers, but on one symbol leaving an unused part in the middle for SSS as show in Figure 5.2.4-1. For the 3 MHz channel bandwidth, the PBCH is further equally punctured from both edges to span 144 subcarriers. The possible time locations of SSBs within a half-frame are determined by sub-carrier spacing and the periodicity of the half-frames where SSBs are transmitted is configured by the network. During a half-frame, different SSBs may be transmitted in different spatial directions (i.e. using different beams, spanning the coverage area of a cell).

Within the frequency span of a carrier, multiple SSBs can be transmitted. The PCIs of SSBs transmitted in different frequency locations do not have to be unique, i.e. different SSBs in the frequency domain can have different PCIs. However, when an SSB is associated with an RMSI, the SSB is referred to as a Cell-Defining SSB (CD-SSB). A PCell is always associated to a CD-SSB located on the synchronization raster.

When an SSB is not associated with an RMSI, the SSB is referred to as a non-Cell Defining SSB (NCD-SSB), which can be used to perform RLM, BFD, and RRM measurements and measurements for RA resource selection inside the active DL BWP when the active BWP does not contain the CD-SSB. A UE may be configured with multiple SSBs provided that each BWP is configured with at most one SSB (CD-SSB or NCD-SSB). For the case that UE performs RLM/BM/BFD and RRM measurements and measurements for RA resource selection inside the active DL BWP based on NCD-SSB within active BWP, bandwidth of UE-specific RRC configured BWP needs not include bandwidth of the CORESET#0 (if CORESET#0 is present) and CD-SSB for Pcell, and bandwidth of UE-specific RRC configured BWP needs not include bandwidth of the CORESET#0 (if CORESET#0 is present) and CD-SSB/NCD-SSB for PSCell (if configured).

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**Figure 5.2.4-1: Time-frequency structure of SSB**

Polar coding is used for PBCH.

The UE may assume a band-specific sub-carrier spacing for the SSB unless a network has configured the UE to assume a different sub-carrier spacing.

PBCH symbols carry its own frequency-multiplexed DMRS.

QPSK modulation is used for PBCH.

The PBCH physical layer model is described in TS 38.202 [20].

End of change