**3GPP TSG-RAN WG2 Meeting #124 *R2-231xxxx***

**Chicago, USA, 13th – 17th Nov, 2023**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.306** | **CR** | **Draft** | **rev** |  | **Current version:** | **17.6.0** |  |
|  | | | | | | | | |
| *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)*.* | | | | | | | | |
|  | | | | | | | | |

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

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | | | |
| ***Title:*** | Draft CR 38.306 for R18 Positioning | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Xiaomi | | | | | | | | | |
| ***Source to TSG:*** | RAN2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_pos\_enh2 | | | | |  | ***Date:*** | | | 2023-11-19 |
|  |  | | | |  | |  | | |  |
| ***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 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)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | Introduce UE capabilities for Rel-18 Positioning. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Caputre the UE capabilities for Rel-18 Positioning according to RAN1 feature lsit and RAN2 agreements. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | UE capabilities for Rel-18 Positioning features will not be captured. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 4.2.7.2, 4.2.21 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | |  | | | | | | | | |

START OF CHANGE

#### 4.2.7.2 *BandNR parameters*

| ***nonGroupSINR-reporting-r16***  Indicates N\_max L1-SINR values reported when UE supports non-group based L1-SINR reporting. UE indicates support of this feature shall indicate support of *ssb-csirs-SINR-measurement-r16.* | Band | No | N/A | N/A |
| --- | --- | --- | --- | --- |
| ***nr-UE-TxTEG-ID-MaxSupport-r17***  Indicates the maximum number of UE TxTEG for SRS resource for positioning, which is supported and reported by UE for UL TDOA. The UE can include this field only if the UE supports *srs-AllPosResources-r16*. | Band | No | N/A | N/A |
| ***olpc-SRS-Pos-r16***  Indicates whether the UE supports OLPC for SRS for positioning. The capability signalling comprises the following parameters.  - *olpc-SRS-PosBasedOnPRS-Serving-r16* indicates whether the UE supports OLPC for SRS for positioning based on PRS from the serving cell in the same band. The UE can include this field only if the UE supports *NR-DL-PRS-ProcessingCapability-r16* defined in TS 37.355 [22], and *srs-PosResources-r16*. Otherwise, the UE does not include this field;  - *olpc-SRS-PosBasedOnSSB-Neigh-r16* indicates whether the UE supports OLPC for SRS for positioning based on SSB from the neighbouring cell in the same band. The UE can include this field only if the UE supports *srs-PosResources-r16*. Otherwise, the UE does not include this field;  - *olpc-SRS-PosBasedOnPRS-Neigh-r16* indicates whether the UE supports OLPC for SRS for positioning based on PRS from the neighbouring cell in the same band. The UE can include this field only if the UE supports *olpc-SRS-PosBasedOnPRS-Serving-r16*. Otherwise, the UE does not include this field;  NOTE: A PRS from a PRS-only TP is treated as PRS from a non-serving cell.  - *maxNumberPathLossEstimatePerServing-r16* indicates the maximum number of pathloss estimates that the UE can simultaneously maintain for all the SRS resource sets for positioning per serving cell in addition to the up to four pathloss estimates that the UE maintains per serving cell for the PUSCH/PUCCH/SRS transmissios. The UE shall include this field if the UE supports any of *olpc-SRS-PosBasedOnPRS-Serving-r16, olpc-SRS-PosBasedOnSSB-Neigh-r16* and *olpc-SRS-PosBasedOnPRS-Neigh-r16.* Otherwise, the UE does not include this field. | Band | No | N/A | N/A |
| ***olpc-SRS-PosRRC-Inactive-r17***  Indicates whether the UE supports OLPC for SRS for positioning in RRC\_INACTIVE. The capability signalling comprises the following parameters.  - *olpc-SRS-PosBasedOnPRS-Serving-r16* indicates whether the UE supports OLPC for SRS for positioning based on PRS from the serving cell in the same band. The UE can include this field only if the UE supports *NR-DL-PRS-ProcessingCapability-r16* defined in TS 37.355 [22], and *srs-PosResourcesRRC-Inactive-r17*. Otherwise, the UE does not include this field;  - *olpc-SRS-PosBasedOnSSB-Neigh-r16* indicates whether the UE supports OLPC for SRS for positioning based on SSB from the neighbouring cell in the same band. The UE can include this field only if the UE supports *srs-PosResourcesRRC-Inactive-r17*. Otherwise, the UE does not include this field;  - *olpc-SRS-PosBasedOnPRS-Neigh-r16* indicates whether the UE supports OLPC for SRS for positioning based on PRS from the neighbouring cell in the same band. The UE can include this field only if the UE supports *olpc-SRS-PosBasedOnPRS-Serving-r16*. Otherwise, the UE does not include this field;  NOTE: A PRS from a PRS-only TP is treated as PRS from a non-serving cell.  *-* *maxNumberPathLossEstimatePerServing-r16* indicates the maximum number of pathloss estimates that the UE can simultaneously maintain for all the SRS resource sets for positioning per serving cell in addition to the up to four pathloss estimates that the UE maintains per serving cell for the PUSCH/PUCCH/SRS transmissions. The UE shall include this field if the UE supports any of *olpc-SRS-PosBasedOnPRS-Serving-r16, olpc-SRS-PosBasedOnSSB-Neigh-r16* and *olpc-SRS-PosBasedOnPRS-Neigh-r16.* Otherwise, the UE does not include this field. | Band | No | N/A | N/A |
| ***oneShotHARQ-feedbackPhy-Priority-r17***  Indicates whether the UE supports transmission of type 3 HARQ-ACK codebook using the first or second PUCCH configuration based on PHY priority indication in the triggering DCI.  A UE supporting this feature shall also indicate support of *oneShotHARQ-feedback-r16* and *twoHARQ-ACK-Codebook-type1-r16*. | Band | No | N/A | N/A |
| ***oneShotHARQ-feedbackTriggeredByDCI-1-2-r17***  Indicates whether the UE supports one-shot HARQ ACK feedback triggered by DCI format 1\_2, comprised of the following functional components:  -Supports feedback of type 3 HARQ-ACK codebook, triggered by a DCI 1\_2 scheduling a PDSCH;  -Supports feedback of type 3 HARQ-ACK codebook, triggered by a DCI 1\_2 without scheduling a PDSCH using a reserved FDRA value.  A UE supporting this feature shall also indicate support of *oneShotHARQ-feedback-r16* and *dci-Format1-2And0-2-r16*. | Band | No | N/A | N/A |
| ***oneSlotPeriodicTRS-r16***  Indicates whether the UE supports one-slot periodic TRS configuration only when no two consecutive slots are indicated as downlink slots by *tdd-UL-DL-ConfigurationCommon* or *tdd-UL-DL-ConfigDedicated*. If the UE supports this feature, the UE needs to report *csi-RS-ForTracking*. | Band | No | TDD only | FR1 only |
| ***outOfOrderOperationDL-r16***  Indicates whether the UE supports out of order operation for DL. The UE that indicates support of this feature shall support *multiDCI-MultiTRP-r16*. The capability signalling comprises the following parameters:  *- supportPDCCH-ToPDSCH-r16* indicates support out-of-order operation for PDCCH to PDSCH;  *- supportPDSCH-ToHARQ-ACK-r16* indicates support out-of-order operation for PDSCH to HARQ-ACK. | Band | No | N/A | N/A |
| ***outOfOrderOperationUL-r16***  Indicates whether the UE supports out of order operation for UL. The UE that indicates support of this feature shall support *multiDCI-MultiTRP-r16.*  Note: Same closed loop index for power control across PUSCHs associated with different *CORESETPoolIndex* values is not supported by a UE indicating the support of this feature when TPC accumulation is enabled. | Band | No | N/A | N/A |
| ***overlapPDSCHsFullyFreqTime-r16***  Indicates the maximal number of PDSCH scrambling sequences per serving cell when the UE supports PDSCHs with fully overlapping Resource Elements. The UE that indicates support of this feature shall support *multiDCI-MultiTRP-r16.*  Note: A UE may assume that its maximum receive timing difference between the DL transmissions from two TRPs is within a Cyclic Prefix | Band | No | N/A | N/A |
| ***overlapPDSCHsInTimePartiallyFreq-r16***  Indicates whether the UE supports PDSCHs with partially overlapping Resource Elements. The UE that indicates support of this feature shall support *overlapPDSCHsFullyFreqTime-r16.* | Band | No | N/A | N/A |
| ***overlapRateMatchingEUTRA-CRS-r16***  Indicates whether the UE supports two LTE-CRS overlapping rate matching patterns within a part of NR carrier using 15 kHz SCS overlapping with a LTE carrier. If the UE supports this feature, the UE needs to report *multipleRateMatchingEUTRA-CRS-r16*. | Band | No | N/A | FR1 only |
| ***parallelMeasurementWithoutRestriction-r17***  Indicates whether the UE supports measurements on cells belonging to different satellites as the serving cell in parallel with normal operation (i.e. data/control transmission and/or reception, and L1 measurements) of serving cell without scheduling restrictions. The feature is applicable only when the serving satellite is NGSO. If the serving cell belongs to GSO satellite, the scheduling restriction is not applied on the premise that a mixed type of satellites on the same frequency layer is not supported in this release. If not reported, for measurements in parallel with normal operation of serving cell scheduling restrictions shall apply. | Band | No | FDD only | FR1 only |
| ***parallelPRS-MeasRRC-Inactive-r17***  Indicates whether the UE supports performing RRM measurement and PRS measurement in parallel. UE shall set the capability value consistently for all FDD-FR1 bands, all TDD-FR1 bands, all TDD-FR2-1 bands and all TDD-FR2-2 bands respectively | Band | No | N/A | N/A |
| ***pdcch-SkippingWithoutSSSG-r17***  Indicates whether the UE supports up to 2-bit indication of PDCCH skipping by scheduling DCI if SSSG is not configured as specified in TS 38.213 [11], clause 10.4. | Band | No | N/A | N/A |
| ***pdcch-SkippingWithSSSG-r17***  Indicates whether the UE supports 2-bit indication of SSSG switching between 2 SSSGs, PDCCH skipping by scheduling DCI, and timer based SSSG switching as specified in TS 38.213 [11], clause 10.4. UE supports search space set group switching capability-1 according to Table 10.4-1 of TS 38.213 [11].  UE indicating support of this feature shall also indicate support of *pdcch-SkippingWithoutSSSG-r17* and *sssg-Switching-1bitInd-r17*. | Band | No | N/A | N/A |
| ***pdsch-1024QAM-2MIMO-FR1-r17***  Indicates whether the UE supports 1024QAM modulation scheme for PDSCH with maximum 2 MIMO layers for FR1 as defined in TS 38.211 [6], MCS and CQI feedback tables based on 1024QAM modulation order as defined in TS 38.214 [12].  UE indicating support of this feature shall also indicate support of *pdsch-256QAM-FR1* and shall not indicate support of *pdsch-1024QAM-FR1-r17*. | Band | No | N/A | FR1 only |
| ***pdsch-1024QAM-FR1-r17***  Indicates whether the UE supports 1024QAM modulation scheme for PDSCH for FR1 as defined in TS 38.211 [6], MCS and CQI feedback tables based on 1024QAM modulation order as defined in TS 38.214 [12].  UE indicating support of this feature shall also indicate support of *pdsch-256QAM-FR1* and shall not indicate support of *pdsch-1024QAM-2MIMO-FR1-r17*. | Band | No | N/A | FR1 only |
| ***pdsch-256QAM-FR2***  Indicates whether the UE supports 256QAM modulation scheme for PDSCH for FR2 as defined in 7.3.1.2 of TS 38.211 [6]. | Band | No | N/A | FR2 only |
| ***pdsch-MappingTypeB-Alt-r16***  Indicates whether the UE supports PDSCH Type B scheduling of length 9 and 10 OFDM symbols, and DMRS shift for length-10 symbols. If the UE supports this feature, the UE needs to report *pdsch-MappingTypeB*. | Band | No | N/A | FR1 only |
| ***periodicBeamReport***  Indicates whether UE supports periodic 'CRI/RSRP' or 'SSBRI/RSRP' reporting using PUCCH formats 2, 3 and 4 in one slot. | Band | Yes | N/A | N/A |
| ***posSRS-RRC-Inactive-OutsideInitialUL-BWP-r17***  Indicates support of Positioning SRS transmission in RRC\_INACTIVE state configured outside initial UL BWP. The capability signalling comprises the following parameters:  - *maxSRSposBandwidthForEachSCS-withinCC-FR1-r17* Indicates the maximum SRS bandwidth supported for each SCS that UE supports within a single CC for FR1*;*  - *maxSRSposBandwidthForEachSCS-withinCC-FR2-r17* indicates the maximum SRS bandwidth supported for each SCS that UE supports within a single CC for FR2;  - *maxNumOfSRSposResourceSets-r17* indicates the max number of SRS Resource Sets for positioning supported by UE;  - *maxNumOfPeriodicSRSposResources-r17* indicates the max number of periodic SRS Resources for positioning;  - *maxNumOfPeriodicSRSposResourcesPerSlot-r17* indicates the max number of periodic SRS Resources for positioning per slot;  - *differentNumerologyBetweenSRSposAndInitialBWP-r17* indicates the support of different numerology between the SRS and the initial UL BWP;  - *srsPosWithoutRestrictionOnBWP-r17* indicates the support of SRS operation without restriction on the BW: BW of the SRS may not include BW of the CORESET#0 and SSB;  - *maxNumOfPeriodicAndSemipersistentSRSposResources-r17* indicates the max number of P/SP SRS Resources for positioning;  - *maxNumOfPeriodicAndSemipersistentSRSposResourcesPerSlot-r17* indicates the max number of P/SP SRS Resources for positioning per slot;  - *differentCenterFreqBetweenSRSposAndInitialBWP-r17* indicates the support of a different center frequency between the SRS for positioning and the initial UL BWP;  - *switchingTimeSRS-TX-OtherTX-r17* indicates the switching time between SRS TX and other TX in initial UL BWP or RX in initial DL BWP  - *maxNumOfSemiPersistentSRSposResources-r17* indicates the max number of semi-persistent SRS Resources for positioning;  - *maxNumOfSemiPersistentSRSposResourcesPerSlot-r17* indicates the max number of semi-persistent SRS Resources for positioning per slot.  The UE can include this field only if the UE supports *srs-PosResourcesRRC-Inactive-r17*. Otherwise, the UE does not include this field;  NOTE 1: The SRS should have a *locationAndBandwidth*, SCS, CP, defined the same way as a legacy BWP.  NOTE 2: If *differentCenterFreqBetweenSRSposAndInitialBWP-r17* is not signalled, the UE only supports same center frequency between the SRS for positioning and initial UL BWP.  NOTE 3: If *differentNumerologyBetweenSRSposAndInitialBWP-r17* is not signalled, the UE only supports same numerology between the SRS and the initial UL BWP.  NOTE 4: If *srsPosWithoutRestrictionOnBWP-r17* is not signalled, the UE supports only SRS BW that include the BW of the CORESET #0 and SSB.  NOTE 5: The fields of *maxNumOfSemiPersistentSRSposResources-r17* and *maxNumOfSemiPersistentSRSposResourcesPerSlot-r17* shall be reported together if supported by UE. One of the fields between *maxSRSposBandwidthForEachSCS-withinCC-FR1-r17* and *maxSRSposBandwidthForEachSCS-withinCC-FR2-r17,* and the fields of *maxNumOfSRSposResourceSets-r17, maxNumOfPeriodicSRSposResources-r17, maxNumOfPeriodicSRSposResourcesPerSlot-r17, maxNumOfPeriodicAndSemipersistentSRSposResources-r17, maxNumOfPeriodicAndSemipersistentSRSposResourcesPerSlot-r17,* and *switchingTimeSRS-TX-OtherTX-r17* shall be reported together if supported by UE.  NOTE 6: *srsPosWithoutRestrictionOnBWP-r17* is not applicable to FDD or SUL bands. | Band | No | N/A | N/A |
| ***posUE-TA-AutoAdjustment-r18***  Indicates whether UE supports of autonomous TA adjustment when cell-reselection happens. | Band | No | N/A | N/A |
| ***posJointTriggerBySingleDCI-RRC-Connected-r18***  Indicates whether UE supports of a Rel-17 single DCI scheduling positioning SRS resource sets across the linked carriers for SRS bandwidth aggregation in RRC\_CONNECTED state. | Band | No | N/A | N/A |
| ***powerBoosting-pi2BPSK***  Indicates whether UE supports power boosting for pi/2 BPSK, when applicable as defined in 6.2 of TS 38.101-1 [2] v16.9.0. It is mandatory with capability signalling. This capability is not applicable to IAB-MT. | Band | CY | TDD only | FR1 only |
| ***posSRS-RRC-InactiveInitialUL-BWP-r18***  Indicates whether UE supports of preconfigured SRS with validity area in RRC\_INACTUIVE for initial BWP. The UE can include this field only if the UE support of SRS for positioning configuration in multiple cells for UEs in RRC\_INACTIVE state for initial UL BWP. | Band | No | N/A | N/A |
| ***posSRS-RRC-InactiveOutsideitialUL-BWP-r18***  Indicates whether UE supports preconfigured SRS with validity area in RRC\_INACTUIVE outside initial BWP. The UE can include this field only if the UE support of SRS for positioning configuration in multiple cells for UEs in RRC\_INACTIVE state configured outside initial UL BWP. | Band | No | N/A | N/A |
| ***priorityIndicatorInDCI-Multicast-r17***  Indicates whether the UE supports DL priority indication for multicast in DCI, comprised of the following functional components:  - Support of priority indicator field configured in DCI formats 4\_2 with CRC scrambled with G-RNTI for multicast;  - Supports two HARQ-ACK codebooks with different priorities to be simultaneously constructed different priorities for multicast and multicast at a UE.  For TN, the UE shall set the capability value consistently for all FDD-FR1 bands, all TDD-FR1 bands and all TDD-FR2 bands, associated with supported shared and non-shared spectrum respectively. For NTN, UE shall set the capability value consistently for all FDD-FR1 NTN bands.  A UE supporting this feature shall also indicate support of *ack-NACK-FeedbackForMulticast-r17* and *dynamicMulticastDCI-Format4-2-r17*. | Band | No | N/A | N/A |
| ***priorityIndicatorInDCI-SPS-Multicast-r17***  Indicates whether the UE supports priority indicator field configured in DCI format 4\_2 for multicast HARQ-ACK feedback of SPS multicast.  For TN, the UE shall set the capability value consistently for all FDD-FR1 bands, all TDD-FR1 bands and all TDD-FR2 bands, associated with supported shared and non-shared spectrum respectively. For NTN, UE shall set the capability value consistently for all FDD-FR1 NTN bands.  A UE supporting this feature shall also indicate support of *ack-NACK-FeedbackForSPS-Multicast-r17* and *sps-MulticastDCI-Format4-2-r17*. | Band | No | N/A | N/A |
| ***prs-MeasurementWithoutMG-r17***  Indicates whether the UE supports using the threshold to compare the Rx time difference between the serving cell and a neighbor cell/TRP for PRS measurements, as defined in clause 9.9.1.2 of TS 38.133 [5], to determine whether the PRS from the non-serving cell satisfy the condition of PRS measurement outside MG. The UE can include this field only if the UE supports one of *prs-ProcessingWindowType1A-r17, prs-ProcessingWindowType1B-r17* and *prs-ProcessingWindowType2-r17*. | Band | No | N/A | N/A |
| ***prs-ProcessingCapabilityOutsideMGinPPW-r17***  Indicates the DL-PRS Processing Capability outside MG of each of the supported PRS Processing Window (PPW) Type in the case the UE supports multiple PPW Types in a band and comprises the following subfields:  - *prsProcessingType-r17****:*** Indicates the PPW Type for which the *prs-ProcessingCapabilityOutsideMGinPPW-r17* are provided.  - *ppw-dl-PRS-BufferType-r17*: Indicates DL-PRS buffering capability. Value *'type1'* indicates sub-slot/symbol level buffering and value *'type2'* indicates slot level buffering.  - *ppw-durationOfPRS-Processing1-r17*: Indicates the duration of DL-PRS symbols N in units of ms a UE can process every T ms assuming maximum DL-PRS bandwidth provided in *ppw-maxNumOfDL-Bandwidth-r17* and comprises the following subfields  - *ppw-durationOfPRS-ProcessingSymbolsN-r17*: This field specifies the values for *N* with values msDot125 indicates 0.125ms, msDot25 indicates 0.25ms, and so on  - *ppw-durationOfPRS-ProcessingSymbolsT-r17*: This field specifies the values for *T* with values ms1 indicates 1ms, ms2 indicates 2ms, and so on.  - *ppw-durationOfPRS-Processing2-r17*: Indicates the duration of DL-PRS symbols N2 in units of ms a UE can process every T2 ms assuming maximum DL-PRS bandwidth provided in *ppw-maxNumOfDL-Bandwidth-r17* and comprises the following subfields:  - *ppw-durationOfPRS-ProcessingSymbolsN2-r17*: This field specifies the values for *N2* with values msDot125 indicates 0.125ms, msDot25 indicates 0.25ms, and so on.  - *ppw-durationOfPRS-ProcessingSymbolsT2-r17*: This field specifies the values for *T2* with values ms4 indicates 4ms, ms5 indicates 5ms, and so on.  - *ppw-maxNumOfDL-PRS-ResProcessedPerSlot-r17*: Indicates the maximum number of DL PRS bandwidth in MHz, which is supported and reported by UE for PRS measurement outside MG within the PPW.  - *ppw-maxNumOfDL-Bandwidth-r17*: Indicates the maximum number of DL PRS bandwidth in MHz for FR1 and FR2, which is supported and reported by UE for PRS measurement outside MG within the PPW.  The UE can include this field only if the UE supports one of *prs-ProcessingWindowType1A-r17*, *prs-ProcessingWindowType1B-r17* and *prs-ProcessingWindowType2-r17*. Otherwise, the UE does not include this field.  NOTE 1: A UE that supports one of *prs-ProcessingWindowType1A-r17*, *prs-ProcessingWindowType1B-r17* or *prs-ProcessingWindowType2-r17* shall always include the *prs-ProcessingCapabilityOutsideMGinPPW-r17*.  NOTE 2: The (N, T) in *ppw-durationOfPRS-Processing1-r17* is interpreted as in (N,T) in *durationOfPRS-Processing-r16* in TS 37.355 [22], and the UE is expected to receive the DL-PRS within the PPW but the processing of the received DL-PRS may be outside a PPW  NOTE 3: The (N2, T2) in *ppw-durationOfPRS-Processing2-r17* is interpreted such that the UE is capable of measuring up to N2 ms DL-PRS within a PPW and is capable of completing the DL-PRS processing within the PPW, e.g., if the time duration from the last symbol of the measured DL-PRS resource(s) inside the PPW to the end of PPW is not smaller than T2 ms.  NOTE 4: A UE which supports *prs-ProcessingCapabilityOutsideMGinPPW-r17* shall support either *ppw-durationOfPRS-Processing1-r17* or *ppw-durationOfPRS-Processing2-r17*, but not both for each supported PPW type in a band. | Band | No | N/A | N/A |
| ***prs-ProcessingRRC-Inactive-r17***  Indicates whether the UE supports PRS processing in RRC\_INACTIVE. | Band | No | N/A | N/A |

Unchanged part skipped

Unchanged part skipped

#### 4.2.21 RedCap Parameters

#### 4.2.21.1 Definition of RedCap UE

RedCap UE is the UE with reduced capability:

- The maximum bandwidth is 20 MHz for FR1, and is 100 MHz for FR2. UE features and corresponding capabilities related to UE bandwidths wider than 20 MHz in FR1 or wider than 100 MHz in FR2 are not supported by RedCap UEs;

- The maximum mandatory supported DRB number is 8;

- The mandatory supported PDCP SN length is 12 bits while 18 bits being optional;

- The mandatory supported RLC AM SN length is 12 bits while 18 bits being optional;

- For FR1, 1 DL MIMO layer if 1 Rx branch is supported, and 2 DL MIMO layers if 2 Rx branches are supported; for FR2, either 1 or 2 DL MIMO layers can be supported, while 2 Rx branches are always supported. For FR1 and FR2, UE features and corresponding capabilities related to more than 2 UE Rx branches or more than 2 DL MIMO layers, as well as UE features and capabilities related to more than 1 UE Tx branch or more than 1 UL MIMO layer are not supported by RedCap UEs;

- CA, MR-DC, DAPS, CPAC and IAB (i.e., the RedCap UE is not expected to act as IAB node) related UE features and corresponding capabilities are not supported by RedCap UEs. All other feature groups or components of the feature groups as captured in TR 38.822 [24] as well as capabilities specified in this specification remain applicable for RedCap UEs same as non-RedCap UEs, unless indicated otherwise.

#### 4.2.21.2 General parameters

|  |  |  |  |
| --- | --- | --- | --- |
| Definitions for parameters | Per | M | FDD-TDD DIFF |
| ***ncd-SSB-ForRedCapInitialBWP-SDT-r17***  Indicates that the UE supports using RedCap-specific initial DL BWP associated with NCD-SSB for SDT. If absent, the UE only supports SDT in an initial DL BWP that includes the CD-SSB. UE supporting this feature shall indicate support of *supportOfRedCap-r17* and *ra-SDT-r17 and/or cg-SDT-r17*. | UE | No | No |
| ***supportOf16DRB-RedCap-r17***  Indicates whether the RedCap UE supports 16 DRBs. This capability is only applicable for RedCap UEs. | UE | No | No |
| ***supportOfRedCap-r17***  Indicates that the UE is a RedCap UE with comprised of at least the following functional components:  - Maximum FR1 RedCap UE bandwidth is 20 MHz;  - Maximum FR2 RedCap UE bandwidth is 100 MHz;  - Support of RedCap early indication based on Msg1, MsgA (if UE indicated support of t*woStepRACH-r16*) and Msg3 for random access;  - Separate initial UL BWP for RedCap UEs;  - It includes the configuration(s) needed for RedCap UE to perform random access  - Enabling/disabling of frequency hopping for common PUCCH resources  - Separate initial DL BWP for RedCap UEs;  - It includes CSS/CORESET for random access  - For separate initial DL BWP used for paging, CD-SSB is included  - For separate initial DL BWP only used for RACH, SSB may or may not be included  - For separate initial DL BWP used in connected mode as BWP#0 configuration option 1, CD-SSB is included  - 1 UE-specific RRC configured DL BWP per carrier;  - 1 UE-specific RRC configured UL BWP per carrier;  - UE-specific RRC-configured DL BWP with CD-SSB or NCD-SSB;  - NCD-SSB based measurements in RRC-configured DL BWP.  A RedCap UE shall set the field to *supported*. | UE | CY | No |

#### 4.2.21.3 PDCP parameters

|  |  |  |  |
| --- | --- | --- | --- |
| Definitions for parameters | Per | M | FDD-TDD DIFF |
| ***longSN-RedCap-r17***  Indicates whether the RedCap UE supports 18 bit length of PDCP sequence number. This capability is only applicable for RedCap UEs. | UE | No | No |

#### 4.2.21.4 RLC parameters

|  |  |  |  |
| --- | --- | --- | --- |
| Definitions for parameters | Per | M | FDD-TDD DIFF |
| ***am-WithLongSN-RedCap-r17***  Indicates whether the RedCap UE supports AM DRB with 18 bit length of RLC sequence number. This capability is only applicable for RedCap UEs. | UE | No | No |

#### 4.2.21.5 MeasAndMobParameters

| Definitions for parameters | Per | M | FDD-TDD DIFF | FR1-FR2 DIFF |
| --- | --- | --- | --- | --- |
| ***rrm-RelaxationRRC-ConnectedRedCap-r17***  Indicates whether UE supports Rel-17 relaxed RRM measurements in RRC\_CONNECTED as specified in TS 38.331 [9]. | UE | No | No | No |

#### 4.2.21.6 Physical layer parameters

##### 4.2.21.6.1 *BandNR* parameters

| Definitions for parameters | Per | M | FDD-TDD  DIFF | FR1-FR2  DIFF |
| --- | --- | --- | --- | --- |
| ***bwp-WithoutCD-SSB-OrNCD-SSB-RedCap-r17***  Indicates support of RRC-configured DL BWP without CD-SSB or NCD-SSB. The UE can include this field only if the UE supports *supportOfRedCap-r17*. | Band | No | N/A | N/A |
| ***halfDuplexFDD-TypeA-RedCap-r17***  Indicates support of Half-duplex FDD operation (instead of full-duplex FDD operation) type A for RedCap UE. The UE can include this field only if the UE supports *supportOfRedCap-r17*. | Band | No | FDD only | FR1 only |
| ***dl-PRS-MeasurementWithRxFH-RRC-InactiveForRedCap-r18***  Indicates whether UE supports of PRS measurement with Rx frequency hopping in RRC\_INACTIVE for RedCap UEs. The UE can include this field only if the UE supports PRS measurement with Rx frequency hopping within a MG and measurement reporting in RRC\_CONNECTED state and *prs-ProcessingRRC-Inactive-r17*. Otherwise, the UE does not include this field. | Band | No | N/A | N/A |
| ***dl-PRS-MeasurementWithRxFH-RRC-IdleForRedCap-r18***  Indicates whether UE supports of PRS measurement with Rx frequency hopping in RRC\_IDLE for RedCap UEs. The UE can include this field only if the UE supports PRS measurement with Rx frequency hopping within a MG and measurement reporting in RRC\_CONNECTED state | Band | No | N/A | N/A |

End of the change