**3GPP TSG-WG2 Meeting #101bis *R2-18xxxxx***

**Busan, Republic of Korea, 21st – 25th May 2018 (revision of** [**R2-1806451**](file:///U%3A%5CData%5CSVN%5CSWEA%5CSwea-L23%5CRAN2_101bis_Sanya%5CDocs%5CR2-1806451.zip)**)**

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| *CR-Form-v11.2* |
| **CHANGE REQUEST** |
|  |
|  | **38.331** | **CR** |  | **rev** |  | **Current version:** | **15.1.0** |  |
|  |
| *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)*.* |
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| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network | **X** | Core Network |  |

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| ***Title:***  |

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| UE capability signalling structure for NR |
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| ***Source to WG:*** |  |
| ***Source to TSG:*** | R2 |
|  |  |
| ***Work item code:*** | NR\_newRAT-Core |  | ***Date:*** | 2018-05-03 |
|  |  |  |  |  |
| ***Category:*** | **F** |  | ***Release:*** | Rel-15 |
|  | *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-12 (Release 12)Rel-13 (Release 13)Rel-14 (Release 14)Rel-15 (Release 15)Rel-16 (Release 16)* |
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| ***Reason for change:*** |  |
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| ***Summary of change:*** |  |
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| ***Consequences if not approved:*** |  |
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| ***Clauses affected:*** |  |
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|  | **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:*** |  |

## 5.6 UE capabilities

### 5.6.1 UE capability transfer

#### 5.6.1.1 General

Editor’s Note: Targeted for completion in Sept 2018

#### 5.6.1.2 Initiation

Editor’s Note: Targeted for completion in Sept 2018.

#### 5.6.1.3 Reception of the *UECapabilityEnquiry* by the UE

Editor’s Note: Targeted for completion in Sept 2018.

#### 5.6.1.4 Compilation of band combinations supported by the UE

The UE shall:

1> if includes *FreqBandList* is received:

2> compile a list of band combinations, candidate for inclusion in the *UECapabilityInformation* message, only consisting of bands included in *FreqBandList*, and prioritized in the order of *FreqBandList*, (i.e. first include remaining band combinations containing the first-listed band, then include remaining band combinations containing the second-listed band, and so on);

2> for each band combination included in the candidate list:

3> if it is regarded as a fallback band combination with the same capabilities of another band combination included in the list of candidates as specified in TS 38.306 [xx]:

4> remove the band combination from the list of candidates;

2> include all band combinations in the candidate list into *supportedBandCombination*;

1> else:

2> include all band combinations supported by the UE into *supportedBandCombination,* excluding fallback band combinations with the same capabilities of another band combination included in the list of band combinations supported by the UE.

#### 5.6.1.5 Compilation of baseband processing combinations supported by the UE

The UE shall:

1> for each band combination included in *supportedBandCombination*:

2> include the baseband processing combination supported for the band combination into *supportedBasebandProcessingCombination*, unless it is already included;

2> if there are the fallback baseband processing combinations of this baseband processing combination as specified in TS 38.306 [xx] for which supported baseband capabilities are different from this baseband processing combination:

3> include only these baseband processing combinations into *supportedBasebandProcessingCombination*.

## ====================== Unmodified Sections Omitted ============================

### 6.3.3 UE capability information elements

#### – *AccessStratumRelease*

The IE *AccessStratumRelease* indicates the release supported by the UE.

*AccessStratumRelease* information element

-- ASN1START

-- TAG-ACCESSSTRATUMRELEASE-START

AccessStratumRelease ::= ENUMERATED {

 rel15, spare7, spare6, spare5, spare4, spare3, spare2, spare1, ... }

-- TAG-ACCESSSTRATUMRELEASE-STOP

-- ASN1STOP

#### – *BandCombinationList*

The IE *BandCombinationList* contains a list of NR CA and/or MR-DC band combinations (also including DL only or UL only band).

*BandCombinationList* information element

-- ASN1START

-- TAG-BANDCOMBINATIONLIST-START

BandCombinationList ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination

BandCombination ::= SEQUENCE {

 bandList SEQUENCE (SIZE (1..maxSimultaneousBands)) OF BandEntry,

 bandCombinationParameters BandCombinationParameters OPTIONAL

}

BandEntry ::= CHOICE

 bandEntryEUTRA BandEntryEUTRA,

 bandEntryNR BandEntryNR

}

BandCombinationParameters ::= SEQUENCE {

 bandCombinationParametersNR BandCombinationParametersNR OPTIONAL,

 bandCombinationParametersMRDC BandCombinationParametersMRDC OPTIONAL

}

BandCombinationParametersNR ::= SEQUENCE {

 multipleTimingAdvances ENUMERATED {supported} OPTIONAL,

 simultaneousRxTxInterBandCA ENUMERATED {supported} OPTIONAL,

 supportedBandwidthCombinationSet BIT STRING (SIZE (1..32)) OPTIONAL

}

BandCombinationParametersMRDC ::= SEQUENCE {

 singleUL-Transmission ENUMERATED {supported} OPTIONAL,

 ul-SharingEUTRA-NR ENUMERATED {supported} OPTIONAL,

 ul-SwitchingTimeEUTRA-NR ENUMERATED {type1, type2} OPTIONAL,

 simultaneousRxTxInterBandENDC ENUMERATED {supported} OPTIONAL,

 asyncIntraBandENDC ENUMERATED {supported} OPTIONAL

}

-- TAG-BANDCOMBINATIONLIST-STOP

-- ASN1STOP

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| *BandCombinationParametersNR field descriptions* |
| ***simultaneousRxTxInterBandCA***R4 2-5: Simultaneous reception and transmission for inter band CA (TDD-TDD or TDD-FDD) |
| ***supportedBandwidthCombinationSet***BCS related to R4 2-1 and Updated CA BW class in R4-1803374 |

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| *BandCombinationParametersMRDC field descriptions* |
| ***asyncIntraBandENDC***R4 2-6: Asynchronous FDD-FDD intra-band EN-DC |
| ***simultaneousRxTxInterBandENDC***R4 2-4: Simultaneous reception and transmission for inter-band EN-DC (TDD-TDD or TDD-FDD) |
| ***ul-SharingEUTRA-NR***R4 1-10: Support of EN-DC with LTE-NR coexistence in UL sharing from UE perspective |
| ***ul-SwitchingTimeEUTRA-NR***R4 1-11: Switching time between LTE UL and NR UL for EN-DC with LTE-NR coexistence in UL sharing from UE perspective |

#### – *BandEntryEUTRA*

The IE *BandEntryEUTRA* is used to indicate the band number and lists of uplink and downlink feature sets that the UE supports on the carrier(s) corresponding to this band entry.

The feature sets referred to from this list are defined in 36.331 as and conveyed as part of the UE-EUTRA-Capability container. The FeatureSetUL-Id-r15 and FeatureSetDL-Id-r15 in the EUTRA feature sets correspond to the FeatureSetUplinkIdEUTRA and FeatureSetDownlinkIdEUTRA, respectively.

The featureSetListDownlink and featureSetListUplink in all BandEntries of a band combination shall have the same number of elements. The UE shall support the combination of feature sets that are at the same position in all band entries and at the same position in the featureSetListDownlink and featureSetListUplink.

*BandEntryEUTRA* information element

-- ASN1START

-- TAG-BANDENTRYEUTRA-START

BandParameterEUTRA ::= SEQUENCE {

 bandNR FreqBandIndicatorEUTRA,

 featureSetListDownlink SEQUENCE (SIZE (1..maxNrofFeatureSetsPerBC) OF FeatureSetDownlinkId-EUTRA,

 featureSetListUplink SEQUENCE (SIZE (1..maxNrofFeatureSetsPerBC) OF FeatureSetUplinkId-EUTRA

}

-- TAG-BANDENTRYEUTRA-STOP

-- ASN1STOP

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| *BandParameterNR field descriptions* |
| ***featureSetListDownlink***The downlink feature sets that are supported on the downlink carrier(s) corresponding to this band entry. The FeatureSetDownlinkId = 0 indicates that the UE does not support configuration of a serving cell. |
| ***featureSetListUplink***The uplink feature sets that are supported on the uplink carrier(s) corresponding to this band entry. The FeatureSetUplinkId = 0 indicates that the UE does not support configuration of a serving cell. |

#### – *BandEntryNR*

The IE *BandEntryNR* is used to indicate the band number and lists of uplink and downlink feature sets that the UE supports on the carrier(s) corresponding to this band entry.

The featureSetListDownlink and featureSetListUplink in all BandEntries of a band combination shall have the same number of elements. The UE shall support the combination of feature sets that are at the same position in all band entries and at the same position in the featureSetListDownlink and featureSetListUplink.

*BandEntryNR* information element

-- ASN1START

-- TAG-BANDENTRYNR-START

BandParameterNR ::= SEQUENCE {

 bandNR FreqBandIndicatorNR,

 featureSetListDownlink SEQUENCE (SIZE (1..maxNrofFeatureSetsPerBC) OF FeatureSetDownlinkId,

 featureSetListUplink SEQUENCE (SIZE (1..maxNrofFeatureSetsPerBC) OF FeatureSetUplinkId

}

-- TAG-BANDENTRYNR-STOP

-- ASN1STOP

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| *BandParameterNR field descriptions* |
| ***featureSetListDownlink***The downlink feature sets that are supported on the downlink carrier(s) corresponding to this band entry. The FeatureSetDownlinkId = 0 indicates that the UE does not support configuration of a serving cell. |
| ***featureSetListUplink***The uplink feature sets that are supported on the uplink carrier(s) corresponding to this band entry. The FeatureSetUplinkId = 0 indicates that the UE does not support configuration of a serving cell. |

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#### – *CA-BandwidthClassNR*

-- ASN1START

-- TAG-CA-BANDWIDTHCLASSNR-START

-- Updated based on R4-1803374

CA-BandwidthClassNR ::= ENUMERATED {a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, ...}

-- TAG-CA-BANDWIDTHCLASSNR-STOP

-- ASN1STOP

#### – *CA-BandwidthClassEUTRA*

-- ASN1START

-- TAG-CA-BANDWIDTHCLASSEUTRA-START

CA-BandwidthClassEUTRA ::= ENUMERATED {a, b, c, d, e, f, ...}

-- TAG-CA-BANDWIDTHCLASSEUTRA-STOP

-- ASN1STOP

#### – *FeatureSetDownlink*

The IE *FeatureSetDownlink* is used to indicate the features that the UE supports on the carriers corresponding to one band entry in a band combination.

*FeatureSetDownlink* information element

-- ASN1START

-- TAG-FEATURESETDOWNLINK-START

FeatureSetDownlink ::= SEQUENCE {

 featureSetDownlinkId FeatureSetDownlinkId,

 freqRange ENUMERATED {fr1, fr2},

 ca-bandwidthClassDL CA-BandwidthClassNR,

 intraBandFreqSeparationDL FreqSeparationClass OPTIONAL,

 featureSetsPerDownlinkCC SEQUENCE (SIZE (1..maxNrofServingCells)) OF FeatureSetDownlinkPerCC-Id,

 ...

}

-- TAG-FEATURESETDOWNLINK-STOP

-- ASN1STOP

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| *FeatureSetDownlink field descriptions* |
| ***featureSetDownlinkId***A unique ID for this feature set which is used to refer from a BandEntry in a BandCombination to the supported feature sets. |
| ***featureSetsPerDownlinkCC***Indicates which features the UE supports on the individual carriers of the feature set (and hence of a band entry that refer to the feature set). The UE shall hence include as many FeatureSetDownlinkPerCC-Id in this list as the number of carriers it supports according to the ca-bandwidthClassDL. The order of the elements in this list is not relevant, i.e., the network may configure any of the carriers in accordance with any of the FeatureSetDownlinkPerCC-Id in this list. |
| ***intraBandFreqSeparationDL***R4 2-3: Non-contiguous intra-band CA frequency separation class for FR2 as in the RAN4 LS R4-1803363 |

#### – *FeatureSetDownlinkId*

The IE *FeatureSetDownlinkId* identifies a downlink feature set. The *FeatureSetDownlinkId=0* is not used by an actual *FeatureSetDownlink* but means that the UE does not support a carrier in this band of a band combination.

*FeatureSetDownlinkId* information element

-- ASN1START

-- TAG-FEATURESETDOWNLINKID-START

FeatureSetDownlinkId ::= INTEGER (0..maxNrofFeatureSetsDownlink)

-- TAG-FEATURESETDOWNLINKID-STOP

-- ASN1STOP

#### – *FeatureSetDownlinkId-EUTRA*

The IE *FeatureSetDownlinkId-EUTRA* identifies a downlink feature set. The *FeatureSetDownlinkId-EUTRA=0* is not used by an actual *FeatureSetDownlink* but means that the UE does not support a carrier in this band of a band combination.

*FeatureSetDownlinkId-EUTRA* information element

-- ASN1START

-- TAG-FEATURESETDOWNLINKID-EUTRA-START

FeatureSetDownlinkId-EUTRA ::= INTEGER (0..maxNrofFeatureSetsDownlink-EUTRA)

-- TAG-FEATURESETDOWNLINKID-EUTRA-STOP

-- ASN1STOP

#### – *FeatureSetDownlinkPerCC*

The IE *FeatureSetDownlinkPerCC* is used to indicate the features that the UE supports for one component carrier of a band entry.

*FeatureSetDownlinkPerCC* information element

-- ASN1START

-- TAG-FEATURESETDOWNLINKPERCC-START

FeatureSetDownlinkPerCC ::= SEQUENCE {

 featureSetDownlinkPerCC-Id FeatureSetDownlinkPerCC-Id,

 supportedSubcarrierSpacingDL SubcarrierSpacing,

 supportedBandwidthDL CHOICE {

 fr1 ENUMERATED {mhz5, mhz10, mhz15, mhz20, mhz25, mhz30, mhz40, mhz50, mhz60, mhz80, mhz100},

 fr2 ENUMERATED {mhz50, mhz100, mhz200, mhz400}

 },

 scalingFactor0dot75 ENUMERATED {supported} OPTIONAL,

 timeDurationForQCL SEQUENCE {

 scs-60kHz ENUMERATED {s7, s14, s28} OPTIONAL,

 sch-120kHz ENUMERATED {s14, s28} OPTIONAL

 } OPTIONAL,

 scellWithoutSSB ENUMERATED {supported} OPTIONAL,

 csi-RS-MeasSCellWithoutSSB ENUMERATED {supported} OPTIONAL,

 maxNumberMIMO-LayersPDSCH MIMO-LayersDL OPTIONAL,

 supportedModulationOrderDL ModulationOrder OPTIONAL,

 srs-AssocCSI-RS ENUMERATED {supported} OPTIONAL,

 type1-3-CSS ENUMERATED {supported} OPTIONAL,

 pdcchMonitoringAnyOccasions ENUMERATED {withoutDCI-gap, withDCI-gap} OPTIONAL,

 ue-SpecificUL-DL-Assignment ENUMERATED {supported} OPTIONAL,

 pdsch-DifferentTB-PerSlot SEQUENCE {

 scs-15kHz ENUMERATED {upto2, upto7} OPTIONAL,

 scs-30kHz ENUMERATED {upto2, upto7} OPTIONAL,

 scs-60kHz ENUMERATED {upto2, upto7} OPTIONAL,

 scs-120kHz ENUMERATED {upto2, upto7} OPTIONAL

 } OPTIONAL,

 crossCarrierScheduling ENUMERATED {supported} OPTIONAL,

 searchSpaceSharingCA-DL ENUMERATED {supported} OPTIONAL

}

-- TAG-FEATURESETDOWNLINKPERCC-STOP

-- ASN1STOP

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| *FeatureSetDownlinkPerCC field descriptions* |
| ***crossCarrierScheduling***R1 6-10: Cross carrier scheduling |
| ***csi-RS-MeasSCellWithoutSSB***R1 1-11: Support of CSI-RS RRM measurement for SCell without SS/PBCH block |
| ***maxNumberMIMO-LayersPDSCH***R1 2-3: PDSCH MIMO layers. Absence of this field implies support of one layer. |
| ***pdcchMonitoringAnyOccasions***R1 3-5 & 3-5a: For type 1 with dedicated RRC configuration, type 3, and UE-SS,, monitoring occasion can be any OFDM symbol(s) of a slot for Case 2 (with a DCI gap) |
| ***pdsch-DifferentTB-PerSlot***R1 5-11 & 5-11a: Up to 2/7 unicast PDSCHs per slot for different TBs |
| ***scalingFactor0dot75***R2-1800012. To be confirmed by RAN1 |
| ***scellWithoutSSB***R1 1-10: Support of SCell without SS/PBCH block |
| ***searchSpaceSharingCA-DL***R1 6-21: DL search space sharing for CA |
| ***srs-AssocCSI-RS***R1 2-15a: Association between CSI-RS and SRS |
| ***supportedBandwidthDL***Accoding to the RAN4 LS R4-1803563, maximum Bandwidth supported per CC is added in BPC FFS how to work together with BCS and max BW for each CC to be defined for each CA band combination in the RAN4 spec. |
| ***supportedModulationOrderDL***Accoding to the RAN4 LS R4-1803563, modulation order is added per CC granularity in BPC FFS whether all of modulation order specified in the spec need to be signalled. FFS how to address the requirements agreed by RAN4, e.g. mandaotry w/o capabiltiy for 64QAM. mandaotry with capabiltiy for DL 256QAM in FR1. |
| ***supportedSubcarrierSpacingDL***R4 2-2: Simultaneous reception or transmission with same or different numerologies in CA It is expressed by the combination of SCS whether simultaneous RxTx is supported or not. |
| ***timeDurationForQCL***R1 2-2: PDSCH beam switching |
| ***type1-3-CSS***R1 3-1a: For type 1 CSS with dedicated RRC configuration and for type 3 CSS, UE specific SS, CORESET resource allocation of 6RB bit-map and duration 3 OFDM symbols for FR2 |
| ***ue-SpecificUL-DL-Assignment***R1 5-1a: UE specific RRC configure UL/DL assignment |

#### – *FeatureSetDownlinkPerCC-Id*

The IE *FeatureSetDownlinkPerCC-Id* is used to configure FFS

*FeatureSetDownlinkPerCC-Id* information element

-- ASN1START

-- TAG-FEATURESETDOWNLINKPERCC-ID-START

FeatureSetDownlinkPerCC-Id ::= INTEGER (0..maxNrofPerCC-FeatureSets)

-- TAG-FEATURESETDOWNLINKPERCC-ID-STOP

-- ASN1STOP

#### – *FeatureSetUplink*

The IE *FeatureSetUplink* is used to indicate the features that the UE supports on the carriers corresponding to one band entry in a band combination.

*FeatureSetUplink* information element

-- ASN1START

-- TAG-FEATURESETUPLINK-START

FeatureSetUplink ::= SEQUENCE {

 featureSetUplinkId FeatureSetUplinkId,

 freqRange ENUMERATED {fr1, fr2},

 ca-BandwidthClassesUL CA-BandwidthClassNR,

 intraBandFreqSeparationUL FreqSeparationClass OPTIONAL,

 featureSetsPerUplinkCC SEQUENCE (SIZE (1.. maxNrofServingCells)) OF FeatureSetUplinkPerCC-Id,

 ...

}

-- TAG-FEATURESETUPLINK-STOP

-- ASN1STOP

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| *FeatureSetUplink field descriptions* |
| ***featureSetsPerUplinkCC***Indicates which features the UE supports on the individual carriers of the feature set (and hence of a band entry that refer to the feature set). The UE shall hence include as many FeatureSetUplinkPerCC-Id in this list as the number of carriers it supports according to the ca-bandwidthClassUL. The order of the elements in this list is not relevant, i.e., the network may configure any of the carriers in accordance with any of the FeatureSetUplinkPerCC-Id in this list. |
| ***featureSetUplinkId***A unique ID for this feature set which is used to refer from a BandEntry in a BandCombination to the supported feature sets. |
| ***intraBandFreqSeparationUL***R4 2-3: Non-contiguous intra-band CA frequency separation class for FR2 as in the RAN4 LS R4-1803363 |

#### – *FeatureSetUplinkId*

The IE *FeatureSetUplinkId* identifies a uplink feature set. The *FeatureSetUplinkId=0* is not used by an actual *FeatureSetUplink* but means that the UE does not support a carrier in this band of a band combination.

*FeatureSetUplinkId* information element

-- ASN1START

-- TAG-FEATURESETUPLINKID-START

FeatureSetUplinkId ::= INTEGER (0..maxNrofFeatureSetsUplink)

-- TAG-FEATURESETUPLINKID-STOP

-- ASN1STOP

#### – *FeatureSetUplinkId-EUTRA*

The IE *FeatureSetUplinkId-EUTRA* identifies a uplink feature set. The *FeatureSetUplinkId-EUTRA=0* is not used by an actual *FeatureSetUplink* but means that the UE does not support a carrier in this band of a band combination.

*FeatureSetUplinkId-EUTRA* information element

-- ASN1START

-- TAG-FEATURESETUPLINKID-EUTRA-START

FeatureSetUplinkId-EUTRA ::= INTEGER (0..maxNrofFeatureSetsUplink-EUTRA)

-- TAG-FEATURESETUPLINKID-EUTRA-STOP

-- ASN1STOP

#### – *FeatureSetUplinkPerCC*

The IE *FeatureSetUplinkPerCC* is used to configure FFS

*FeatureSetUplinkPerCC* information element

-- ASN1START

-- TAG-FEATURESETUPLINKPERCC-START

BasebandParametersPerCC-UL ::= SEQUENCE {

 featureSetUplinkPerCC-Id FeatureSetUplinkPerCC-Id,

 supportedSubcarrierSpacingUL SubcarrierSpacing,

 supportedBandwidthUL CHOICE {

 fr1 ENUMERATED {mhz5, mhz10, mhz15, mhz20, mhz25, mhz30, mhz40, mhz50, mhz60, mhz80, mhz100},

 fr2 ENUMERATED {mhz50, mhz100, mhz200, mhz400}

 },

 scalingFactor0dot75 ENUMERATED {supported} OPTIONAL,

 maxNumberMIMO-LayersCB-PUSCH MIMO-LayersUL OPTIONAL,

 maxNumberMIMO-LayersNonCB-PUSCH MIMO-LayersUL OPTIONAL,

 supportedModulationOrderUL ModulationOrder OPTIONAL,

 supportedSRS-Resources SRS-Resources OPTIONAL,

 srs-TxSwitch SRS-TxSwitch OPTIONAL,

 lowLatencyCSI-Feedback ENUMERATED {supported} OPTIONAL,

 pusch-DifferentTB-PerSlot SEQUENCE {

 scs-15kHz ENUMERATED {upto2, upto7} OPTIONAL,

 scs-30kHz ENUMERATED {upto2, upto7} OPTIONAL,

 scs-60kHz ENUMERATED {upto2, upto7} OPTIONAL,

 scs-120kHz ENUMERATED {upto2, upto7} OPTIONAL

 } OPTIONAL,

 twoPUCCH-Group ENUMERATED {supported} OPTIONAL,

 diffNumerologyAcrossPUCCH-Group ENUMERATED {supported} OPTIONAL,

 diffNumerologyWithinPUCCH-Group ENUMERATED {supported} OPTIONAL,

 crossCarrierScheduling ENUMERATED {supported} OPTIONAL,

 supportedNumberTAG ENUMERATED {n2, n3, n4} OPTIONAL,

 dynamicSwitchSUL ENUMERATED {supported} OPTIONAL,

 simultaneousTxSUL-NonSUL ENUMERATED {supported} OPTIONAL,

 searchSpaceSharingCA-UL ENUMERATED {supported} OPTIONAL

}

-- TAG-FEATURESETUPLINKPERCC-STOP

-- ASN1STOP

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| *FeatureSetUplinkPerCC field descriptions* |
| ***crossCarrierScheduling***R1 6-10: Cross carrier scheduling |
| ***diffNumerologyAcrossPUCCH-Group***R1 6-8: Different numerology across PUCCH groups |
| ***diffNumerologyWithinPUCCH-Group***R1 6-9: Different numerologies across carriers within the same PUCCH group |
| ***dynamicSwitchSUL***R1 6-18: Supplemental uplink with dynamic switch |
| ***lowLatencyCSI-Feedback***R1 2-57: Support low latency CSI feedback |
| ***maxNumberMIMO-LayersCB-PUSCH***R1 2-14: Codebook based PUSCH MIMO transmission. Absence of this field implies that CB-based PUSCH is not supported. |
| ***maxNumberMIMO-LayersNonCB-PUSCH***R1 2-15: Non-codebook based PUSCH MIMO transmission. Absence of this field implies that Non-CB-based PUSCH is not supported. |
| ***pusch-DifferentTB-PerSlot***R1 5-12 & 5-12a: Up to 2/7 PUSCHs per slot for different TBs |
| ***scalingFactor0dot75***R2-1800012. To be confirmed by RAN1 |
| ***searchSpaceSharingCA-UL***R1 6-22: UL search space sharing for CA |
| ***simultaneousTxSUL-NonSUL***R1 6-19: Simultaneous transmission of SRS on an SUL/non-SUL carrier and PUSCH/PUCCH/SRS/PRACH on the other UL carrier in the same cell Details on the channel/signal combination are to be described in TS 38.306 |
| ***srs-TxSwitch***R1 2-55: SRS Tx switch |
| ***supportedBandwidthUL***Accoding to the RAN4 LS R4-1803563, maximum Bandwidth supported per CC is added in BPC FFS how to work together with BCS and max BW for each CC to be defined for each CA band combination in the RAN4 spec. |
| ***supportedModulationOrderUL***Accoding to the RAN4 LS R4-1803563, modulation order is added per CC granularity in BPC FFS whether all of modulation order specified in the spec need to be signalled. FFS how to address the requirements agreed by RAN4, e.g. mandaotry w/o capabiltiy for 64QAM. mandaotry with capabiltiy for DL 256QAM in FR1. |
| ***supportedNumberTAG***R1 6-11: Number of supported TAGs |
| ***supportedSRS-Resources***R1 2-53: SRS resources |
| ***supportedSubcarrierSpacingUL***R4 2-2: Simultaneous reception or transmission with same or different numerologies in CA It is expressed by the combination of SCS whether simultaneous RxTx is supported or not. |
| ***twoPUCCH-Group***R1 6-7: Two PUCCH group |

#### – *FeatureSetUplinkPerCC-Id*

The IE *FeatureSetUplinkPerCC-Id* is used to configure FFS

*FeatureSetUplinkPerCC-Id* information element

-- ASN1START

-- TAG-FEATURESETUPLINKPERCC-ID-START

FeatureSetUplinkPerCC-Id INTEGER (0..maxNrofPerCC-FeatureSets)

-- TAG-FEATURESETUPLINKPERCC-ID-STOP

-- ASN1STOP

#### – *FeatureSets*

The IE *FeatureSets* is used to configure pools of downlink and uplink features sets. The band combinations refer to the IDs of the feature set(s) that the UE supports.

*FeatureSets* information element

-- ASN1START

-- TAG-FEATURESETS-START

FeatureSets ::= SEQUENCE {

 featureSetsDownlink SEQUENCE (SIZE (1..maxNroDL-FeatureSets) OF FeatureSetDownlink OPTIONAL,

 featureSetsDownlinkPerCC SEQUENCE (SIZE (1..maxNrofPerCC-FeatureSets) OF FeatureSetsDownlinkPerCC OPTIONAL,

 featureSetsUplink SEQUENCE (SIZE (1..maxNroUL-FeatureSets) OF FeatureSetUplink OPTIONAL,

 featureSetsUplinikPerCC SEQUENCE (SIZE (1..maxNrofPerCC-FeatureSets) OF FeatureSetsUplinkPerCC OPTIONAL

}

-- TAG-FEATURESETS-STOP

-- ASN1STOP

#### – *FreqBandIndicatorEUTRA*

-- ASN1START

-- TAG-FREQ-BAND-INDICATOR-EUTRA-START

FreqBandIndicatorEUTRA ::= INTEGER (1..maxBandsEUTRA)

-- TAG-FREQ-BAND-INDICATOR-EUTRA-STOP

-- ASN1STOP

#### – *FreqBandList*

The IE *FreqBandList* is used to contain list of NR and/or E-UTRA frequency bands for which the UE is requested to provide its supported NR CA and/or MR-DC band combinations (i.e. within the UE capability containers for NR and MR-DC, as requested by E-UTRA).

*FreqBandList* information element

-- ASN1START

-- TAG-FREQBANDLIST-START

FreqBandList ::= SEQUENCE (SIZE (1..maxBandsMRDC)) OF FreqBandInformation

FreqBandInformation ::= CHOICE {

 bandEUTRA FreqBandIndicatorEUTRA,

 bandNR FreqBandIndicatorNR

}

-- TAG-FREQBANDLIST-STOP

-- ASN1STOP

#### – *FreqSeparationClass*

The IE *FreqSeparationClas*s is used for an intra-band non-contiguous CA band combination to indicate frequency separation between lower edge of lowest CC and upper edge of highest CC in a frequency band.

*FreqSeparationClass* information element

-- ASN1START

-- TAG-FREQSEPARATIONCLASS-START

FreqSeparationClass ::= ENUMERATED {c1, c2, c3, ...}

-- TAG-FREQSEPARATIONCLASS-STOP

-- ASN1STOP

#### – *MIMO-Layers*

-- ASN1START

-- TAG-MIMO-LAYERS-START

MIMO-LayersDL ::= ENUMERATED {twoLayers, fourLayers, eightLayers}

MIMO-LayersUL ::= ENUMERATED {oneLayer, twoLayers, fourLayers}

-- TAG-MIMO-LAYERS-STOP

-- ASN1STOP

#### – *ModulationOrder*

-- ASN1START

-- TAG-MODULATION-ORDER-START

ModulationOrder ::= ENUMERATED {bpsk-halfpi, bpsk, qpsk, qam16, qam64, qam256}

-- TAG-MODULATION-ORDER-STOP

-- ASN1STOP

#### – *RAT-Type*

The IE *RAT-Type* is used to indicate the radio access technology (RAT), including NR, of the requested/transferred UE capabilities.

*RAT-Type* information element

-- ASN1START

-- TAG-RAT-TYPE-START

RAT-Type ::= ENUMERATED {nr, eutra-nr, spare2, spare1, ...}

-- TAG-RAT-TYPE-STOP

-- ASN1STOP

#### – *UE-CapabilityRAT-ContainerList*

The IE *UE-CapabilityRAT-ContainerList* contains a list of containers, one for each RAT for which UE capabilities are transferred, if any.

*UE-CapabilityRAT-ContainerList* information element

-- ASN1START

-- TAG-UE-CAPABILITY-RAT-CONTAINER-LIST-START

UE-CapabilityRAT-ContainerList ::=SEQUENCE (SIZE (0.. maxRAT-CapabilityContainers)) OF UE-CapabilityRAT-Container

UE-CapabilityRAT-Container ::= SEQUENCE {

 rat-Type RAT-Type,

 ue-CapabilityRAT-Container OCTET STRING

}

-- TAG-UE-CAPABILITY-RAT-CONTAINER-LIST-STOP

-- ASN1STOP

|  |
| --- |
| *UE-CapabilityRAT-ContainerList* field descriptions |
| ***ue-CapabilityRAT-Container***Container for the UE capabilities of the indicated RAT. The encoding is defined in the specification of each RAT:For NR: the encoding of UE capabilities is defined in UE-NR-Capability.For EUTRA-NR: the encoding of UE capabilities is defined in UE-MRDC-Capability |

#### – *UE-MRDC-Capability*

The IE *UE-MRDC-Capability* is used to convey the UE Radio Access Capability Parameters for MR-DC, see TS 38.306 [yy].

*UE-MRDC-Capability* information element

-- ASN1START

-- TAG-UE-MRDC-CAPABILITY-START

UE-MRDC-Capability ::= SEQUENCE {

 measParametersMRDC MeasParametersMRDC OPTIONAL,

 rf-ParametersMRDC RF-ParametersMRDC,

 phy-ParametersMRDC Phy-ParametersMRDC OPTIONAL,

 generalParametersMRDC GeneralParametersMRDC-XDD-Diff OPTIONAL,

 fdd-Add-UE-MRDC-Capabilities UE-MRDC-CapabilityAddXDD-Mode OPTIONAL,

 tdd-Add-UE-MRDC-Capabilities UE-MRDC-CapabilityAddXDD-Mode OPTIONAL,

 fr1-Add-UE-MRDC-Capabilities UE-MRDC-CapabilityAddFRX-Mode OPTIONAL,

 fr2-Add-UE-MRDC-Capabilities UE-MRDC-CapabilityAddFRX-Mode OPTIONAL,

 lateNonCriticalExtension OCTET STRING OPTIONAL,

 nonCriticalExtension SEQUENCE {} OPTIONAL

}

UE-MRDC-CapabilityAddXDD-Mode ::= SEQUENCE {

 phy-ParametersMRDC-XDD-Diff Phy-ParametersMRDC-XDD-Diff OPTIONAL,

 measParametersMRDC-XDD-Diff MeasParametersMRDC-XDD-Diff OPTIONAL,

 generalParametersMRDC-XDD-Diff GeneralParametersMRDC-XDD-Diff OPTIONAL

}

UE-MRDC-CapabilityAddFRX-Mode ::= SEQUENCE {

 phy-ParametersMRDC-FRX-Diff Phy-ParametersMRDC-FRX-Diff OPTIONAL,

 measParametersMRDC-FRX-Diff MeasParametersMRDC-FRX-Diff

}

GeneralParametersMRDC-XDD-Diff ::= SEQUENCE {

 splitSRB-WithOneUL-Path ENUMERATED {supported} OPTIONAL,

 splitDRB-withUL-Both-MCG-SCG ENUMERATED {supported} OPTIONAL,

 srb3 ENUMERATED {supported} OPTIONAL

}

-- TAG-UE-MRDC-CAPABILITY-STOP

-- ASN1STOP

#### – *RF-ParametersMRDC*

The IE *RF-ParametersMRDC* is used to configure FFS

*RF-ParametersMRDC* information element

-- ASN1START

-- TAG-RF-PARAMETERSMRDC-START

RF-ParametersMRDC ::= SEQUENCE {

 supportedBandCombination BandCombinationListMRDC,

}

-- TAG-RF-PARAMETERSMRDC-STOP

-- ASN1STOP

#### – *Phy-ParametersMRDC*

The IE *Phy-ParametersMRDC* is used to configure FFS

*Phy-ParametersMRDC* information element

-- ASN1START

-- TAG-PHY-PARAMETERSMRDC-START

Phy-ParametersMRDC ::= SEQUENCE {

 phy-ParametersMRDC-XDD-Diff Phy-ParametersMRDC-XDD-Diff OPTIONAL,

 phy-ParametersMRDC-FRX-Diff Phy-ParametersMRDC-FRX-Diff OPTIONAL

}

Phy-ParametersMRDC-XDD-Diff ::= SEQUENCE {

 dynamicPowerSharing ENUMERATED {supported} OPTIONAL,

 tdm-Pattern ENUMERATED {supported} OPTIONAL

}

Phy-ParametersMRDC-FRX-Diff ::= SEQUENCE {

 dynamicPowerSharing ENUMERATED {supported} OPTIONAL,

 tdm-Pattern ENUMERATED {supported} OPTIONAL

}

-- TAG-PHY-PARAMETERSMRDC-STOP

-- ASN1STOP

|  |
| --- |
| *Phy-ParametersMRDC-FRX-Diff field descriptions* |
| ***dynamicPowerSharing***R1 8-1: Dynamic power sharing for LTE-NR DC |
| ***tdm-Pattern***R1 6-13 & 8-2: Case 1 Single Tx UL LTE-NR DC |

|  |
| --- |
| *Phy-ParametersMRDC-XDD-Diff field descriptions* |
| ***dynamicPowerSharing***R1 8-1: Dynamic power sharing for LTE-NR DC |
| ***tdm-Pattern***R1 6-13 & 8-2: Case 1 Single Tx UL LTE-NR DC |

#### – *MeasParametersMRDC*

The IE *MeasParametersMRDC* is used to configure FFS

*MeasParametersMRDC* information element

-- ASN1START

-- TAG-MEASPARAMETERSMRDC-START

MeasParametersMRDC ::= SEQUENCE {

 measParametersMRDC-Common MeasParametersMRDC-Common,

 measParametersMRDC-XDD-Diff MeasParametersMRDC-XDD-Diff OPTIONAL,

 measParametersMRDC-FRX-Diff MeasParametersMRDC-FRX-Diff

}

MeasParametersMRDC-Common ::= SEQUENCE {

 independentGapConfig ENUMERATED {supported} OPTIONAL

}

MeasParametersMRDC-XDD-Diff ::= SEQUENCE {

 sftd-MeasPSCell ENUMERATED {supported} OPTIONAL,

 sftd-MeasNR-Cell ENUMERATED {supported} OPTIONAL

}

MeasParametersMRDC-FRX-Diff ::= SEQUENCE {

 simultaneousRxDataSSB-DiffNumerology ENUMERATED {supported} OPTIONAL

}

-- TAG-MEASPARAMETERSMRDC-STOP

-- ASN1STOP

|  |
| --- |
| *MeasParametersMRDC-Common field descriptions* |
| ***independentGapConfig***R4 3-1: Independent measurement gap configurations for FR1 and FR2 |

|  |
| --- |
| *MeasParametersMRDC-FRX-Diff field descriptions* |
| ***simultaneousRxDataSSB-DiffNumerology***R4 3-2: Simultaneous reception of data and SS block with different numerologies when UE conducts the serving cell measurement or intra-frequency measurement |

#### – *UE-NR-Capability*

The IE *UE-NR-Capability* is used to convey the NR UE Radio Access Capability Parameters, see TS 38.306 [yy].

*UE-NR-Capability* information element

-- ASN1START

-- TAG-UE-NR-CAPABILITY-START

UE-NR-Capability ::= SEQUENCE {

 accessStratumRelease AccessStratumRelease,

 pdcp-Parameters PDCP-Parameters,

 rlc-Parameters RLC-Parameters OPTIONAL,

 mac-Parameters MAC-Parameters OPTIONAL,

 phy-Parameters Phy-Parameters,

 rf-Parameters RF-Parameters,

 measParameters MeasParameters OPTIONAL,

 fdd-Add-UE-NR-Capabilities UE-NR-CapabilityAddXDD-Mode OPTIONAL,

 tdd-Add-UE-NR-Capabilities UE-NR-CapabilityAddXDD-Mode OPTIONAL,

 fr1-Add-UE-NR-Capabilities UE-NR-CapabilityAddFRX-Mode OPTIONAL,

 fr2-Add-UE-NR-Capabilities UE-NR-CapabilityAddFRX-Mode OPTIONAL,

 featureSets FeatureSets OPTIONAL,

 lateNonCriticalExtension OCTET STRING OPTIONAL,

 nonCriticalExtension SEQUENCE {} OPTIONAL

}

UE-NR-CapabilityAddXDD-Mode ::= SEQUENCE {

 phy-ParametersXDD-Diff Phy-ParametersXDD-Diff OPTIONAL,

 mac-ParametersXDD-Diff MAC-ParametersXDD-Diff OPTIONAL,

 measParametersXDD-Diff MeasParametersXDD-Diff OPTIONAL

}

UE-NR-CapabilityAddFRX-Mode ::= SEQUENCE {

 phy-ParametersFRX-Diff Phy-ParametersFRX-Diff OPTIONAL,

 measParametersFRX-Diff MeasParametersFRX-Diff OPTIONAL

}

#### – *Phy-Parameters*

The IE *Phy-Parameters* is used to configure FFS

*Phy-Parameters* information element

-- ASN1START

-- TAG-PHY-PARAMETERS-START

Phy-Parameters ::= SEQUENCE {

 phy-ParametersCommon Phy-ParametersCommon OPTIONAL,

 phy-ParametersXDD-Diff Phy-ParametersXDD-Diff OPTIONAL,

 phy-ParametersFRX-Diff Phy-ParametersFRX-Diff OPTIONAL,

 phy-ParametersFR1 Phy-ParametersFR1 OPTIONAL,

 phy-ParametersFR2 Phy-ParametersFR2 OPTIONAL,

}

Phy-ParametersCommon ::= SEQUENCE {

 csi-RS-CFRA-ForHO ENUMERATED {supported} OPTIONAL,

 dynamicPRB-BundlingDL ENUMERATED {supported} OPTIONAL,

 sp-CSI-ReportPUCCH ENUMERATED {supported} OPTIONAL,

 sp-CSI-ReportPUSCH ENUMERATED {supported} OPTIONAL,

 nzp-CSI-RS-IntefMgmt ENUMERATED {supported} OPTIONAL,

 type2-SP-CSI-Feedback-LongPUCCH ENUMERATED {supported} OPTIONAL,

 multipleCORESET ENUMERATED {supported} OPTIONAL,

 dynamicSFI ENUMERATED {supported} OPTIONAL,

 precoderGranularityCORESET ENUMERATED {supported} OPTIONAL,

 dynamicHARQ-ACK-Codebook ENUMERATED {supported} OPTIONAL,

 semiStaticHARQ-ACK-Codebook ENUMERATED {supported} OPTIONAL,

 spatialBundlingHARQ-ACK ENUMERATED {supported} OPTIONAL,

 dynamicBetaOffsetInd-HARQ-ACK-CSI ENUMERATED {supported} OPTIONAL,

 pucch-Repetition-F1-3-4 ENUMERATED {supported} OPTIONAL,

 ra-Type0-PUSCH ENUMERATED {supported} OPTIONAL,

 dynamicSwitchRA-Type0-1-PDSCH ENUMERATED {supported} OPTIONAL,

 dynamicSwitchRA-Type0-1-PUSCH ENUMERATED {supported} OPTIONAL,

 pdsch-MappingTypeA ENUMERATED {supported} OPTIONAL,

 pdsch-MappingTypeB ENUMERATED {supported} OPTIONAL,

 interleavingVRB-ToPRB-PDSCH ENUMERATED {supported} OPTIONAL,

 interleavingVRB-ToPRB-PUSCH ENUMERATED {supported} OPTIONAL,

 interSlotFreqHopping-PUSCH ENUMERATED {supported} OPTIONAL,

 type1-PUSCH-RepetitionOneSlot ENUMERATED {supported} OPTIONAL,

 type1-PUSCH-RepetitionMultiSlots ENUMERATED {supported} OPTIONAL,

 type2-PUSCH-RepetitionOneSlot ENUMERATED {supported} OPTIONAL,

 type2-PUSCH-RepetitionMultiSlots ENUMERATED {supported} OPTIONAL,

 pusch-RepetitionMultiSlots ENUMERATED {supported} OPTIONAL,

 pdsch-RepetitionMultiSlots ENUMERATED {supported} OPTIONAL,

 downlinkSPS ENUMERATED {supported} OPTIONAL,

 configuredUL-GrantType1 ENUMERATED {supported} OPTIONAL,

 configuredUL-GrantType2 ENUMERATED {supported} OPTIONAL,

 pre-EmptIndication-DL ENUMERATED {supported} OPTIONAL,

 cbg-TransIndication BIT STRING (SIZE (2)) OPTIONAL,

 cbg-FlushIndication-DL ENUMERATED {supported} OPTIONAL,

 dynamicHARQ-ACK-CodeB-CBG-Retx-DL ENUMERATED {supported} OPTIONAL,

 rateMatchingResrcSetSemi-Static ENUMERATED {supported} OPTIONAL,

 rateMatchingResrcSetDynamic ENUMERATED {supported} OPTIONAL,

 rateMatchingLTE-CRS ENUMERATED {supported} OPTIONAL,

 bwp-SwitchingDelay ENUMERATED {type1, type2} OPTIONAL

}

Phy-ParametersXDD-Diff ::= SEQUENCE {

 twoPUCCH-F0-2-ConsecSymbols ENUMERATED {supported} OPTIONAL,

 twoDifferentTPC-Loop-PUSCH ENUMERATED {supported} OPTIONAL,

 twoDifferentTPC-Loop-PUCCH ENUMERATED {supported} OPTIONAL

}

Phy-ParametersFRX-Diff ::= SEQUENCE {

 oneFL-DMRS-TwoAdditionalDMRS BIT STRING (SIZE (2)) OPTIONAL,

 twoFL-DMRS BIT STRING (SIZE (2)) OPTIONAL,

 twoFL-DMRS-TwoAdditionalDMRS BIT STRING (SIZE (2)) OPTIONAL,

 oneFL-DMRS-ThreeAdditionalDMRS BIT STRING (SIZE (2)) OPTIONAL,

 supportedDMRS-TypeDL ENUMERATED {type1, type2} OPTIONAL,

 supportedDMRS-TypeUL ENUMERATED {type1, type2} OPTIONAL,

 semiOpenLoopCSI ENUMERATED {supported} OPTIONAL,

 csi-ReportWithoutPMI ENUMERATED {supported} OPTIONAL,

 csi-ReportWithCRI ENUMERATED {supported} OPTIONAL,

 csi-ReportWithoutCQI ENUMERATED {supported} OPTIONAL,

 onePortsPTRS BIT STRING (SIZE (2)) OPTIONAL,

 twoPUCCH-F0-2-ConsecSymbols ENUMERATED {supported} OPTIONAL,

 pucch-F2-WithFH ENUMERATED {supported} OPTIONAL,

 pucch-F3-WithFH ENUMERATED {supported} OPTIONAL,

 pucch-F4-WithFH ENUMERATED {supported} OPTIONAL,

 freqHoppingPUCCH-F0-2 ENUMERATED {notSupported} OPTIONAL,

 freqHoppingPUCCH-F1-3-4 ENUMERATED {notSupported} OPTIONAL,

 mux-SR-HARQ-ACK-CSI-PUCCH ENUMERATED {supported} OPTIONAL,

 uci-CodeBlockSegmentation ENUMERATED {supported} OPTIONAL,

 onePUCCH-LongAndShortFormat ENUMERATED {supported} OPTIONAL,

 twoPUCCH-AnyOthersInSlot ENUMERATED {supported} OPTIONAL,

 intraSlotFreqHopping-PUSCH ENUMERATED {supported} OPTIONAL,

 pusch-LBRM ENUMERATED {supported} OPTIONAL,

 pdcch-BlindDetectionCA ENUMERATED {supported} OPTIONAL,

 tpc-PUSCH-RNTI ENUMERATED {supported} OPTIONAL,

 tpc-PUCCH-RNTI ENUMERATED {supported} OPTIONAL,

 tpc-SRS-RNTI ENUMERATED {supported} OPTIONAL,

 absoluteTPC-Command ENUMERATED {supported} OPTIONAL,

 twoDifferentTPC-Loop-PUSCH ENUMERATED {supported} OPTIONAL,

 twoDifferentTPC-Loop-PUCCH ENUMERATED {supported} OPTIONAL,

 pusch-HalfPi-BPSK ENUMERATED {supported} OPTIONAL,

 pucch-F3-4-HalfPi-BPSK ENUMERATED {supported} OPTIONAL,

 oneSymbolGP-TDD ENUMERATED {supported} OPTIONAL,

 almostContiguousCP-OFDM-UL ENUMERATED {supported} OPTIONAL

}

Phy-ParametersFR1 ::= SEQUENCE {

 pdcchMonitoringSingleOccasion ENUMERATED {supported} OPTIONAL,

 scs-60kHz ENUMERATED {supported} OPTIONAL,

 pdsch-256QAM-FR1 ENUMERATED {supported} OPTIONAL

}

Phy-ParametersFR2 ::= SEQUENCE {

 calibrationGapPA ENUMERATED {supported} OPTIONAL

}

-- TAG-PHY-PARAMETERS-STOP

-- ASN1STOP

|  |
| --- |
| *Phy-ParametersCommon field descriptions* |
| ***bwp-SwitchingDelay***R4 1-8: BWP switching delay |
| ***csi-RS-CFRA-ForHO***R1 1-9: CSI-RS based CFRA for HO |
| ***cbg-FlushIndication-DL***R1 5-23: CBGFI for CBG-based re-transmission for DL |
| ***cbg-TransIndication***R1 5-22 & 5-25: CBG-based re-transmission for DL/UL using CBGTI |
| ***configuredUL-GrantType1***R1 5-19: Type 1 Configured UL grant |
| ***configuredUL-GrantType2***R1 5-20: Type 2 Configured UL grant |
| ***downlinkSPS***R1 5-18: DL SPS |
| ***dynamicBetaOffsetInd-HARQ-ACK-CSI***R1 4-21: Dynamic beta-offset configuration and indication for HARQ-ACK and/or CSI |
| ***dynamicHARQ-ACK-CodeB-CBG-Retx-DL***R1 5-24: Dynamic HARQ-ACK codebook using sub-codebooks for CBG-based re-transmission for DL |
| ***dynamicHARQ-ACK-Codebook***R1 4-10: Dynamic HARQ-ACK codebook |
| ***dynamicPRB-BundlingDL***R1 2-11: Downlink dynamic PRB bundling (DL) |
| ***dynamicSFI***R1 3-6: Dynamic SFI monitoring and dynamic UL/DL determination |
| ***dynamicSwitchRA-Type0-1-PDSCH***R1 5-3: Dynamic switching between RA type 0 and RA type 1 for PDSCH |
| ***dynamicSwitchRA-Type0-1-PUSCH***R1 5-4: Dynamic switching between RA type 0 andRA type 1 for PUSCH |
| ***interleavingVRB-ToPRB-PDSCH***R1 5-7: Interleaving for VRB-to-PRB mapping for PDSCH |
| ***interleavingVRB-ToPRB-PUSCH***R1 5-8: Interleaving for VRB-to-PRB mapping for PUSCH |
| ***interSlotFreqHopping-PUSCH***R1 5-10: Inter-slot frequency hopping for PUSCH |
| ***multipleCORESET***R1 3-3: More than one CORESET per BWP (in addition to CORESET #0) |
| ***nzp-CSI-RS-IntefMgmt***R1 2-34: NZP-CSI-RS based interference measurement |
| ***pdsch-MappingTypeA***R1 5-6: PDSCH mapping type A with less than 7 OFDM symbols |
| ***pdsch-MappingTypeB***R1 5-6a: PDSCH mapping type B |
| ***pdsch-RepetitionMultiSlots***R1 5-17a: PDSCH repetitions over multiple slots |
| ***pre-EmptIndication-DL***R1 5-21: Pre-emption indication for DL |
| ***precoderGranularityCORESET***R1 3-7: Precoder-granularity of CORESET size |
| ***pucch-Repetition-F1-3-4***R1 4-23: Repetitions for PUCCH format 1, 3,and 4 over multiple slots with K = 1, 2, 4, 8 |
| ***pusch-RepetitionMultiSlots***R1 5-17: PUSCH repetitions over multiple slots |
| ***ra-Type0-PUSCH***R1 5-2: RA type 0 for PUSCH |
| ***rateMatchingLTE-CRS***R1 5-28: Rate-matching around LTE CRS |
| ***rateMatchingResrcSetDynamic***R1 5-27: Dynamic rate-matching resource set configuration for DL |
| ***rateMatchingResrcSetSemi-Static***R1 5-26: Semi-static rate-matching resource set configuration for DL |
| ***semiStaticHARQ-ACK-Codebook***R1 4-11: Semi-static HARQ-ACK codebook |
| ***spatialBundlingHARQ-ACK***R1 4-12: HARQ-ACK spatial bundling for PUCCH or PUSCH per PUCCH group |
| ***sp-CSI-ReportPUCCH***R1 2-32a: Semi-persistent CSI report on PUCCH |
| ***sp-CSI-ReportPUSCH***R1 2-32b: Semi-persistent CSI report on PUSCH |
| ***type1-PUSCH-RepetitionMultiSlots***R1 5-14: Type 1 configured PUSCH repetitions over multiple slots |
| ***type1-PUSCH-RepetitionOneSlot***R1 5-13: Type 1 configured PUSCH repetitions within a slot |
| ***type2-PUSCH-RepetitionMultiSlots***R1 5-16: Type 2 configured PUSCH repetitions over multiple slots |
| ***type2-PUSCH-RepetitionOneSlot***R1 5-15: Type 2 configured PUSCH repetitions within a slot |
| ***type2-SP-CSI-Feedback-LongPUCCH***R1 2-42: Support Type II SP-CSI feedback on long PUCCH |

|  |
| --- |
| *Phy-ParametersFR1 field descriptions* |
| ***pdcchMonitoringSingleOccasion***R1 3-2: Unicast PDCCH monitoring following Case 1-2 |
| ***pdsch-256QAM-FR1***R4 1-4: 256QAM for PDSCH in FR1 |
| ***scs-60kHz***R4 1-1: 60kHz of subcarrier spacing for FR1 |

|  |
| --- |
| *Phy-ParametersFR2 field descriptions* |
| ***calibrationGapPA***R4 2-8: PA calibration gap |

|  |
| --- |
| *Phy-ParametersFRX-Diff field descriptions* |
| ***absoluteTPC-Command***R1 8-6: Absolute TPC command mode |
| ***almostContiguousCP-OFDM-UL***R4 2-7: Almost contiguous UL CP-OFDM |
| ***csi-ReportWithCRI***R1 2-39: CSI report with CRI |
| ***csi-ReportWithoutCQI***R1 2-39a: CSI report without CQI |
| ***csi-ReportWithoutPMI***R1 2-38: CSI report without PMI |
| ***freqHoppingPUCCH-F0-2***R1 4-6: Non-frequency hopping for PUCCH formats 0 and 2 |
| ***freqHoppingPUCCH-F1-3-4***R1 4-7: Non-frequency hopping for PUCCH format 1, 3, and 4 |
| ***intraSlotFreqHopping-PUSCH***R1 5-9: Intra-slot frequency-hopping for PUSCH except for PUSCH scheduled by Type 1 before RRC connection |
| ***mux-SR-HARQ-ACK-CSI-PUCCH***R1 4-19: SR/HARQ-ACK/CSI multiplexing once per slot using a PUCCH (or piggybacked on a PUSCH) |
| ***oneFL-DMRS-ThreeAdditionalDMRS***R1 2-9 & 2-19: Support 1+3 DMRS (DL/UL) |
| ***oneFL-DMRS-TwoAdditionalDMRS***R1 2-6 & 2-16b: Support 1+2 DMRS (DL/UL) |
| ***onePortsPTRS***R1 2-44 & 2-47: 1 port of DL/UL PTRS |
| ***onePUCCH-LongAndShortFormat***R1 4-22: 1 long PUCCH format and 1 short PUCCH format in the same slot |
| ***oneSymbolGP-TDD***R4 1-9: 1-symbol GP in unpaired spectrum |
| ***pdcch-BlindDetectionCA***R1 6-5a: PDCCH blind detection capability for CA |
| ***pucch-F2-WithFH***R1 4-3: PUCCH format 2 over 1 – 2 OFDM symbols once per slot with FH |
| ***pucch-F3-4-HalfPi-BPSK***R4 1-7: pi/2-BPSK for PUCCH format 3/4 |
| ***pucch-F3-WithFH***R1 4-4: PUCCH format 3 over 4 – 14 OFDM symbols once per slot with FH |
| ***pucch-F4-WithFH***R1 4-5: PUCCH format 4 over 4 – 14 OFDM symbols once per slot with FH |
| ***pusch-HalfPi-BPSK***R4 1-6: pi/2-BPSK for PUSCH |
| ***pusch-LBRM***R1 5-29: LBRM for PUSCH |
| ***semiOpenLoopCSI***R1 2-37: Support Semi-open loop CSI |
| ***supportedDMRS-TypeDL***R1 2-10: Support DMRS type (DL) |
| ***supportedDMRS-TypeUL***R1 2-17: Support DMRS type (UL) |
| ***tpc-PUCCH-RNTI***R1 8-4: TPC-PUCCH-RNTI |
| ***tpc-PUSCH-RNTI***R1 8-3: TPC-PUSCH-RNTI |
| ***tpc-SRS-RNTI***R1 8-5: TPC-SRS-RNTI |
| ***twoDifferentTPC-Loop-PUCCH***R1 8-8: UL power control with 2 PUCCH closed loops |
| ***twoDifferentTPC-Loop-PUSCH***R1 8-7: UL power control with 2 PUSCH closed loops |
| ***twoFL-DMRS-TwoAdditionalDMRS***R1 2-8 & 2-18a: Supported 2 symbols front-loaded +2 symbols additional DMRS(DL/UL) |
| ***twoFL-DMRS***R1 2-7 & 2-18: Supported 2 symbols front-loaded DMRS(DL/UL) |
| ***twoPUCCH-AnyOthersInSlot***R1 4-22a: 2 PUCCH transmissions in the same slot which are not covered by 4-22 and 4-2 |
| ***twoPUCCH-F0-2-ConsecSymbols***R1 4-2: 2 PUCCH of format 0 or 2 in consecutive symbols |
| ***uci-CodeBlockSegmentation***R1 4-20: UCI code-block segmentation |

|  |
| --- |
| *Phy-ParametersXDD-Diff field descriptions* |
| ***twoDifferentTPC-Loop-PUCCH***R1 8-8: UL power control with 2 PUCCH closed loops |
| ***twoDifferentTPC-Loop-PUSCH***R1 8-7: UL power control with 2 PUSCH closed loops |
| ***twoPUCCH-F0-2-ConsecSymbols***R1 4-2: 2 PUCCH of format 0 or 2 in consecutive symbols |

#### – *RF-Parameters*

The IE *RF-Parameters* is used to indicate which bands the UE supports. Furthermore, this IE is used to indicate which features the UE supports in certain bands (supportedBandList) and which features it supports in certain band combinations (supportedBandCombinationList)

*RF-Parameters* information element

-- ASN1START

-- TAG-RF-PARAMETERS-START

RF-Parameters ::= SEQUENCE {

 supportedBandList SEQUENCE (SIZE (1..maxBands)) OF BandNR,

 supportedBandCombinationList BandCombinationList,

}

BandNR ::= SEQUENCE {

 bandNR FreqBandIndicatorNR,

 modifiedMPR-Behaviour BIT STRING (SIZE (8)) OPTIONAL,

 maxChannelBW-PerCC ENUMERATED {mhz400} OPTIONAL,

 mimo-ParametersPerBand MIMO-ParametersPerBand OPTIONAL,

 extendedCP ENUMERATED {supported} OPTIONAL,

 phaseCoherenceUL ENUMERATED {supported} OPTIONAL,

 scellWithoutSSB ENUMERATED {supported} OPTIONAL,

 csi-RS-MeasSCellWithoutSSB ENUMERATED {supported} OPTIONAL,

 srs-AssocCSI-RS ENUMERATED {supported} OPTIONAL,

 type1-3-CSS ENUMERATED {supported} OPTIONAL,

 multipleTCI ENUMERATED {supported} OPTIONAL,

 pdcchMonitoringAnyOccasions ENUMERATED {withoutDCI-gap, withDCI-gap} OPTIONAL,

 ue-SpecificUL-DL-Assignment ENUMERATED {supported} OPTIONAL,

 pdsch-DifferentTB-PerSlot SEQUENCE {

 scs-15kHz ENUMERATED {upto2, upto7} OPTIONAL,

 scs-30kHz ENUMERATED {upto2, upto7} OPTIONAL,

 scs-60kHz ENUMERATED {upto2, upto7} OPTIONAL,

 scs-120kHz ENUMERATED {upto2, upto7} OPTIONAL

 } OPTIONAL,

 pusch-DifferentTB-PerSlot SEQUENCE {

 scs-15kHz ENUMERATED {upto2, upto7} OPTIONAL,

 scs-30kHz ENUMERATED {upto2, upto7} OPTIONAL,

 scs-60kHz ENUMERATED {upto2, upto7} OPTIONAL,

 scs-120kHz ENUMERATED {upto2, upto7} OPTIONAL

 } OPTIONAL,

 bwp-SameNumerology ENUMERATED {upto2, upto4} OPTIONAL,

 bwp-DiffNumerology ENUMERATED {upto4} OPTIONAL,

 twoPUCCH-Group ENUMERATED {supported} OPTIONAL,

 diffNumerologyAcrossPUCCH-Group ENUMERATED {supported} OPTIONAL,

 diffNumerologyWithinPUCCH-Group ENUMERATED {supported} OPTIONAL,

 crossCarrierScheduling ENUMERATED {supported} OPTIONAL,

 supportedNumberTAG ENUMERATED {n2, n3, n4} OPTIONAL,

 simultaneousTxSUL-NonSUL ENUMERATED {supported} OPTIONAL,

 searchSpaceSharingCA-DL ENUMERATED {supported} OPTIONAL,

 searchSpaceSharingCA-UL ENUMERATED {supported} OPTIONAL,

 pdsch-256QAM-FR2 ENUMERATED {supported} OPTIONAL,

 pusch-256QAM ENUMERATED {supported} OPTIONAL

}

MIMO-ParametersPerBand ::= SEQUENCE {

 timeDurationForQCL SEQUENCE {

 scs-60kHz ENUMERATED {s7, s14, s28} OPTIONAL,

 sch-120kHz ENUMERATED {s14, s28} OPTIONAL

 } OPTIONAL,

 maxNumberMIMO-LayersPDSCH MIMO-LayersDL OPTIONAL,

 maxNumberMIMO-LayersCB-PUSCH MIMO-LayersUL OPTIONAL,

 maxNumberMIMO-LayersNonCB-PUSCH MIMO-LayersUL OPTIONAL,

 maxNumberConfiguredTCIstates ENUMERATED {n4, n8, n16, n32, n64} OPTIONAL,

 maxNumberActiveTCI-PerCC ENUMERATED {n1, n2, n4, n8} OPTIONAL,

 pusch-TransCoherence ENUMERATED {nonCoherent, partialNonCoherent, fullCoherent} OPTIONAL,

 beamCorrespondence ENUMERATED {supported} OPTIONAL,

 periodicBeamReport ENUMERATED {supported} OPTIONAL,

 aperiodicBeamReport ENUMERATED {supported} OPTIONAL,

 sp-BeamReportPUCCH ENUMERATED {supported} OPTIONAL,

 sp-BeamReportPUSCH ENUMERATED {supported} OPTIONAL,

 beamManagementSSB-CSI-RS BeamManagementSSB-CSI-RS OPTIONAL,

 maxNumberRxBeam INTEGER (2..8) OPTIONAL,

 maxNumberRxTxBeamSwitchDL SEQUENCE {

 scs-15kHz ENUMERATED {n4, n7, n14} OPTIONAL,

 scs-30kHz ENUMERATED {n4, n7, n14} OPTIONAL,

 scs-60kHz ENUMERATED {n4, n7, n14} OPTIONAL,

 scs-120kHz ENUMERATED {n4, n7, n14} OPTIONAL,

 scs-240kHz ENUMERATED {n4, n7, n14} OPTIONAL

 } OPTIONAL,

 maxNumberNonGroupBeamReporting ENUMERATED {n1, n2, n4} OPTIONAL,

 groupBeamReporting ENUMERATED {supported} OPTIONAL,

 uplinkBeamManagement SEQUENCE {

 maxNumberSRS-ResourcePerSet ENUMERATED {n8, n16, n32},

 maxNumberSRS-ResourceSet INTEGER (1..8)

 } OPTIONAL,

 maxNumberCSI-RS-BFR INTEGER (1..64) OPTIONAL,

 maxNumberSSB-BFR INTEGER (1..64) OPTIONAL,

 maxNumberCSI-RS-SSB-BFR INTEGER (1..256) OPTIONAL,

 twoPortsPTRS BIT STRING (SIZE (2)) OPTIONAL,

 supportedSRS-Resources SRS-Resources OPTIONAL,

 srs-TxSwitch SRS-TxSwitch OPTIONAL,

 maxNumberSimultaneousSRS-PerCC INTEGER (1..4) OPTIONAL,

 lowLatencyCSI-Feedback ENUMERATED {supported} OPTIONAL

}

-- R1 2-24: SSB/CSI-RS for beam management

BeamManagementSSB-CSI-RS ::= SEQUENCE {

 maxNumberSSB-CSI-RS-ResourceOneTx ENUMERATED {n8, n16, n32, n64},

 maxNumberSSB-CSI-RS-ResourceTwoTx ENUMERATED {n0, n4, n8, n16, n32, n64},

 supportedCSI-RS-Density ENUMERATED {one, three, oneAndThree}

}

-- R1 2-53: SRS resources

SRS-Resources ::= SEQUENCE {

 maxNumberAperiodicSRS-PerBWP ENUMERATED {n1, n2, n4, n8, n16},

 maxNumberAperiodicSRS-PerBWP-PerSlot INTEGER (1..6),

 maxNumberPeriodicSRS-PerBWP ENUMERATED {n1, n2, n4, n8, n16},

 maxNumberPeriodicSRS-PerBWP-PerSlot INTEGER (1..6),

 maxNumberSemiPersitentSRS-PerBWP ENUMERATED {n0, n1, n2, n4, n8, n16},

 maxNumberSP-SRS-PerBWP-PerSlot INTEGER (0..6),

 maxNumberSRS-Ports-PerResource ENUMERATED {n1, n2, n4}

}

-- R1 2-55: SRS Tx switch

SRS-TxSwitch ::= SEQUENCE {

 supportedSRS-TxPortSwitch ENUMERATED {t1r2, t1r4, t2r4, t1r4-t2r4},

 txSwitchImpactToRx ENUMERATED {true} OPTIONAL

}

-- TAG-RF-PARAMETERS-STOP

-- ASN1STOP

|  |
| --- |
| *BandNR field descriptions* |
| ***bwp-DiffNumerology***R1 6-4: BWP adaptation (up to 4 BWPs) with different numerologies |
| ***bwp-SameNumerology***R1 6-2 & 6-3: Type A/B BWP adaptation (up to 2/4 BWPs) with same numerology |
| ***crossCarrierScheduling***R1 6-10: Cross carrier scheduling |
| ***csi-RS-MeasSCellWithoutSSB***R1 1-11: Support of CSI-RS RRM measurement for SCell without SS/PBCH block |
| ***diffNumerologyAcrossPUCCH-Group***R1 6-8: Different numerology across PUCCH groups |
| ***diffNumerologyWithinPUCCH-Group***R1 6-9: Different numerologies across carriers within the same PUCCH group |
| ***extendedCP***R1 0-10: Extended CP |
| ***maxChannelBW-PerCC***R4 2-1: Maximum channel bandwidth supported in each band for DL and UL separately and for each SCS that UE supports within a single CC RAN4 agreed that 400 MHz is optional for FR2. The other values defined for FR1/fR2 in TS 38.101 are mandatory w/o capability bit. |
| ***modifiedMPR-Behaviour***Modified MPR behaviour as in RAN4 LS R2-1804077, which is needed for NSA as well as SA |
| ***multipleTCI***R1 3-4: More than one TCI state configurations per CORESET |
| ***pdcchMonitoringAnyOccasions***R1 3-5 & 3-5a: For type 1 with dedicated RRC configuration, type 3, and UE-SS,, monitoring occasion can be any OFDM symbol(s) of a slot for Case 2 (with a DCI gap) |
| ***pdsch-256QAM-FR2***R4 1-4: 256QAM for PDSCH in FR2 |
| ***pdsch-DifferentTB-PerSlot***R1 5-11 & 5-11a: Up to 2/7 unicast PDSCHs per slot for different TBs |
| ***phaseCoherenceUL***R1 0-13: Phase coherence across non-contiguous UL symbols in slot in the transmission of one channel |
| ***pusch-256QAM***R4 1-5: 256QAM for PUSCH |
| ***pusch-DifferentTB-PerSlot***R1 5-12 & 5-12a: Up to 2/7 PUSCHs per slot for different TBs |
| ***scellWithoutSSB***R1 1-10: Support of SCell without SS/PBCH block |
| ***searchSpaceSharingCA-DL***R1 6-21: DL search space sharing for CA |
| ***searchSpaceSharingCA-UL***R1 6-22: UL search space sharing for CA |
| ***simultaneousTxSUL-NonSUL***R1 6-19: Simultaneous transmission of SRS on an SUL/non-SUL carrier and PUSCH/PUCCH/SRS/PRACH on the other UL carrier in the same cell Details on the channel/signal combination are to be described in TS 38.306 |
| ***srs-AssocCSI-RS***R1 2-15a: Association between CSI-RS and SRS |
| ***supportedNumberTAG***R1 6-11: Number of supported TAGs |
| ***twoPUCCH-Group***R1 6-7: Two PUCCH group |
| ***type1-3-CSS***R1 3-1a: For type 1 CSS with dedicated RRC configuration and for type 3 CSS, UE specific SS, CORESET resource allocation of 6RB bit-map and duration 3 OFDM symbols for FR2 |
| ***ue-SpecificUL-DL-Assignment***R1 5-1a: UE specific RRC configure UL/DL assignment |

|  |
| --- |
| *MIMO-ParametersPerBand field descriptions* |
| ***aperiodicBeamReport***R1 2-22: Aperiodic beam report on PUSCH |
| ***beamCorrespondence***R1 2-20: Beam correspondence |
| ***beamManagementSSB-CSI-RS***R1 2-24: SSB/CSI-RS for beam management |
| ***groupBeamReporting***R1 2-29a: Group based beam reporting |
| ***lowLatencyCSI-Feedback***R1 2-57: Support low latency CSI feedback |
| ***maxNumberConfiguredTCIstates***R1 2-4: TCI states for PDSCH |
| ***maxNumberCSI-RS-BFR***R1 2-31: Beam failure recovery |
| ***maxNumberMIMO-LayersCB-PUSCH***R1 2-14: Codebook based PUSCH MIMO transmission. Absence of this field implies that CB-based PUSCH is not supported. |
| ***maxNumberMIMO-LayersNonCB-PUSCH***R1 2-15: Non-codebook based PUSCH MIMO transmission. Absence of this field implies that Non-CB-based PUSCH is not supported. |
| ***maxNumberMIMO-LayersPDSCH***R1 2-3: PDSCH MIMO layers. Absence of this field implies support of one layer. |
| ***maxNumberNonGroupBeamReporting***R1 2-29: Non-group based beam reporting |
| ***maxNumberRxBeam***R1 2-26: Receiving beam selection using CSI-RS resource repetition "ON" |
| ***maxNumberRxTxBeamSwitchDL***R1 2-27: Beam switching (including SSB and CSI-RS) |
| ***maxNumberSimultaneousSRS-PerCC***R1 2-54a: Simultaneous SRS Tx |
| ***periodicBeamReport***R1 2-21: Periodic beam report on PUCCH |
| ***pusch-TransCoherence***R1 2-13: PUSCH transmission coherence |
| ***sp-BeamReportPUCCH***R1 2-23: Semi-persistent beam report on PUCCH |
| ***sp-BeamReportPUSCH***R1 2-23a: Semi-persistent beam report on PUSCH |
| ***srs-TxSwitch***R1 2-55: SRS Tx switch |
| ***supportedSRS-Resources***R1 2-53: SRS resources |
| ***timeDurationForQCL***R1 2-2: PDSCH beam switching |
| ***twoPortsPTRS***R1 2-45 & 2-48: 2 ports of DL/UL PTRS |
| ***uplinkBeamManagement***R1 2-30: UL beam management |

#### – *PDCP-Parameters*

The IE *PDCP-Parameters* is used to configure FFS

*PDCP-Parameters* information element

-- ASN1START

-- TAG-PDCP-PARAMETERS-START

PDCP-Parameters ::= SEQUENCE {

 supportedROHC-Profiles SEQUENCE {

 profile0x0000 BOOLEAN,

 profile0x0001 BOOLEAN,

 profile0x0002 BOOLEAN,

 profile0x0003 BOOLEAN,

 profile0x0004 BOOLEAN,

 profile0x0006 BOOLEAN,

 profile0x0101 BOOLEAN,

 profile0x0102 BOOLEAN,

 profile0x0103 BOOLEAN,

 profile0x0104 BOOLEAN

 },

 maxNumberROHC-ContextSessions ENUMERATED {cs2, cs4, cs8, cs12, cs16, cs24, cs32, cs48, cs64,

 cs128, cs256, cs512, cs1024, cs16384, spare2, spare1},

 uplinkOnlyROHC-Profiles ENUMERATED {supported} OPTIONAL,

 continueROHC-Context ENUMERATED {supported} OPTIONAL,

 outOfOrderDelivery ENUMERATED {supported} OPTIONAL,

 shortSN ENUMERATED {supported} OPTIONAL

}

-- TAG-PDCP-PARAMETERS-STOP

-- ASN1STOP

#### – *RLC-Parameters*

The IE *RLC-Parameters* is used to configure FFS

*RLC-Parameters* information element

-- ASN1START

-- TAG-RLC-PARAMETERS-START

RLC-Parameters ::= SEQUENCE {

 am-WithShortSN ENUMERATED {supported} OPTIONAL,

 um-WithShortSN ENUMERATED {supported} OPTIONAL,

 um-WIthLongSN ENUMERATED {supported} OPTIONAL

}

-- TAG-RLC-PARAMETERS-STOP

-- ASN1STOP

#### – *MAC-Parameters*

The IE *MAC-Parameters* is used to configure FFS

*MAC-Parameters* information element

-- ASN1START

-- TAG-MAC-PARAMETERS-START

MAC-Parameters ::= SEQUENCE {

 mac-ParametersCommon MAC-ParametersCommon OPTIONAL,

 mac-ParametersXDD-Diff MAC-ParametersXDD-Diff OPTIONAL

}

MAC-ParametersCommon ::= SEQUENCE {

 lcp-Restriction ENUMERATED {supported} OPTIONAL,

 pucch-SpatialRelInfoMAC-CE ENUMERATED {supported} OPTIONAL

}

MAC-ParametersXDD-Diff ::= SEQUENCE {

 skipUplinkTxDynamic ENUMERATED {supported} OPTIONAL,

 logicalChannelSR-DelayTimer ENUMERATED {supported} OPTIONAL,

 longDRX-Cycle ENUMERATED {supported} OPTIONAL,

 shortDRX-Cycle ENUMERATED {supported} OPTIONAL,

 multipleSR-Configurations ENUMERATED {supported} OPTIONAL,

 multipleConfiguredGrantConfigurations ENUMERATED {supported} OPTIONAL

 -- If supported UE supports 16 configured grant configurations, otherwise 1 ConfiguredGrant config is supported.

 -- Confirmation is needed whether to align the number to what the configuration signalling can support, and to consider whether the 16 refers

 -- to the configurations or the active ones only (as they are within the BWP).

}

-- TAG-MAC-PARAMETERS-STOP

-- ASN1STOP

|  |
| --- |
| *MAC-ParametersCommon field descriptions* |
| ***pucch-SpatialRelInfoMAC-CE***R1 4-24: PUCCH-spatialrelationinfo indication by a MAC CE per PUCCH resource |

|  |
| --- |
| *MAC-ParametersXDD-Diff field descriptions* |
| ***multipleConfiguredGrantConfigurations***If supported UE supports 8 SR configurations, otherwise 1 SR config is supported. Confirmation is needed whether to align the number to what the configuration signalling can support. |

#### – *MeasParameters*

The IE *MeasParameters* is used to configure FFS

*MeasParameters* information element

-- ASN1START

-- TAG-MEASPARAMETERS-START

MeasParameters ::= SEQUENCE {

 measParametersXDD-Diff MeasParametersXDD-Diff OPTIONAL,

 measParametersFRX-Diff MeasParametersFRX-Diff OPTIONAL

}

MeasParametersXDD-Diff ::= SEQUENCE {

 intraAndInterF-MeasAndReport ENUMERATED {supported} OPTIONAL,

 eventA-MeasAndReport ENUMERATED {supported} OPTIONAL

 -- Confirmation is needed on the need of capability/IOT signaling in LTE for support of the additional measurement gap configurations.

}

MeasParametersFRX-Diff ::= SEQUENCE {

 ss-SINR-Meas ENUMERATED {supported} OPTIONAL,

 csi-RSRP-AndRSRQ-MeasWithSSB ENUMERATED {supported} OPTIONAL,

 csi-RSRP-AndRSRQ-MeasWithoutSSB ENUMERATED {supported} OPTIONAL,

 csi-SINR-Meas ENUMERATED {supported} OPTIONAL,

 csi-RS-RLM ENUMERATED {supported} OPTIONAL

}

-- TAG-MEASPARAMETERS-STOP

-- ASN1STOP

|  |
| --- |
| *MeasParametersFRX-Diff field descriptions* |
| ***csi-RS-RLM***R1 1-7: CSI-RS based RLM |
| ***csi-RSRP-AndRSRQ-MeasWithoutSSB***R1 1-5a: CSI-RS based RRM measurement without associated SS-block |
| ***csi-RSRP-AndRSRQ-MeasWithSSB***R1 1-5: CSI-RS based RRM measurement with associated SS-block |
| ***csi-SINR-Meas***R1 1-6: CSI-RS based SINR measurement |
| ***ss-SINR-Meas***R1 1-3: SSB based SINR measurement |

### 6.3.4 Other information elements

#### – *RRC-TransactionIdentifier*

The IE *RRC-TransactionIdentifier* is used, together with the message type, for the identification of an RRC procedure (transaction).

*RRC-TransactionIdentifier* information element

-- ASN1START

-- TAG-RRC-TRANSACTIONIDENTIFIER-START

RRC-TransactionIdentifier ::= INTEGER (0..3)

-- TAG-RRC-TRANSACTIONIDENTIFIER-STOP

-- ASN1STOP