**3GPP TSG-RAN WG2 Meeting #125 *R2-2401639***

**Athens, Greece, Feb. 26th – Mar. 1st, 2024**

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| --- |
| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
|  |
|  | **38.331** | **CR** | **Draft** | **rev** |  | **Current version:** | **18.0.0** |  |
|  |
| *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:***  | Draft 38.331 CR for positioning capability  |
|  |  |
| ***Source to WG:*** | Xiaomi |
| ***Source to TSG:*** | R2 |
|  |  |
| ***Work item code:*** | NR\_pos\_enh2-Core |  | ***Date:*** | 2024-02-21 |
|  |  |  |  |  |
| ***Category:*** | **B** |  | ***Release:*** | Rel-18  |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)…Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19)* |
|  |  |
| ***Reason for change:*** | Capture UE capabilities for Rel-18 positioning based on updated RAN1 feature list in R2-2313819. |
|  |  |
| ***Summary of change:*** | Caputre the following UE capabilities for Rel-18 positioning according to RAN1 feature list:41-1-2, 41-1-3, 41-1-4a, 41-1-4b, 41-1-4c, 41-1-5, 41-1-8, 41-1-17, 41-2-11, 41-3-1, 41-3-2, 41-4-6, 41-4-7, 41-4-8, 41-5-1,41-5-2, 41-5-2a. |
|  |  |
| ***Consequences if not approved:*** | UE capabilities for Rel-18 positioning will not be captured. |
|  |  |
| ***Clauses affected:*** | 6.3.3 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** | **Y** |  |  Other core specifications  | TS/TR 38.306... 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

# 6 Protocol data units, formats and parameters (ASN.1)

## 6.3 RRC information elements

### 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, rel16, rel17, rel18, spare4, spare3, spare2, spare1, ... }

-- TAG-ACCESSSTRATUMRELEASE-STOP

-- ASN1STOP

#### – *AerialParameters*

The IE *AerialParameters* is used to convey the capabilities supported by the UE for aerial operation.

*AerialParameters* information element

-- ASN1START

-- TAG-AERIALPARAMETERS-START

AerialParameters-r18 ::= SEQUENCE {

 -- Support of Aerial UE features

 aerialUE-Capability-r18 ENUMERATED {supported} OPTIONAL,

 -- Support of altitude measurement and event H1/H2-triggered reporting

 altitudeMeas-r18 ENUMERATED {supported} OPTIONAL,

 -- Support of altitude based measurement configuration of SSB-ToMeasure

 altitudeBasedSSB-ToMeasure-r18 ENUMERATED {supported} OPTIONAL,

 -- Support of events A3H1, A3H2, A4H1, A4H2, A5H1, A5H2

 eventAxHy-r18 ENUMERATED {supported} OPTIONAL,

 -- Support of flight path reporting

 flightPathReporting-r18 ENUMERATED {supported} OPTIONAL,

 -- Support of flight path availability indication via UAI

 flightPathAvailabilityIndicationUAI-r18 ENUMERATED {supported} OPTIONAL,

 -- Support of numberOfTriggeringCells for eventA3, eventA4, and eventA5, and additionally, if the UE supports eventAxHy-r18,

 -- support of numberOfTriggeringCells for eventA3H1, eventA3H2, eventA4H1, eventA4H2, eventA5H1, and eventA5H2

 multipleCellsMeasExtension-r18 ENUMERATED {supported} OPTIONAL,

 -- Support aerial-specific Ns and Pmax list broadcasted by the cell

 nr-NS-PmaxListAerial-r18 ENUMERATED {supported} OPTIONAL, -- Editor's Note:

 -- Understanding is that a UE that doesn't support any frequency band that requires an aerial specific NS value doesn't need to

 -- implement the procedure for aerial specific NS value. Whether indication is needed is still FFS. This is only shown as

 -- placeholder. Support of reporting only the measurement report corresponding to the event with the smallest value between the

 -- altitude of the UAV and the altitude threshold for which the altitude-related entering condition e.g. A3H1-2 is satisfied, when

 -- multiple events of the same type (Hx or AxHy) for the same MO (for AxHy) are triggered simultaneously.

 simulMultiTriggerSingleMeasReport-r18 ENUMERATED {supported} OPTIONAL,

 -- Support of A2X service(s) using PC5 Sidelink and dedicated resource pool for A2X service(s)

 sl-A2X-Service-r18 ENUMERATED {brid, daa, bridAndDAA} OPTIONAL,

 -- Editor's Note: Granularity of this capability, e.g. per UE/band/FS is still FFS. Depending on the conclusion, this may need to

 -- be moved.

 ...

}

-- TAG-AERIALPARAMETERS-STOP

-- ASN1STOP

#### – *AppLayerMeasParameters*

The IE *AppLayerMeasParameters* is used to convey the capabilities supported by the UE for application layer measurements.

*AppLayerMeasParameters* information element

-- ASN1START

-- TAG-APPLAYERMEASPARAMETERS-START

AppLayerMeasParameters-r17 ::= SEQUENCE {

 qoe-Streaming-MeasReport-r17 ENUMERATED {supported} OPTIONAL,

 qoe-MTSI-MeasReport-r17 ENUMERATED {supported} OPTIONAL,

 qoe-VR-MeasReport-r17 ENUMERATED {supported} OPTIONAL,

 ran-VisibleQoE-Streaming-MeasReport-r17 ENUMERATED {supported} OPTIONAL,

 ran-VisibleQoE-VR-MeasReport-r17 ENUMERATED {supported} OPTIONAL,

 ul-MeasurementReportAppLayer-Seg-r17 ENUMERATED {supported} OPTIONAL,

 ...,

 [[

 qoe-IdleInactiveMeasReport-r18 ENUMERATED {supported} OPTIONAL,

 qoe-NRDC-MeasReport-r18 ENUMERATED {supported} OPTIONAL,

 qoe-AdditionalMemoryMeasReport-r18 ENUMERATED {kB128, kB256, kB512, kB1024} OPTIONAL,

 qoe-PriorityBasedDiscarding-r18 ENUMERATED {supported} OPTIONAL,

 srb5-r18 ENUMERATED {supported} OPTIONAL

 ]]

}

-- TAG-APPLAYERMEASPARAMETERS-STOP

-- ASN1STOP

#### – *BandCombinationList*

The IE *BandCombinationList* contains a list of NR CA, NR non-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

BandCombinationList-v1540 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-v1540

BandCombinationList-v1550 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-v1550

BandCombinationList-v1560 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-v1560

BandCombinationList-v1570 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-v1570

BandCombinationList-v1580 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-v1580

BandCombinationList-v1590 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-v1590

BandCombinationList-v15g0 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-v15g0

BandCombinationList-v15n0 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-v15n0

BandCombinationList-v1610 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-v1610

BandCombinationList-v1630 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-v1630

BandCombinationList-v1640 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-v1640

BandCombinationList-v1650 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-v1650

BandCombinationList-v1680 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-v1680

BandCombinationList-v1690 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-v1690

BandCombinationList-v16a0 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-v16a0

BandCombinationList-v1700 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-v1700

BandCombinationList-v1720 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-v1720

BandCombinationList-v1730 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-v1730

BandCombinationList-v1740 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-v1740

BandCombinationList-v1760 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-v1760

BandCombinationList-v1770 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-v1770

BandCombinationList-v1800 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-v1800

BandCombinationList-UplinkTxSwitch-r16 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-UplinkTxSwitch-r16

BandCombinationList-UplinkTxSwitch-v1630 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-UplinkTxSwitch-v1630

BandCombinationList-UplinkTxSwitch-v1640 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-UplinkTxSwitch-v1640

BandCombinationList-UplinkTxSwitch-v1650 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-UplinkTxSwitch-v1650

BandCombinationList-UplinkTxSwitch-v1670 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-UplinkTxSwitch-v1670

BandCombinationList-UplinkTxSwitch-v1690 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-UplinkTxSwitch-v1690

BandCombinationList-UplinkTxSwitch-v16a0 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-UplinkTxSwitch-v16a0

BandCombinationList-UplinkTxSwitch-v16e0 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-UplinkTxSwitch-v16e0

BandCombinationList-UplinkTxSwitch-v1700 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-UplinkTxSwitch-v1700

BandCombinationList-UplinkTxSwitch-v1720 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-UplinkTxSwitch-v1720

BandCombinationList-UplinkTxSwitch-v1730 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-UplinkTxSwitch-v1730

BandCombinationList-UplinkTxSwitch-v1740 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-UplinkTxSwitch-v1740

BandCombinationList-UplinkTxSwitch-v1760 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-UplinkTxSwitch-v1760

BandCombinationList-UplinkTxSwitch-v1770 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-UplinkTxSwitch-v1770

BandCombinationList-UplinkTxSwitch-v1800 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombination-UplinkTxSwitch-v1800

BandCombination ::= SEQUENCE {

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

 featureSetCombination FeatureSetCombinationId,

 ca-ParametersEUTRA CA-ParametersEUTRA OPTIONAL,

 ca-ParametersNR CA-ParametersNR OPTIONAL,

 mrdc-Parameters MRDC-Parameters OPTIONAL,

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

 powerClass-v1530 ENUMERATED {pc2} OPTIONAL

}

BandCombination-v1540::= SEQUENCE {

 bandList-v1540 SEQUENCE (SIZE (1..maxSimultaneousBands)) OF BandParameters-v1540,

 ca-ParametersNR-v1540 CA-ParametersNR-v1540 OPTIONAL

}

BandCombination-v1550 ::= SEQUENCE {

 ca-ParametersNR-v1550 CA-ParametersNR-v1550

}

BandCombination-v1560::= SEQUENCE {

 ne-DC-BC ENUMERATED {supported} OPTIONAL,

 ca-ParametersNRDC CA-ParametersNRDC OPTIONAL,

 ca-ParametersEUTRA-v1560 CA-ParametersEUTRA-v1560 OPTIONAL,

 ca-ParametersNR-v1560 CA-ParametersNR-v1560 OPTIONAL

}

BandCombination-v1570 ::= SEQUENCE {

 ca-ParametersEUTRA-v1570 CA-ParametersEUTRA-v1570

}

BandCombination-v1580 ::= SEQUENCE {

 mrdc-Parameters-v1580 MRDC-Parameters-v1580

}

BandCombination-v1590::= SEQUENCE {

 supportedBandwidthCombinationSetIntraENDC BIT STRING (SIZE (1..32)) OPTIONAL,

 mrdc-Parameters-v1590 MRDC-Parameters-v1590

}

BandCombination-v15g0::= SEQUENCE {

 ca-ParametersNR-v15g0 CA-ParametersNR-v15g0 OPTIONAL,

 ca-ParametersNRDC-v15g0 CA-ParametersNRDC-v15g0 OPTIONAL,

 mrdc-Parameters-v15g0 MRDC-Parameters-v15g0 OPTIONAL

}

BandCombination-v15n0::= SEQUENCE {

 mrdc-Parameters-v15n0 MRDC-Parameters-v15n0

}

BandCombination-v1610 ::= SEQUENCE {

 bandList-v1610 SEQUENCE (SIZE (1..maxSimultaneousBands)) OF BandParameters-v1610 OPTIONAL,

 ca-ParametersNR-v1610 CA-ParametersNR-v1610 OPTIONAL,

 ca-ParametersNRDC-v1610 CA-ParametersNRDC-v1610 OPTIONAL,

 powerClass-v1610 ENUMERATED {pc1dot5} OPTIONAL,

 powerClassNRPart-r16 ENUMERATED {pc1, pc2, pc3, pc5} OPTIONAL,

 featureSetCombinationDAPS-r16 FeatureSetCombinationId OPTIONAL,

 mrdc-Parameters-v1620 MRDC-Parameters-v1620 OPTIONAL

}

BandCombination-v1630 ::= SEQUENCE {

 ca-ParametersNR-v1630 CA-ParametersNR-v1630 OPTIONAL,

 ca-ParametersNRDC-v1630 CA-ParametersNRDC-v1630 OPTIONAL,

 mrdc-Parameters-v1630 MRDC-Parameters-v1630 OPTIONAL,

 supportedTxBandCombListPerBC-Sidelink-r16 BIT STRING (SIZE (1..maxBandComb)) OPTIONAL,

 supportedRxBandCombListPerBC-Sidelink-r16 BIT STRING (SIZE (1..maxBandComb)) OPTIONAL,

 scalingFactorTxSidelink-r16 SEQUENCE (SIZE (1..maxBandComb)) OF ScalingFactorSidelink-r16 OPTIONAL,

 scalingFactorRxSidelink-r16 SEQUENCE (SIZE (1..maxBandComb)) OF ScalingFactorSidelink-r16 OPTIONAL

}

BandCombination-v1640 ::= SEQUENCE {

 ca-ParametersNR-v1640 CA-ParametersNR-v1640 OPTIONAL,

 ca-ParametersNRDC-v1640 CA-ParametersNRDC-v1640 OPTIONAL

}

BandCombination-v1650 ::= SEQUENCE {

 ca-ParametersNRDC-v1650 CA-ParametersNRDC-v1650 OPTIONAL

}

BandCombination-v1680 ::= SEQUENCE {

 intrabandConcurrentOperationPowerClass-r16 SEQUENCE (SIZE (1..maxBandComb)) OF IntraBandPowerClass-r16 OPTIONAL

}

BandCombination-v1690 ::= SEQUENCE {

 ca-ParametersNR-v1690 CA-ParametersNR-v1690 OPTIONAL

}

BandCombination-v16a0 ::= SEQUENCE {

 ca-ParametersNR-v16a0 CA-ParametersNR-v16a0 OPTIONAL,

 ca-ParametersNRDC-v16a0 CA-ParametersNRDC-v16a0 OPTIONAL

}

BandCombination-v1700 ::= SEQUENCE {

 ca-ParametersNR-v1700 CA-ParametersNR-v1700 OPTIONAL,

 ca-ParametersNRDC-v1700 CA-ParametersNRDC-v1700 OPTIONAL,

 mrdc-Parameters-v1700 MRDC-Parameters-v1700 OPTIONAL,

 bandList-v1710 SEQUENCE (SIZE (1..maxSimultaneousBands)) OF BandParameters-v1710 OPTIONAL,

 supportedBandCombListPerBC-SL-RelayDiscovery-r17 BIT STRING (SIZE (1..maxBandComb)) OPTIONAL,

 supportedBandCombListPerBC-SL-NonRelayDiscovery-r17 BIT STRING (SIZE (1..maxBandComb)) OPTIONAL

}

BandCombination-v1720 ::= SEQUENCE {

 ca-ParametersNR-v1720 CA-ParametersNR-v1720 OPTIONAL,

 ca-ParametersNRDC-v1720 CA-ParametersNRDC-v1720 OPTIONAL

}

BandCombination-v1730 ::= SEQUENCE {

 ca-ParametersNR-v1730 CA-ParametersNR-v1730 OPTIONAL,

 ca-ParametersNRDC-v1730 CA-ParametersNRDC-v1730 OPTIONAL,

 bandList-v1730 SEQUENCE (SIZE (1..maxSimultaneousBands)) OF BandParameters-v1730 OPTIONAL

}

BandCombination-v1740 ::= SEQUENCE {

 ca-ParametersNR-v1740 CA-ParametersNR-v1740 OPTIONAL

}

BandCombination-v1760 ::= SEQUENCE {

 ca-ParametersNR-v1760 CA-ParametersNR-v1760,

 ca-ParametersNRDC-v1760 CA-ParametersNRDC-v1760

}

BandCombination-v1770::= SEQUENCE {

 bandList-v1770 SEQUENCE (SIZE (1..maxSimultaneousBands)) OF BandParameters-v1770,

 mrdc-Parameters-v1770 MRDC-Parameters-v1770 OPTIONAL,

 ca-ParametersNR-v1770 CA-ParametersNR-v1770 OPTIONAL

}

BandCombination-v1800 ::= SEQUENCE {

 ca-ParametersNR-v1800 CA-ParametersNR-v1800 OPTIONAL,

 ca-ParametersNRDC-v1800 CA-ParametersNRDC-v1800 OPTIONAL,

 supportedBandCombListPerBC-SL-U2U-RelayDiscovery-r18 BIT STRING (SIZE (1..maxBandComb)) OPTIONAL

}

BandCombination-UplinkTxSwitch-r16 ::= SEQUENCE {

 bandCombination-r16 BandCombination,

 bandCombination-v1540 BandCombination-v1540 OPTIONAL,

 bandCombination-v1560 BandCombination-v1560 OPTIONAL,

 bandCombination-v1570 BandCombination-v1570 OPTIONAL,

 bandCombination-v1580 BandCombination-v1580 OPTIONAL,

 bandCombination-v1590 BandCombination-v1590 OPTIONAL,

 bandCombination-v1610 BandCombination-v1610 OPTIONAL,

 supportedBandPairListNR-r16 SEQUENCE (SIZE (1..maxULTxSwitchingBandPairs)) OF ULTxSwitchingBandPair-r16,

 uplinkTxSwitching-OptionSupport-r16 ENUMERATED {switchedUL, dualUL, both} OPTIONAL,

 uplinkTxSwitching-PowerBoosting-r16 ENUMERATED {supported} OPTIONAL,

 ...,

 [[

 -- R4 16-5 UL-MIMO coherence capability for dynamic Tx switching between 3CC 1Tx-2Tx switching

 uplinkTxSwitching-PUSCH-TransCoherence-r16 ENUMERATED {nonCoherent, fullCoherent} OPTIONAL

 ]]

}

BandCombination-UplinkTxSwitch-v1630 ::= SEQUENCE {

 bandCombination-v1630 BandCombination-v1630 OPTIONAL

}

BandCombination-UplinkTxSwitch-v1640 ::= SEQUENCE {

 bandCombination-v1640 BandCombination-v1640 OPTIONAL

}

BandCombination-UplinkTxSwitch-v1650 ::= SEQUENCE {

 bandCombination-v1650 BandCombination-v1650 OPTIONAL

}

BandCombination-UplinkTxSwitch-v1670 ::= SEQUENCE {

 bandCombination-v15g0 BandCombination-v15g0 OPTIONAL

}

BandCombination-UplinkTxSwitch-v1690 ::= SEQUENCE {

 bandCombination-v1690 BandCombination-v1690 OPTIONAL

}

BandCombination-UplinkTxSwitch-v16a0 ::= SEQUENCE {

 bandCombination-v16a0 BandCombination-v16a0 OPTIONAL

}

BandCombination-UplinkTxSwitch-v16e0 ::= SEQUENCE {

 bandCombination-v15n0 BandCombination-v15n0 OPTIONAL

}

BandCombination-UplinkTxSwitch-v1700 ::= SEQUENCE {

 bandCombination-v1700 BandCombination-v1700 OPTIONAL,

 -- R4 16-1/16-2/16-3 Dynamic Tx switching between 2CC/3CC 2Tx-2Tx/1Tx-2Tx switching

 supportedBandPairListNR-v1700 SEQUENCE (SIZE (1..maxULTxSwitchingBandPairs)) OF ULTxSwitchingBandPair-v1700 OPTIONAL,

 -- R4 16-6: UL-MIMO coherence capability for dynamic Tx switching between 2Tx-2Tx switching

 uplinkTxSwitchingBandParametersList-v1700 SEQUENCE (SIZE (1.. maxSimultaneousBands)) OF UplinkTxSwitchingBandParameters-v1700 OPTIONAL

}

BandCombination-UplinkTxSwitch-v1720 ::= SEQUENCE {

 bandCombination-v1720 BandCombination-v1720 OPTIONAL,

 uplinkTxSwitching-OptionSupport2T2T-r17 ENUMERATED {switchedUL, dualUL, both} OPTIONAL

}

BandCombination-UplinkTxSwitch-v1730 ::= SEQUENCE {

 bandCombination-v1730 BandCombination-v1730 OPTIONAL

}

BandCombination-UplinkTxSwitch-v1740 ::= SEQUENCE {

 bandCombination-v1740 BandCombination-v1740 OPTIONAL

}

BandCombination-UplinkTxSwitch-v1760 ::= SEQUENCE {

 bandCombination-v1760 BandCombination-v1760 OPTIONAL

}

BandCombination-UplinkTxSwitch-v1770 ::= SEQUENCE {

 bandCombination-v1770 BandCombination-v1770 OPTIONAL

}

BandCombination-UplinkTxSwitch-v1800 ::= SEQUENCE {

 supportedBandPairListNR-r18 SEQUENCE (SIZE (1..maxULTxSwitchingBandPairs)) OF ULTxSwitchingBandPair-r18 OPTIONAL,

 -- R1 49-Y: Minimum separation time for two uplink switching on more than 2 bands within any two consecutive reference slots

 uplinkTxSwitchingMinimumSeparationTime-r18 ENUMERATED {n0us, n500us} OPTIONAL,

 uplinkTxSwitchingAdditionalPeriodDualUL-List-r18 SEQUENCE (SIZE (1..maxULTxSwitchingBetweenBandPairs-r18)) OF

 UplinkTxSwitchingAdditionalPeriodDualUL-r18 OPTIONAL

}

ULTxSwitchingBandPair-r16 ::= SEQUENCE {

 bandIndexUL1-r16 INTEGER(1..maxSimultaneousBands),

 bandIndexUL2-r16 INTEGER(1..maxSimultaneousBands),

 uplinkTxSwitchingPeriod-r16 ENUMERATED {n35us, n140us, n210us},

 uplinkTxSwitching-DL-Interruption-r16 BIT STRING (SIZE(1..maxSimultaneousBands)) OPTIONAL

}

ULTxSwitchingBandPair-v1700 ::= SEQUENCE {

 uplinkTxSwitchingPeriod2T2T-r17 ENUMERATED {n35us, n140us, n210us} OPTIONAL

}

ULTxSwitchingBandPair-r18 ::= SEQUENCE {

 bandCombination-v1800 BandCombination-v1800 OPTIONAL,

 bandIndexUL1-r18 INTEGER(1..maxSimultaneousBands),

 bandIndexUL2-r18 INTEGER(1..maxSimultaneousBands),

 uplinkTxSwitchingOptionForBandPair-r18 ENUMERATED {switchedUL, dualUL, both},

 -- R1 49-X: Supported switching option for each band pair in the band combination for UL Tx switching across more than 2 bands

 uplinkTxSwitchingPeriodForBandPair-r18 SEQUENCE {

 switchingPeriodFor2T-r18 ENUMERATED {n35us, n140us, n210us} OPTIONAL,

 switchingPeriodFor1T-r18 ENUMERATED {n35us, n140us, n210us}

 },

 uplinkTxSwitching-DL-Interruption-r18 BIT STRING (SIZE(1..maxSimultaneousBands)) OPTIONAL,

 uplinkTxSwitchingPeriodUnaffectedBandDualUL-List-r18 SEQUENCE (SIZE (1..maxSimultaneousBands-2-r18)) OF

 SwitchingPeriodUnaffectedBandDualUL-r18 OPTIONAL

}

UplinkTxSwitchingBandParameters-v1700 ::= SEQUENCE {

 bandIndex-r17 INTEGER(1..maxSimultaneousBands),

 uplinkTxSwitching2T2T-PUSCH-TransCoherence-r17 ENUMERATED {nonCoherent, fullCoherent} OPTIONAL

}

UplinkTxSwitchingAdditionalPeriodDualUL-r18::= SEQUENCE {

 uplinkTxSwitchingBetweenBandPairs-r18 SEQUENCE {

 bandPairIndex1-r18 INTEGER(1.. maxULTxSwitchingBandPairs),

 anotherBandPairOrBand-r18 CHOICE {

 bandPairIndex2-r18 INTEGER(1.. maxULTxSwitchingBandPairs),

 bandIndex-r18 INTEGER(1..maxSimultaneousBands)

 }

 },

 switchingAdditionalPeriodDualUL-r18 ENUMERATED {n35us, n140us, n210us}

}

SwitchingPeriodUnaffectedBandDualUL-r18::= SEQUENCE {

 bandIndexUnaffected-r18 INTEGER(1..maxSimultaneousBands),

 periodUnaffectedBandDualUL-r18 CHOICE {

 maintainedUL-Trans-r18 NULL,

 periodOnULBands-r18 ENUMERATED {n35us, n140us, n210us}

 }

}

CombinationCarrierType-r18 ::= SEQUENCE {

 schedulingCellCarrierType-r18 ENUMERATED {licensed-fdd-fr1, licensed-tdd-fr1, unlicensed-tdd-fr1, fr2-1, fr2-2},

 scheduledCellCarrierType-r18 ENUMERATED {licensed-fdd-fr1, licensed-tdd-fr1, unlicensed-tdd-fr1, fr2-1, fr2-2}

}

BandParameters ::= CHOICE {

 eutra SEQUENCE {

 bandEUTRA FreqBandIndicatorEUTRA,

 ca-BandwidthClassDL-EUTRA CA-BandwidthClassEUTRA OPTIONAL,

 ca-BandwidthClassUL-EUTRA CA-BandwidthClassEUTRA OPTIONAL

 },

 nr SEQUENCE {

 bandNR FreqBandIndicatorNR,

 ca-BandwidthClassDL-NR CA-BandwidthClassNR OPTIONAL,

 ca-BandwidthClassUL-NR CA-BandwidthClassNR OPTIONAL

 }

}

BandParameters-v1540 ::= SEQUENCE {

 srs-CarrierSwitch CHOICE {

 nr SEQUENCE {

 srs-SwitchingTimesListNR SEQUENCE (SIZE (1..maxSimultaneousBands)) OF SRS-SwitchingTimeNR

 },

 eutra SEQUENCE {

 srs-SwitchingTimesListEUTRA SEQUENCE (SIZE (1..maxSimultaneousBands)) OF SRS-SwitchingTimeEUTRA

 }

 } OPTIONAL,

 srs-TxSwitch SEQUENCE {

 supportedSRS-TxPortSwitch ENUMERATED {t1r2, t1r4, t2r4, t1r4-t2r4, t1r1, t2r2, t4r4, notSupported},

 txSwitchImpactToRx INTEGER (1..32) OPTIONAL,

 txSwitchWithAnotherBand INTEGER (1..32) OPTIONAL

 } OPTIONAL

}

BandParameters-v1610 ::= SEQUENCE {

 srs-TxSwitch-v1610 SEQUENCE {

 supportedSRS-TxPortSwitch-v1610 ENUMERATED {t1r1-t1r2, t1r1-t1r2-t1r4, t1r1-t1r2-t2r2-t2r4, t1r1-t1r2-t2r2-t1r4-t2r4,

 t1r1-t2r2, t1r1-t2r2-t4r4}

 } OPTIONAL

}

BandParameters-v1710 ::= SEQUENCE {

 -- R1 23-8-3 SRS Antenna switching for >4Rx

 srs-AntennaSwitchingBeyond4RX-r17 SEQUENCE {

 -- 1. Support of SRS antenna switching xTyR with y>4

 supportedSRS-TxPortSwitchBeyond4Rx-r17 BIT STRING (SIZE (11)),

 -- 2. Report the entry number of the first-listed band with UL in the band combination that affects this DL

 entryNumberAffectBeyond4Rx-r17 INTEGER (1..32) OPTIONAL,

 -- 3. Report the entry number of the first-listed band with UL in the band combination that switches together with this UL

 entryNumberSwitchBeyond4Rx-r17 INTEGER (1..32) OPTIONAL

 } OPTIONAL

}

BandParameters-v1730 ::= SEQUENCE {

 -- R1 39-3-2 Affected bands for inter-band CA during SRS carrier switching

 srs-SwitchingAffectedBandsListNR-r17 SEQUENCE (SIZE (1..maxSimultaneousBands)) OF SRS-SwitchingAffectedBandsNR-r17

}

BandParameters-v1770 ::= SEQUENCE {

 ca-BandwidthClassDL-NR-r17 CA-BandwidthClassNR-r17 OPTIONAL,

 ca-BandwidthClassUL-NR-r17 CA-BandwidthClassNR-r17 OPTIONAL

}

ScalingFactorSidelink-r16 ::= ENUMERATED {f0p4, f0p75, f0p8, f1}

IntraBandPowerClass-r16 ::= ENUMERATED {pc2, pc3, spare6, spare5, spare4, spare3, spare2, spare1}

SRS-SwitchingAffectedBandsNR-r17 ::= BIT STRING (SIZE (1..maxSimultaneousBands))

-- TAG-BANDCOMBINATIONLIST-STOP

-- ASN1STOP

|  |
| --- |
| *BandCombination* field descriptions |
| ***BandCombinationList-v1540, BandCombinationList-v1550, BandCombinationList-v1560, BandCombinationList-v1570, BandCombinationList-v1580, BandCombinationList-v1590, BandCombinationList-v15g0, BandCombinationList-v15n0, BandCombinationList-v1610*, *BandCombinationList-v1630*, *BandCombinationList-v1640*, *BandCombinationList-v1650, BandCombinationList-v1680, BandCombinationList-v1690, BandCombinationList-v16a0, BandCombinationList-v1700, BandCombinationList-v1720, BandCombinationList-v1730, BandCombinationList-v1760, BandCombinationList-v1770, BandCombinationList-v1800***The UE shall include the same number of entries, and listed in the same order, as in *BandCombinationList* (without suffix). If the field is included in *supportedBandCombinationListNEDC-Only-v1610*, the UE shall include the same number of entries, and listed in the same order, as in *BandCombinationList* of *supportedBandCombinationListNEDC-Only* (without suffix) field.If the field is included in *supportedBandCombinationListNEDC-Only-v15a0*, the UE shall include the same number of entries, and listed in the same order, as in *BandCombinationList* (without suffix) of *supportedBandCombinationListNEDC-Only* (without suffix) field. |
| ***BandCombinationList-UplinkTxSwitch-r16, BandCombinationList-UplinkTxSwitch-v1630, BandCombinationList-UplinkTxSwitch-v1640, BandCombinationList-UplinkTxSwitch-v1650, BandCombinationList-UplinkTxSwitch-v1690, BandCombinationList-UplinkTxSwitch-v16a0, BandCombinationList-UplinkTxSwitch-v16e0, BandCombinationList-UplinkTxSwitch-v1700, BandCombinationList-UplinkTxSwitch-v1720, BandCombinationList-UplinkTxSwitch-v1730, BandCombinationList-UplinkTxSwitch-v1760, BandCombinationList-UplinkTxSwitch-v1770, BandCombination-UplinkTxSwitch-v1800***The UE shall include the same number of entries, and listed in the same order, as in *BandCombinationList-UplinkTxSwitch-r16*.For the field of *supportedBandCombinationList-UplinkTxSwitch-v1700*, if the UE does not support 2Tx-2Tx switching for a given band combination, the field of *supportedBandPairListNR-v1700* in the corresponding entry is absent. |
| ***ca-ParametersNRDC***If the field is included for a band combination in the NR capability container, the field indicates support of NR-DC. Otherwise, the field is absent. |
| ***featureSetCombinationDAPS***If this field is present for a band combination, it reports the feature set combination supported for the band combination when any DAPS bearer is configured. |
| ***ne-DC-BC***If the field is included for a band combination in the MR-DC capability container, the field indicates support of NE-DC. Otherwise, the field is absent. |
| ***supportedBandPairListNR-r16, supportedBandPairListNR-v1700***Indicates a list of band pair supporting UL Tx switching as defined in TS 38.101-1 [15] for a given band combination.A UE supporting 2Tx-2Tx switching should include both of *supportedBandPairListNR-r16* and *supportedBandPairListNR-v1700*. And the UE shall include the same number of entries listed in the same order as in *supportedBandPairListNR-r16*.If the UE does not support 2Tx-2Tx switching for a given band pair, the field of *uplinkTxSwitchingPeriod2T2T* in the corresponding entry is absent. |
| ***supportedBandPairListNR-r18***Indicates a list of band pair supporting UL Tx switching up to 4 bands as defined in TS 38.101-1 [15] for a given band combination. The UE shall include all the possible band pairs.For a band pair only supporting 1Tx-1Tx switching, the UE should include *switchingPeriodFor1T* in *ULTxSwitchingBandPair-r18*.For a band pair supporting 1Tx-2Tx switching, the UE always supports 1Tx-1Tx switching, and the UE should include *switchingPeriodFor1T* in *ULTxSwitchingBandPair-r18*.For a band pair supporting 2Tx-2Tx switching, the UE always supports 1Tx-2Tx switching and 1Tx-1Tx switching, the UE should include *switchingPeriodFor2T* as well as *switchingPeriodFor1T* in *ULTxSwitchingBandPair-r18*. |
| ***srs-SwitchingTimesListNR***Indicates, for a particular pair of NR bands, the RF retuning time when switching between a NR carrier corresponding to this band entry and another (PUSCH-less) NR carrier corresponding to the band entry in the order indicated below:- For the first NR band, the UE shall include the same number of entries for NR bands as in *bandList*, i.e. first entry corresponds to first NR band in *bandList* and so on,- For the second NR band, the UE shall include one entry less, i.e. first entry corresponds to the second NR band in *bandList* and so on- And so on |
| ***srs-SwitchingTimesListEUTRA***Indicates, for a particular pair of E-UTRA bands, the RF retuning time when switching between an E-UTRA carrier corresponding to this band entry and another (PUSCH-less) E-UTRA carrier corresponding to the band entry in the order indicated below:- For the first E-UTRA band, the UE shall include the same number of entries for E-UTRA bands as in *bandList,* i.e. first entry corresponds to first E-UTRA band in *bandList* and so on,- For the second E-UTRA band, the UE shall include one entry less, i.e. first entry corresponds to the second E-UTRA band in *bandList* and so on - And so on |
| ***srs-TxSwitch***Indicates supported SRS antenna switch capability for the associated band. If the UE indicates support of *SRS-SwitchingTimeNR*, the UE is allowed to set this field for a band with associated *FeatureSetUplinkId* set to 0 for SRS carrier switching. |
| ***uplinkTxSwitchingBandParametersList-v1700***Indicates a list of per band per band combination capabilities for UL Tx switching. |

#### – *BandCombinationListSidelinkEUTRA-NR*

The IE *BandCombinationListSidelinkEUTRA-NR* contains a list of V2X sidelink and NR sidelink band combinations.

BandCombinationListSidelinkEUTRA-NR information element

-- ASN1START

-- TAG-BANDCOMBINATIONLISTSIDELINKEUTRANR-START

BandCombinationListSidelinkEUTRA-NR-r16 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombinationParametersSidelinkEUTRA-NR-r16

BandCombinationListSidelinkEUTRA-NR-v1630 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombinationParametersSidelinkEUTRA-NR-v1630

BandCombinationListSidelinkEUTRA-NR-v1710 ::= SEQUENCE (SIZE (1..maxBandComb)) OF BandCombinationParametersSidelinkEUTRA-NR-v1710

BandCombinationParametersSidelinkEUTRA-NR-r16 ::= SEQUENCE (SIZE (1..maxSimultaneousBands)) OF BandParametersSidelinkEUTRA-NR-r16

BandCombinationParametersSidelinkEUTRA-NR-v1630 ::= SEQUENCE (SIZE (1..maxSimultaneousBands)) OF BandParametersSidelinkEUTRA-NR-v1630

BandCombinationParametersSidelinkEUTRA-NR-v1710 ::= SEQUENCE (SIZE (1..maxSimultaneousBands)) OF BandParametersSidelinkEUTRA-NR-v1710

BandParametersSidelinkEUTRA-NR-r16 ::= CHOICE {

 eutra SEQUENCE {

 bandParametersSidelinkEUTRA1-r16 OCTET STRING OPTIONAL,

 bandParametersSidelinkEUTRA2-r16 OCTET STRING OPTIONAL

 },

 nr SEQUENCE {

 bandParametersSidelinkNR-r16 BandParametersSidelink-r16

 }

}

BandParametersSidelinkEUTRA-NR-v1630 ::= CHOICE {

 eutra NULL,

 nr SEQUENCE {

 tx-Sidelink-r16 ENUMERATED {supported} OPTIONAL,

 rx-Sidelink-r16 ENUMERATED {supported} OPTIONAL,

 sl-CrossCarrierScheduling-r16 ENUMERATED {supported} OPTIONAL

 }

}

BandParametersSidelinkEUTRA-NR-v1710 ::= CHOICE {

 eutra NULL,

 nr SEQUENCE {

 --32-4

 sl-TransmissionMode2-PartialSensing-r17 SEQUENCE {

 harq-TxProcessModeTwoSidelink-r17 ENUMERATED {n8, n16},

 scs-CP-PatternTxSidelinkModeTwo-r17 CHOICE {

 fr1-r17 SEQUENCE {

 scs-15kHz-r17 BIT STRING (SIZE (16)) OPTIONAL,

 scs-30kHz-r17 BIT STRING (SIZE (16)) OPTIONAL,

 scs-60kHz-r17 BIT STRING (SIZE (16)) OPTIONAL

 },

 fr2-r17 SEQUENCE {

 scs-60kHz-r17 BIT STRING (SIZE (16)) OPTIONAL,

 scs-120kHz-r17 BIT STRING (SIZE (16)) OPTIONAL

 }

 } OPTIONAL,

 extendedCP-Mode2PartialSensing-r17 ENUMERATED {supported} OPTIONAL,

 dl-openLoopPC-Sidelink-r17 ENUMERATED {supported} OPTIONAL

 } OPTIONAL,

 --32-2a: Receiving NR sidelink of PSFCH

 rx-sidelinkPSFCH-r17 ENUMERATED {n5, n15, n25, n32, n35, n45, n50, n64} OPTIONAL,

 --32-5a-1

 tx-IUC-Scheme1-Mode2Sidelink-r17 ENUMERATED {supported} OPTIONAL,

 --32-5b-1

 tx-IUC-Scheme2-Mode2Sidelink-r17 ENUMERATED {n4, n8, n16} OPTIONAL

 }

}

BandParametersSidelink-r16 ::= SEQUENCE {

 freqBandSidelink-r16 FreqBandIndicatorNR

}

-- TAG-BANDCOMBINATIONLISTSIDELINKEUTRANR-STOP

-- ASN1STOP

|  |
| --- |
| *BandParametersSidelinkEUTRA-NR* field descriptions |
| ***bandParametersSidelinkEUTRA1,*** ***bandParametersSidelinkEUTRA2***This field includes the *V2X-BandParameters-r14* and *V2X-BandParameters-v1530* IE as specified in 36.331 [10]. It is used for reporting the per-band capability for V2X sidelink communication. |

#### – *BandCombinationListSL-Discovery*

The IE *BandCombinationListSL-Discovery* contains a list of NR Sidelink discovery band combinations.

*BandCombinationListSidelinkSL-Discovery* information element

-- ASN1START

-- TAG-BANDCOMBINATIONLISTSLDISCOVERY-START

BandCombinationListSL-Discovery-r17 ::= SEQUENCE (SIZE (1..maxSimultaneousBands)) OF BandParametersSidelinkDiscovery-r17

BandParametersSidelinkDiscovery-r17 ::= SEQUENCE {

 sl-CrossCarrierScheduling-r17 ENUMERATED {supported} OPTIONAL,

 --R1 32-4: Transmitting NR sidelink mode 2 with partial sensing

 sl-TransmissionMode2-PartialSensing-r17 SEQUENCE {

 harq-TxProcessModeTwoSidelink-r17 ENUMERATED {n8, n16},

 scs-CP-PatternTxSidelinkModeTwo-r17 CHOICE {

 fr1-r17 SEQUENCE {

 scs-15kHz-r17 BIT STRING (SIZE (16)) OPTIONAL,

 scs-30kHz-r17 BIT STRING (SIZE (16)) OPTIONAL,

 scs-60kHz-r17 BIT STRING (SIZE (16)) OPTIONAL

 },

 fr2-r17 SEQUENCE {

 scs-60kHz-r17 BIT STRING (SIZE (16)) OPTIONAL,

 scs-120kHz-r17 BIT STRING (SIZE (16)) OPTIONAL

 }

 } OPTIONAL,

 extendedCP-Mode2PartialSensing-r17 ENUMERATED {supported} OPTIONAL,

 dl-openLoopPC-Sidelink-r17 ENUMERATED {supported} OPTIONAL

 } OPTIONAL,

 --R1 32-5a-1: Transmitting Inter-UE coordination scheme 1 in NR sidelink mode 2

 tx-IUC-Scheme1-Mode2Sidelink-r17 ENUMERATED {supported} OPTIONAL

}

-- TAG-BANDCOMBINATIONLISTSLDISCOVERY-STOP

-- ASN1STOP

#### – *CA-BandwidthClassEUTRA*

The IE *CA-BandwidthClassEUTRA* indicates the E-UTRA CA bandwidth class as defined in TS 36.101 [22], table 5.6A-1.

*CA-BandwidthClassEUTRA* information element

-- ASN1START

-- TAG-CA-BANDWIDTHCLASSEUTRA-START

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

-- TAG-CA-BANDWIDTHCLASSEUTRA-STOP

-- ASN1STOP

#### – *CA-BandwidthClassNR*

The IE *CA-BandwidthClassNR* indicates the NR CA bandwidth class as defined in TS 38.101-1 [15], table 5.3A.5-1 and TS 38.101-2 [39], table 5.3A.4-1.

*CA-BandwidthClassNR* information element

-- ASN1START

-- TAG-CA-BANDWIDTHCLASSNR-START

-- R4 17-6: new CA BW Classes R2-R12

-- R4 17-7: new CA BW Classes V, W

CA-BandwidthClassNR ::= ENUMERATED {a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, ...,r2-v1730, r3-v1730, r4-v1730, r5-v1730, r6-v1730, r7-v1730, r8-v1730, r9-v1730, r10-v1730, r11-v1730, r12-v1730,v-v1770, w-v1770 }

CA-BandwidthClassNR-r17 ::= ENUMERATED {r, s, t, u, ...}

-- TAG-CA-BANDWIDTHCLASSNR-STOP

-- ASN1STOP

#### – *CA-ParametersEUTRA*

The IE *CA-ParametersEUTRA* contains the E-UTRA part of band combination parameters for a given MR-DC band combination.

NOTE: If additional E-UTRA band combination parameters are defined in TS 36.331 [10], which are supported for MR-DC, they will be defined here as well.

*CA-ParametersEUTRA* information element

-- ASN1START

-- TAG-CA-PARAMETERSEUTRA-START

CA-ParametersEUTRA ::= SEQUENCE {

 multipleTimingAdvance ENUMERATED {supported} OPTIONAL,

 simultaneousRx-Tx ENUMERATED {supported} OPTIONAL,

 supportedNAICS-2CRS-AP BIT STRING (SIZE (1..8)) OPTIONAL,

 additionalRx-Tx-PerformanceReq ENUMERATED {supported} OPTIONAL,

 ue-CA-PowerClass-N ENUMERATED {class2} OPTIONAL,

 supportedBandwidthCombinationSetEUTRA-v1530 BIT STRING (SIZE (1..32)) OPTIONAL,

 ...

}

CA-ParametersEUTRA-v1560 ::= SEQUENCE {

 fd-MIMO-TotalWeightedLayers INTEGER (2..128) OPTIONAL

}

CA-ParametersEUTRA-v1570 ::= SEQUENCE {

 dl-1024QAM-TotalWeightedLayers INTEGER (0..10) OPTIONAL

}

-- TAG-CA-PARAMETERSEUTRA-STOP

-- ASN1STOP

#### – *CA-ParametersNR*

The IE *CA-ParametersNR* contains carrier aggregation and inter-frequency DAPS handover related capabilities that are defined per band combination.

*CA-ParametersNR* information element

-- ASN1START

-- TAG-CA-PARAMETERSNR-START

CA-ParametersNR ::= SEQUENCE {

 dummy ENUMERATED {supported} OPTIONAL,

 parallelTxSRS-PUCCH-PUSCH ENUMERATED {supported} OPTIONAL,

 parallelTxPRACH-SRS-PUCCH-PUSCH ENUMERATED {supported} OPTIONAL,

 simultaneousRxTxInterBandCA ENUMERATED {supported} OPTIONAL,

 simultaneousRxTxSUL ENUMERATED {supported} OPTIONAL,

 diffNumerologyAcrossPUCCH-Group ENUMERATED {supported} OPTIONAL,

 diffNumerologyWithinPUCCH-GroupSmallerSCS ENUMERATED {supported} OPTIONAL,

 supportedNumberTAG ENUMERATED {n2, n3, n4} OPTIONAL,

 ...

}

CA-ParametersNR-v1540 ::= SEQUENCE {

 simultaneousSRS-AssocCSI-RS-AllCC INTEGER (5..32) OPTIONAL,

 csi-RS-IM-ReceptionForFeedbackPerBandComb SEQUENCE {

 maxNumberSimultaneousNZP-CSI-RS-ActBWP-AllCC INTEGER (1..64) OPTIONAL,

 totalNumberPortsSimultaneousNZP-CSI-RS-ActBWP-AllCC INTEGER (2..256) OPTIONAL

 } OPTIONAL,

 simultaneousCSI-ReportsAllCC INTEGER (5..32) OPTIONAL,

 dualPA-Architecture ENUMERATED {supported} OPTIONAL

}

CA-ParametersNR-v1550 ::= SEQUENCE {

 dummy ENUMERATED {supported} OPTIONAL

}

CA-ParametersNR-v1560 ::= SEQUENCE {

 diffNumerologyWithinPUCCH-GroupLargerSCS ENUMERATED {supported} OPTIONAL

}

CA-ParametersNR-v15g0 ::= SEQUENCE {

 simultaneousRxTxInterBandCAPerBandPair SimultaneousRxTxPerBandPair OPTIONAL,

 simultaneousRxTxSULPerBandPair SimultaneousRxTxPerBandPair OPTIONAL

}

CA-ParametersNR-v1610 ::= SEQUENCE {

 -- R1 9-3: Parallel MsgA and SRS/PUCCH/PUSCH transmissions across CCs in inter-band CA

 parallelTxMsgA-SRS-PUCCH-PUSCH-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 9-4: MsgA operation in a band combination including SUL

 msgA-SUL-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 10-9c: Joint search space group switching across multiple cells

 jointSearchSpaceSwitchAcrossCells-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 14-5: Half-duplex UE behaviour in TDD CA for same SCS

 half-DuplexTDD-CA-SameSCS-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 18-4: SCell dormancy within active time

 scellDormancyWithinActiveTime-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 18-4a: SCell dormancy outside active time

 scellDormancyOutsideActiveTime-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 18-6: Cross-carrier A-CSI RS triggering with different SCS

 crossCarrierA-CSI-trigDiffSCS-r16 ENUMERATED {higherA-CSI-SCS,lowerA-CSI-SCS,both} OPTIONAL,

 -- R1 18-6a: Default QCL assumption for cross-carrier A-CSI-RS triggering

 defaultQCL-CrossCarrierA-CSI-Trig-r16 ENUMERATED {diffOnly, both} OPTIONAL,

 -- R1 18-7: CA with non-aligned frame boundaries for inter-band CA

 interCA-NonAlignedFrame-r16 ENUMERATED {supported} OPTIONAL,

 simul-SRS-Trans-BC-r16 ENUMERATED {n2} OPTIONAL,

 interFreqDAPS-r16 SEQUENCE {

 interFreqAsyncDAPS-r16 ENUMERATED {supported} OPTIONAL,

 interFreqDiffSCS-DAPS-r16 ENUMERATED {supported} OPTIONAL,

 interFreqMultiUL-TransmissionDAPS-r16 ENUMERATED {supported} OPTIONAL,

 interFreqSemiStaticPowerSharingDAPS-Mode1-r16 ENUMERATED {supported} OPTIONAL,

 interFreqSemiStaticPowerSharingDAPS-Mode2-r16 ENUMERATED {supported} OPTIONAL,

 interFreqDynamicPowerSharingDAPS-r16 ENUMERATED {short, long} OPTIONAL,

 interFreqUL-TransCancellationDAPS-r16 ENUMERATED {supported} OPTIONAL

 } OPTIONAL,

 codebookParametersPerBC-r16 CodebookParameters-v1610 OPTIONAL,

 -- R1 16-2a-10 Value of R for BD/CCE

 blindDetectFactor-r16 INTEGER (1..2) OPTIONAL,

 -- R1 11-2a: Capability on the number of CCs for monitoring a maximum number of BDs and non-overlapped CCEs per span when configured

 -- with DL CA with Rel-16 PDCCH monitoring capability on all the serving cells

 pdcch-MonitoringCA-r16 SEQUENCE {

 maxNumberOfMonitoringCC-r16 INTEGER (2..16),

 supportedSpanArrangement-r16 ENUMERATED {alignedOnly, alignedAndNonAligned}

 } OPTIONAL,

 -- R1 11-2c: Number of carriers for CCE/BD scaling with DL CA with mix of Rel. 16 and Rel. 15 PDCCH monitoring capabilities on

 -- different carriers

 pdcch-BlindDetectionCA-Mixed-r16 SEQUENCE {

 pdcch-BlindDetectionCA1-r16 INTEGER (1..15),

 pdcch-BlindDetectionCA2-r16 INTEGER (1..15),

 supportedSpanArrangement-r16 ENUMERATED {alignedOnly, alignedAndNonAligned}

 } OPTIONAL,

 -- R1 11-2d: Capability on the number of CCs for monitoring a maximum number of BDs and non-overlapped CCEs per span for MCG and for

 -- SCG when configured for NR-DC operation with Rel-16 PDCCH monitoring capability on all the serving cells

 pdcch-BlindDetectionMCG-UE-r16 INTEGER (1..14) OPTIONAL,

 pdcch-BlindDetectionSCG-UE-r16 INTEGER (1..14) OPTIONAL,

 -- R1 11-2e: Number of carriers for CCE/BD scaling for MCG and for SCG when configured for NR-DC operation with mix of Rel. 16 and

 -- Rel. 15 PDCCH monitoring capabilities on different carriers

 pdcch-BlindDetectionMCG-UE-Mixed-r16 SEQUENCE {

 pdcch-BlindDetectionMCG-UE1-r16 INTEGER (0..15),

 pdcch-BlindDetectionMCG-UE2-r16 INTEGER (0..15)

 } OPTIONAL,

 pdcch-BlindDetectionSCG-UE-Mixed-r16 SEQUENCE {

 pdcch-BlindDetectionSCG-UE1-r16 INTEGER (0..15),

 pdcch-BlindDetectionSCG-UE2-r16 INTEGER (0..15)

 } OPTIONAL,

 -- R1 18-5 cross-carrier scheduling with different SCS in DL CA

 crossCarrierSchedulingDL-DiffSCS-r16 ENUMERATED {low-to-high, high-to-low, both} OPTIONAL,

 -- R1 18-5a Default QCL assumption for cross-carrier scheduling

 crossCarrierSchedulingDefaultQCL-r16 ENUMERATED {diff-only, both} OPTIONAL,

 -- R1 18-5b cross-carrier scheduling with different SCS in UL CA

 crossCarrierSchedulingUL-DiffSCS-r16 ENUMERATED {low-to-high, high-to-low, both} OPTIONAL,

 -- R1 13.19a Simultaneous positioning SRS and MIMO SRS transmission for a given BC

 simul-SRS-MIMO-Trans-BC-r16 ENUMERATED {n2} OPTIONAL,

 -- R1 16-3a, 16-3a-1, 16-3b, 16-3b-1: New Individual Codebook

 codebookParametersAdditionPerBC-r16 CodebookParametersAdditionPerBC-r16 OPTIONAL,

 -- R1 16-8: Mixed codebook

 codebookComboParametersAdditionPerBC-r16 CodebookComboParametersAdditionPerBC-r16 OPTIONAL

}

CA-ParametersNR-v1630 ::= SEQUENCE {

 -- R1 22-5b: Simultaneous transmission of SRS for antenna switching and SRS for CB/NCB /BM for inter-band UL CA

 -- R1 22-5d: Simultaneous transmission of SRS for antenna switching for inter-band UL CA

 simulTX-SRS-AntSwitchingInterBandUL-CA-r16 SimulSRS-ForAntennaSwitching-r16 OPTIONAL,

 -- R4 8-5: supported beam management type for inter-band CA

 beamManagementType-r16 ENUMERATED {ibm, dummy} OPTIONAL,

 -- R4 7-3a: UL frequency separation class with aggregate BW and Gap BW

 intraBandFreqSeparationUL-AggBW-GapBW-r16 ENUMERATED {classI, classII, classIII} OPTIONAL,

 -- RAN 89: Case B in case of Inter-band CA with non-aligned frame boundaries

 interCA-NonAlignedFrame-B-r16 ENUMERATED {supported} OPTIONAL

}

CA-ParametersNR-v1640 ::= SEQUENCE {

 -- R4 7-5: Support of reporting UL Tx DC locations for uplink intra-band CA.

 uplinkTxDC-TwoCarrierReport-r16 ENUMERATED {supported} OPTIONAL,

 -- RAN 22-6: Support of up to 3 different numerologies in the same NR PUCCH group for NR part of EN-DC, NGEN-DC, NE-DC and NR-CA

 -- where UE is not configured with two NR PUCCH groups

 maxUpTo3Diff-NumerologiesConfigSinglePUCCH-grp-r16 PUCCH-Grp-CarrierTypes-r16 OPTIONAL,

 -- RAN 22-6a: Support of up to 4 different numerologies in the same NR PUCCH group for NR part of EN-DC, NGEN-DC, NE-DC and NR-CA

 -- where UE is not configured with two NR PUCCH groups

 maxUpTo4Diff-NumerologiesConfigSinglePUCCH-grp-r16 PUCCH-Grp-CarrierTypes-r16 OPTIONAL,

 -- RAN 22-7: Support two PUCCH groups for NR-CA with 3 or more bands with at least two carrier types

 twoPUCCH-Grp-ConfigurationsList-r16 SEQUENCE (SIZE (1..maxTwoPUCCH-Grp-ConfigList-r16)) OF TwoPUCCH-Grp-Configurations-r16 OPTIONAL,

 -- R1 22-7a: Different numerology across NR PUCCH groups

 diffNumerologyAcrossPUCCH-Group-CarrierTypes-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 22-7b: Different numerologies across NR carriers within the same NR PUCCH group, with PUCCH on a carrier of smaller SCS

 diffNumerologyWithinPUCCH-GroupSmallerSCS-CarrierTypes-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 22-7c: Different numerologies across NR carriers within the same NR PUCCH group, with PUCCH on a carrier of larger SCS

 diffNumerologyWithinPUCCH-GroupLargerSCS-CarrierTypes-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 11-2f: add the replicated FGs of 11-2a/c with restriction for non-aligned span case

 -- with DL CA with Rel-16 PDCCH monitoring capability on all the serving cells

 pdcch-MonitoringCA-NonAlignedSpan-r16 INTEGER (2..16) OPTIONAL,

 -- R1 11-2g: add the replicated FGs of 11-2a/c with restriction for non-aligned span case

 pdcch-BlindDetectionCA-Mixed-NonAlignedSpan-r16 SEQUENCE {

 pdcch-BlindDetectionCA1-r16 INTEGER (1..15),

 pdcch-BlindDetectionCA2-r16 INTEGER (1..15)

 } OPTIONAL

}

CA-ParametersNR-v1690 ::= SEQUENCE {

 csi-ReportingCrossPUCCH-Grp-r16 SEQUENCE {

 computationTimeForA-CSI-r16 ENUMERATED {sameAsNoCross, relaxed},

 additionalSymbols-r16 SEQUENCE {

 scs-15kHz-additionalSymbols-r16 ENUMERATED {s14, s28} OPTIONAL,

 scs-30kHz-additionalSymbols-r16 ENUMERATED {s14, s28} OPTIONAL,

 scs-60kHz-additionalSymbols-r16 ENUMERATED {s14, s28, s56} OPTIONAL,

 scs-120kHz-additionalSymbols-r16 ENUMERATED {s14, s28, s56} OPTIONAL

 } OPTIONAL,

 sp-CSI-ReportingOnPUCCH-r16 ENUMERATED {supported} OPTIONAL,

 sp-CSI-ReportingOnPUSCH-r16 ENUMERATED {supported} OPTIONAL,

 carrierTypePairList-r16 SEQUENCE (SIZE (1..maxCarrierTypePairList-r16)) OF CarrierTypePair-r16

 } OPTIONAL

}

CA-ParametersNR-v16a0 ::= SEQUENCE {

 pdcch-BlindDetectionMixedList-r16 SEQUENCE(SIZE(1..maxNrofPdcch-BlindDetectionMixed-1-r16)) OF PDCCH-BlindDetectionMixedList-r16

}

CA-ParametersNR-v1700 ::= SEQUENCE {

 -- R1 23-9-1: Basic Features of Further Enhanced Port-Selection Type II Codebook (FeType-II) per band combination information

 codebookParametersfetype2PerBC-r17 CodebookParametersfetype2PerBC-r17 OPTIONAL,

 -- R4 18-4: Support of enhanced Demodulation requirements for CA in HST SFN FR1

 demodulationEnhancementCA-r17 ENUMERATED {supported} OPTIONAL,

 -- R4 20-1: Maximum uplink duty cycle for NR inter-band CA power class 2

 maxUplinkDutyCycle-interBandCA-PC2-r17 ENUMERATED {n50, n60, n70, n80, n90, n100} OPTIONAL,

 -- R4 20-2: Maximum uplink duty cycle for NR SUL combination power class 2

 maxUplinkDutyCycle-SULcombination-PC2-r17 ENUMERATED {n50, n60, n70, n80, n90, n100} OPTIONAL,

 beamManagementType-CBM-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 25-18: Parallel PUCCH and PUSCH transmission across CCs in inter-band CA

 parallelTxPUCCH-PUSCH-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 23-9-5 Active CSI-RS resources and ports for mixed codebook types in any slot per band combination

 codebookComboParameterMixedTypePerBC-r17 CodebookComboParameterMixedTypePerBC-r17 OPTIONAL,

 -- R1 23-7-1 Basic Features of CSI Enhancement for Multi-TRP

 mTRP-CSI-EnhancementPerBC-r17 SEQUENCE {

 maxNumNZP-CSI-RS-r17 INTEGER (2..8),

 cSI-Report-mode-r17 ENUMERATED {mode1, mode2, both},

 supportedComboAcrossCCs-r17 SEQUENCE (SIZE (1..16)) OF CSI-MultiTRP-SupportedCombinations-r17,

 codebookMode-NCJT-r17 ENUMERATED{mode1,mode1And2}

 } OPTIONAL,

 -- R1 23-7-1b Active CSI-RS resources and ports in the presence of multi-TRP CSI

 codebookComboParameterMultiTRP-PerBC-r17 CodebookComboParameterMultiTRP-PerBC-r17 OPTIONAL,

 -- R1 24-8b: 32 DL HARQ processes for FR 2-2 - maximum number of component carriers

 maxCC-32-DL-HARQ-ProcessFR2-2-r17 ENUMERATED {n1, n2, n3, n4, n6, n8, n16, n32} OPTIONAL,

 -- R1 24-9b: 32 UL HARQ processes for FR 2-2 - maximum number of component carriers

 maxCC-32-UL-HARQ-ProcessFR2-2-r17 ENUMERATED {n1, n2, n3, n4, n5, n8, n16, n32} OPTIONAL,

 -- R1 34-2: Cross-carrier scheduling from SCell to PCell/PSCell (Type B)

 crossCarrierSchedulingSCell-SpCellTypeB-r17 CrossCarrierSchedulingSCell-SpCell-r17 OPTIONAL,

-- R1 34-1: Cross-carrier scheduling from SCell to PCell/PSCell with search space restrictions (Type A)

 crossCarrierSchedulingSCell-SpCellTypeA-r17 CrossCarrierSchedulingSCell-SpCell-r17 OPTIONAL,

 -- R1 34-1a: DCI formats on PCell/PSCell USS set(s) support

 dci-FormatsPCellPSCellUSS-Sets-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 34-3: Disabling scaling factor alpha when sSCell is deactivated

 disablingScalingFactorDeactSCell-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 34-4: Disabling scaling factor alpha when sSCell is deactivated

 disablingScalingFactorDormantSCell-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 34-5: Non-aligned frame boundaries between PCell/PSCell and sSCell

 non-AlignedFrameBoundaries-r17 SEQUENCE {

 scs15kHz-15kHz-r17 BIT STRING (SIZE (1..496)) OPTIONAL,

 scs15kHz-30kHz-r17 BIT STRING (SIZE (1..496)) OPTIONAL,

 scs15kHz-60kHz-r17 BIT STRING (SIZE (1..496)) OPTIONAL,

 scs30kHz-30kHz-r17 BIT STRING (SIZE (1..496)) OPTIONAL,

 scs30kHz-60kHz-r17 BIT STRING (SIZE (1..496)) OPTIONAL,

 scs60kHz-60kHz-r17 BIT STRING (SIZE (1..496)) OPTIONAL

 } OPTIONAL

}

CA-ParametersNR-v1720 ::= SEQUENCE {

 -- R1 39-1: Parallel SRS and PUCCH/PUSCH transmission across CCs in intra-band non-contiguous CA

 parallelTxSRS-PUCCH-PUSCH-intraBand-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 39-2: Parallel PRACH and SRS/PUCCH/PUSCH transmissions across CCs in intra-band non-contiguous CA

 parallelTxPRACH-SRS-PUCCH-PUSCH-intraBand-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 25-9: Semi-static PUCCH cell switching for a single PUCCH group only

 semiStaticPUCCH-CellSwitchSingleGroup-r17 SEQUENCE {

 pucch-Group-r17 ENUMERATED {primaryGroupOnly, secondaryGroupOnly, eitherPrimaryOrSecondaryGroup},

 pucch-Group-Config-r17 PUCCH-Group-Config-r17

 } OPTIONAL,

 -- R1 25-9a: Semi-static PUCCH cell switching for two PUCCH groups

 semiStaticPUCCH-CellSwitchTwoGroups-r17 SEQUENCE (SIZE (1..maxTwoPUCCH-Grp-ConfigList-r17)) OF TwoPUCCH-Grp-Configurations-r17 OPTIONAL,

 -- R1 25-10: PUCCH cell switching based on dynamic indication for same length of overlapping PUCCH slots/sub-slots for a single

 -- PUCCH group only

 dynamicPUCCH-CellSwitchSameLengthSingleGroup-r17 SEQUENCE {

 pucch-Group-r17 ENUMERATED {primaryGroupOnly, secondaryGroupOnly, eitherPrimaryOrSecondaryGroup},

 pucch-Group-Config-r17 PUCCH-Group-Config-r17

 } OPTIONAL,

 -- R1 25-10a: PUCCH cell switching based on dynamic indication for different length of overlapping PUCCH slots/sub-slots

 -- for a single PUCCH group only

 dynamicPUCCH-CellSwitchDiffLengthSingleGroup-r17 SEQUENCE {

 pucch-Group-r17 ENUMERATED {primaryGroupOnly, secondaryGroupOnly, eitherPrimaryOrSecondaryGroup},

 pucch-Group-Config-r17 PUCCH-Group-Config-r17

 } OPTIONAL,

 -- R1 25-10b: PUCCH cell switching based on dynamic indication for same length of overlapping PUCCH slots/sub-slots for two PUCCH

 -- groups

 dynamicPUCCH-CellSwitchSameLengthTwoGroups-r17 SEQUENCE (SIZE (1..maxTwoPUCCH-Grp-ConfigList-r17)) OF TwoPUCCH-Grp-Configurations-r17

 OPTIONAL,

 -- R1 25-10c: PUCCH cell switching based on dynamic indication for different length of overlapping PUCCH slots/sub-slots for two

 -- PUCCH groups

 dynamicPUCCH-CellSwitchDiffLengthTwoGroups-r17 SEQUENCE (SIZE (1..maxTwoPUCCH-Grp-ConfigList-r17)) OF TwoPUCCH-Grp-Configurations-r17

 OPTIONAL,

 -- R1 33-2a: ACK/NACK based HARQ-ACK feedback and RRC-based enabling/disabling ACK/NACK-based

 -- feedback for dynamic scheduling for multicast

 ack-NACK-FeedbackForMulticast-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 33-2d: PTP retransmission for multicast dynamic scheduling

 ptp-Retx-Multicast-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 33-4: NACK-only based HARQ-ACK feedback for RRC-based enabling/disabling multicast with ACK/NACK transforming

 nack-OnlyFeedbackForMulticast-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 33-4a: NACK-only based HARQ-ACK feedback for multicast corresponding to a specific sequence or a PUCCH transmission

 nack-OnlyFeedbackSpecificResourceForMulticast-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 33-5-1a: ACK/NACK based HARQ-ACK feedback and RRC-based enabling/disabling ACK/NACK-based feedback

 -- for SPS group-common PDSCH for multicast

 ack-NACK-FeedbackForSPS-Multicast-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 33-5-1d: PTP retransmission for SPS group-common PDSCH for multicast

 ptp-Retx-SPS-Multicast-r17 ENUMERATED {supported} OPTIONAL,

 -- R4 26-1: Higher Power Limit CA DC

 higherPowerLimit-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 39-4: Parallel MsgA and SRS/PUCCH/PUSCH transmissions across CCs in intra-band non-contiguous CA

 parallelTxMsgA-SRS-PUCCH-PUSCH-intraBand-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 24-11a: Capability on the number of CCs for monitoring a maximum number of BDs and non-overlapped CCEs per span when

 -- configured with DL CA with Rel-17 PDCCH monitoring capability on all the serving cells

 pdcch-MonitoringCA-r17 INTEGER (4..16) OPTIONAL,

 -- R1 24-11f: Capability on the number of CCs for monitoring a maximum number of BDs and non-overlapped CCEs for MCG and for SCG

 -- when configured for NR-DC operation with Rel-17 PDCCH monitoring capability on all the serving cells

 pdcch-BlindDetectionMCG-SCG-List-r17 SEQUENCE(SIZE(1..maxNrofPdcch-BlindDetection-r17)) OF PDCCH-BlindDetectionMCG-SCG-r17

 OPTIONAL,

 -- R1 24-11c: Number of carriers for CCE/BD scaling with DL CA with mix of Rel. 17 and Rel. 15 PDCCH monitoring capabilities on

 -- different Carriers

 -- R1 24-11g: Number of carriers for CCE/BD scaling for MCG and for SCG when configured for NR-DC operation with mix of Rel. 17 and

 -- Rel. 15 PDCCH monitoring capabilities on different carriers

 pdcch-BlindDetectionMixedList1-r17 SEQUENCE(SIZE(1..maxNrofPdcch-BlindDetection-r17)) OF PDCCH-BlindDetectionMixed-r17

 OPTIONAL,

 -- R1 24-11d: Number of carriers for CCE/BD scaling with DL CA with mix of Rel. 17 and Rel. 16 PDCCH monitoring capabilities on

 -- different Carriers

 -- R1 24-11h: Number of carriers for CCE/BD scaling for MCG and for SCG when configured for NR-DC operation with mix of Rel. 17 and

 -- Rel. 16 PDCCH monitoring capabilities on different carriers

 pdcch-BlindDetectionMixedList2-r17 SEQUENCE(SIZE(1..maxNrofPdcch-BlindDetection-r17)) OF PDCCH-BlindDetectionMixed-r17

 OPTIONAL,

 -- R1 24-11e: Number of carriers for CCE/BD scaling with DL CA with mix of Rel. 17, Rel. 16 and Rel. 15 PDCCH monitoring

 -- capabilities on different carriers

 -- R1 24-11i: Number of carriers for CCE/BD scaling for MCG and for SCG when configured for NR-DC operation with mix of Rel. 17,

 -- Rel. 16 and Rel. 15 PDCCH monitoring capabilities on different carriers

 pdcch-BlindDetectionMixedList3-r17 SEQUENCE(SIZE(1..maxNrofPdcch-BlindDetection-r17)) OF PDCCH-BlindDetectionMixed1-r17

 OPTIONAL

}

CA-ParametersNR-v1730 ::= SEQUENCE {

 -- R1 30-4a: DM-RS bundling for PUSCH repetition type A (per BC)

 dmrs-BundlingPUSCH-RepTypeAPerBC-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 30-4b: DM-RS bundling for PUSCH repetition type B(per BC)

 dmrs-BundlingPUSCH-RepTypeBPerBC-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 30-4c: DM-RS bundling for TB processing over multi-slot PUSCH(per BC)

 dmrs-BundlingPUSCH-multiSlotPerBC-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 30-4d: DMRS bundling for PUCCH repetitions(per BC)

 dmrs-BundlingPUCCH-RepPerBC-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 30-4g: Restart DM-RS bundling (per BC)

 dmrs-BundlingRestartPerBC-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 30-4h: DM-RS bundling for non-back-to-back transmission (per BC)

 dmrs-BundlingNonBackToBackTX-PerBC-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 39-3-1: Stay on the target CC for SRS carrier switching

 stayOnTargetCC-SRS-CarrierSwitch-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 33-3-3a: FDM-ed Type-1 and Type-2 HARQ-ACK codebooks for multiplexing HARQ-ACK for unicast and HARQ-ACK for multicast

 fdm-CodebookForMux-UnicastMulticastHARQ-ACK-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 33-3-3b: Mode 2 TDM-ed Type-1 and Type-2 HARQ-ACK codebook for multiplexing HARQ-ACK for unicast and HARQ-ACK for multicast

 mode2-TDM-CodebookForMux-UnicastMulticastHARQ-ACK-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 33-3-4: Mode 1 for type1 codebook generation

 mode1-ForType1-CodebookGeneration-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 33-5-1j: NACK-only based HARQ-ACK feedback for multicast corresponding to a specific sequence or a PUCCH transmission

 -- for SPS group-commmon PDSCH for multicast

 nack-OnlyFeedbackSpecificResourceForSPS-Multicast-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 33-8-2: Up to 2 PUCCH resources configuration for multicast feedback for dynamically scheduled multicast

 multiPUCCH-ConfigForMulticast-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 33-8-3: PUCCH resource configuration for multicast feedback for SPS GC-PDSCH

 pucch-ConfigForSPS-Multicast-r17 ENUMERATED {supported} OPTIONAL,

 -- The following parameter is associated with R1 33-2a, R1 33-3-3a, and R1 33-3-3b, and is not a RAN1 FG.

 maxNumberG-RNTI-HARQ-ACK-Codebook-r17 INTEGER (1..4) OPTIONAL,

 -- R1 33-3-5: Feedback multiplexing for unicast PDSCH and group-common PDSCH for multicast with same priority and different codebook

 -- type

 mux-HARQ-ACK-UnicastMulticast-r17 ENUMERATED {supported} OPTIONAL

}

CA-ParametersNR-v1740 ::= SEQUENCE {

 -- R1 33-5-1f: NACK-only based HARQ-ACK feedback for multicast RRC-based enabling/disabling NACK-only based feedback

 -- for SPS group-common PDSCH for multicast

 nack-OnlyFeedbackForSPS-Multicast-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 33-8-1: PUCCH resource configuration for multicast feedback for dynamically scheduled multicast

 singlePUCCH-ConfigForMulticast-r17 ENUMERATED {supported} OPTIONAL

}

CA-ParametersNR-v1760 ::= SEQUENCE {

 prioSCellPRACH-OverSP-PeriodicSRS-Support-r17 ENUMERATED {supported} OPTIONAL

}

CA-ParametersNR-v1770 ::= SEQUENCE {

 parallelTxPUCCH-PUSCH-SamePriority-r17 ENUMERATED {supported} OPTIONAL

}

CA-ParametersNR-v1800 ::= SEQUENCE {

 codebookParametersetype2DopplerCSI-PerBC-r18 CodebookParametersetype2DopplerCSI-r18 OPTIONAL,

 codebookParametersfetype2DopplerCSI-PerBC-r18 CodebookParametersfetype2DopplerCSI-r18 OPTIONAL,

 -- R1 49-1b: Multi-cell PDSCH scheduling by DCI format 1\_3 on a scheduling cell not included in a set of cells with different

 -- SCS/carrier type between scheduling cell and cells in the set

 multiCell-PDSCH-DCI-1-3-DiffSCS-r18 SEQUENCE {

 coScheduledCellSCS-r18 ENUMERATED {lowScheduling-highScheduled, highScheduling-lowScheduled, both},

 combinationCarrierType-r18 SEQUENCE (SIZE(1..maxSchedulingBandCombination-r18)) OF

 CombinationCarrierType-r18,

 maxNumberCoScheduledCell-r18 INTEGER (2..4),

 maxNumberSetsOfCellAcrossPUCCH-Group-r18 INTEGER (1..8),

 maxNumberSetsOfCellScheduling-r18 INTEGER (1..4),

 harqFeedbackType-r18 ENUMERATED {type1, type2, type1And2},

 coScheduledCellIndicationScheme-r18 ENUMERATED {fdra,cellInd, both}

 } OPTIONAL,

 -- R1 55-6a: Capability on the number of CCs for monitoring a maximum number of BDs and non-overlapped CCEs per span when configured

 -- with DL CA with Rel-16 PDCCH monitoring capability on all the serving cells

 pdcch-MonitoringCA-r18 SEQUENCE {

 maxNumberOfMonitoringCC-r18 INTEGER (2..16),

 supportedSpanArrangement-r18 ENUMERATED {alignedOnly, alignedAndNonAligned}

 } OPTIONAL,

 -- R1 55-6c: Number of carriers for CCE/BD scaling with DL CA with mix of Rel. 16 and Rel. 15 PDCCH monitoring capabilities on

 -- different carriers

 pdcch-BlindDetectionCA-Mixed-r18 SEQUENCE {

 blindDetectionCA-Mixed-r18 SEQUENCE(SIZE (1..maxNrofPdcch-BlindDetection-r17)) OF

 PDCCH-BlindDetectionCA-Mixed-r18,

 supportedSpanArrangement-r18 ENUMERATED{ alignedOnly, alignedAndNonAligned }

 } OPTIONAL,

 -- R1 55-6e: Number of carriers for CCE/BD scaling for MCG and for SCG when configured for NR-DC operation with mix of Rel. 16

 -- and Rel. 15 PDCCH monitoring capabilities on different carriers

 pdcch-BlinkdDetectionMCG-SCG-List-r18 SEQUENCE(SIZE (1..maxNrofPdcch-BlindDetection-r17)) OF PDCCH-BlindDetectionMCG-SCG-r18

 OPTIONAL,

 -- R1 55-6g: Number of carriers for CCE/BD scaling with DL CA with mix of Rel. 16 and Rel. 15 PDCCH monitoring capabilities on

 -- different carriers with restriction for non-aligned span case

 pdcch-BlindDetectionCA-Mixed-NonAlignedSpan-r18 SEQUENCE(SIZE (1..maxNrofPdcch-BlindDetection-r17)) OF

 PDCCH-BlindDetectionCA-Mixed-r18 OPTIONAL,

 -- R1 55-6f: Capability on the number of CCs for monitoring a maximum number of BDs and non-overlapped CCEs per span when configured

 -- with DL CA with Rel-16 PDCCH monitoring capability on all the serving cells with restriction for non-aligned span case

 pdcch-MonitoringCA-NonAlignedSpan-r18 INTEGER (2..16) OPTIONAL,

 -- R4 33-1: Support of intra-band non-collocated NR CA operation

 intraBandNR-CA-non-collocated-r18 ENUMERATED {supported} OPTIONAL

}

CrossCarrierSchedulingSCell-SpCell-r17 ::= SEQUENCE {

 supportedSCS-Combinations-r17 SEQUENCE {

 scs15kHz-15kHz-r17 ENUMERATED {supported} OPTIONAL,

 scs15kHz-30kHz-r17 ENUMERATED {supported} OPTIONAL,

 scs15kHz-60kHz-r17 ENUMERATED {supported} OPTIONAL,

 scs30kHz-30kHz-r17 BIT STRING (SIZE (1..496)) OPTIONAL,

 scs30kHz-60kHz-r17 BIT STRING (SIZE (1..496)) OPTIONAL,

 scs60kHz-60kHz-r17 BIT STRING (SIZE (1..496)) OPTIONAL

 },

 pdcch-MonitoringOccasion-r17 ENUMERATED {val1, val2}

}

PDCCH-BlindDetectionMixedList-r16::= SEQUENCE {

 pdcch-BlindDetectionCA-MixedExt-r16 CHOICE {

 pdcch-BlindDetectionCA-Mixed-v16a0 PDCCH-BlindDetectionCA-MixedExt-r16,

 pdcch-BlindDetectionCA-Mixed-NonAlignedSpan-v16a0 PDCCH-BlindDetectionCA-MixedExt-r16

 } OPTIONAL,

 pdcch-BlindDetectionCG-UE-MixedExt-r16 SEQUENCE{

 pdcch-BlindDetectionMCG-UE-Mixed-v16a0 PDCCH-BlindDetectionCG-UE-MixedExt-r16,

 pdcch-BlindDetectionSCG-UE-Mixed-v16a0 PDCCH-BlindDetectionCG-UE-MixedExt-r16

 } OPTIONAL

}

PDCCH-BlindDetectionCA-MixedExt-r16 ::= SEQUENCE {

 pdcch-BlindDetectionCA1-r16 INTEGER (1..15),

 pdcch-BlindDetectionCA2-r16 INTEGER (1..15)

}

PDCCH-BlindDetectionCG-UE-MixedExt-r16 ::= SEQUENCE {

 pdcch-BlindDetectionCG-UE1-r16 INTEGER (0..15),

 pdcch-BlindDetectionCG-UE2-r16 INTEGER (0..15)

}

PDCCH-BlindDetectionMCG-SCG-r17 ::= SEQUENCE {

 pdcch-BlindDetectionMCG-UE-r17 INTEGER (1..15),

 pdcch-BlindDetectionSCG-UE-r17 INTEGER (1..15)

}

PDCCH-BlindDetectionMixed-r17::= SEQUENCE {

 pdcch-BlindDetectionCA-Mixed-r17 PDCCH-BlindDetectionCA-Mixed-r17 OPTIONAL,

 pdcch-BlindDetectionCG-UE-Mixed-r17 SEQUENCE{

 pdcch-BlindDetectionMCG-UE-Mixed-v17 PDCCH-BlindDetectionCG-UE-Mixed-r17,

 pdcch-BlindDetectionSCG-UE-Mixed-v17 PDCCH-BlindDetectionCG-UE-Mixed-r17

 } OPTIONAL

}

PDCCH-BlindDetectionCG-UE-Mixed-r17 ::= SEQUENCE {

 pdcch-BlindDetectionCG-UE1-r17 INTEGER (0..15),

 pdcch-BlindDetectionCG-UE2-r17 INTEGER (0..15)

}

PDCCH-BlindDetectionCA-Mixed-r17 ::= SEQUENCE {

 pdcch-BlindDetectionCA1-r17 INTEGER (1..15) OPTIONAL,

 pdcch-BlindDetectionCA2-r17 INTEGER (1..15) OPTIONAL

}

PDCCH-BlindDetectionMixed1-r17::= SEQUENCE {

 pdcch-BlindDetectionCA-Mixed1-r17 PDCCH-BlindDetectionCA-Mixed1-r17 OPTIONAL,

 pdcch-BlindDetectionCG-UE-Mixed1-r17 SEQUENCE{

 pdcch-BlindDetectionMCG-UE-Mixed1-v17 PDCCH-BlindDetectionCG-UE-Mixed1-r17,

 pdcch-BlindDetectionSCG-UE-Mixed1-v17 PDCCH-BlindDetectionCG-UE-Mixed1-r17

 } OPTIONAL

}

PDCCH-BlindDetectionCG-UE-Mixed1-r17 ::= SEQUENCE {

 pdcch-BlindDetectionCG-UE1-r17 INTEGER (0..15),

 pdcch-BlindDetectionCG-UE2-r17 INTEGER (0..15),

 pdcch-BlindDetectionCG-UE3-r17 INTEGER (0..15)

}

PDCCH-BlindDetectionCA-Mixed1-r17 ::= SEQUENCE {

 pdcch-BlindDetectionCA1-r17 INTEGER (1..15) OPTIONAL,

 pdcch-BlindDetectionCA2-r17 INTEGER (1..15) OPTIONAL,

 pdcch-BlindDetectionCA3-r17 INTEGER (1..15) OPTIONAL

}

PDCCH-BlindDetectionMCG-SCG-r18 ::= SEQUENCE{

 pdcch-BlindDetectionMCG-UE-Mixed-r18 PDCCH-BlindDetectionCG-UE-Mixed-r18,

 pdcch-BlindDetectionSCG-UE-Mixed-r18 PDCCH-BlindDetectionCG-UE-Mixed-r18

}

PDCCH-BlindDetectionCA-Mixed-r18 ::= SEQUENCE {

 pdcch-BlindDetectionCA1-r18 INTEGER (1..15),

 pdcch-BlindDetectionCA2-r18 INTEGER (1..15)

}

PDCCH-BlindDetectionCG-UE-Mixed-r18 ::= SEQUENCE {

 pdcch-BlindDetectionCG-UE1-r18 INTEGER (0..15),

 pdcch-BlindDetectionCG-UE2-r18 INTEGER (0..15)

}

SimulSRS-ForAntennaSwitching-r16 ::= SEQUENCE {

 supportSRS-xTyR-xLessThanY-r16 ENUMERATED {supported} OPTIONAL,

 supportSRS-xTyR-xEqualToY-r16 ENUMERATED {supported} OPTIONAL,

 supportSRS-AntennaSwitching-r16 ENUMERATED {supported} OPTIONAL

}

TwoPUCCH-Grp-Configurations-r16 ::= SEQUENCE {

 pucch-PrimaryGroupMapping-r16 TwoPUCCH-Grp-ConfigParams-r16,

 pucch-SecondaryGroupMapping-r16 TwoPUCCH-Grp-ConfigParams-r16

}

TwoPUCCH-Grp-Configurations-r17 ::= SEQUENCE {

 primaryPUCCH-GroupConfig-r17 PUCCH-Group-Config-r17,

 secondaryPUCCH-GroupConfig-r17 PUCCH-Group-Config-r17

}

TwoPUCCH-Grp-ConfigParams-r16 ::= SEQUENCE {

 pucch-GroupMapping-r16 PUCCH-Grp-CarrierTypes-r16,

 pucch-TX-r16 PUCCH-Grp-CarrierTypes-r16

}

CarrierTypePair-r16 ::= SEQUENCE {

 carrierForCSI-Measurement-r16 PUCCH-Grp-CarrierTypes-r16,

 carrierForCSI-Reporting-r16 PUCCH-Grp-CarrierTypes-r16

}

PUCCH-Grp-CarrierTypes-r16 ::= SEQUENCE {

 fr1-NonSharedTDD-r16 ENUMERATED {supported} OPTIONAL,

 fr1-SharedTDD-r16 ENUMERATED {supported} OPTIONAL,

 fr1-NonSharedFDD-r16 ENUMERATED {supported} OPTIONAL,

 fr2-r16 ENUMERATED {supported} OPTIONAL

}

PUCCH-Group-Config-r17 ::= SEQUENCE {

 fr1-FR1-NonSharedTDD-r17 ENUMERATED {supported} OPTIONAL,

 fr2-FR2-NonSharedTDD-r17 ENUMERATED {supported} OPTIONAL,

 fr1-FR2-NonSharedTDD-r17 ENUMERATED {supported} OPTIONAL

}

-- TAG-CA-PARAMETERSNR-STOP

-- ASN1STOP

|  |
| --- |
| *CA-ParametersNR* field description |
| ***codebookParametersPerBC***For a given supported band combination, this field indicates the alternative list of *SupportedCSI-RS-Resource* supported for each codebook type, amongst the supported CSI-RS resources included in *codebookParametersPerBand* in *MIMO-ParametersPerBand*. |

#### – *CA-ParametersNRDC*

The IE *CA-ParametersNRDC* contains dual connectivity related capabilities that are defined per band combination.

*CA-ParametersNRDC* information element

-- ASN1START

-- TAG-CA-PARAMETERS-NRDC-START

CA-ParametersNRDC ::= SEQUENCE {

 ca-ParametersNR-ForDC CA-ParametersNR OPTIONAL,

 ca-ParametersNR-ForDC-v1540 CA-ParametersNR-v1540 OPTIONAL,

 ca-ParametersNR-ForDC-v1550 CA-ParametersNR-v1550 OPTIONAL,

 ca-ParametersNR-ForDC-v1560 CA-ParametersNR-v1560 OPTIONAL,

 featureSetCombinationDC FeatureSetCombinationId OPTIONAL

}

CA-ParametersNRDC-v15g0 ::= SEQUENCE {

 ca-ParametersNR-ForDC-v15g0 CA-ParametersNR-v15g0 OPTIONAL

}

CA-ParametersNRDC-v1610 ::= SEQUENCE {

 -- R1 18-1: Semi-static power sharing mode1 between MCG and SCG cells of same FR for NR dual connectivity

 intraFR-NR-DC-PwrSharingMode1-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 18-1a: Semi-static power sharing mode 2 between MCG and SCG cells of same FR for NR dual connectivity

 intraFR-NR-DC-PwrSharingMode2-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 18-1b: Dynamic power sharing between MCG and SCG cells of same FR for NR dual connectivity

 intraFR-NR-DC-DynamicPwrSharing-r16 ENUMERATED {short, long} OPTIONAL,

 asyncNRDC-r16 ENUMERATED {supported} OPTIONAL

}

CA-ParametersNRDC-v1630 ::= SEQUENCE {

 ca-ParametersNR-ForDC-v1610 CA-ParametersNR-v1610 OPTIONAL,

 ca-ParametersNR-ForDC-v1630 CA-ParametersNR-v1630 OPTIONAL

}

CA-ParametersNRDC-v1640 ::= SEQUENCE {

 ca-ParametersNR-ForDC-v1640 CA-ParametersNR-v1640 OPTIONAL

}

CA-ParametersNRDC-v1650 ::= SEQUENCE {

 supportedCellGrouping-r16 BIT STRING (SIZE (1..maxCellGroupings-r16)) OPTIONAL

}

CA-ParametersNRDC-v16a0 ::= SEQUENCE {

 ca-ParametersNR-ForDC-v16a0 CA-ParametersNR-v16a0 OPTIONAL

}

CA-ParametersNRDC-v1700 ::= SEQUENCE {

 -- R1 31-9: Indicates the support of simultaneous transmission and reception of an IAB-node from multiple parent nodes

 simultaneousRxTx-IAB-MultipleParents-r17 ENUMERATED {supported} OPTIONAL,

 condPSCellAdditionNRDC-r17 ENUMERATED {supported} OPTIONAL,

 scg-ActivationDeactivationNRDC-r17 ENUMERATED {supported} OPTIONAL,

 scg-ActivationDeactivationResumeNRDC-r17 ENUMERATED {supported} OPTIONAL,

 beamManagementType-CBM-r17 ENUMERATED {supported} OPTIONAL

}

CA-ParametersNRDC-v1720 ::= SEQUENCE {

 ca-ParametersNR-ForDC-v1700 CA-ParametersNR-v1700 OPTIONAL,

 ca-ParametersNR-ForDC-v1720 CA-ParametersNR-v1720 OPTIONAL

}

CA-ParametersNRDC-v1730 ::= SEQUENCE {

 ca-ParametersNR-ForDC-v1730 CA-ParametersNR-v1730 OPTIONAL

}

CA-ParametersNRDC-v1760 ::= SEQUENCE {

 ca-ParametersNR-ForDC-v1760 CA-ParametersNR-v1760

}

CA-ParametersNRDC-v1800 ::= SEQUENCE {

 ca-ParametersNR-ForDC-v1800 CA-ParametersNR-v1800 OPTIONAL,

 -- R1 55-6d: Capability on the number of CCs for monitoring a maximum number of BDs and non-overlapped CCEs per span for MCG and for

 -- SCG when configured for NR-DC operation with Rel-16 PDCCH monitoring on all the serving cells

 pdcch-BlindDetectionNRDC-r18 SEQUENCE(SIZE (1..maxNrofPdcch-BlindDetection-r17)) OF PDCCH-BlindDetectionMixed1-r18

 OPTIONAL

}

PDCCH-BlindDetectionMixed1-r18::= SEQUENCE {

 pdcch-BlindDetectionCG-UE-Mixed-r18 SEQUENCE{

 pdcch-BlindDetectionMCG-UE-Mixed-r18 PDCCH-BlindDetectionCG-UE-Mixed-r18,

 pdcch-BlindDetectionSCG-UE-Mixed-r18 PDCCH-BlindDetectionCG-UE-Mixed-r18

 }

}

-- TAG-CA-PARAMETERS-NRDC-STOP

-- ASN1STOP

|  |
| --- |
| *CA-ParametersNRDC* field descriptions |
| ***ca-ParametersNR-forDC (with and without suffix)***If this field is present for a band combination, it reports the UE capabilities when NR-DC is configured with the band combination. If a version of this field (i.e., with or without suffix) is absent for a band combination, the corresponding *ca-ParametersNR* field version in *BandCombination* is applicable to the UE configured with NR-DC for the band combination. If a version of this field (i.e., with or without suffix) is present for a band combination but does not contain any parameters, the UE does not support the corresponding field version when configured with NR-DC for the band combination. |
| ***featureSetCombinationDC***If this field is present for a band combination, it reports the feature set combination supported for the band combination when NR-DC is configured. If this field is absent for a band combination, the *featureSetCombination* in *BandCombination* (without suffix) is applicable to the UE configured with NR-DC for the band combination. |

#### – *CarrierAggregationVariant*

The IE *CarrierAggregationVariant* informs the network about supported "placement" of the SpCell in an NR cell group.

*CarrierAggregationVariant* information element

-- ASN1START

-- TAG-CARRIERAGGREGATIONVARIANT-START

CarrierAggregationVariant ::= SEQUENCE {

 fr1fdd-FR1TDD-CA-SpCellOnFR1FDD ENUMERATED {supported} OPTIONAL,

 fr1fdd-FR1TDD-CA-SpCellOnFR1TDD ENUMERATED {supported} OPTIONAL,

 fr1fdd-FR2TDD-CA-SpCellOnFR1FDD ENUMERATED {supported} OPTIONAL,

 fr1fdd-FR2TDD-CA-SpCellOnFR2TDD ENUMERATED {supported} OPTIONAL,

 fr1tdd-FR2TDD-CA-SpCellOnFR1TDD ENUMERATED {supported} OPTIONAL,

 fr1tdd-FR2TDD-CA-SpCellOnFR2TDD ENUMERATED {supported} OPTIONAL,

 fr1fdd-FR1TDD-FR2TDD-CA-SpCellOnFR1FDD ENUMERATED {supported} OPTIONAL,

 fr1fdd-FR1TDD-FR2TDD-CA-SpCellOnFR1TDD ENUMERATED {supported} OPTIONAL,

 fr1fdd-FR1TDD-FR2TDD-CA-SpCellOnFR2TDD ENUMERATED {supported} OPTIONAL

}

-- TAG-CARRIERAGGREGATIONVARIANT-STOP

-- ASN1STOP

#### – *CodebookParameters*

The IE *CodebookParameters* is used to convey codebook related parameters.

*CodebookParameters* information element

-- ASN1START

-- TAG-CODEBOOKPARAMETERS-START

CodebookParameters ::= SEQUENCE {

 type1 SEQUENCE {

 singlePanel SEQUENCE {

 supportedCSI-RS-ResourceList SEQUENCE (SIZE (1.. maxNrofCSI-RS-Resources)) OF SupportedCSI-RS-Resource,

 modes ENUMERATED {mode1, mode1andMode2},

 maxNumberCSI-RS-PerResourceSet INTEGER (1..8)

 },

 multiPanel SEQUENCE {

 supportedCSI-RS-ResourceList SEQUENCE (SIZE (1.. maxNrofCSI-RS-Resources)) OF SupportedCSI-RS-Resource,

 modes ENUMERATED {mode1, mode2, both},

 nrofPanels ENUMERATED {n2, n4},

 maxNumberCSI-RS-PerResourceSet INTEGER (1..8)

 } OPTIONAL

 },

 type2 SEQUENCE {

 supportedCSI-RS-ResourceList SEQUENCE (SIZE (1.. maxNrofCSI-RS-Resources)) OF SupportedCSI-RS-Resource,

 parameterLx INTEGER (2..4),

 amplitudeScalingType ENUMERATED {wideband, widebandAndSubband},

 amplitudeSubsetRestriction ENUMERATED {supported} OPTIONAL

 } OPTIONAL,

 type2-PortSelection SEQUENCE {

 supportedCSI-RS-ResourceList SEQUENCE (SIZE (1.. maxNrofCSI-RS-Resources)) OF SupportedCSI-RS-Resource,

 parameterLx INTEGER (2..4),

 amplitudeScalingType ENUMERATED {wideband, widebandAndSubband}

 } OPTIONAL

}

CodebookParameters-v1610 ::= SEQUENCE {

 supportedCSI-RS-ResourceListAlt-r16 SEQUENCE {

 type1-SinglePanel-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-Resources)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16) OPTIONAL,

 type1-MultiPanel-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-Resources)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16) OPTIONAL,

 type2-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-Resources)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16) OPTIONAL,

 type2-PortSelection-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-Resources)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16) OPTIONAL

 } OPTIONAL

}

CodebookParametersAddition-r16 ::= SEQUENCE {

 etype2-r16 SEQUENCE {

 -- R1 16-3a Regular eType 2 R=1

 etype2R1-r16 SEQUENCE {

 supportedCSI-RS-ResourceListAdd-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF

 INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 },

 -- R1 16-3a-1 Regular eType 2 R=2

 etype2R2-r16 SEQUENCE {

 supportedCSI-RS-ResourceListAdd-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF

 INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 } OPTIONAL,

 -- R1 16-3a-2: Support of parameter combinations 7-8

 paramComb7-8-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 16-3a-3: Support of rank 3,4

 rank3-4-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 16-3a-4: CBSR with soft amplitude restriction

 amplitudeSubsetRestriction-r16 ENUMERATED {supported} OPTIONAL

 } OPTIONAL,

 etype2-PS-r16 SEQUENCE {

 -- R1 16-3b Regular eType 2 R=1 PortSelection

 etype2R1-PortSelection-r16 SEQUENCE {

 supportedCSI-RS-ResourceListAdd-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF

 INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 },

 -- R1 16-3b-1 Regular eType 2 R=2 PortSelection

 etype2R2-PortSelection-r16 SEQUENCE {

 supportedCSI-RS-ResourceListAdd-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF

 INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 } OPTIONAL,

 -- R1 16-3b-2: Support of rank 3,4

 rank3-4-r16 ENUMERATED {supported} OPTIONAL

 } OPTIONAL

}

CodebookComboParametersAddition-r16 ::= SEQUENCE {

 -- R1 16-8 Mixed codebook types

 type1SP-Type2-null-r16 SEQUENCE {

 supportedCSI-RS-ResourceListAdd-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 } OPTIONAL,

 type1SP-Type2PS-null-r16 SEQUENCE {

 supportedCSI-RS-ResourceListAdd-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 } OPTIONAL,

 type1SP-eType2R1-null-r16 SEQUENCE {

 supportedCSI-RS-ResourceListAdd-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 } OPTIONAL,

 type1SP-eType2R2-null-r16 SEQUENCE {

 supportedCSI-RS-ResourceListAdd-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 } OPTIONAL,

 type1SP-eType2R1PS-null-r16 SEQUENCE {

 supportedCSI-RS-ResourceListAdd-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 } OPTIONAL,

 type1SP-eType2R2PS-null-r16 SEQUENCE {

 supportedCSI-RS-ResourceListAdd-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 } OPTIONAL,

 type1SP-Type2-Type2PS-r16 SEQUENCE {

 supportedCSI-RS-ResourceListAdd-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 } OPTIONAL,

 type1MP-Type2-null-r16 SEQUENCE {

 supportedCSI-RS-ResourceListAdd-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 } OPTIONAL,

 type1MP-Type2PS-null-r16 SEQUENCE {

 supportedCSI-RS-ResourceListAdd-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 } OPTIONAL,

 type1MP-eType2R1-null-r16 SEQUENCE {

 supportedCSI-RS-ResourceListAdd-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 } OPTIONAL,

 type1MP-eType2R2-null-r16 SEQUENCE {

 supportedCSI-RS-ResourceListAdd-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 } OPTIONAL,

 type1MP-eType2R1PS-null-r16 SEQUENCE {

 supportedCSI-RS-ResourceListAdd-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 } OPTIONAL,

 type1MP-eType2R2PS-null-r16 SEQUENCE {

 supportedCSI-RS-ResourceListAdd-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 } OPTIONAL,

 type1MP-Type2-Type2PS-r16 SEQUENCE {

 supportedCSI-RS-ResourceListAdd-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 } OPTIONAL

}

CodebookParametersfetype2-r17 ::= SEQUENCE {

 -- R1 23-9-1 Basic Features of Further Enhanced Port-Selection Type II Codebook (FeType-II)

 fetype2basic-r17 SEQUENCE (SIZE (1.. maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16),

 -- R1 23-9-2 Support of M=2 and R=1 for FeType-II

 fetype2R1-r17 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r17)) OF INTEGER (0.. maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 -- R1 23-9-4 Support of R = 2 for FeType-II

 fetype2R2-r17 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r17)) OF INTEGER (0.. maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 -- R1 23-9-3 Support of rank 3, 4 for FeType-II

 fetype2Rank3Rank4-r17 ENUMERATED {supported} OPTIONAL

}

CodebookComboParameterMixedType-r17 ::= SEQUENCE {

 -- R1 23-9-5 Active CSI-RS resources and ports for mixed codebook types in any slot

 type1SP-feType2PS-null-r17 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 type1SP-feType2PS-M2R1-null-r17 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 type1SP-feType2PS-M2R2-null-r1 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 type1SP-Type2-feType2-PS-M1-r17 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 type1SP-Type2-feType2-PS-M2R1-r17 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 type1SP-eType2R1-feType2-PS-M1-r17 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 type1SP-eType2R1-feType2-PS-M2R1-r17 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 type1MP-feType2PS-null-r17 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 type1MP-feType2PS-M2R1-null-r17 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 type1MP-feType2PS-M2R2-null-r17 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 type1MP-Type2-feType2-PS-M1-r17 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 type1MP-Type2-feType2-PS-M2R1-r17 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 type1MP-eType2R1-feType2-PS-M1-r17 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 type1MP-eType2R1-feType2-PS-M2R1-r17 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL

}

CodebookComboParameterMultiTRP-r17::= SEQUENCE {

 -- R1 23-7-1b Active CSI-RS resources and ports in the presence of multi-TRP CSI

 -- {Codebook 2, Codebook 3} =(NULL, NULL}

 nCJT-null-null SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 nCJT1SP-null-null SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 -- {Codebook 2, Codebook 3} = {( {"Rel 16 combinations in FG 16-8"}

 nCJT-Type2-null-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 nCJT-Type2PS-null-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 nCJT-eType2R1-null-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 nCJT-eType2R2-null-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 nCJT-eType2R1PS-null-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 nCJT-eType2R2PS-null-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 nCJT-Type2-Type2PS-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 nCJT1SP-Type2-null-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 nCJT1SP-Type2PS-null-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 nCJT1SP-eType2R1-null-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 nCJT1SP-eType2R2-null-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 nCJT1SP-eType2R1PS-null-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 nCJT1SP-eType2R2PS-null-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 nCJT1SP-Type2-Type2PS-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 -- {Codebook 2, Codebook 3} = {"New Rel17 combinations in FG 23-9-5"}

 nCJT-feType2PS-null-r17 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 nCJT-feType2PS-M2R1-null-r17 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 nCJT-feType2PS-M2R2-null-r17 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 nCJT-Type2-feType2-PS-M1-r17 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 nCJT-Type2-feType2-PS-M2R1-r17 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 nCJT-eType2R1-feType2-PS-M1-r17 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 nCJT-eType2R1-feType2-PS-M2R1-r17 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 nCJT1SP-feType2PS-null-r17 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 nCJT1SP-feType2PS-M2R1-null-r17 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 nCJT1SP-feType2PS-M2R2-null-r1 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 nCJT1SP-Type2-feType2-PS-M1-r17 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 nCJT1SP-Type2-feType2-PS-M2R1-r17 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 nCJT1SP-eType2R1-feType2-PS-M1-r17 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 nCJT1SP-eType2R1-feType2-PS-M2R1-r17 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL

}

CodebookParametersAdditionPerBC-r16::= SEQUENCE {

 -- R1 16-3a Regular eType 2 R=1

 etype2R1-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 -- R1 16-3a-1 Regular eType 2 R=2

 etype2R2-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 -- R1 16-3b Regular eType 2 R=1 PortSelection

 etype2R1-PortSelection-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 -- R1 16-3b-1 Regular eType 2 R=2 PortSelection

 etype2R2-PortSelection-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL

}

CodebookComboParametersAdditionPerBC-r16::= SEQUENCE {

 -- R1 16-8 Mixed codebook types

 type1SP-Type2-null-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 type1SP-Type2PS-null-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 type1SP-eType2R1-null-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 type1SP-eType2R2-null-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 type1SP-eType2R1PS-null-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 type1SP-eType2R2PS-null-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 type1SP-Type2-Type2PS-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 type1MP-Type2-null-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 type1MP-Type2PS-null-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 type1MP-eType2R1-null-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 type1MP-eType2R2-null-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 type1MP-eType2R1PS-null-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 type1MP-eType2R2PS-null-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 type1MP-Type2-Type2PS-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL

}

CodebookParametersfetype2PerBC-r17 ::= SEQUENCE {

 -- R1 23-9-1 Basic Features of Further Enhanced Port-Selection Type II Codebook (FeType-II)

 fetype2basic-r17 SEQUENCE (SIZE (1.. maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16),

 -- R1 23-9-2 Support of M=2 and R=1 for FeType-II

 fetype2R1-r17 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r17)) OF INTEGER (0.. maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 -- R1 23-9-4 Support of R = 2 for FeType-II

 fetype2R2-r17 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r17)) OF INTEGER (0.. maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL

}

CodebookComboParameterMixedTypePerBC-r17 ::= SEQUENCE {

 -- R1 23-9-5 Active CSI-RS resources and ports for mixed codebook types in any slot

 type1SP-feType2PS-null-r17 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 type1SP-feType2PS-M2R1-null-r17 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 type1SP-feType2PS-M2R2-null-r17 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 type1SP-Type2-feType2-PS-M1-r17 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 type1SP-Type2-feType2-PS-M2R1-r17 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 type1SP-eType2R1-feType2-PS-M1-r17 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 type1SP-eType2R1-feType2-PS-M2R1-r17 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 type1MP-feType2PS-null-r17 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 type1MP-feType2PS-M2R1-null-r17 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 type1MP-feType2PS-M2R2-null-r17 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 type1MP-Type2-feType2-PS-M1-r17 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 type1MP-Type2-feType2-PS-M2R1-r17 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 type1MP-eType2R1-feType2-PS-M1-r17 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 type1MP-eType2R1-feType2-PS-M2R1-r17 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL

}

CodebookComboParameterMultiTRP-PerBC-r17::= SEQUENCE {

 -- R1 23-7-1b Active CSI-RS resources and ports in the presence of multi-TRP CSI

 -- {Codebook 2, Codebook 3} =(NULL, NULL}

 nCJT-null-null SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 nCJT1SP-null-null SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 -- {Codebook 2, Codebook 3} = {( {"Rel 16 combinations in FG 16-8"}

 nCJT-Type2-null-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 nCJT-Type2PS-null-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 nCJT-eType2R1-null-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 nCJT-eType2R2-null-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 nCJT-eType2R1PS-null-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 nCJT-eType2R2PS-null-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 nCJT-Type2-Type2PS-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 nCJT1SP-Type2-null-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 nCJT1SP-Type2PS-null-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 nCJT1SP-eType2R1-null-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 nCJT1SP-eType2R2-null-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 nCJT1SP-eType2R1PS-null-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 nCJT1SP-eType2R2PS-null-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 nCJT1SP-Type2-Type2PS-r16 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 -- {Codebook 2, Codebook 3} = {"New Rel17 combinations in FG 23-9-5"}

 nCJT-feType2PS-null-r17 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 nCJT-feType2PS-M2R1-null-r17 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 nCJT-feType2PS-M2R2-null-r17 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 nCJT-Type2-feType2-PS-M1-r17 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 nCJT-Type2-feType2-PS-M2R1-r17 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 nCJT-eType2R1-feType2-PS-M1-r17 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 nCJT-eType2R1-feType2-PS-M2R1-r17 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 nCJT1SP-feType2PS-null-r17 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 nCJT1SP-feType2PS-M2R1-null-r17 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 nCJT1SP-feType2PS-M2R2-null-r1 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 nCJT1SP-Type2-feType2-PS-M1-r17 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 nCJT1SP-Type2-feType2-PS-M2R1-r17 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 nCJT1SP-eType2R1-feType2-PS-M1-r17 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 nCJT1SP-eType2R1-feType2-PS-M2R1-r17 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL

}

CodebookParametersetype2DopplerCSI-r18 ::= SEQUENCE {

 -- R1 40-3-2-1: Support of Rel-16-based doppler CSI

 eType2Doppler-r18 SEQUENCE {

 supportedCSI-RS-ResourceList-r18 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER

 (0..maxNrofCSI-RS-ResourcesAlt-1-r16),

 valueY-P-SP-CSI-RS-r18 INTEGER (1..3),

 valueY-A-CSI-RS-r18 INTEGER (1..3),

 scalingfactor-r18 ENUMERATED {n1, n2, n4}

 },

 -- R1 40-3-2-1a: Support of Rel-16-based doppler measurement with N4>1

 eType2DopplerN4-r18 SEQUENCE {

 supportedCSI-RS-ReportSettingList1-r18 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF

 INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16),

 supportedCSI-RS-ReportSettingList2-r18 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF

 INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 } OPTIONAL,

 -- R1 40-3-2-1a-1: DD unit size when A-CSI-RS is configured for CMR N4>1

 ddUnitSize-A-CSI-RS-CMR-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 40-3-2-2: Support R=2 for Rel-16-based doppler codebook

 eType2DopplerR2-r18 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 -- R1 40-3-2-3: Support X=1 based on first and last slot of WCSI, for Rel-16-based doppler codebook

 eType2DopplerX1-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 40-3-2-3a: Support X=2 CQI based on 2 slots for Rel-16-based doppler codebook

 eType2DopplerX2-r18 ENUMERATED {supported} OPTIONAL,

 --R1 40-3-2-7: support of l = (n – nCSI,ref ) for CSI reference slot for Rel-16 based doppler codebook

 eType2DopplerL-N4D1-r18 ENUMERATED {supported} OPTIONAL

}

CodebookParametersfetype2DopplerCSI-r18 ::= SEQUENCE {

 -- R1 40-3-2-4: Support of Rel-17-based doppler CSI

 feType2Doppler-r18 SEQUENCE {

 supportedCSI-RS-ResourceList-r18 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER

 (0..maxNrofCSI-RS-ResourcesAlt-1-r16),

 valueY-A-CSI-RS-r18 INTEGER (1..3),

 scalingfactor-r18 ENUMERATED {n1, n2, n4}

 },

 -- R1 40-3-2-5: Support of M=2 and R=1 for Rel-17-based doppler codebook

 feType2DopplerM2R1-r18 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER

 (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 -- R1 40-3-2-6: Support R=2 for Rel-17-based doppler codebook

 feType2DopplerR2-r18 SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesExt-r16)) OF INTEGER (0..maxNrofCSI-RS-ResourcesAlt-1-r16)

 OPTIONAL,

 --R1 40-3-2-7a: Support of l = (n – nCSI,ref ) for CSI reference slot for Rel-17 based doppler codebook

 feType2DopplerL-N4D1-r18 ENUMERATED {supported} OPTIONAL

}

CodebookVariantsList-r16 ::= SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesAlt-r16)) OF SupportedCSI-RS-Resource

SupportedCSI-RS-Resource ::= SEQUENCE {

 maxNumberTxPortsPerResource ENUMERATED {p2, p4, p8, p12, p16, p24, p32},

 maxNumberResourcesPerBand INTEGER (1..64),

 totalNumberTxPortsPerBand INTEGER (2..256)

}

SupportedCSI-RS-ReportSettingList-r18 ::= SEQUENCE (SIZE (1..maxNrofCSI-RS-ResourcesAlt-r16)) OF SupportedCSI-RS-ReportSetting-r18

SupportedCSI-RS-ReportSetting-r18 ::= SEQUENCE {

 maxN4-r18 ENUMERATED {n1, n2, n4, n8},

 maxNumberTxPortsPerResource-r18 ENUMERATED {p2, p4, p8, p12, p16, p24, p32},

 maxNumberResourcesPerBand-r18 INTEGER (1..64),

 totalNumberTxPortsPerBand-r18 INTEGER (2..256)

}

-- TAG-CODEBOOKPARAMETERS-STOP

-- ASN1STOP

|  |
| --- |
| *CodebookParameters* field descriptions |
| ***supportedCSI-RS-ResourceListAlt***This field indicates the alternative list of *SupportedCSI-RS-Resource* supported for each codebook type. The supported CSI-RS resource is indicated by an integer value which pinpoints *SupportedCSI-RS-Resource* defined in *CodebookVariantsList*. The value 0 corresponds to the first entry of *CodebookVariantsList*. The value 1 corresponds to the second entry of *CodebookVariantsList*, and so on. For each codebook type, the field shall be included in both *codebookParametersPerBC* (but optional for single CC) and *codebookParametersPerBand*. |

#### – *DL-PRS-MeasurementWithRxFH-RRC-Connected*

The IE *DL-PRS-MeasurementWithRxFH-RRC-Connected* is used to convey the capabilities supported by the UE for PRS measurement with Rx frequency hopping within a MG and measurement reporting in RRC\_CONNECTED for RedCap Ues.

*DL-PRS-MeasurementWithRxFH-RRC-Connected information element*

-- ASN1START

-- TAG-DL-PRS-MEASUREMENTWITHRXFH-RRC-COONECTED-START

DL-PRS-MeasurementWithRxFH-RRC-Connected-r18 ::= SEQUENCE {

 maximumOfPRS-BandwidthAcorssAllHopsFR1-r18 ENUMERATED {mhz40, mhz50, mhz80, mhz100} OPTIONAL,

 maximumOfPRS-BandwidthAcorssAllHopsFR2-r18 ENUMERATED {mhz100, mhz200, mhz400} OPTIONAL,

 maximumOfFH-Hops-r18 ENUMERATED {n2, n3, n4, n5, n6} OPTIONAL,

 processingDuration-r18 SEQUENCE {

 processingPRS-SymbolsDurationN3-r18 ENUMERATED {msDot125, msDot25, msDot5, ms1, ms2, ms4, ms6, ms8, ms12,

 ms16, ms20, ms25, ms30, ms32, ms35, ms40, ms45, ms50},

 processingDurationT3-r18 ENUMERATED {ms8, ms16, ms20, ms30, ms40, ms80, ms160, ms320, ms640, ms1280}

 } OPTIONAL,

 rf-RxRetunTimeFR1-r18 ENUMERATED {n70, n140, n210} OPTIONAL,

 rf-RxRetunTimeFR2-r18 ENUMERATED {n35, n70, n140} OPTIONAL,

 mumOfOverlappingPRB-r18 ENUMERATED {n0, n1, n2, n4} OPTIONAL,

 ...

}

-- TAG-DL-PRS-MEASUREMENTWITHRXFH-RRC-COONECTED-STOP

-- ASN1STOP

#### – *ERedCapParameters*

The IE *ERedCapParameters* is used to indicate the UE capabilities supported by eRedCap UEs.

*ERedCapParameters* information element

-- ASN1START

-- TAG-EREDCAPPARAMETERS-START

ERedCapParameters-r18::= SEQUENCE {

 -- R1 48-1: eRedCap UE with reduced peak data rate and reduced baseband bandwidth in FR1

 supportOfERedCap-r18 ENUMERATED {supported},

 -- R1 48-2: eRedCap UE with reduced peak data rate without reduced baseband bandwidth in FR1

 eRedCapNotReducedBB-BW-r18 ENUMERATED {supported} OPTIONAL,

 eRedCapIgnoreCapabilityFiltering-r18 ENUMERATED {supported} OPTIONAL

}

-- TAG-EREDCAPPARAMETERS-STOP

-- ASN1STOP

#### – *FeatureSetCombination*

The IE *FeatureSetCombination* is a two-dimensional matrix of *FeatureSet* entries.

Each *FeatureSetsPerBand* contains a list of feature sets applicable to the carrier(s) of one band entry of the associated band combination. Across the associated bands, the UE shall support the combination of *FeatureSets* at the same position in the *FeatureSetsPerBand*. All *FeatureSetsPerBand* in one *FeatureSetCombination* must have the same number of entries.

The number of *FeatureSetsPerBand* in the *FeatureSetCombination* must be equal to the number of band entries in an associated band combination. The first *FeatureSetPerBand* applies to the first band entry of the band combination, and so on.

Each *FeatureSet* contains either a pair of NR or E-UTRA feature set IDs for UL and DL.

In case of NR, the actual feature sets for UL and DL are defined in the *FeatureSets* IE and referred to from here by their ID, i.e., their position in the *featureSetsUplink* / *featureSetsDownlink* list in the FeatureSet IE.

In case of E-UTRA, the feature sets referred to from this list are defined in TS 36.331 [10] and conveyed as part of the *UE-EUTRA-Capability* container.

The *FeatureSetUplink* and *FeatureSetDownlink* referred to from the *FeatureSet* comprise, among other information, a set of *FeatureSetUplinkPerCC-Ids* and *FeatureSetDownlinkPerCC-Ids*. The number of these per-CC IDs determines the number of carriers that the UE is able to aggregate contiguously in frequency domain in the corresponding band. The number of carriers supported by the UE is also restricted by the bandwidth class indicated in the associated *BandCombination*, if present.

In feature set combinations the UE shall exclude entries with same or lower capabilities, since the network may anyway assume that the UE supports those.

NOTE 1: The UE may advertise fallback band-combinations in which it supports additional functionality explicitly in two ways: Either by setting FeatureSet IDs to zero (inter-band and intra-band non-contiguous fallback) and by reducing the number of FeatureSet-PerCC Ids in a Feature Set (intra-band contiguous fallback). Or by separate *BandCombination* entries with associated *FeatureSetCombinations*.

NOTE 2: The UE may advertise a *FeatureSetCombination* containing only fallback band combinations. That means, in a *FeatureSetCombination,* each group of *FeatureSets* across the bands may contain at least one pair of *FeatureSetUplinkId* and *FeatureSetDownlinkId* which is set to 0/0.

NOTE 3: The Network configures serving cell(s) and BWP(s) configuration to comply with capabilities derived from the combination of FeatureSets at the same position in the FeatureSetsPerBand, regardless of activated/deactivated serving cell(s) and BWP(s).

*FeatureSetCombination* information element

-- ASN1START

-- TAG-FEATURESETCOMBINATION-START

FeatureSetCombination ::= SEQUENCE (SIZE (1..maxSimultaneousBands)) OF FeatureSetsPerBand

FeatureSetsPerBand ::= SEQUENCE (SIZE (1..maxFeatureSetsPerBand)) OF FeatureSet

FeatureSet ::= CHOICE {

 eutra SEQUENCE {

 downlinkSetEUTRA FeatureSetEUTRA-DownlinkId,

 uplinkSetEUTRA FeatureSetEUTRA-UplinkId

 },

 nr SEQUENCE {

 downlinkSetNR FeatureSetDownlinkId,

 uplinkSetNR FeatureSetUplinkId

 }

}

-- TAG-FEATURESETCOMBINATION-STOP

-- ASN1STOP

#### – *FeatureSetCombinationId*

The IE *FeatureSetCombinationId* identifies a *FeatureSetCombination*. The *FeatureSetCombinationId* of a *FeatureSetCombination* is the position of the *FeatureSetCombination* in the featureSetCombinations list (in *UE-NR-Capability* or *UE-MRDC-Capability*). The *FeatureSetCombinationId* = 0 refers to the first entry in the *featureSetCombinations* list (in *UE-NR-Capability* or *UE-MRDC-Capability*).

NOTE: The *FeatureSetCombinationId* = 1024 is not used due to the maximum entry number of *featureSetCombinations*.

*FeatureSetCombinationId* information element

-- ASN1START

-- TAG-FEATURESETCOMBINATIONID-START

FeatureSetCombinationId ::= INTEGER (0.. maxFeatureSetCombinations)

-- TAG-FEATURESETCOMBINATIONID-STOP

-- ASN1STOP

#### – *FeatureSetDownlink*

The IE *FeatureSetDownlink* indicates a set of 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 {

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

 intraBandFreqSeparationDL FreqSeparationClass OPTIONAL,

 scalingFactor ENUMERATED {f0p4, f0p75, f0p8} OPTIONAL,

 dummy8 ENUMERATED {supported} OPTIONAL,

 scellWithoutSSB ENUMERATED {supported} OPTIONAL,

 csi-RS-MeasSCellWithoutSSB ENUMERATED {supported} OPTIONAL,

 dummy1 ENUMERATED {supported} OPTIONAL,

 type1-3-CSS ENUMERATED {supported} OPTIONAL,

 pdcch-MonitoringAnyOccasions ENUMERATED {withoutDCI-Gap, withDCI-Gap} OPTIONAL,

 dummy2 ENUMERATED {supported} OPTIONAL,

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

 searchSpaceSharingCA-DL ENUMERATED {supported} OPTIONAL,

 timeDurationForQCL SEQUENCE {

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

 scs-120kHz ENUMERATED {s14, s28} OPTIONAL

 } OPTIONAL,

 pdsch-ProcessingType1-DifferentTB-PerSlot SEQUENCE {

 scs-15kHz ENUMERATED {upto2, upto4, upto7} OPTIONAL,

 scs-30kHz ENUMERATED {upto2, upto4, upto7} OPTIONAL,

 scs-60kHz ENUMERATED {upto2, upto4, upto7} OPTIONAL,

 scs-120kHz ENUMERATED {upto2, upto4, upto7} OPTIONAL

 } OPTIONAL,

 dummy3 DummyA OPTIONAL,

 dummy4 SEQUENCE (SIZE (1.. maxNrofCodebooks)) OF DummyB OPTIONAL,

 dummy5 SEQUENCE (SIZE (1.. maxNrofCodebooks)) OF DummyC OPTIONAL,

 dummy6 SEQUENCE (SIZE (1.. maxNrofCodebooks)) OF DummyD OPTIONAL,

 dummy7 SEQUENCE (SIZE (1.. maxNrofCodebooks)) OF DummyE OPTIONAL

}

FeatureSetDownlink-v1540 ::= SEQUENCE {

 oneFL-DMRS-TwoAdditionalDMRS-DL ENUMERATED {supported} OPTIONAL,

 additionalDMRS-DL-Alt ENUMERATED {supported} OPTIONAL,

 twoFL-DMRS-TwoAdditionalDMRS-DL ENUMERATED {supported} OPTIONAL,

 oneFL-DMRS-ThreeAdditionalDMRS-DL ENUMERATED {supported} OPTIONAL,

 pdcch-MonitoringAnyOccasionsWithSpanGap SEQUENCE {

 scs-15kHz ENUMERATED {set1, set2, set3} OPTIONAL,

 scs-30kHz ENUMERATED {set1, set2, set3} OPTIONAL,

 scs-60kHz ENUMERATED {set1, set2, set3} OPTIONAL,

 scs-120kHz ENUMERATED {set1, set2, set3} OPTIONAL

 } OPTIONAL,

 pdsch-SeparationWithGap ENUMERATED {supported} OPTIONAL,

 pdsch-ProcessingType2 SEQUENCE {

 scs-15kHz ProcessingParameters OPTIONAL,

 scs-30kHz ProcessingParameters OPTIONAL,

 scs-60kHz ProcessingParameters OPTIONAL

 } OPTIONAL,

 pdsch-ProcessingType2-Limited SEQUENCE {

 differentTB-PerSlot-SCS-30kHz ENUMERATED {upto1, upto2, upto4, upto7}

 } OPTIONAL,

 dl-MCS-TableAlt-DynamicIndication ENUMERATED {supported} OPTIONAL

}

FeatureSetDownlink-v15a0 ::= SEQUENCE {

 supportedSRS-Resources SRS-Resources OPTIONAL

}

FeatureSetDownlink-v1610 ::= SEQUENCE {

 -- R1 22-4e/4f/4g/4h: CBG based reception for DL with unicast PDSCH(s) per slot per CC with UE processing time Capability 1

 cbgPDSCH-ProcessingType1-DifferentTB-PerSlot-r16 SEQUENCE {

 scs-15kHz-r16 ENUMERATED {one, upto2, upto4, upto7} OPTIONAL,

 scs-30kHz-r16 ENUMERATED {one, upto2, upto4, upto7} OPTIONAL,

 scs-60kHz-r16 ENUMERATED {one, upto2, upto4, upto7} OPTIONAL,

 scs-120kHz-r16 ENUMERATED {one, upto2, upto4, upto7} OPTIONAL

 } OPTIONAL,

 -- R1 22-3e/3f/3g/3h: CBG based reception for DL with unicast PDSCH(s) per slot per CC with UE processing time Capability 2

 cbgPDSCH-ProcessingType2-DifferentTB-PerSlot-r16 SEQUENCE {

 scs-15kHz-r16 ENUMERATED {one, upto2, upto4, upto7} OPTIONAL,

 scs-30kHz-r16 ENUMERATED {one, upto2, upto4, upto7} OPTIONAL,

 scs-60kHz-r16 ENUMERATED {one, upto2, upto4, upto7} OPTIONAL,

 scs-120kHz-r16 ENUMERATED {one, upto2, upto4, upto7} OPTIONAL

 } OPTIONAL,

 intraFreqDAPS-r16 SEQUENCE {

 intraFreqDiffSCS-DAPS-r16 ENUMERATED {supported} OPTIONAL,

 intraFreqAsyncDAPS-r16 ENUMERATED {supported} OPTIONAL

 } OPTIONAL,

 intraBandFreqSeparationDL-v1620 FreqSeparationClassDL-v1620 OPTIONAL,

 intraBandFreqSeparationDL-Only-r16 FreqSeparationClassDL-Only-r16 OPTIONAL,

 -- R1 11-2: Rel-16 PDCCH monitoring capability

 pdcch-Monitoring-r16 SEQUENCE {

 pdsch-ProcessingType1-r16 SEQUENCE {

 scs-15kHz-r16 PDCCH-MonitoringOccasions-r16 OPTIONAL,

 scs-30kHz-r16 PDCCH-MonitoringOccasions-r16 OPTIONAL

 } OPTIONAL,

 pdsch-ProcessingType2-r16 SEQUENCE {

 scs-15kHz-r16 PDCCH-MonitoringOccasions-r16 OPTIONAL,

 scs-30kHz-r16 PDCCH-MonitoringOccasions-r16 OPTIONAL

 } OPTIONAL

 } OPTIONAL,

 -- R1 11-2b: Mix of Rel. 16 PDCCH monitoring capability and Rel. 15 PDCCH monitoring capability on different carriers

 pdcch-MonitoringMixed-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 18-5c: Processing up to X unicast DCI scheduling for DL per scheduled CC

 crossCarrierSchedulingProcessing-DiffSCS-r16 SEQUENCE {

 scs-15kHz-120kHz-r16 ENUMERATED {n1,n2,n4} OPTIONAL,

 scs-15kHz-60kHz-r16 ENUMERATED {n1,n2,n4} OPTIONAL,

 scs-30kHz-120kHz-r16 ENUMERATED {n1,n2,n4} OPTIONAL,

 scs-15kHz-30kHz-r16 ENUMERATED {n2} OPTIONAL,

 scs-30kHz-60kHz-r16 ENUMERATED {n2} OPTIONAL,

 scs-60kHz-120kHz-r16 ENUMERATED {n2} OPTIONAL

 } OPTIONAL,

 -- R1 16-2b-1: Support of single-DCI based SDM scheme

 singleDCI-SDM-scheme-r16 ENUMERATED {supported} OPTIONAL

}

FeatureSetDownlink-v1700 ::= SEQUENCE {

 -- R1 36-2: Scaling factor to be applied to 1024QAM for FR1

 scalingFactor-1024QAM-FR1-r17 ENUMERATED {f0p4, f0p75, f0p8} OPTIONAL,

 -- R1 24 feature for existing UE cap to include new SCS

 timeDurationForQCL-v1710 SEQUENCE {

 scs-480kHz ENUMERATED {s56, s112} OPTIONAL,

 scs-960kHz ENUMERATED {s112, s224} OPTIONAL

 } OPTIONAL,

 -- R1 23-6-1 SFN scheme A (scheme 1) for PDSCH and PDCCH

 sfn-SchemeA-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 23-6-1-1 SFN scheme A (scheme 1) for PDCCH only

 sfn-SchemeA-PDCCH-only-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 23-6-1a Dynamic switching - scheme A

 sfn-SchemeA-DynamicSwitching-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 23-6-1b SFN scheme A (scheme 1) for PDSCH only

 sfn-SchemeA-PDSCH-only-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 23-6-2 SFN scheme B (TRP based pre-compensation) for PDSCH and PDCCH

 sfn-SchemeB-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 23-6-2a Dynamic switching - scheme B

 sfn-SchemeB-DynamicSwitching-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 23-6-2b SFN scheme B (TRP based pre-compensation) for PDSCH only

 sfn-SchemeB-PDSCH-only-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 23-2-1d PDCCH repetition for Case 2 PDCCH monitoring with a span gap

 mTRP-PDCCH-Case2-1SpanGap-r17 SEQUENCE {

 scs-15kHz-r17 PDCCH-RepetitionParameters-r17 OPTIONAL,

 scs-30kHz-r17 PDCCH-RepetitionParameters-r17 OPTIONAL,

 scs-60kHz-r17 PDCCH-RepetitionParameters-r17 OPTIONAL,

 scs-120kHz-r17 PDCCH-RepetitionParameters-r17 OPTIONAL

 } OPTIONAL,

 -- R1 23-2-1e PDCCH repetition for Rel-16 PDCCH monitoring

 mTRP-PDCCH-legacyMonitoring-r17 SEQUENCE {

 scs-15kHz-r17 PDCCH-RepetitionParameters-r17 OPTIONAL,

 scs-30kHz-r17 PDCCH-RepetitionParameters-r17 OPTIONAL

 } OPTIONAL,

 -- R1 23-2-4 Simultaneous configuration of PDCCH repetition and multi-DCI based multi-TRP

 mTRP-PDCCH-multiDCI-multiTRP-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 33-2: Dynamic scheduling for multicast for PCell

 dynamicMulticastPCell-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 23-2-1 PDCCH repetition

 mTRP-PDCCH-Repetition-r17 SEQUENCE {

 numBD-twoPDCCH-r17 INTEGER (2..3),

 maxNumOverlaps-r17 ENUMERATED {n1,n2,n3,n5,n10,n20,n40}

 } OPTIONAL

}

FeatureSetDownlink-v1720 ::= SEQUENCE {

 -- R1 25-19: RTT-based Propagation delay compensation based on CSI-RS for tracking and SRS

 rtt-BasedPDC-CSI-RS-ForTracking-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 25-19a: RTT-based Propagation delay compensation based on DL PRS for RTT-based PDC and SRS

 rtt-BasedPDC-PRS-r17 SEQUENCE {

 maxNumberPRS-Resource-r17 ENUMERATED {n1, n2, n4, n8, n16, n32, n64},

 maxNumberPRS-ResourceProcessedPerSlot-r17 SEQUENCE {

 scs-15kHz-r17 ENUMERATED {n1, n2, n4, n6, n8, n12, n16, n24, n32, n48, n64} OPTIONAL,

 scs-30kHz-r17 ENUMERATED {n1, n2, n4, n6, n8, n12, n16, n24, n32, n48, n64} OPTIONAL,

 scs-60kHz-r17 ENUMERATED {n1, n2, n4, n6, n8, n12, n16, n24, n32, n48, n64} OPTIONAL,

 scs-120kHz-r17 ENUMERATED {n1, n2, n4, n6, n8, n12, n16, n24, n32, n48, n64} OPTIONAL

 }

 } OPTIONAL,

 -- R1 33-5-1: SPS group-common PDSCH for multicast on PCell

 sps-Multicast-r17 ENUMERATED {supported} OPTIONAL

}

FeatureSetDownlink-v1730 ::= SEQUENCE {

 -- R1 25-19b: Support of PRS as spatial relation RS for SRS

 prs-AsSpatialRelationRS-For-SRS-r17 ENUMERATED {supported} OPTIONAL

}

FeatureSetDownlink-v1800 ::= SEQUENCE {

 -- R1 40-3-3-6: Maximum number of TRS resource sets in a report configuration

 maxNumberTRS-ResourceSet-r18 INTEGER (2..3) OPTIONAL,

 -- R1 40-4-1b: 1 symbol FL DMRS and 2 additional DMRS symbols for more than one port for Rel.18 enhanced DMRS ports for PDSCH

 pdsch-1SymbolFL-DMRS-Addition2Symbol-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 40-4-1c: Alternative additional DMRS position for co-existence with LTE CRS for Rel.18 enhanced DMRS ports for PDSCH

 pdsch-AlternativeDMRS-Coexistence-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 40-4-1d: 2 symbols FL-DMRS for Rel.18 enhanced DMRS ports for PDSCH

 pdsch-2SymbolFL-DMRS-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 40-4-1e: 2-symbol FL DMRS + one additional 2-symbols DMRS for Rel.18 enhanced DMRS ports for PDSCH

 pdsch-2SymbolFL-DMRS-Addition2Symbol-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 40-4-1f: 1 symbol FL DMRS and 3 additional DMRS symbols for Rel.18 enhanced DMRS ports for PDSCH

 pdsch-1SymbolFL-DMRS-Addition3Symbol-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 40-4-1g: DMRS type for Rel.18 enhanced DMRS ports for PDSCH

 pdsch-DMRS-Type-r18 ENUMERATED {etype1, etype1And2} OPTIONAL,

 -- R1 40-4-1h: 1 port DL PTRS for Rel.18 enhanced DMRS ports for PDSCH with rank 1-8

 pdsch-1PortDL-PTRS-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 40-4-1j: Support 1 symbol FL DMRS and 2 additional DMRS symbols for at least one port for mapping type A

 mappingTypeA-1SymbolFL-DMRS-Addition2Symbol-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 40-4-4: Reception of PDSCH without the scheduling restriction for Rel.18 eType1 DMRS ports

 pdsch-ReceptionWithoutSchedulingRestriction-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 40-4-5a: Additional row(s) for antenna ports (0,2,3) for Rel.18 DMRS ports for single-DCI based M-TRP

 dmrs-MultiTRP-AddtionRows-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 40-4-12: Support of Rel-18 DMRS and PDSCH processing capability 2 simultaneously

 simulDMRS-PDSCH-r18 SEQUENCE {

 scs-15kHz-r18 INTEGER (0..4) OPTIONAL,

 scs-30kHz-r18 INTEGER (0..5) OPTIONAL,

 scs-60kHz-r18 INTEGER (0..7) OPTIONAL

 } OPTIONAL,

 -- R1 53-1: Support RLM/BM/BFD and gapless L3 intra-frequency measurements based on CD-SSB outside active BWP without interruptions

 bwpOperationMeasWithoutInterrupt-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 53-2: Support RLM/BM/BFD measurements based on CD-SSB outside active BWP with interruptions

 bwpOperationMeasWithInterrupt-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 55-6: (2, 2) span-based PDCCH monitoring with additional restriction(s)

 pdcch-MonitoringSpan2-2-r18 SEQUENCE{

 pdsch-ProcessingType1-r18 SEQUENCE{

 scs-15kHz-r18 ENUMERATED {supported} OPTIONAL,

 scs-30kHz-r18 ENUMERATED {supported} OPTIONAL

 },

 pdsch-ProcessingType2-r18 SEQUENCE{

 scs-15kHz-r18 ENUMERATED {supported} OPTIONAL,

 scs-30kHz-r18 ENUMERATED {supported} OPTIONAL

 }

 } OPTIONAL,

 -- R1 55-6b: Mix of Rel-16 PDCCH monitoring capability and Rel. 15 PDCCH monitoring capability on different carriers

 pdcch-MonitoringMixed-r18 ENUMERATED {supported} OPTIONAL,

 multicastInactive-r18 ENUMERATED {supported} OPTIONAL

}

PDCCH-MonitoringOccasions-r16 ::= SEQUENCE {

 period7span3-r16 ENUMERATED {supported} OPTIONAL,

 period4span3-r16 ENUMERATED {supported} OPTIONAL,

 period2span2-r16 ENUMERATED {supported} OPTIONAL

}

PDCCH-RepetitionParameters-r17 ::= SEQUENCE {

 supportedMode-r17 ENUMERATED {intra-span, inter-span, both},

 limitX-PerCC-r17 ENUMERATED {n4, n8, n16, n32, n44, n64, nolimit} OPTIONAL,

 limitX-AcrossCC-r17 ENUMERATED {n4, n8, n16, n32, n44, n64, n128, n256, n512, nolimit} OPTIONAL

}

DummyA ::= SEQUENCE {

 maxNumberNZP-CSI-RS-PerCC INTEGER (1..32),

 maxNumberPortsAcrossNZP-CSI-RS-PerCC ENUMERATED {p2, p4, p8, p12, p16, p24, p32, p40, p48, p56, p64, p72, p80,

 p88, p96, p104, p112, p120, p128, p136, p144, p152, p160, p168,

 p176, p184, p192, p200, p208, p216, p224, p232, p240, p248, p256},

 maxNumberCS-IM-PerCC ENUMERATED {n1, n2, n4, n8, n16, n32},

 maxNumberSimultaneousCSI-RS-ActBWP-AllCC ENUMERATED {n5, n6, n7, n8, n9, n10, n12, n14, n16, n18, n20, n22, n24, n26,

 n28, n30, n32, n34, n36, n38, n40, n42, n44, n46, n48, n50, n52,

 n54, n56, n58, n60, n62, n64},

 totalNumberPortsSimultaneousCSI-RS-ActBWP-AllCC ENUMERATED {p8, p12, p16, p24, p32, p40, p48, p56, p64, p72, p80,

 p88, p96, p104, p112, p120, p128, p136, p144, p152, p160, p168,

 p176, p184, p192, p200, p208, p216, p224, p232, p240, p248, p256}

}

DummyB ::= SEQUENCE {

 maxNumberTxPortsPerResource ENUMERATED {p2, p4, p8, p12, p16, p24, p32},

 maxNumberResources INTEGER (1..64),

 totalNumberTxPorts INTEGER (2..256),

 supportedCodebookMode ENUMERATED {mode1, mode1AndMode2},

 maxNumberCSI-RS-PerResourceSet INTEGER (1..8)

}

DummyC ::= SEQUENCE {

 maxNumberTxPortsPerResource ENUMERATED {p8, p16, p32},

 maxNumberResources INTEGER (1..64),

 totalNumberTxPorts INTEGER (2..256),

 supportedCodebookMode ENUMERATED {mode1, mode2, both},

 supportedNumberPanels ENUMERATED {n2, n4},

 maxNumberCSI-RS-PerResourceSet INTEGER (1..8)

}

DummyD ::= SEQUENCE {

 maxNumberTxPortsPerResource ENUMERATED {p4, p8, p12, p16, p24, p32},

 maxNumberResources INTEGER (1..64),

 totalNumberTxPorts INTEGER (2..256),

 parameterLx INTEGER (2..4),

 amplitudeScalingType ENUMERATED {wideband, widebandAndSubband},

 amplitudeSubsetRestriction ENUMERATED {supported} OPTIONAL,

 maxNumberCSI-RS-PerResourceSet INTEGER (1..8)

}

DummyE ::= SEQUENCE {

 maxNumberTxPortsPerResource ENUMERATED {p4, p8, p12, p16, p24, p32},

 maxNumberResources INTEGER (1..64),

 totalNumberTxPorts INTEGER (2..256),

 parameterLx INTEGER (2..4),

 amplitudeScalingType ENUMERATED {wideband, widebandAndSubband},

 maxNumberCSI-RS-PerResourceSet INTEGER (1..8)

}

-- TAG-FEATURESETDOWNLINK-STOP

-- ASN1STOP

|  |
| --- |
| *FeatureSetDownlink* field descriptions |
| ***featureSetListPerDownlinkCC***Indicates which features the UE supports on the individual DL carriers of the feature set (and hence of a band entry that refer to the feature set). The UE shall hence include at least as many *FeatureSetDownlinkPerCC-Id* in this list as the number of carriers it supports according to the *ca-BandwidthClassDL*, except if indicating additional functionality by reducing the number of *FeatureSetDownlinkPerCC-Id* in the feature set (see NOTE 1 in *FeatureSetCombination* IE description). 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. |
| ***supportedSRS-Resources***Indicates supported SRS resources for SRS carrier switching to the band associated with this *FeatureSetDownlink*. The UE is only allowed to set this field for a band with associated *FeatureSetUplinkId* set to 0. |

#### – *FeatureSetDownlinkId*

The IE *FeatureSetDownlinkId* identifies a downlink feature set. The *FeatureSetDownlinkId* of a *FeatureSetDownlink* is the index position of the *FeatureSetDownlink* in the *featureSetsDownlink* list in the *FeatureSets* IE. The first element in that list is referred to by *FeatureSetDownlinkId* = 1. 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..maxDownlinkFeatureSets)

-- TAG-FEATURESETDOWNLINKID-STOP

-- ASN1STOP

#### – *FeatureSetDownlinkPerCC*

The IE *FeatureSetDownlinkPerCC* indicates a set of features that the UE supports on the corresponding carrier of one band entry of a band combination.

*FeatureSetDownlinkPerCC* information element

-- ASN1START

-- TAG-FEATURESETDOWNLINKPERCC-START

FeatureSetDownlinkPerCC ::= SEQUENCE {

 supportedSubcarrierSpacingDL SubcarrierSpacing,

 supportedBandwidthDL SupportedBandwidth,

 channelBW-90mhz ENUMERATED {supported} OPTIONAL,

 maxNumberMIMO-LayersPDSCH MIMO-LayersDL OPTIONAL,

 supportedModulationOrderDL ModulationOrder OPTIONAL

}

FeatureSetDownlinkPerCC-v1620 ::= SEQUENCE {

 -- R1 16-2a: Mulit-DCI based multi-TRP

 multiDCI-MultiTRP-r16 MultiDCI-MultiTRP-r16 OPTIONAL,

 -- R1 16-2b-3: Support of single-DCI based FDMSchemeB

 supportFDM-SchemeB-r16 ENUMERATED {supported} OPTIONAL

}

FeatureSetDownlinkPerCC-v1700 ::= SEQUENCE {

 supportedMinBandwidthDL-r17 SupportedBandwidth-v1700 OPTIONAL,

 broadcastSCell-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 33-2g: MIMO layers for multicast PDSCH

 maxNumberMIMO-LayersMulticastPDSCH-r17 ENUMERATED {n2, n4, n8} OPTIONAL,

 -- R1 33-2h: Dynamic scheduling for multicast for SCell

 dynamicMulticastSCell-r17 ENUMERATED {supported} OPTIONAL,

 supportedBandwidthDL-v1710 SupportedBandwidth-v1700 OPTIONAL,

 -- R4 24-1/24-2/24-3/24-4/24-5

 supportedCRS-InterfMitigation-r17 CRS-InterfMitigation-r17 OPTIONAL

}

FeatureSetDownlinkPerCC-v1720 ::= SEQUENCE {

 -- R1 33-2j: Supported maximum modulation order used for maximum data rate calculation for multicast PDSCH

 maxModulationOrderForMulticastDataRateCalculation-r17 ENUMERATED {qam64, qam256, qam1024} OPTIONAL,

 -- R1 33-1-2: FDM-ed unicast PDSCH and group-common PDSCH for broadcast

 fdm-BroadcastUnicast-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 33-3-2: FDM-ed unicast PDSCH and one group-common PDSCH for multicast

 fdm-MulticastUnicast-r17 ENUMERATED {supported} OPTIONAL

}

FeatureSetDownlinkPerCC-v1730 ::= SEQUENCE {

 -- R1 33-3-3: Intra-slot TDM-ed unicast PDSCH and group-common PDSCH

 intraSlotTDM-UnicastGroupCommonPDSCH-r17 ENUMERATED {yes, no} OPTIONAL,

 -- R1 33-5-3: One SPS group-common PDSCH configuration for multicast for SCell

 sps-MulticastSCell-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 33-5-4: Up to 8 SPS group-common PDSCH configurations per CFR for multicast for SCell

 sps-MulticastSCellMultiConfig-r17 INTEGER (1..8) OPTIONAL,

 -- R1 33-1-1: Dynamic slot-level repetition for broadcast MTCH

 dci-BroadcastWith16Repetitions-r17 ENUMERATED {supported} OPTIONAL

}

FeatureSetDownlinkPerCC-v1800 ::= SEQUENCE {

 -- R1 40-2-1: Basic feature for multi-DCI based intra-cell Multi-TRP operation with two TA enhancement

 multiDCI-IntraCellMultiTRP-TwoTA-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 40-2-2: Basic feature for multi-DCI based inter-cell Multi-TRP operation with two TA enhancement

 multiDCI-InterCellMultiTRP-TwoTA-r18 INTEGER (1..2) OPTIONAL,

 -- R1 40-2-6: Rx timing difference larger than CP length

 rxTimingDiff-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 55-7: Two QCL TypeD for CORESET monitoring in multi-DCI based multi-TRP

 multiDCI-MultiTRP-CORESET-Monitoring-r18 ENUMERATED {supported} OPTIONAL,

 broadcastNonServingCell-r18 ENUMERATED {supported} OPTIONAL

}

MultiDCI-MultiTRP-r16 ::= SEQUENCE {

 maxNumberCORESET-r16 ENUMERATED {n2, n3, n4, n5},

 maxNumberCORESETPerPoolIndex-r16 INTEGER (1..3),

 maxNumberUnicastPDSCH-PerPool-r16 ENUMERATED {n1, n2, n3, n4, n7}

}

CRS-InterfMitigation-r17 ::= SEQUENCE {

 -- R4 24-1 CRS-IM (Interference Mitigation) in DSS scenario

 crs-IM-DSS-15kHzSCS-r17 ENUMERATED {supported} OPTIONAL,

 -- R4 24-2 CRS-IM in non-DSS and 15 kHz NR SCS scenario, without the assistance of network signaling on LTE channel bandwidth

 crs-IM-nonDSS-15kHzSCS-r17 ENUMERATED {supported} OPTIONAL,

 -- R4 24-3 CRS-IM in non-DSS and 15 kHz NR SCS scenario, with the assistance of network signaling on LTE channel bandwidth

 crs-IM-nonDSS-NWA-15kHzSCS-r17 ENUMERATED {supported} OPTIONAL,

 -- R4 24-4 CRS-IM in non-DSS and 30 kHz NR SCS scenario, without the assistance of network signaling on LTE channel bandwidth

 crs-IM-nonDSS-30kHzSCS-r17 ENUMERATED {supported} OPTIONAL,

 -- R4 24-5 CRS-IM in non-DSS and 30 kHz NR SCS scenario, with the assistance of network signaling on LTE channel bandwidth

 crs-IM-nonDSS-NWA-30kHzSCS-r17 ENUMERATED {supported} OPTIONAL

}

-- TAG-FEATURESETDOWNLINKPERCC-STOP

-- ASN1STOP

#### – *FeatureSetDownlinkPerCC-Id*

The IE *FeatureSetDownlinkPerCC-Id* identifies a set of features applicable to one carrier of a feature set. The *FeatureSetDownlinkPerCC-Id* of a *FeatureSetDownlinkPerCC* is the index position of the *FeatureSetDownlinkPerCC* in the *featureSetsDownlinkPerCC*. The first element in the list is referred to by *FeatureSetDownlinkPerCC-Id* = 1, and so on.

*FeatureSetDownlinkPerCC-Id* information element

-- ASN1START

-- TAG-FEATURESETDOWNLINKPERCC-ID-START

FeatureSetDownlinkPerCC-Id ::= INTEGER (1..maxPerCC-FeatureSets)

-- TAG-FEATURESETDOWNLINKPERCC-ID-STOP

-- ASN1STOP

#### – *FeatureSetEUTRA-DownlinkId*

The IE *FeatureSetEUTRA-DownlinkId* identifies a downlink feature set in E-UTRA list (see TS 36.331 [10]. The first element in that list is referred to by *FeatureSetEUTRA-DownlinkId* = 1. The *FeatureSetEUTRA-DownlinkId=0* is used when the UE does not support a carrier in this band of a band combination.

*FeatureSetEUTRA-DownlinkId* information element

-- ASN1START

-- TAG-FEATURESETEUTRADOWNLINKID-START

FeatureSetEUTRA-DownlinkId ::= INTEGER (0..maxEUTRA-DL-FeatureSets)

-- TAG-FEATURESETEUTRADOWNLINKID-STOP

-- ASN1STOP

#### – *FeatureSetEUTRA-UplinkId*

The IE *FeatureSetEUTRA-UplinkId* identifies an uplink feature set in E-UTRA list (see TS 36.331 [10]. The first element in that list is referred to by *FeatureSetEUTRA-UplinkId* = 1. The *FeatureSetEUTRA-UplinkId* *=0* is used when the UE does not support a carrier in this band of a band combination.

*FeatureSetEUTRA-UplinkId* information element

-- ASN1START

-- TAG-FEATURESETEUTRAUPLINKID-START

FeatureSetEUTRA-UplinkId ::= INTEGER (0..maxEUTRA-UL-FeatureSets)

-- TAG-FEATURESETEUTRAUPLINKID-STOP

-- ASN1STOP

#### – *FeatureSets*

The IE *FeatureSets* is used to provide pools of downlink and uplink features sets. A *FeatureSetCombination* refers to the IDs of the feature set(s) that the UE supports in that *FeatureSetCombination*. The *BandCombination* entries in the *BandCombinationList* then indicate the ID of the *FeatureSetCombination* that the UE supports for that band combination.

The entries in the lists in this IE are identified by their index position. For example, the *FeatureSetUplinkPerCC-Id* = 4 identifies the 4th element in the *featureSetsUplinkPerCC* list.

NOTE: When feature sets (per CC) IEs require extension in future versions of the specification, new versions of the *FeatureSetDownlink*, *FeatureSetUplink*, *FeatureSets*, *FeatureSetDownlinkPerCC* and/or *FeatureSetUplinkPerCC* will be created and instantiated in corresponding new lists in the *FeatureSets* IE. For example, if new capability bits are to be added to the *FeatureSetDownlink*, they will instead be defined in a new *FeatureSetDownlink-rxy* which will be instantiated in a new *featureSetDownlinkList-rxy* list. If a UE indicates in a *FeatureSetCombination* that it supports the *FeatureSetDownlink* with ID #5, it implies that it supports both the features in *FeatureSetDownlink* #5 and *FeatureSetDownlink-rxy* #5 (if present). The number of entries in the new list(s) shall be the same as in the original list(s).

*FeatureSets* information element

-- ASN1START

-- TAG-FEATURESETS-START

FeatureSets ::= SEQUENCE {

 featureSetsDownlink SEQUENCE (SIZE (1..maxDownlinkFeatureSets)) OF FeatureSetDownlink OPTIONAL,

 featureSetsDownlinkPerCC SEQUENCE (SIZE (1..maxPerCC-FeatureSets)) OF FeatureSetDownlinkPerCC OPTIONAL,

 featureSetsUplink SEQUENCE (SIZE (1..maxUplinkFeatureSets)) OF FeatureSetUplink OPTIONAL,

 featureSetsUplinkPerCC SEQUENCE (SIZE (1..maxPerCC-FeatureSets)) OF FeatureSetUplinkPerCC OPTIONAL,

 ...,

 [[

 featureSetsDownlink-v1540 SEQUENCE (SIZE (1..maxDownlinkFeatureSets)) OF FeatureSetDownlink-v1540 OPTIONAL,

 featureSetsUplink-v1540 SEQUENCE (SIZE (1..maxUplinkFeatureSets)) OF FeatureSetUplink-v1540 OPTIONAL,

 featureSetsUplinkPerCC-v1540 SEQUENCE (SIZE (1..maxPerCC-FeatureSets)) OF FeatureSetUplinkPerCC-v1540 OPTIONAL

 ]],

 [[

 featureSetsDownlink-v15a0 SEQUENCE (SIZE (1..maxDownlinkFeatureSets)) OF FeatureSetDownlink-v15a0 OPTIONAL

 ]],

 [[

 featureSetsDownlink-v1610 SEQUENCE (SIZE (1..maxDownlinkFeatureSets)) OF FeatureSetDownlink-v1610 OPTIONAL,

 featureSetsUplink-v1610 SEQUENCE (SIZE (1..maxUplinkFeatureSets)) OF FeatureSetUplink-v1610 OPTIONAL,

 featureSetDownlinkPerCC-v1620 SEQUENCE (SIZE (1..maxPerCC-FeatureSets)) OF FeatureSetDownlinkPerCC-v1620 OPTIONAL

 ]],

 [[

 featureSetsUplink-v1630 SEQUENCE (SIZE (1..maxUplinkFeatureSets)) OF FeatureSetUplink-v1630 OPTIONAL

 ]],

 [[

 featureSetsUplink-v1640 SEQUENCE (SIZE (1..maxUplinkFeatureSets)) OF FeatureSetUplink-v1640 OPTIONAL

 ]],

 [[

 featureSetsDownlink-v1700 SEQUENCE (SIZE (1..maxDownlinkFeatureSets)) OF FeatureSetDownlink-v1700 OPTIONAL,

 featureSetsDownlinkPerCC-v1700 SEQUENCE (SIZE (1..maxPerCC-FeatureSets)) OF FeatureSetDownlinkPerCC-v1700 OPTIONAL,

 featureSetsUplink-v1710 SEQUENCE (SIZE (1..maxUplinkFeatureSets)) OF FeatureSetUplink-v1710 OPTIONAL,

 featureSetsUplinkPerCC-v1700 SEQUENCE (SIZE (1..maxPerCC-FeatureSets)) OF FeatureSetUplinkPerCC-v1700 OPTIONAL

 ]],

 [[

 featureSetsDownlink-v1720 SEQUENCE (SIZE (1..maxDownlinkFeatureSets)) OF FeatureSetDownlink-v1720 OPTIONAL,

 featureSetsDownlinkPerCC-v1720 SEQUENCE (SIZE (1..maxPerCC-FeatureSets)) OF FeatureSetDownlinkPerCC-v1720 OPTIONAL,

 featureSetsUplink-v1720 SEQUENCE (SIZE (1..maxUplinkFeatureSets)) OF FeatureSetUplink-v1720 OPTIONAL

 ]],

 [[

 featureSetsDownlink-v1730 SEQUENCE (SIZE (1..maxDownlinkFeatureSets)) OF FeatureSetDownlink-v1730 OPTIONAL,

 featureSetsDownlinkPerCC-v1730 SEQUENCE (SIZE (1..maxPerCC-FeatureSets)) OF FeatureSetDownlinkPerCC-v1730 OPTIONAL

 ]],

 [[

 featureSetsDownlink-v1800 SEQUENCE (SIZE (1..maxDownlinkFeatureSets)) OF FeatureSetDownlink-v1800 OPTIONAL,

 featureSetsDownlinkPerCC-v1800 SEQUENCE (SIZE (1..maxPerCC-FeatureSets)) OF FeatureSetDownlinkPerCC-v1800 OPTIONAL,

 featureSetsUplink-v1800 SEQUENCE (SIZE (1..maxUplinkFeatureSets)) OF FeatureSetUplink-v1800 OPTIONAL,

 featureSetsUplinkPerCC-v1800 SEQUENCE (SIZE (1..maxPerCC-FeatureSets)) OF FeatureSetUplinkPerCC-v1800 OPTIONAL

 ]]

}

FeatureSets-v16d0 ::= SEQUENCE {

 featureSetsUplink-v16d0 SEQUENCE (SIZE (1..maxUplinkFeatureSets)) OF FeatureSetUplink-v16d0 OPTIONAL

}

-- TAG-FEATURESETS-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 {

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

 scalingFactor ENUMERATED {f0p4, f0p75, f0p8} OPTIONAL,

 dummy3 ENUMERATED {supported} OPTIONAL,

 intraBandFreqSeparationUL FreqSeparationClass OPTIONAL,

 searchSpaceSharingCA-UL ENUMERATED {supported} OPTIONAL,

 dummy1 DummyI OPTIONAL,

 supportedSRS-Resources SRS-Resources OPTIONAL,

 twoPUCCH-Group ENUMERATED {supported} OPTIONAL,

 dynamicSwitchSUL ENUMERATED {supported} OPTIONAL,

 simultaneousTxSUL-NonSUL ENUMERATED {supported} OPTIONAL,

 pusch-ProcessingType1-DifferentTB-PerSlot SEQUENCE {

 scs-15kHz ENUMERATED {upto2, upto4, upto7} OPTIONAL,

 scs-30kHz ENUMERATED {upto2, upto4, upto7} OPTIONAL,

 scs-60kHz ENUMERATED {upto2, upto4, upto7} OPTIONAL,

 scs-120kHz ENUMERATED {upto2, upto4, upto7} OPTIONAL

 } OPTIONAL,

 dummy2 DummyF OPTIONAL

}

FeatureSetUplink-v1540 ::= SEQUENCE {

 zeroSlotOffsetAperiodicSRS ENUMERATED {supported} OPTIONAL,

 pa-PhaseDiscontinuityImpacts ENUMERATED {supported} OPTIONAL,

 pusch-SeparationWithGap ENUMERATED {supported} OPTIONAL,

 pusch-ProcessingType2 SEQUENCE {

 scs-15kHz ProcessingParameters OPTIONAL,

 scs-30kHz ProcessingParameters OPTIONAL,

 scs-60kHz ProcessingParameters OPTIONAL

 } OPTIONAL,

 ul-MCS-TableAlt-DynamicIndication ENUMERATED {supported} OPTIONAL

}

FeatureSetUplink-v1610 ::= SEQUENCE {

 -- R1 11-5: PUsCH repetition Type B

 pusch-RepetitionTypeB-r16 SEQUENCE {

 maxNumberPUSCH-Tx-r16 ENUMERATED {n2, n3, n4, n7, n8, n12},

 hoppingScheme-r16 ENUMERATED {interSlotHopping, interRepetitionHopping, both}

 } OPTIONAL,

 -- R1 11-7: UL cancelation scheme for self-carrier

 ul-CancellationSelfCarrier-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 11-7a: UL cancelation scheme for cross-carrier

 ul-CancellationCrossCarrier-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 16-5c: The maximum number of SRS resources in one SRS resource set with usage set to 'codebook' for Mode 2

 ul-FullPwrMode2-MaxSRS-ResInSet-r16 ENUMERATED {n1, n2, n4} OPTIONAL,

 -- R1 22-4a/4b/4c/4d: CBG based transmission for UL with unicast PUSCH(s) per slot per CC with UE processing time Capability 1

 cbgPUSCH-ProcessingType1-DifferentTB-PerSlot-r16 SEQUENCE {

 scs-15kHz-r16 ENUMERATED {one-pusch, upto2, upto4, upto7} OPTIONAL,

 scs-30kHz-r16 ENUMERATED {one-pusch, upto2, upto4, upto7} OPTIONAL,

 scs-60kHz-r16 ENUMERATED {one-pusch, upto2, upto4, upto7} OPTIONAL,

 scs-120kHz-r16 ENUMERATED {one-pusch, upto2, upto4, upto7} OPTIONAL

 } OPTIONAL,

 -- R1 22-3a/3b/3c/3d: CBG based transmission for UL with unicast PUSCH(s) per slot per CC with UE processing time Capability 2

 cbgPUSCH-ProcessingType2-DifferentTB-PerSlot-r16 SEQUENCE {

 scs-15kHz-r16 ENUMERATED {one-pusch, upto2, upto4, upto7} OPTIONAL,

 scs-30kHz-r16 ENUMERATED {one-pusch, upto2, upto4, upto7} OPTIONAL,

 scs-60kHz-r16 ENUMERATED {one-pusch, upto2, upto4, upto7} OPTIONAL,

 scs-120kHz-r16 ENUMERATED {one-pusch, upto2, upto4, upto7} OPTIONAL

 } OPTIONAL,

 supportedSRS-PosResources-r16 SRS-AllPosResources-r16 OPTIONAL,

 intraFreqDAPS-UL-r16 SEQUENCE {

 dummy ENUMERATED {supported} OPTIONAL,

 intraFreqTwoTAGs-DAPS-r16 ENUMERATED {supported} OPTIONAL,

 dummy1 ENUMERATED {supported} OPTIONAL,

 dummy2 ENUMERATED {supported} OPTIONAL,

 dummy3 ENUMERATED {short, long} OPTIONAL

 } OPTIONAL,

 intraBandFreqSeparationUL-v1620 FreqSeparationClassUL-v1620 OPTIONAL,

 -- R1 11-3: More than one PUCCH for HARQ-ACK transmission within a slot

 multiPUCCH-r16 SEQUENCE {

 sub-SlotConfig-NCP-r16 ENUMERATED {set1, set2} OPTIONAL,

 sub-SlotConfig-ECP-r16 ENUMERATED {set1, set2} OPTIONAL

 } OPTIONAL,

 -- R1 11-3c: 2 PUCCH of format 0 or 2 for a single 7\*2-symbol subslot based HARQ-ACK codebook

 twoPUCCH-Type1-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 11-3d: 2 PUCCH of format 0 or 2 for a single 2\*7-symbol subslot based HARQ-ACK codebook

 twoPUCCH-Type2-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 11-3e: 1 PUCCH format 0 or 2 and 1 PUCCH format 1, 3 or 4 in the same subslot for a single 2\*7-symbol HARQ-ACK codebooks

 twoPUCCH-Type3-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 11-3f: 2 PUCCH transmissions in the same subslot for a single 2\*7-symbol HARQ-ACK codebooks which are not covered by 11-3d and

 -- 11-3e

 twoPUCCH-Type4-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 11-3g: SR/HARQ-ACK multiplexing once per subslot using a PUCCH (or HARQ-ACK piggybacked on a PUSCH) when SR/HARQ-ACK

 -- are supposed to be sent with different starting symbols in a subslot

 mux-SR-HARQ-ACK-r16 ENUMERATED {supported} OPTIONAL,

 dummy1 ENUMERATED {supported} OPTIONAL,

 dummy2 ENUMERATED {supported} OPTIONAL,

 -- R1 11-4c: 2 PUCCH of format 0 or 2 for two HARQ-ACK codebooks with one 7\*2-symbol sub-slot based HARQ-ACK codebook

 twoPUCCH-Type5-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 11-4d: 2 PUCCH of format 0 or 2 in consecutive symbols for two HARQ-ACK codebooks with one 2\*7-symbol sub-slot based HARQ-ACK

 -- codebook

 twoPUCCH-Type6-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 11-4e: 2 PUCCH of format 0 or 2 for two subslot based HARQ-ACK codebooks

 twoPUCCH-Type7-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 11-4f: 1 PUCCH format 0 or 2 and 1 PUCCH format 1, 3 or 4 in the same subslot for HARQ-ACK codebooks with one 2\*7-symbol

 -- subslot based HARQ-ACK codebook

 twoPUCCH-Type8-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 11-4g: 1 PUCCH format 0 or 2 and 1 PUCCH format 1, 3 or 4 in the same subslot for two subslot based HARQ-ACK codebooks

 twoPUCCH-Type9-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 11-4h: 2 PUCCH transmissions in the same subslot for two HARQ-ACK codebooks with one 2\*7-symbol subslot which are not covered

 -- by 11-4c and 11-4e

 twoPUCCH-Type10-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 11-4i: 2 PUCCH transmissions in the same subslot for two subslot based HARQ-ACK codebooks which are not covered by 11-4d and

 -- 11-4f

 twoPUCCH-Type11-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 12-1: UL intra-UE multiplexing/prioritization of overlapping channel/signals with two priority levels in physical layer

 ul-IntraUE-Mux-r16 SEQUENCE {

 pusch-PreparationLowPriority-r16 ENUMERATED {sym0, sym1, sym2},

 pusch-PreparationHighPriority-r16 ENUMERATED {sym0, sym1, sym2}

 } OPTIONAL,

 -- R1 16-5a: Supported UL full power transmission mode of fullpower

 ul-FullPwrMode-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 18-5d: Processing up to X unicast DCI scheduling for UL per scheduled CC

 crossCarrierSchedulingProcessing-DiffSCS-r16 SEQUENCE {

 scs-15kHz-120kHz-r16 ENUMERATED {n1,n2,n4} OPTIONAL,

 scs-15kHz-60kHz-r16 ENUMERATED {n1,n2,n4} OPTIONAL,

 scs-30kHz-120kHz-r16 ENUMERATED {n1,n2,n4} OPTIONAL,

 scs-15kHz-30kHz-r16 ENUMERATED {n2} OPTIONAL,

 scs-30kHz-60kHz-r16 ENUMERATED {n2} OPTIONAL,

 scs-60kHz-120kHz-r16 ENUMERATED {n2} OPTIONAL

 } OPTIONAL,

 -- R1 16-5b: Supported UL full power transmission mode of fullpowerMode1

 ul-FullPwrMode1-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 16-5c-2: Ports configuration for Mode 2

 ul-FullPwrMode2-SRSConfig-diffNumSRSPorts-r16 ENUMERATED {p1-2, p1-4, p1-2-4} OPTIONAL,

 -- R1 16-5c-3: TPMI group for Mode 2

 ul-FullPwrMode2-TPMIGroup-r16 SEQUENCE {

 twoPorts-r16 BIT STRING(SIZE(2)) OPTIONAL,

 fourPortsNonCoherent-r16 ENUMERATED{g0, g1, g2, g3} OPTIONAL,

 fourPortsPartialCoherent-r16 ENUMERATED{g0, g1, g2, g3, g4, g5, g6} OPTIONAL

 } OPTIONAL

}

FeatureSetUplink-v1630 ::= SEQUENCE {

 -- R1 22-8: For SRS for CB PUSCH and antenna switching on FR1 with symbol level offset for aperiodic SRS transmission

 offsetSRS-CB-PUSCH-Ant-Switch-fr1-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 22-8a: PDCCH monitoring on any span of up to 3 consecutive OFDM symbols of a slot and constrained timeline for SRS for CB

 -- PUSCH and antenna switching on FR1

 offsetSRS-CB-PUSCH-PDCCH-MonitorSingleOcc-fr1-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 22-8b: For type 1 CSS with dedicated RRC configuration, type 3 CSS, and UE-SS, monitoring occasion can be any OFDM symbol(s)

 -- of a slot for Case 2 and constrained timeline for SRS for CB PUSCH and antenna switching on FR1

 offsetSRS-CB-PUSCH-PDCCH-MonitorAnyOccWithoutGap-fr1-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 22-8c: For type 1 CSS with dedicated RRC configuration, type 3 CSS, and UE-SS, monitoring occasion can be any OFDM symbol(s)

 -- of a slot for Case 2 with a DCI gap and constrained timeline for SRS for CB PUSCH and antenna switching on FR1

 offsetSRS-CB-PUSCH-PDCCH-MonitorAnyOccWithGap-fr1-r16 ENUMERATED {supported} OPTIONAL,

 dummy ENUMERATED {supported} OPTIONAL,

 -- R1 22-9: Cancellation of PUCCH, PUSCH or PRACH with a DCI scheduling a PDSCH or CSI-RS or a DCI format 2\_0 for SFI

 partialCancellationPUCCH-PUSCH-PRACH-TX-r16 ENUMERATED {supported} OPTIONAL

}

FeatureSetUplink-v1640 ::= SEQUENCE {

 -- R1 11-4: Two HARQ-ACK codebooks with up to one sub-slot based HARQ-ACK codebook (i.e. slot-based + slot-based, or slot-based +

 -- sub-slot based) simultaneously constructed for supporting HARQ-ACK codebooks with different priorities at a UE

 twoHARQ-ACK-Codebook-type1-r16 SubSlot-Config-r16 OPTIONAL,

 -- R1 11-4a: Two sub-slot based HARQ-ACK codebooks simultaneously constructed for supporting HARQ-ACK codebooks with different

 -- priorities at a UE

 twoHARQ-ACK-Codebook-type2-r16 SubSlot-Config-r16 OPTIONAL,

 -- R1 22-8d: All PDCCH monitoring occasion can be any OFDM symbol(s) of a slot for Case 2 with a span gap and constrained timeline

 -- for SRS for CB PUSCH and antenna switching on FR1

 offsetSRS-CB-PUSCH-PDCCH-MonitorAnyOccWithSpanGap-fr1-r16 SEQUENCE {

 scs-15kHz-r16 ENUMERATED {set1, set2, set3} OPTIONAL,

 scs-30kHz-r16 ENUMERATED {set1, set2, set3} OPTIONAL,

 scs-60kHz-r16 ENUMERATED {set1, set2, set3} OPTIONAL

 } OPTIONAL

}

FeatureSetUplink-v16d0 ::= SEQUENCE {

 pusch-RepetitionTypeB-v16d0 SEQUENCE {

 maxNumberPUSCH-Tx-Cap1-r16 ENUMERATED {n2, n3, n4, n7, n8, n12},

 maxNumberPUSCH-Tx-Cap2-r16 ENUMERATED {n2, n3, n4, n7, n8, n12}

 } OPTIONAL

}

FeatureSetUplink-v1710 ::= SEQUENCE {

 -- R1 23-3-1 Multi-TRP PUSCH repetition (type A) -codebook based

 mTRP-PUSCH-TypeA-CB-r17 ENUMERATED {n1,n2,n4} OPTIONAL,

 -- R1 23-3-1-2 Multi-TRP PUSCH repetition (type A) - non-codebook based

 mTRP-PUSCH-RepetitionTypeA-r17 ENUMERATED {n1,n2,n3,n4} OPTIONAL,

 -- R1 23-3-3 Multi-TRP PUCCH repetition-intra-slot

 mTRP-PUCCH-IntraSlot-r17 ENUMERATED {pf0-2, pf1-3-4, pf0-4} OPTIONAL,

 -- R1 23-8-4 Maximum 2 SP and 1 periodic SRS sets for antenna switching

 srs-AntennaSwitching2SP-1Periodic-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 23-8-9 Extension of aperiodic SRS configuration for 1T4R, 1T2R and 2T4R

 srs-ExtensionAperiodicSRS-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 23-8-10 1 aperiodic SRS resource set for 1T4R

 srs-OneAP-SRS-r17 ENUMERATED {supported} OPTIONAL,

 -- R4 16-8 UE power class per band per band combination

 ue-PowerClassPerBandPerBC-r17 ENUMERATED {pc1dot5, pc2, pc3} OPTIONAL,

 -- R4 17-8 UL transmission in FR2 bands within an UL gap when the UL gap is activated

 tx-Support-UL-GapFR2-r17 ENUMERATED {supported} OPTIONAL

}

FeatureSetUplink-v1720 ::= SEQUENCE {

 -- R1 25-3: Repetitions for PUCCH format 0, 1, 2, 3 and 4 over multiple PUCCH subslots with configured K = 2, 4, 8

 pucch-Repetition-F0-1-2-3-4-RRC-Config-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 25-3a: Repetitions for PUCCH format 0, 1, 2, 3 and 4 over multiple PUCCH subslots using dynamic repetition indication

 pucch-Repetition-F0-1-2-3-4-DynamicIndication-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 25-3b: Inter-subslot frequency hopping for PUCCH repetitions

 interSubslotFreqHopping-PUCCH-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 25-8: Semi-static HARQ-ACK codebook for sub-slot PUCCH

 semiStaticHARQ-ACK-CodebookSub-SlotPUCCH-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 25-14: PHY prioritization of overlapping low-priority DG-PUSCH and high-priority CG-PUSCH

 phy-PrioritizationLowPriorityDG-HighPriorityCG-r17 INTEGER(1..16) OPTIONAL,

 -- R1 25-15: PHY prioritization of overlapping high-priority DG-PUSCH and low-priority CG-PUSCH

 phy-PrioritizationHighPriorityDG-LowPriorityCG-r17 SEQUENCE {

 pusch-PreparationLowPriority-r17 ENUMERATED{sym0, sym1, sym2},

 additionalCancellationTime-r17 SEQUENCE {

 scs-15kHz-r17 ENUMERATED{sym0, sym1, sym2} OPTIONAL,

 scs-30kHz-r17 ENUMERATED{sym0, sym1, sym2, sym3, sym4} OPTIONAL,

 scs-60kHz-r17 ENUMERATED{sym0, sym1, sym2, sym3, sym4, sym5, sym6, sym7, sym8} OPTIONAL,

 scs-120kHz-r17 ENUMERATED{sym0, sym1, sym2, sym3, sym4, sym5, sym6, sym7, sym8, sym9,

 sym10, sym11, sym12, sym13, sym14, sym15, sym16} OPTIONAL

 },

 maxNumberCarriers-r17 INTEGER(1..16)

 } OPTIONAL,

 -- R4 17-5 Support of UL DC location(s) report

 extendedDC-LocationReport-r17 ENUMERATED {supported} OPTIONAL

}

FeatureSetUplink-v1800 ::= SEQUENCE {

 -- R1 40-3-3-2: Number of delay values

 tdcpNumberDelayValue-r18 INTEGER (2..4) OPTIONAL,

 -- R1 40-3-3-4: Phase report

 phaseReportMoreThanOne-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 40-4-6d: 2 symbols front-loaded DMRS (uplink) for Rel.18 enhanced DMRS ports for PUSCH

 pusch-2SymbolFL-DMRS-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 40-4-6e: 2-symbol FL DMRS + one additional 2-symbols DMRS for Rel.18 enhanced DMRS ports for PUSCH

 pusch-2SymbolFL-DMRS-Addition2Symbol-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 40-4-6f: 1 symbol FL DMRS and 3 additional DMRS symbols for Rel.18 enhanced DMRS ports for PUSCH

 pusch-1SymbolFL-DMRS-Addition3Symbol-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 40-4-12: Support Rel-18 UL DMRS with single-DCI based M-TRP

 ul-DMRS-SingleDCI-M-TRP-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 40-4-13: Support Rel-18 UL DMRS with M-DCI based M-TRP

 ul-DMRS-M-DCI-M-TRP-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 40-5-5: Maximum 2 SP and 1 periodic SRS sets for 8T8R antenna switching

 max2SP1SRS8T8R-AntennaSwitch-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 40-6-4: Single-DCI based STx2P SFN scheme for PUCCH

 pucch-SingleDCI-STx2P-SFN-r18 ENUMERATED {pf0-2, pf1-3-4, pf0-4} OPTIONAL,

 -- R4 27-1 TxDiversity for 4Tx

 txDiversity4Tx-r18 ENUMERATED {supported} OPTIONAL,

 -- R4 44-1 TxDiversity for 2Tx

 txDiversity2Tx-r18 ENUMERATED {supported} OPTIONAL

}

FeatureSetUplink-v18xy ::= SEQUENCE {

 -- R1 41-4-6: Positioning SRS bandwidth aggregation in RRC\_CONNECTED

 posSRS-BWA-RRC-Connected-r18 PosSRS-BWA-RRC-Connected-r18 OPTIONAL,

 -- R1 41-4-7: Positioning SRS bandwidth aggregation independent from UL communication CA in RRC\_CONNECTED

 posSRS-BWA-IndependentCA-RRC-Connected-r18 PosSRS-BWA-IndependentCA-RRC-Connected-r18 OPTIONAL,

 -- R1 41-4-9: Indicate which other bands in the band combination are affected due to the need of a guard period

 posSRS-BWA-AffectedBandList-r18 SEQUENCE (SIZE (1..maxBands)) OF BandNR OPTIONAL

}

SubSlot-Config-r16 ::= SEQUENCE {

 sub-SlotConfig-NCP-r16 ENUMERATED {n4,n5,n6,n7} OPTIONAL,

 sub-SlotConfig-ECP-r16 ENUMERATED {n4,n5,n6} OPTIONAL

}

SRS-AllPosResources-r16 ::= SEQUENCE {

 srs-PosResources-r16 SRS-PosResources-r16,

 srs-PosResourceAP-r16 SRS-PosResourceAP-r16 OPTIONAL,

 srs-PosResourceSP-r16 SRS-PosResourceSP-r16 OPTIONAL

}

SRS-PosResources-r16 ::= SEQUENCE {

 maxNumberSRS-PosResourceSetPerBWP-r16 ENUMERATED {n1, n2, n4, n8, n12, n16},

 maxNumberSRS-PosResourcesPerBWP-r16 ENUMERATED {n1, n2, n4, n8, n16, n32, n64},

 maxNumberSRS-ResourcesPerBWP-PerSlot-r16 ENUMERATED {n1, n2, n3, n4, n5, n6, n8, n10, n12, n14},

 maxNumberPeriodicSRS-PosResourcesPerBWP-r16 ENUMERATED {n1, n2, n4, n8, n16, n32, n64},

 maxNumberPeriodicSRS-PosResourcesPerBWP-PerSlot-r16 ENUMERATED {n1, n2, n3, n4, n5, n6, n8, n10, n12, n14}

}

SRS-PosResourceAP-r16 ::= SEQUENCE {

 maxNumberAP-SRS-PosResourcesPerBWP-r16 ENUMERATED {n1, n2, n4, n8, n16, n32, n64},

 maxNumberAP-SRS-PosResourcesPerBWP-PerSlot-r16 ENUMERATED {n1, n2, n3, n4, n5, n6, n8, n10, n12, n14}

}

SRS-PosResourceSP-r16 ::= SEQUENCE {

 maxNumberSP-SRS-PosResourcesPerBWP-r16 ENUMERATED {n1, n2, n4, n8, n16, n32, n64},

 maxNumberSP-SRS-PosResourcesPerBWP-PerSlot-r16 ENUMERATED {n1, n2, n3, n4, n5, n6, n8, n10, n12, n14}

}

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),

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

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

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

}

DummyF ::= SEQUENCE {

 maxNumberPeriodicCSI-ReportPerBWP INTEGER (1..4),

 maxNumberAperiodicCSI-ReportPerBWP INTEGER (1..4),

 maxNumberSemiPersistentCSI-ReportPerBWP INTEGER (0..4),

 simultaneousCSI-ReportsAllCC INTEGER (5..32)

}

PosSRS-BWA-RRC-Connected-r18 ::= SEQUENCE {

 numOfCarriersIntraBandContiguous-r18 ENUMERATED {two, three, twoandthree} OPTIONAL,

 maximumOfAggregatedBW-TwoCarriersFR1-r18 ENUMERATED {mhz80, mhz100, mhz160, mhz200} OPTIONAL,

 maximumOfAggregatedBW-TwoCarriersFR2-r18 ENUMERATED {mhz50, mhz100, mhz200, mhz400, mhz600, mhz800} OPTIONAL,

 maximumOfAggregatedBW-ThreeCarriersFR1-r18 ENUMERATED {mhz80, mhz100, mhz160, mhz200, mhz300} OPTIONAL,

 maximumOfAggregatedBW-ThreeCarriersFR2-r18 ENUMERATED {mhz50, mhz100, mhz200, mhz400, mhz600, mhz800, mhz1000, mhz1200} OPTIONAL,

 maximumOfAggregatedResourceSet-r18 ENUMERATED {n1, n2, n4, n8, n12, n16} OPTIONAL,

 maximumOfAggregatedResourcePeriodic-r18 ENUMERATED {n1, n2, n4, n8, n16, n32, n64} OPTIONAL,

 maximumOfAggregatedResourceAperiodic-r18 ENUMERATED {n0, n1, n2, n4, n8, n16, n32, n64} OPTIONAL,

 maximumOfAggregatedResourceSemi-r18 ENUMERATED {n0, n1, n2, n4, n8, n16, n32, n64} OPTIONAL,

 maximumOfAggregatedResourcePeriodicPerSlot-r18 ENUMERATED {n1, n2, n3, n4, n5, n6, n8, n10, n12, n14} OPTIONAL,

 maximumOfAggregatedResourceAperiodicPerSlot-r18 ENUMERATED {n0, n1, n2, n3, n4, n5, n6, n8, n10, n12, n14} OPTIONAL,

 maximumOfAggregatedResourceSemiPerSlot-r18 ENUMERATED {n0, n1, n2, n3, n4, n5, n6, n8, n10, n12, n14} OPTIONAL,

 supportOfSameSRS-PowerReduction-r18 ENUMERATED {supported} OPTIONAL,

 ...

}

PosSRS-BWA-IndependentCA-RRC-Connected-r18 ::= SEQUENCE {

 numOfCarriersIntraBandContiguous-r18 ENUMERATED {two, three, twoandthree} OPTIONAL,

 maximumOfAggregatedBW-TwoCarriersFR1-r18 ENUMERATED {mhz80, mhz100, mhz160, mhz200} OPTIONAL,

 maximumOfAggregatedBW-TwoCarriersFR2-r18 ENUMERATED {mhz50, mhz100, mhz200, mhz400, mhz600, mhz800} OPTIONAL,

 maximumOfAggregatedBW-ThreeCarriersFR1-r18 ENUMERATED {mhz80, mhz100, mhz160, mhz200, mhz300} OPTIONAL,

 maximumOfAggregatedBW-ThreeCarriersFR2-r18 ENUMERATED {mhz50, mhz100, mhz200, mhz400, mhz600, mhz800, mhz1000, mhz1200} OPTIONAL,

 maximumOfAggregatedResourceSet-r18 ENUMERATED {n1, n2, n4, n8, n12, n16} OPTIONAL,

 maximumOfAggregatedResourcePeriodic-r18 ENUMERATED {n1, n2, n4, n8, n16, n32, n64} OPTIONAL,

 maximumOfAggregatedResourceAperiodic-r18 ENUMERATED {n0, n1, n2, n4, n8, n16, n32, n64} OPTIONAL,

 maximumOfAggregatedResourceSemi-r18 ENUMERATED {n0, n1, n2, n4, n8, n16, n32, n64} OPTIONAL,

 maximumOfAggregatedResourcePeriodicPerSlot-r18 ENUMERATED {n1, n2, n3, n4, n5, n6, n8, n10, n12, n14} OPTIONAL,

 maximumOfAggregatedResourceAperiodicPerSlot-r18 ENUMERATED {n0, n1, n2, n3, n4, n5, n6, n8, n10, n12, n14} OPTIONAL,

 maximumOfAggregatedResourceSemiPerSlot-r18 ENUMERATED {n0, n1, n2, n3, n4, n5, n6, n8, n10, n12, n14} OPTIONAL,

 supportOfSameSRS-PowerReduction-r18 ENUMERATED {supported} OPTIONAL,

 guardPeriod-r18 ENUMERATED {ms0, ms30, ms100, ms140, ms200} OPTIONAL,

 ...

}

-- TAG-FEATURESETUPLINK-STOP

-- ASN1STOP

|  |
| --- |
| *FeatureSetUplink* field descriptions |
| ***featureSetListPerUplinkCC***Indicates which features the UE supports on the individual UL carriers of the feature set (and hence of a band entry that refers to the feature set). The UE shall hence include at least as many *FeatureSetUplinkPerCC-Id* in this list as the number of carriers it supports according to the *ca-BandwidthClassUL*, except if indicating additional functionality by reducing the number of *FeatureSetUplinkPerCC-Id* in the feature set (see NOTE 1 in *FeatureSetCombination* IE description). 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*

The IE *FeatureSetUplinkId* identifies an uplink feature set. The *FeatureSetUplinkId* of a *FeatureSetUplink* is the index position of the *FeatureSetUplink* in the *featureSetsUplink* list in the *FeatureSets* IE. The first element in the list is referred to by *FeatureSetUplinkId* = 1, and so on. 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..maxUplinkFeatureSets)

-- TAG-FEATURESETUPLINKID-STOP

-- ASN1STOP

#### – *FeatureSetUplinkPerCC*

The IE *FeatureSetUplinkPerCC* indicates a set of features that the UE supports on the corresponding carrier of one band entry of a band combination.

*FeatureSetUplinkPerCC* information element

-- ASN1START

-- TAG-FEATURESETUPLINKPERCC-START

FeatureSetUplinkPerCC ::= SEQUENCE {

 supportedSubcarrierSpacingUL SubcarrierSpacing,

 supportedBandwidthUL SupportedBandwidth,

 channelBW-90mhz ENUMERATED {supported} OPTIONAL,

 mimo-CB-PUSCH SEQUENCE {

 maxNumberMIMO-LayersCB-PUSCH MIMO-LayersUL OPTIONAL,

 maxNumberSRS-ResourcePerSet INTEGER (1..2)

 } OPTIONAL,

 maxNumberMIMO-LayersNonCB-PUSCH MIMO-LayersUL OPTIONAL,

 supportedModulationOrderUL ModulationOrder OPTIONAL

}

FeatureSetUplinkPerCC-v1540 ::= SEQUENCE {

 mimo-NonCB-PUSCH SEQUENCE {

 maxNumberSRS-ResourcePerSet INTEGER (1..4),

 maxNumberSimultaneousSRS-ResourceTx INTEGER (1..4)

 } OPTIONAL

}

FeatureSetUplinkPerCC-v1700 ::= SEQUENCE {

 supportedMinBandwidthUL-r17 SupportedBandwidth-v1700 OPTIONAL,

 -- R1 23-3-1-3 FeMIMO: Multi-TRP PUSCH repetition (type B) - non-codebook based

 mTRP-PUSCH-RepetitionTypeB-r17 ENUMERATED {n1,n2,n3,n4} OPTIONAL,

 -- R1 23-3-1-1 -codebook based Multi-TRP PUSCH repetition (type B)

 mTRP-PUSCH-TypeB-CB-r17 ENUMERATED {n1,n2,n4} OPTIONAL,

 supportedBandwidthUL-v1710 SupportedBandwidth-v1700 OPTIONAL

}

FeatureSetUplinkPerCC-v1800 ::= SEQUENCE {

 -- R1 40-6-1: Single-DCI based STx2P SDM scheme for PUSCH—codebook

 pusch-CB-SingleDCI-STx2P-SDM-r18 SEQUENCE {

 maxNumberSRS-ResourcePerSet-r18 ENUMERATED {n1,n2,n4},

 maxNumberLayerPerPanel-r18 INTEGER (1..2),

 maxNumberNZP-PUSCH-PortsPerSet-r18 ENUMERATED {n1,n2,n4},

 maxNumberSRS-AntennaPortsPerSet-r18 ENUMERATED {n1,n2,n4}

 } OPTIONAL,

 -- R1 40-6-1a: Single-DCI based STx2P SDM scheme for PUSCH—noncodebook

 pusch-NonCB-SingleDCI-STx2P-SDM-r18 SEQUENCE {

 maxNumberSRS-ResourcePerSet-r18 INTEGER (1..4),

 maxNumberLayerPerPanel-r18 INTEGER (1..2),

 maxNumberSimulSRS-ResourcePerSet-r18 INTEGER (1..4)

 } OPTIONAL,

 -- R1 40-6-2: Single-DCI based STx2P SFN scheme for PUSCH—codebook

 pusch-CB-SingleDCI-STx2P-SFN-r18 SEQUENCE {

 maxNumberSRS-ResourcePerSet-r18 ENUMERATED {n1,n2,n4},

 maxNumberLayerPerSet-r18 INTEGER (1..2),

 maxNumberSRS-AntennaPortsPerSet-r18 ENUMERATED {n1,n2,n4},

 maxNumberNZP-PUSCH-PortsPerSet-r18 ENUMERATED {n1,n2,n4}

 } OPTIONAL,

 -- R1 40-6-2a: Single-DCI based STx2P SFN scheme for PUSCH—noncodebook

 pusch-NonCB-SingleDCI-STx2P-SFN-r18 SEQUENCE {

 maxNumberSRS-ResourcePerSet-r18 INTEGER (1..4),

 maxNumberLayerPerSet-r18 INTEGER (1..2),

 maxNumberSimulSRS-ResourcePerSet-r18 INTEGER (1..4)

 } OPTIONAL,

 -- R1 40-6-3a: codebook multi-DCI based STx2P PUSCH+PUSCH for DG+DG

 twoPUSCH-CB-MultiDCI-STx2P-DG-DG-r18 SEQUENCE {

 maxNumberSRS-ResourcePerSet-r18 ENUMERATED {n1, n2, n4},

 maxNumberLayerOverlapping-r18 INTEGER (1..2),

 maxNumberNZP-PUSCH-Overlapping-r18 ENUMERATED {n1, n2, n4},

 maxNumberPUSCH-PerCORESET-PerSlot-r18 SEQUENCE {

 scs-60kHz-r18 ENUMERATED {n1,n2,n3,n4,n7} OPTIONAL,

 scs-120kHz-r18 ENUMERATED {n1,n2,n3,n4,n7} OPTIONAL

 } OPTIONAL,

 maxNumberTotalLayerOverlapping-r18 INTEGER (2..4),

 maxNumberSRS-AntennaPortsPerSet-r18 ENUMERATED {n1,n2,n4}

 } OPTIONAL,

 -- R1 40-6-3b: Noncodebook multi-DCI based STx2P PUSCH+PUSCH for DG+DG

 twoPUSCH-NonCB-MultiDCI-STx2P-DG-DG-r18 SEQUENCE {

 maxNumberSRS-ResourcePerSet-r18 INTEGER (1..4),

 maxNumberLayerOverlapping-r18 INTEGER (1..2),

 maxNumberSimulSRS-ResourcePerSet-r18 INTEGER (1..4),

 maxNumberPUSCH-PerCORESET-PerSlot-r18 SEQUENCE {

 scs-60kHz-r18 ENUMERATED {n1,n2,n3,n4,n7} OPTIONAL,

 scs-120kHz-r18 ENUMERATED {n1,n2,n3,n4,n7} OPTIONAL

 } OPTIONAL,

 maxNumberTotalLayerOverlapping-r18 INTEGER (2..4)

 } OPTIONAL,

 -- R1 40-6-6: Out-of-order operation for multi-DCI based STx2P PUSCH+PUSCH

 twoPUSCH-MultiDCI-STx2P-OutOfOrder-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 40-7-1a: Codebook-based 8Tx PUSCH—codebook1

 codebook1-8TxPUSCH-r18 ENUMERATED {n4-1,n2-2,both} OPTIONAL,

 -- R1 40-7-1b: Codebook-based 8Tx PUSCH—codebook2

 codebook2-8TxPUSCH-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 40-7-1c: Codebook-based 8Tx PUSCH—codebook3

 codebook3-8TxPUSCH-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 40-7-1d: Codebook-based 8Tx PUSCH—codebook4

 codebook4-8TxPUSCH-r18 ENUMERATED {supported} OPTIONAL

}

-- TAG-FEATURESETUPLINKPERCC-STOP

-- ASN1STOP

#### – *FeatureSetUplinkPerCC-Id*

The IE *FeatureSetUplinkPerCC-Id* identifies a set of features applicable to one carrier of a feature set. The *FeatureSetUplinkPerCC-Id* of a *FeatureSetUplinkPerCC* is the index position of the *FeatureSetUplinkPerCC* in the *featureSetsUplinkPerCC*. The first element in the list is referred to by *FeatureSetUplinkPerCC-Id* = 1, and so on.

*FeatureSetUplinkPerCC-Id* information element

-- ASN1START

-- TAG-FEATURESETUPLINKPERCC-ID-START

FeatureSetUplinkPerCC-Id ::= INTEGER (1..maxPerCC-FeatureSets)

-- TAG-FEATURESETUPLINKPERCC-ID-STOP

-- ASN1STOP

#### – *FreqBandIndicatorEUTRA*

-- ASN1START

-- TAG-FREQBANDINDICATOREUTRA-START

FreqBandIndicatorEUTRA ::= INTEGER (1..maxBandsEUTRA)

-- TAG-FREQBANDINDICATOREUTRA-STOP

-- ASN1STOP

#### – *FreqBandList*

The IE *FreqBandList* is used by the network to request NR CA, NR non-CA and/or MR-DC band combinations for specific NR and/or E-UTRA frequency bands and/or up to a specific number of carriers and/or up to specific aggregated bandwidth. This is also used to request feature sets (for NR) and feature set combinations (for NR and MR-DC). For NR sidelink communication, this is used by the initiating UE to request sidelink UE radio access capabilities from the peer UE. This is also used to request lower MSD capability for specific NR frequency bands for the UE supporting lower MSD.

*FreqBandList* information element

-- ASN1START

-- TAG-FREQBANDLIST-START

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

FreqBandInformation ::= CHOICE {

 bandInformationEUTRA FreqBandInformationEUTRA,

 bandInformationNR FreqBandInformationNR

}

FreqBandInformationEUTRA ::= SEQUENCE {

 bandEUTRA FreqBandIndicatorEUTRA,

 ca-BandwidthClassDL-EUTRA CA-BandwidthClassEUTRA OPTIONAL, -- Need N

 ca-BandwidthClassUL-EUTRA CA-BandwidthClassEUTRA OPTIONAL -- Need N

}

FreqBandInformationNR ::= SEQUENCE {

 bandNR FreqBandIndicatorNR,

 maxBandwidthRequestedDL AggregatedBandwidth OPTIONAL, -- Need N

 maxBandwidthRequestedUL AggregatedBandwidth OPTIONAL, -- Need N

 maxCarriersRequestedDL INTEGER (1..maxNrofServingCells) OPTIONAL, -- Need N

 maxCarriersRequestedUL INTEGER (1..maxNrofServingCells) OPTIONAL -- Need N

}

AggregatedBandwidth ::= ENUMERATED {mhz50, mhz100, mhz150, mhz200, mhz250, mhz300, mhz350,

 mhz400, mhz450, mhz500, mhz550, mhz600, mhz650, mhz700, mhz750, mhz800}

-- 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 { mhz800, mhz1200, mhz1400, ..., mhz400-v1650, mhz600-v1650}

FreqSeparationClassDL-v1620 ::= ENUMERATED {mhz1000, mhz1600, mhz1800, mhz2000, mhz2200, mhz2400}

FreqSeparationClassUL-v1620 ::= ENUMERATED {mhz1000}

-- TAG-FREQSEPARATIONCLASS-STOP

-- ASN1STOP

#### *– FreqSeparationClassDL-Only*

The IE *FreqSeparationClassDL-Only* is used to indicate the frequency separation between lower edge of lowest CC and upper edge of highest CC of DL only frequency spectrum in a frequency band.

*FreqSeparationClassDL-Only* information element

-- ASN1START

-- TAG-FREQSEPARATIONCLASSDL-Only-START

FreqSeparationClassDL-Only-r16 ::= ENUMERATED {mhz200, mhz400, mhz600, mhz800, mhz1000, mhz1200}

-- TAG-FREQSEPARATIONCLASSDL-Only-STOP

-- ASN1STOP

#### – *FR2-2-AccessParamsPerBand*

The IE *FR2-2-AccessParamsPerBand* is used to convey FR2-2 related parameters specific for a certain frequency band (not per feature set or band combination).

FR2-2-AccessParamsPerBand information element

-- ASN1START

-- TAG-FR2-2-ACCESSPARAMSPERBAND-START

FR2-2-AccessParamsPerBand-r17 ::= SEQUENCE {

 -- R1 24-1: Basic FR2-2 DL support

 dl-FR2-2-SCS-120kHz-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 24-1a: Basic FR2-2 UL support

 ul-FR2-2-SCS-120kHz-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 24-2: 120KHz SSB support for initial access in FR2-2

 initialAccessSSB-120kHz-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 24-1b: Wideband PRACH for 120 kHz in FR2-2

 widebandPRACH-SCS-120kHz-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 24-1c: Multi-RB support PUCCH format 0/1/4 for 120 kHz in FR2-2

 multiRB-PUCCH-SCS-120kHz-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 24-1d: Multiple PDSCH scheduling by single DCI for 120kHz in FR2-2

 multiPDSCH-SingleDCI-FR2-2-SCS-120kHz-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 24-1e: Multiple PUSCH scheduling by single DCI for 120kHz in FR2-2

 multiPUSCH-SingleDCI-FR2-2-SCS-120kHz-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 24-4: 480KHz SCS support for DL

 dl-FR2-2-SCS-480kHz-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 24-4a: 480KHz SCS support for UL

 ul-FR2-2-SCS-480kHz-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 24-3: 480KHz SSB support for initial access in FR2-2

 initialAccessSSB-480kHz-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 24-4b: Wideband PRACH for 480 kHz in FR2-2

 widebandPRACH-SCS-480kHz-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 24-4c: Multi-RB support PUCCH format 0/1/4 for 480 kHz in FR2-2

 multiRB-PUCCH-SCS-480kHz-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 24-4f: Enhanced PDCCH monitoring for 480KHz in FR2-2

 enhancedPDCCH-monitoringSCS-480kHz-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 24-5: 960KHz SCS support for DL

 dl-FR2-2-SCS-960kHz-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 24-5a: 960KHz SCS support for UL

 ul-FR2-2-SCS-960kHz-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 24-5c: Multi-RB support PUCCH format 0/1/4 for 960 kHz in FR2-2

 multiRB-PUCCH-SCS-960kHz-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 24-5f: Enhanced PDCCH monitoring for 960KHz in FR2-2

 enhancedPDCCH-monitoringSCS-960kHz-r17 SEQUENCE {

 pdcch-monitoring4-1-r17 ENUMERATED {supported} OPTIONAL,

 pdcch-monitoring4-2-r17 ENUMERATED {supported} OPTIONAL,

 pdcch-monitoring8-4-r17 ENUMERATED {supported} OPTIONAL

 } OPTIONAL,

 -- R1 24-6: Type 1 channel access procedure in uplink for FR2-2 with shared spectrum channel access

 type1-ChannelAccess-FR2-2-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 24-7: Type 2 channel access procedure in uplink for FR2-2 with shared spectrum channel access

 type2-ChannelAccess-FR2-2-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 24-10: Reduced beam switching time delay

 reduced-BeamSwitchTiming-FR2-2-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 24-8: 32 DL HARQ processes for FR 2-2

 support32-DL-HARQ-ProcessPerSCS-r17 SEQUENCE {

 scs-120kHz-r17 ENUMERATED {supported} OPTIONAL,

 scs-480kHz-r17 ENUMERATED {supported} OPTIONAL,

 scs-960kHz-r17 ENUMERATED {supported} OPTIONAL

 } OPTIONAL,

 -- R1 24-9: 32 UL HARQ processes for FR 2-2

 support32-UL-HARQ-ProcessPerSCS-r17 SEQUENCE {

 scs-120kHz-r17 ENUMERATED {supported} OPTIONAL,

 scs-480kHz-r17 ENUMERATED {supported} OPTIONAL,

 scs-960kHz-r17 ENUMERATED {supported} OPTIONAL

 } OPTIONAL,

 ...,

 [[

 -- R4 15-1: 64QAM for PUSCH for FR2-2

 modulation64-QAM-PUSCH-FR2-2-r17 ENUMERATED {supported} OPTIONAL

 ]]

}

-- TAG-FR2-2-ACCESSPARAMSPERBAND-STOP

-- ASN1STOP

#### – *HighSpeedParameters*

The IE *HighSpeedParameters* is used to convey capabilities related to high speed scenarios.

*HighSpeedParameters* information element

-- ASN1START

-- TAG-HIGHSPEEDPARAMETERS-START

HighSpeedParameters-r16 ::= SEQUENCE {

 measurementEnhancement-r16 ENUMERATED {supported} OPTIONAL,

 demodulationEnhancement-r16 ENUMERATED {supported} OPTIONAL

}

HighSpeedParameters-v1650 ::= CHOICE {

 intraNR-MeasurementEnhancement-r16 ENUMERATED {supported},

 interRAT-MeasurementEnhancement-r16 ENUMERATED {supported}

}

HighSpeedParameters-v1700 ::= SEQUENCE {

 -- R4 18-1: Enhanced RRM requirements specified for CA for FR1 HST

 measurementEnhancementCA-r17 ENUMERATED {supported} OPTIONAL,

 -- R4 18-2: Enhanced RRM requirements specified for inter-frequency measurement in connected mode for FR1 HST

 measurementEnhancementInterFreq-r17 ENUMERATED {supported} OPTIONAL

}

-- TAG-HIGHSPEEDPARAMETERS-STOP

-- ASN1STOP

#### – *IMS-Parameters*

The IE *IMS-Parameters* is used to convey capabilities related to IMS.

*IMS-Parameters* information element

-- ASN1START

-- TAG-IMS-PARAMETERS-START

IMS-Parameters ::= SEQUENCE {

 ims-ParametersCommon IMS-ParametersCommon OPTIONAL,

 ims-ParametersFRX-Diff IMS-ParametersFRX-Diff OPTIONAL,

 ...

}

IMS-Parameters-v1700 ::= SEQUENCE {

 ims-ParametersFR2-2-r17 IMS-ParametersFR2-2-r17 OPTIONAL

}

IMS-ParametersCommon ::= SEQUENCE {

 voiceOverEUTRA-5GC ENUMERATED {supported} OPTIONAL,

 ...,

 [[

 voiceOverSCG-BearerEUTRA-5GC ENUMERATED {supported} OPTIONAL

 ]],

 [[

 voiceFallbackIndicationEPS-r16 ENUMERATED {supported} OPTIONAL

 ]]

}

IMS-ParametersFRX-Diff ::= SEQUENCE {

 voiceOverNR ENUMERATED {supported} OPTIONAL,

 ...

}

IMS-ParametersFR2-2-r17 ::= SEQUENCE {

 voiceOverNR-r17 ENUMERATED {supported} OPTIONAL,

 ...

}

-- TAG-IMS-PARAMETERS-STOP

-- ASN1STOP

#### – *InterRAT-Parameters*

The IE *InterRAT-Parameters* is used convey UE capabilities related to the other RATs.

*InterRAT-Parameters* information element

-- ASN1START

-- TAG-INTERRAT-PARAMETERS-START

InterRAT-Parameters ::= SEQUENCE {

 eutra EUTRA-Parameters OPTIONAL,

 ...,

 [[

 utra-FDD-r16 UTRA-FDD-Parameters-r16 OPTIONAL

 ]]

}

EUTRA-Parameters ::= SEQUENCE {

 supportedBandListEUTRA SEQUENCE (SIZE (1..maxBandsEUTRA)) OF FreqBandIndicatorEUTRA,

 eutra-ParametersCommon EUTRA-ParametersCommon OPTIONAL,

 eutra-ParametersXDD-Diff EUTRA-ParametersXDD-Diff OPTIONAL,

 ...

}

EUTRA-ParametersCommon ::= SEQUENCE {

 mfbi-EUTRA ENUMERATED {supported} OPTIONAL,

 modifiedMPR-BehaviorEUTRA BIT STRING (SIZE (32)) OPTIONAL,

 multiNS-Pmax-EUTRA ENUMERATED {supported} OPTIONAL,

 rs-SINR-MeasEUTRA ENUMERATED {supported} OPTIONAL,

 ...,

 [[

 ne-DC ENUMERATED {supported} OPTIONAL

 ]],

 [[

 nr-HO-ToEN-DC-r16 ENUMERATED {supported} OPTIONAL

 ]]

}

EUTRA-ParametersXDD-Diff ::= SEQUENCE {

 rsrqMeasWidebandEUTRA ENUMERATED {supported} OPTIONAL,

 ...

}

UTRA-FDD-Parameters-r16 ::= SEQUENCE {

 supportedBandListUTRA-FDD-r16 SEQUENCE (SIZE (1..maxBandsUTRA-FDD-r16)) OF SupportedBandUTRA-FDD-r16,

 ...

}

SupportedBandUTRA-FDD-r16 ::= ENUMERATED {

 bandI, bandII, bandIII, bandIV, bandV, bandVI,

 bandVII, bandVIII, bandIX, bandX, bandXI,

 bandXII, bandXIII, bandXIV, bandXV, bandXVI,

 bandXVII, bandXVIII, bandXIX, bandXX,

 bandXXI, bandXXII, bandXXIII, bandXXIV,

 bandXXV, bandXXVI, bandXXVII, bandXXVIII,

 bandXXIX, bandXXX, bandXXXI, bandXXXII}

-- TAG-INTERRAT-PARAMETERS-STOP

-- ASN1STOP

#### – *MAC-Parameters*

The IE *MAC-Parameters* is used to convey capabilities related to MAC.

*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-Parameters-v1610 ::= SEQUENCE {

 mac-ParametersFRX-Diff-r16 MAC-ParametersFRX-Diff-r16 OPTIONAL

}

MAC-Parameters-v1700 ::= SEQUENCE {

 mac-ParametersFR2-2-r17 MAC-ParametersFR2-2-r17 OPTIONAL

}

MAC-ParametersCommon ::= SEQUENCE {

 lcp-Restriction ENUMERATED {supported} OPTIONAL,

 dummy ENUMERATED {supported} OPTIONAL,

 lch-ToSCellRestriction ENUMERATED {supported} OPTIONAL,

 ...,

 [[

 recommendedBitRate ENUMERATED {supported} OPTIONAL,

 recommendedBitRateQuery ENUMERATED {supported} OPTIONAL

 ]],

 [[

 recommendedBitRateMultiplier-r16 ENUMERATED {supported} OPTIONAL,

 preEmptiveBSR-r16 ENUMERATED {supported} OPTIONAL,

 autonomousTransmission-r16 ENUMERATED {supported} OPTIONAL,

 lch-PriorityBasedPrioritization-r16 ENUMERATED {supported} OPTIONAL,

 lch-ToConfiguredGrantMapping-r16 ENUMERATED {supported} OPTIONAL,

 lch-ToGrantPriorityRestriction-r16 ENUMERATED {supported} OPTIONAL,

 singlePHR-P-r16 ENUMERATED {supported} OPTIONAL,

 ul-LBT-FailureDetectionRecovery-r16 ENUMERATED {supported} OPTIONAL,

 -- R4 8-1: MPE

 tdd-MPE-P-MPR-Reporting-r16 ENUMERATED {supported} OPTIONAL,

 lcid-ExtensionIAB-r16 ENUMERATED {supported} OPTIONAL

 ]],

 [[

 spCell-BFR-CBRA-r16 ENUMERATED {supported} OPTIONAL

 ]],

 [[

 srs-ResourceId-Ext-r16 ENUMERATED {supported} OPTIONAL

 ]],

 [[

 enhancedUuDRX-forSidelink-r17 ENUMERATED {supported} OPTIONAL,

 --27-10: Support of UL MAC CE based MG activation request for PRS measurements

 mg-ActivationRequestPRS-Meas-r17 ENUMERATED {supported} OPTIONAL,

 --27-11: Support of DL MAC CE based MG activation request for PRS measurements

 mg-ActivationCommPRS-Meas-r17 ENUMERATED {supported} OPTIONAL,

 intraCG-Prioritization-r17 ENUMERATED {supported} OPTIONAL,

 jointPrioritizationCG-Retx-Timer-r17 ENUMERATED {supported} OPTIONAL,

 survivalTime-r17 ENUMERATED {supported} OPTIONAL,

 lcg-ExtensionIAB-r17 ENUMERATED {supported} OPTIONAL,

 harq-FeedbackDisabled-r17 ENUMERATED {supported} OPTIONAL,

 uplink-Harq-ModeB-r17 ENUMERATED {supported} OPTIONAL,

 sr-TriggeredBy-TA-Report-r17 ENUMERATED {supported} OPTIONAL,

 extendedDRX-CycleInactive-r17 ENUMERATED {supported} OPTIONAL,

 simultaneousSR-PUSCH-DiffPUCCH-groups-r17 ENUMERATED {supported} OPTIONAL,

 lastTransmissionUL-r17 ENUMERATED {supported} OPTIONAL

 ]],

 [[

 sr-TriggeredByTA-ReportATG-r18 ENUMERATED {supported} OPTIONAL,

 -- similar to R1 26-4: UE reporting of information related to TA pre-compensation defined for ATG

 uplinkTA-ReportingATG-r18 ENUMERATED {supported} OPTIONAL,

 extendedDRX-CycleInactive-r18 ENUMERATED {supported} OPTIONAL

 ]]

}

MAC-ParametersFRX-Diff-r16 ::= SEQUENCE {

 directMCG-SCellActivation-r16 ENUMERATED {supported} OPTIONAL,

 directMCG-SCellActivationResume-r16 ENUMERATED {supported} OPTIONAL,

 directSCG-SCellActivation-r16 ENUMERATED {supported} OPTIONAL,

 directSCG-SCellActivationResume-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 19-1: DRX Adaptation

 drx-Adaptation-r16 SEQUENCE {

 non-SharedSpectrumChAccess-r16 MinTimeGap-r16 OPTIONAL,

 sharedSpectrumChAccess-r16 MinTimeGap-r16 OPTIONAL

 } OPTIONAL,

 ...

}

MAC-ParametersFR2-2-r17 ::= SEQUENCE {

 directMCG-SCellActivation-r17 ENUMERATED {supported} OPTIONAL,

 directMCG-SCellActivationResume-r17 ENUMERATED {supported} OPTIONAL,

 directSCG-SCellActivation-r17 ENUMERATED {supported} OPTIONAL,

 directSCG-SCellActivationResume-r17 ENUMERATED {supported} OPTIONAL,

 drx-Adaptation-r17 SEQUENCE {

 non-SharedSpectrumChAccess-r17 MinTimeGapFR2-2-r17 OPTIONAL,

 sharedSpectrumChAccess-r17 MinTimeGapFR2-2-r17 OPTIONAL

 } 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,

 multipleConfiguredGrants ENUMERATED {supported} OPTIONAL,

 ...,

 [[

 secondaryDRX-Group-r16 ENUMERATED {supported} OPTIONAL

 ]],

 [[

 enhancedSkipUplinkTxDynamic-r16 ENUMERATED {supported} OPTIONAL,

 enhancedSkipUplinkTxConfigured-r16 ENUMERATED {supported} OPTIONAL

 ]],

 [[

 ptm-Retransmission-r18 ENUMERATED {supported} OPTIONAL,

 ptm-RetransmissionInactive-r18 ENUMERATED {supported} OPTIONAL

 ]]

}

MinTimeGap-r16 ::= SEQUENCE {

 scs-15kHz-r16 ENUMERATED {sl1, sl3} OPTIONAL,

 scs-30kHz-r16 ENUMERATED {sl1, sl6} OPTIONAL,

 scs-60kHz-r16 ENUMERATED {sl1, sl12} OPTIONAL,

 scs-120kHz-r16 ENUMERATED {sl2, sl24} OPTIONAL

}

MinTimeGapFR2-2-r17 ::= SEQUENCE {

 scs-120kHz-r17 ENUMERATED {sl2, sl24} OPTIONAL,

 scs-480kHz-r17 ENUMERATED {sl8, sl96} OPTIONAL,

 scs-960kHz-r17 ENUMERATED {sl16, sl192} OPTIONAL

}

-- TAG-MAC-PARAMETERS-STOP

-- ASN1STOP

#### – *MeasAndMobParameters*

The IE *MeasAndMobParameters* is used to convey UE capabilities related to measurements for radio resource management (RRM), radio link monitoring (RLM) and mobility (e.g. handover).

*MeasAndMobParameters* information element

-- ASN1START

-- TAG-MEASANDMOBPARAMETERS-START

MeasAndMobParameters ::= SEQUENCE {

 measAndMobParametersCommon MeasAndMobParametersCommon OPTIONAL,

 measAndMobParametersXDD-Diff MeasAndMobParametersXDD-Diff OPTIONAL,

 measAndMobParametersFRX-Diff MeasAndMobParametersFRX-Diff OPTIONAL

}

MeasAndMobParameters-v1700 ::= SEQUENCE {

 measAndMobParametersFR2-2-r17 MeasAndMobParametersFR2-2-r17 OPTIONAL

}

MeasAndMobParametersCommon ::= SEQUENCE {

 supportedGapPattern BIT STRING (SIZE (22)) OPTIONAL,

 ssb-RLM ENUMERATED {supported} OPTIONAL,

 ssb-AndCSI-RS-RLM ENUMERATED {supported} OPTIONAL,

 ...,

 [[

 eventB-MeasAndReport ENUMERATED {supported} OPTIONAL,

 handoverFDD-TDD ENUMERATED {supported} OPTIONAL,

 eutra-CGI-Reporting ENUMERATED {supported} OPTIONAL,

 nr-CGI-Reporting ENUMERATED {supported} OPTIONAL

 ]],

 [[

 independentGapConfig ENUMERATED {supported} OPTIONAL,

 periodicEUTRA-MeasAndReport ENUMERATED {supported} OPTIONAL,

 handoverFR1-FR2 ENUMERATED {supported} OPTIONAL,

 maxNumberCSI-RS-RRM-RS-SINR ENUMERATED {n4, n8, n16, n32, n64, n96} OPTIONAL

 ]],

 [[

 nr-CGI-Reporting-ENDC ENUMERATED {supported} OPTIONAL

 ]],

 [[

 eutra-CGI-Reporting-NEDC ENUMERATED {supported} OPTIONAL,

 eutra-CGI-Reporting-NRDC ENUMERATED {supported} OPTIONAL,

 nr-CGI-Reporting-NEDC ENUMERATED {supported} OPTIONAL,

 nr-CGI-Reporting-NRDC ENUMERATED {supported} OPTIONAL

 ]],

 [[

 reportAddNeighMeasForPeriodic-r16 ENUMERATED {supported} OPTIONAL,

 condHandoverParametersCommon-r16 SEQUENCE {

 condHandoverFDD-TDD-r16 ENUMERATED {supported} OPTIONAL,

 condHandoverFR1-FR2-r16 ENUMERATED {supported} OPTIONAL

 } OPTIONAL,

 nr-NeedForGap-Reporting-r16 ENUMERATED {supported} OPTIONAL,

 supportedGapPattern-NRonly-r16 BIT STRING (SIZE (10)) OPTIONAL,

 supportedGapPattern-NRonly-NEDC-r16 ENUMERATED {supported} OPTIONAL,

 maxNumberCLI-RSSI-r16 ENUMERATED {n8, n16, n32, n64} OPTIONAL,

 maxNumberCLI-SRS-RSRP-r16 ENUMERATED {n4, n8, n16, n32} OPTIONAL,

 maxNumberPerSlotCLI-SRS-RSRP-r16 ENUMERATED {n2, n4, n8} OPTIONAL,

 mfbi-IAB-r16 ENUMERATED {supported} OPTIONAL,

 dummy ENUMERATED {supported} OPTIONAL,

 nr-CGI-Reporting-NPN-r16 ENUMERATED {supported} OPTIONAL,

 idleInactiveEUTRA-MeasReport-r16 ENUMERATED {supported} OPTIONAL,

 idleInactive-ValidityArea-r16 ENUMERATED {supported} OPTIONAL,

 eutra-AutonomousGaps-r16 ENUMERATED {supported} OPTIONAL,

 eutra-AutonomousGaps-NEDC-r16 ENUMERATED {supported} OPTIONAL,

 eutra-AutonomousGaps-NRDC-r16 ENUMERATED {supported} OPTIONAL,

 pcellT312-r16 ENUMERATED {supported} OPTIONAL,

 supportedGapPattern-r16 BIT STRING (SIZE (2)) OPTIONAL

 ]],

 [[

 -- R4 19-2 Concurrent measurement gaps

 concurrentMeasGap-r17 CHOICE {

 concurrentPerUE-OnlyMeasGap-r17 ENUMERATED {supported},

 concurrentPerUE-PerFRCombMeasGap-r17 ENUMERATED {supported}

 } OPTIONAL,

 -- R4 19-1 Network controlled small gap (NCSG)

 nr-NeedForGapNCSG-Reporting-r17 ENUMERATED {supported} OPTIONAL,

 eutra-NeedForGapNCSG-Reporting-r17 ENUMERATED {supported} OPTIONAL,

 -- R4 19-1-1 per FR Network controlled small gap (NCSG)

 ncsg-MeasGapPerFR-r17 ENUMERATED {supported} OPTIONAL,

 -- R4 19-1-2 Network controlled small gap (NCSG) supported patterns

 ncsg-MeasGapPatterns-r17 BIT STRING (SIZE(24)) OPTIONAL,

 -- R4 19-1-3 Network controlled small gap (NCSG) supported NR-only patterns

 ncsg-MeasGapNR-Patterns-r17 BIT STRING (SIZE(24)) OPTIONAL,

 -- R4 19-3-2 pre-configured measurement gap

 preconfiguredUE-AutonomousMeasGap-r17 ENUMERATED {supported} OPTIONAL,

 -- R4 19-3-1 pre-configured measurement gap

 preconfiguredNW-ControlledMeasGap-r17 ENUMERATED {supported} OPTIONAL,

 handoverFR1-FR2-2-r17 ENUMERATED {supported} OPTIONAL,

 handoverFR2-1-FR2-2-r17 ENUMERATED {supported} OPTIONAL,

 -- RAN4 14-1: per-FR MG for PRS measurement

 independentGapConfigPRS-r17 ENUMERATED {supported} OPTIONAL,

 rrm-RelaxationRRC-ConnectedRedCap-r17 ENUMERATED {supported} OPTIONAL,

 -- R4 25-3: Parallel measurements with multiple measurement gaps

 parallelMeasurementGap-r17 ENUMERATED {n2} OPTIONAL,

 condHandoverWithSCG-NRDC-r17 ENUMERATED {supported} OPTIONAL,

 gNB-ID-LengthReporting-r17 ENUMERATED {supported} OPTIONAL,

 gNB-ID-LengthReporting-ENDC-r17 ENUMERATED {supported} OPTIONAL,

 gNB-ID-LengthReporting-NEDC-r17 ENUMERATED {supported} OPTIONAL,

 gNB-ID-LengthReporting-NRDC-r17 ENUMERATED {supported} OPTIONAL,

 gNB-ID-LengthReporting-NPN-r17 ENUMERATED {supported} OPTIONAL

 ]],

 [[

 -- R4 25-1: Parallel measurements on multiple SMTC-s for a single frequency carrier

 parallelSMTC-r17 ENUMERATED {n4} OPTIONAL,

 -- R4 19-2-1 Concurrent measurement gaps for EUTRA

 concurrentMeasGapEUTRA-r17 ENUMERATED {supported} OPTIONAL,

 serviceLinkPropDelayDiffReporting-r17 ENUMERATED {supported} OPTIONAL,

 -- R4 19-1-4 Network controlled small gap (NCSG) performing measurement based on flag deriveSSB-IndexFromCellInter

 ncsg-SymbolLevelScheduleRestrictionInter-r17 ENUMERATED {supported} OPTIONAL

 ]],

 [[

 eventD1-MeasReportTrigger-r17 ENUMERATED {supported} OPTIONAL,

 independentGapConfig-maxCC-r17 SEQUENCE {

 fr1-Only-r17 INTEGER (1..32) OPTIONAL,

 fr2-Only-r17 INTEGER (1..32) OPTIONAL,

 fr1-AndFR2-r17 INTEGER (1..32) OPTIONAL

 } OPTIONAL

 ]],

 [[

 interSatMeas-r17 ENUMERATED {supported} OPTIONAL,

 deriveSSB-IndexFromCellInterNon-NCSG-r17 ENUMERATED {supported} OPTIONAL

 ]],

 [[

 -- R4 31-1 Enhanced L3 measurement reporting for unknown SCell activation if the valid L3 measurement results are available

 l3-MeasUnknownSCellActivation-r18 ENUMERATED {supported} OPTIONAL,

 -- R4 31-3 Shorter measurement interval for unknown SCell activation

 shortMeasInterval-r18 ENUMERATED {supported} OPTIONAL,

 nr-NeedForInterruptionReport-r18 ENUMERATED {supported} OPTIONAL,

 measSequenceConfig-r18 ENUMERATED {supported} OPTIONAL,

 cellIndividualOffsetPerMeasEvent-r18 ENUMERATED {supported} OPTIONAL

 ]]

}

MeasAndMobParametersXDD-Diff ::= SEQUENCE {

 intraAndInterF-MeasAndReport ENUMERATED {supported} OPTIONAL,

 eventA-MeasAndReport ENUMERATED {supported} OPTIONAL,

 ...,

 [[

 handoverInterF ENUMERATED {supported} OPTIONAL,

 handoverLTE-EPC ENUMERATED {supported} OPTIONAL,

 handoverLTE-5GC ENUMERATED {supported} OPTIONAL

 ]],

 [[

 sftd-MeasNR-Neigh ENUMERATED {supported} OPTIONAL,

 sftd-MeasNR-Neigh-DRX ENUMERATED {supported} OPTIONAL

 ]],

 [[

 dummy ENUMERATED {supported} OPTIONAL

 ]]

}

MeasAndMobParametersFRX-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,

 ...,

 [[

 handoverInterF ENUMERATED {supported} OPTIONAL,

 handoverLTE-EPC ENUMERATED {supported} OPTIONAL,

 handoverLTE-5GC ENUMERATED {supported} OPTIONAL

 ]],

 [[

 maxNumberResource-CSI-RS-RLM ENUMERATED {n2, n4, n6, n8} OPTIONAL

 ]],

 [[

 simultaneousRxDataSSB-DiffNumerology ENUMERATED {supported} OPTIONAL

 ]],

 [[

 nr-AutonomousGaps-r16 ENUMERATED {supported} OPTIONAL,

 nr-AutonomousGaps-ENDC-r16 ENUMERATED {supported} OPTIONAL,

 nr-AutonomousGaps-NEDC-r16 ENUMERATED {supported} OPTIONAL,

 nr-AutonomousGaps-NRDC-r16 ENUMERATED {supported} OPTIONAL,

 dummy ENUMERATED {supported} OPTIONAL,

 cli-RSSI-Meas-r16 ENUMERATED {supported} OPTIONAL,

 cli-SRS-RSRP-Meas-r16 ENUMERATED {supported} OPTIONAL,

 interFrequencyMeas-NoGap-r16 ENUMERATED {supported} OPTIONAL,

 simultaneousRxDataSSB-DiffNumerology-Inter-r16 ENUMERATED {supported} OPTIONAL,

 idleInactiveNR-MeasReport-r16 ENUMERATED {supported} OPTIONAL,

 -- R4 6-2: Support of beam level Early Measurement Reporting

 idleInactiveNR-MeasBeamReport-r16 ENUMERATED {supported} OPTIONAL

 ]],

 [[

 increasedNumberofCSIRSPerMO-r16 ENUMERATED {supported} OPTIONAL

 ]]

}

MeasAndMobParametersFR2-2-r17 ::= SEQUENCE {

 handoverInterF-r17 ENUMERATED {supported} OPTIONAL,

 handoverLTE-EPC-r17 ENUMERATED {supported} OPTIONAL,

 handoverLTE-5GC-r17 ENUMERATED {supported} OPTIONAL,

 idleInactiveNR-MeasReport-r17 ENUMERATED {supported} OPTIONAL,

...

}

-- TAG-MEASANDMOBPARAMETERS-STOP

-- ASN1STOP

#### – *MeasAndMobParametersMRDC*

The IE *MeasAndMobParametersMRDC* is used to convey capability parameters related to RRM measurements and RRC mobility.

*MeasAndMobParametersMRDC* information element

-- ASN1START

-- TAG-MEASANDMOBPARAMETERSMRDC-START

MeasAndMobParametersMRDC ::= SEQUENCE {

 measAndMobParametersMRDC-Common MeasAndMobParametersMRDC-Common OPTIONAL,

 measAndMobParametersMRDC-XDD-Diff MeasAndMobParametersMRDC-XDD-Diff OPTIONAL,

 measAndMobParametersMRDC-FRX-Diff MeasAndMobParametersMRDC-FRX-Diff OPTIONAL

}

MeasAndMobParametersMRDC-v1560 ::= SEQUENCE {

 measAndMobParametersMRDC-XDD-Diff-v1560 MeasAndMobParametersMRDC-XDD-Diff-v1560 OPTIONAL

}

MeasAndMobParametersMRDC-v1610 ::= SEQUENCE {

 measAndMobParametersMRDC-Common-v1610 MeasAndMobParametersMRDC-Common-v1610 OPTIONAL,

 interNR-MeasEUTRA-IAB-r16 ENUMERATED {supported} OPTIONAL

}

MeasAndMobParametersMRDC-v1700 ::= SEQUENCE {

 measAndMobParametersMRDC-Common-v1700 MeasAndMobParametersMRDC-Common-v1700 OPTIONAL

}

MeasAndMobParametersMRDC-v1730 ::= SEQUENCE {

 measAndMobParametersMRDC-Common-v1730 MeasAndMobParametersMRDC-Common-v1730 OPTIONAL

}

MeasAndMobParametersMRDC-Common ::= SEQUENCE {

 independentGapConfig ENUMERATED {supported} OPTIONAL

}

MeasAndMobParametersMRDC-Common-v1610 ::= SEQUENCE {

 condPSCellChangeParametersCommon-r16 SEQUENCE {

 condPSCellChangeFDD-TDD-r16 ENUMERATED {supported} OPTIONAL,

 condPSCellChangeFR1-FR2-r16 ENUMERATED {supported} OPTIONAL

 } OPTIONAL,

 pscellT312-r16 ENUMERATED {supported} OPTIONAL

}

MeasAndMobParametersMRDC-Common-v1700 ::= SEQUENCE {

 condPSCellChangeParameters-r17 SEQUENCE {

 inter-SN-condPSCellChangeFDD-TDD-NRDC-r17 ENUMERATED {supported} OPTIONAL,

 inter-SN-condPSCellChangeFR1-FR2-NRDC-r17 ENUMERATED {supported} OPTIONAL,

 inter-SN-condPSCellChangeFDD-TDD-ENDC-r17 ENUMERATED {supported} OPTIONAL,

 inter-SN-condPSCellChangeFR1-FR2-ENDC-r17 ENUMERATED {supported} OPTIONAL,

 mn-InitiatedCondPSCellChange-FR1FDD-ENDC-r17 ENUMERATED {supported} OPTIONAL,

 mn-InitiatedCondPSCellChange-FR1TDD-ENDC-r17 ENUMERATED {supported} OPTIONAL,

 mn-InitiatedCondPSCellChange-FR2TDD-ENDC-r17 ENUMERATED {supported} OPTIONAL,

 sn-InitiatedCondPSCellChange-FR1FDD-ENDC-r17 ENUMERATED {supported} OPTIONAL,

 sn-InitiatedCondPSCellChange-FR1TDD-ENDC-r17 ENUMERATED {supported} OPTIONAL,

 sn-InitiatedCondPSCellChange-FR2TDD-ENDC-r17 ENUMERATED {supported} OPTIONAL

 } OPTIONAL,

 condHandoverWithSCG-ENDC-r17 ENUMERATED {supported} OPTIONAL,

 condHandoverWithSCG-NEDC-r17 ENUMERATED {supported} OPTIONAL

}

MeasAndMobParametersMRDC-Common-v1730 ::= SEQUENCE {

 independentGapConfig-maxCC-r17 SEQUENCE {

 fr1-Only-r17 INTEGER (1..32) OPTIONAL,

 fr2-Only-r17 INTEGER (1..32) OPTIONAL,

 fr1-AndFR2-r17 INTEGER (1..32) OPTIONAL

 }

}

MeasAndMobParametersMRDC-XDD-Diff ::= SEQUENCE {

 sftd-MeasPSCell ENUMERATED {supported} OPTIONAL,

 sftd-MeasNR-Cell ENUMERATED {supported} OPTIONAL

}

MeasAndMobParametersMRDC-XDD-Diff-v1560 ::= SEQUENCE {

 sftd-MeasPSCell-NEDC ENUMERATED {supported} OPTIONAL

}

MeasAndMobParametersMRDC-FRX-Diff ::= SEQUENCE {

 simultaneousRxDataSSB-DiffNumerology ENUMERATED {supported} OPTIONAL

}

-- TAG-MEASANDMOBPARAMETERSMRDC-STOP

-- ASN1STOP

#### – *MIMO-Layers*

The IE *MIMO-Layers* is used to convey the number of supported MIMO layers.

*MIMO-Layers* information element

-- ASN1START

-- TAG-MIMO-LAYERS-START

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

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

-- TAG-MIMO-LAYERS-STOP

-- ASN1STOP

#### – *MIMO-ParametersPerBand*

The IE *MIMO-ParametersPerBand* is used to convey MIMO related parameters specific for a certain band (not per feature set or band combination).

*MIMO-ParametersPerBand* information element

-- ASN1START

-- TAG-MIMO-PARAMETERSPERBAND-START

MIMO-ParametersPerBand ::= SEQUENCE {

 tci-StatePDSCH SEQUENCE {

 maxNumberConfiguredTCI-StatesPerCC ENUMERATED {n4, n8, n16, n32, n64, n128} OPTIONAL,

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

 } OPTIONAL,

 additionalActiveTCI-StatePDCCH ENUMERATED {supported} OPTIONAL,

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

 beamCorrespondenceWithoutUL-BeamSweeping ENUMERATED {supported} OPTIONAL,

 periodicBeamReport ENUMERATED {supported} OPTIONAL,

 aperiodicBeamReport ENUMERATED {supported} OPTIONAL,

 sp-BeamReportPUCCH ENUMERATED {supported} OPTIONAL,

 sp-BeamReportPUSCH ENUMERATED {supported} OPTIONAL,

 dummy1 DummyG 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-BM ENUMERATED {n2, n4, n8, n16},

 maxNumberSRS-ResourceSet INTEGER (1..8)

 } OPTIONAL,

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

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

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

 dummy2 ENUMERATED {supported} OPTIONAL,

 twoPortsPTRS-UL ENUMERATED {supported} OPTIONAL,

 dummy5 SRS-Resources OPTIONAL,

 dummy3 INTEGER (1..4) OPTIONAL,

 beamReportTiming SEQUENCE {

 scs-15kHz ENUMERATED {sym2, sym4, sym8} OPTIONAL,

 scs-30kHz ENUMERATED {sym4, sym8, sym14, sym28} OPTIONAL,

 scs-60kHz ENUMERATED {sym8, sym14, sym28} OPTIONAL,

 scs-120kHz ENUMERATED {sym14, sym28, sym56} OPTIONAL

 } OPTIONAL,

 ptrs-DensityRecommendationSetDL SEQUENCE {

 scs-15kHz PTRS-DensityRecommendationDL OPTIONAL,

 scs-30kHz PTRS-DensityRecommendationDL OPTIONAL,

 scs-60kHz PTRS-DensityRecommendationDL OPTIONAL,

 scs-120kHz PTRS-DensityRecommendationDL OPTIONAL

 } OPTIONAL,

 ptrs-DensityRecommendationSetUL SEQUENCE {

 scs-15kHz PTRS-DensityRecommendationUL OPTIONAL,

 scs-30kHz PTRS-DensityRecommendationUL OPTIONAL,

 scs-60kHz PTRS-DensityRecommendationUL OPTIONAL,

 scs-120kHz PTRS-DensityRecommendationUL OPTIONAL

 } OPTIONAL,

 dummy4 DummyH OPTIONAL,

 aperiodicTRS ENUMERATED {supported} OPTIONAL,

 ...,

 [[

 dummy6 ENUMERATED {true} OPTIONAL,

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

 beamSwitchTiming SEQUENCE {

 scs-60kHz ENUMERATED {sym14, sym28, sym48, sym224, sym336} OPTIONAL,

 scs-120kHz ENUMERATED {sym14, sym28, sym48, sym224, sym336} OPTIONAL

 } OPTIONAL,

 codebookParameters CodebookParameters OPTIONAL,

 csi-RS-IM-ReceptionForFeedback CSI-RS-IM-ReceptionForFeedback OPTIONAL,

 csi-RS-ProcFrameworkForSRS CSI-RS-ProcFrameworkForSRS OPTIONAL,

 csi-ReportFramework CSI-ReportFramework OPTIONAL,

 csi-RS-ForTracking CSI-RS-ForTracking OPTIONAL,

 srs-AssocCSI-RS SEQUENCE (SIZE (1.. maxNrofCSI-RS-Resources)) OF SupportedCSI-RS-Resource OPTIONAL,

 spatialRelations SpatialRelations OPTIONAL

 ]],

 [[

 -- R1 16-2b-0: Support of default QCL assumption with two TCI states

 defaultQCL-TwoTCI-r16 ENUMERATED {supported} OPTIONAL,

 codebookParametersPerBand-r16 CodebookParameters-v1610 OPTIONAL,

 -- R1 16-1b-3: Support of PUCCH resource groups per BWP for simultaneous spatial relation update

 simul-SpatialRelationUpdatePUCCHResGroup-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 16-1f: Maximum number of SCells configured for SCell beam failure recovery simultaneously

 maxNumberSCellBFR-r16 ENUMERATED {n1,n2,n4,n8} OPTIONAL,

 -- R1 16-2c: Supports simultaneous reception with different Type-D for FR2 only

 simultaneousReceptionDiffTypeD-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 16-1a-1: SSB/CSI-RS for L1-SINR measurement

 ssb-csirs-SINR-measurement-r16 SEQUENCE {

 maxNumberSSB-CSIRS-OneTx-CMR-r16 ENUMERATED {n8, n16, n32, n64},

 maxNumberCSI-IM-NZP-IMR-res-r16 ENUMERATED {n8, n16, n32, n64},

 maxNumberCSIRS-2Tx-res-r16 ENUMERATED {n0, n4, n8, n16, n32, n64},

 maxNumberSSB-CSIRS-res-r16 ENUMERATED {n8, n16, n32, n64, n128},

 maxNumberCSI-IM-NZP-IMR-res-mem-r16 ENUMERATED {n8, n16, n32, n64, n128},

 supportedCSI-RS-Density-CMR-r16 ENUMERATED {one, three, oneAndThree},

 maxNumberAperiodicCSI-RS-Res-r16 ENUMERATED {n2, n4, n8, n16, n32, n64},

 supportedSINR-meas-r16 ENUMERATED {ssbWithCSI-IM, ssbWithNZP-IMR, csirsWithNZP-IMR, csi-RSWithoutIMR} OPTIONAL

 } OPTIONAL,

 -- R1 16-1a-2: Non-group based L1-SINR reporting

 nonGroupSINR-reporting-r16 ENUMERATED {n1, n2, n4} OPTIONAL,

 -- R1 16-1a-3: Non-group based L1-SINR reporting

 groupSINR-reporting-r16 ENUMERATED {supported} OPTIONAL,

 multiDCI-multiTRP-Parameters-r16 SEQUENCE {

 -- R1 16-2a-0: Overlapping PDSCHs in time and fully overlapping in frequency and time

 overlapPDSCHsFullyFreqTime-r16 INTEGER (1..2) OPTIONAL,

 -- R1 16-2a-1: Overlapping PDSCHs in time and partially overlapping in frequency and time

 overlapPDSCHsInTimePartiallyFreq-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 16-2a-2: Out of order operation for DL

 outOfOrderOperationDL-r16 SEQUENCE {

 supportPDCCH-ToPDSCH-r16 ENUMERATED {supported} OPTIONAL,

 supportPDSCH-ToHARQ-ACK-r16 ENUMERATED {supported} OPTIONAL

 } OPTIONAL,

 -- R1 16-2a-3: Out of order operation for UL

 outOfOrderOperationUL-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 16-2a-5: Separate CRS rate matching

 separateCRS-RateMatching-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 16-2a-6: Default QCL enhancement for multi-DCI based multi-TRP

 defaultQCL-PerCORESETPoolIndex-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 16-2a-7: Maximum number of activated TCI states

 maxNumberActivatedTCI-States-r16 SEQUENCE {

 maxNumberPerCORESET-Pool-r16 ENUMERATED {n1, n2, n4, n8},

 maxTotalNumberAcrossCORESET-Pool-r16 ENUMERATED {n2, n4, n8, n16}

 } OPTIONAL

 } OPTIONAL,

 singleDCI-SDM-scheme-Parameters-r16 SEQUENCE {

 -- R1 16-2b-1b: Single-DCI based SDM scheme - Support of new DMRS port entry

 supportNewDMRS-Port-r16 ENUMERATED {supported1, supported2, supported3} OPTIONAL,

 -- R1 16-2b-1a: Support of s-port DL PTRS

 supportTwoPortDL-PTRS-r16 ENUMERATED {supported} OPTIONAL

 } OPTIONAL,

 -- R1 16-2b-2: Support of single-DCI based FDMSchemeA

 supportFDM-SchemeA-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 16-2b-3a: Single-DCI based FDMSchemeB CW soft combining

 supportCodeWordSoftCombining-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 16-2b-4: Single-DCI based TDMSchemeA

 supportTDM-SchemeA-r16 ENUMERATED {kb3, kb5, kb10, kb20, noRestriction} OPTIONAL,

 -- R1 16-2b-5: Single-DCI based inter-slot TDM

 supportInter-slotTDM-r16 SEQUENCE {

 supportRepNumPDSCH-TDRA-r16 ENUMERATED {n2, n3, n4, n5, n6, n7, n8, n16},

 maxTBS-Size-r16 ENUMERATED {kb3, kb5, kb10, kb20, noRestriction},

 maxNumberTCI-states-r16 INTEGER (1..2)

 } OPTIONAL,

 -- R1 16-4: Low PAPR DMRS for PDSCH

 lowPAPR-DMRS-PDSCH-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 16-6a: Low PAPR DMRS for PUSCH without transform precoding

 lowPAPR-DMRS-PUSCHwithoutPrecoding-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 16-6b: Low PAPR DMRS for PUCCH

 lowPAPR-DMRS-PUCCH-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 16-6c: Low PAPR DMRS for PUSCH with transform precoding & pi/2 BPSK

 lowPAPR-DMRS-PUSCHwithPrecoding-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 16-7: Extension of the maximum number of configured aperiodic CSI report settings

 csi-ReportFrameworkExt-r16 CSI-ReportFrameworkExt-r16 OPTIONAL,

 -- R1 16-3a, 16-3a-1, 16-3b, 16-3b-1, 16-8: Individual new codebook types

 codebookParametersAddition-r16 CodebookParametersAddition-r16 OPTIONAL,

 -- R1 16-8: Mixed codebook types

 codebookComboParametersAddition-r16 CodebookComboParametersAddition-r16 OPTIONAL,

 -- R4 8-2: SSB based beam correspondence

 beamCorrespondenceSSB-based-r16 ENUMERATED {supported} OPTIONAL,

 -- R4 8-3: CSI-RS based beam correspondence

 beamCorrespondenceCSI-RS-based-r16 ENUMERATED {supported} OPTIONAL,

 beamSwitchTiming-r16 SEQUENCE {

 scs-60kHz-r16 ENUMERATED {sym224, sym336} OPTIONAL,

 scs-120kHz-r16 ENUMERATED {sym224, sym336} OPTIONAL

 } OPTIONAL

 ]],

 [[

 -- R1 16-1a-4: Semi-persistent L1-SINR report on PUCCH

 semi-PersistentL1-SINR-Report-PUCCH-r16 SEQUENCE {

 supportReportFormat1-2OFDM-syms-r16 ENUMERATED {supported} OPTIONAL,

 supportReportFormat4-14OFDM-syms-r16 ENUMERATED {supported} OPTIONAL

 } OPTIONAL,

 -- R1 16-1a-5: Semi-persistent L1-SINR report on PUSCH

 semi-PersistentL1-SINR-Report-PUSCH-r16 ENUMERATED {supported} OPTIONAL

 ]],

 [[

 -- R1 16-1h: Support of 64 configured PUCCH spatial relations

 spatialRelations-v1640 SEQUENCE {

 maxNumberConfiguredSpatialRelations-v1640 ENUMERATED {n96, n128, n160, n192, n224, n256, n288, n320}

 } OPTIONAL,

 -- R1 16-1i: Support of 64 configured candidate beam RSs for BFR

 support64CandidateBeamRS-BFR-r16 ENUMERATED {supported} OPTIONAL

 ]],

 [[

 -- R1 16-2a-9: Interpretation of maxNumberMIMO-LayersPDSCH for multi-DCI based mTRP

 maxMIMO-LayersForMulti-DCI-mTRP-r16 ENUMERATED {supported} OPTIONAL

 ]],

 [[

 supportedSINR-meas-v1670 BIT STRING (SIZE (4)) OPTIONAL

 ]],

 [[

 -- R1 23-8-5 Increased repetition for SRS

 srs-increasedRepetition-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 23-8-6 Partial frequency sounding of SRS

 srs-partialFrequencySounding-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 23-8-7 Start RB location hopping for partial frequency SRS

 srs-startRB-locationHoppingPartial-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 23-8-8 Comb-8 SRS

 srs-combEight-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 23-9-1 Basic Features of Further Enhanced Port-Selection Type II Codebook (FeType-II) per band information

 codebookParametersfetype2-r17 CodebookParametersfetype2-r17 OPTIONAL,

 -- R1 23-3-1-2a Two associated CSI-RS resources

 mTRP-PUSCH-twoCSI-RS-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 23-3-2 Multi-TRP PUCCH repetition scheme 1 (inter-slot)

 mTRP-PUCCH-InterSlot-r17 ENUMERATED {pf0-2, pf1-3-4, pf0-4} OPTIONAL,

 -- R1 23-3-2b Cyclic mapping for multi-TRP PUCCH repetition

 mTRP-PUCCH-CyclicMapping-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 23-3-2c Second TPC field for multi-TRP PUCCH repetition

 mTRP-PUCCH-SecondTPC-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 23-5-2 MTRP BFR based on two BFD-RS set

 mTRP-BFR-twoBFD-RS-Set-r17 SEQUENCE {

 maxBFD-RS-resourcesPerSetPerBWP-r17 ENUMERATED {n1, n2},

 maxBFR-r17 INTEGER (1..9),

 maxBFD-RS-resourcesAcrossSetsPerBWP-r17 ENUMERATED {n2, n3, n4}

 } OPTIONAL,

 -- R1 23-5-2a PUCCH-SR resources for MTRP BFRQ - Max number of PUCCH-SR resources for MTRP BFRQ per cell group

 mTRP-BFR-PUCCH-SR-perCG-r17 ENUMERATED{n1, n2} OPTIONAL,

 -- R1 23-5-2b Association between a BFD-RS resource set on SpCell and a PUCCH SR resource

 mTRP-BFR-association-PUCCH-SR-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 23-6-3 Simultaneous activation of two TCI states for PDCCH across multiple CCs (HST/URLLC)

 sfn-SimulTwoTCI-AcrossMultiCC-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 23-6-4 Default DL beam setup for SFN

 sfn-DefaultDL-BeamSetup-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 23-6-4a Default UL beam setup for SFN PDCCH(FR2 only)

 sfn-DefaultUL-BeamSetup-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 23-8-1 SRS triggering offset enhancement

 srs-TriggeringOffset-r17 ENUMERATED {n1, n2, n4} OPTIONAL,

 -- R1 23-8-2 Triggering SRS only in DCI 0\_1/0\_2

 srs-TriggeringDCI-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 23-9-5 Active CSI-RS resources and ports for mixed codebook types in any slot per band information

 codebookComboParameterMixedType-r17 CodebookComboParameterMixedType-r17 OPTIONAL,

 -- R1 23-1-1 Unified TCI [with joint DL/UL TCI update] for intra-cell beam management

 unifiedJointTCI-r17 SEQUENCE{

 maxConfiguredJointTCI-r17 ENUMERATED {n8, n12, n16, n24, n32, n48, n64, n128},

 maxActivatedTCIAcrossCC-r17 ENUMERATED {n1, n2, n4, n8, n16}

 } OPTIONAL,

 -- R1 23-1-1b Unified TCI with joint DL/UL TCI update for intra- and inter-cell beam management with more than one MAC-CE

 unifiedJointTCI-multiMAC-CE-r17 SEQUENCE{

 minBeamApplicationTime-r17 ENUMERATED {n1, n2, n4, n7, n14, n28, n42, n56, n70, n84, n98, n112, n224, n336}

 OPTIONAL,

 maxNumMAC-CE-PerCC ENUMERATED {n2, n3, n4, n5, n6, n7, n8}

 } OPTIONAL,

 -- R1 23-1-1d Per BWP TCI state pool configuration for CA mode

 unifiedJointTCI-perBWP-CA-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 23-1-1e TCI state pool configuration with TCI pool sharing for CA mode

 unifiedJointTCI-ListSharingCA-r17 ENUMERATED {n1,n2,n4,n8} OPTIONAL,

 -- R1 23-1-1f Common multi-CC TCI state ID update and activation

 unifiedJointTCI-commonMultiCC-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 23-1-1g Beam misalignment between the DL source RS in the TCI state

 unifiedJointTCI-BeamAlignDLRS-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 23-1-1h Association between TCI state and UL PC settings for PUCCH, PUSCH, and SRS

 unifiedJointTCI-PC-association-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 23-1-1i Indication/configuration of R17 TCI states for aperiodic CSI-RS, PDCCH, PDSCH

 unifiedJointTCI-Legacy-r17 ENUMERATED {supported} OPTIONAL,

 -- 23-1-1m Indication/configuration of R17 TCI states for SRS

 unifiedJointTCI-Legacy-SRS-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 23-1-1j Indication/configuration of R17 TCI states for CORESET #0

 unifiedJointTCI-Legacy-CORESET0-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 23-1-1c SCell BFR with unified TCI framework (NOTE; pre-requisite is empty)

 unifiedJointTCI-SCellBFR-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 23-1-1a Unified TCI with joint DL/UL TCI update for inter-cell beam management

 unifiedJointTCI-InterCell-r17 SEQUENCE{

 additionalMAC-CE-PerCC-r17 ENUMERATED {n0, n1, n2, n4},

 additionalMAC-CE-AcrossCC-r17 ENUMERATED {n0, n1, n2, n4}

 } OPTIONAL,

 -- R1 23-10-1 Unified TCI with separate DL/UL TCI update for intra-cell beam management

 unifiedSeparateTCI-r17 SEQUENCE{

 maxConfiguredDL-TCI-r17 ENUMERATED {n4, n8, n12, n16, n24, n32, n48, n64, n128},

 maxConfiguredUL-TCI-r17 ENUMERATED {n4, n8, n12, n16, n24, n32, n48, n64},

 maxActivatedDL-TCIAcrossCC-r17 ENUMERATED {n1, n2, n4, n8, n16},

 maxActivatedUL-TCIAcrossCC-r17 ENUMERATED {n1, n2, n4, n8, n16}

 } OPTIONAL,

 -- R1 23-10-1b Unified TCI with separate DL/UL TCI update for intra-cell beam management with more than one MAC-CE

 unifiedSeparateTCI-multiMAC-CE-r17 SEQUENCE{

 minBeamApplicationTime-r17 ENUMERATED {n1, n2, n4, n7, n14, n28, n42, n56, n70, n84, n98, n112, n224, n336},

 maxActivatedDL-TCIPerCC-r17 INTEGER (2..8),

 maxActivatedUL-TCIPerCC-r17 INTEGER (2..8)

 } OPTIONAL,

 -- R1 23-10-1d Per BWP DL/UL-TCI state pool configuration for CA mode

 unifiedSeparateTCI-perBWP-CA-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 23-10-1e TCI state pool configuration with DL/UL-TCI pool sharing for CA mode

 unifiedSeparateTCI-ListSharingCA-r17 SEQUENCE {

 maxNumListDL-TCI-r17 ENUMERATED {n1,n2,n4,n8} OPTIONAL,

 maxNumListUL-TCI-r17 ENUMERATED {n1,n2,n4,n8} OPTIONAL

 } OPTIONAL,

 -- R1 23-10-1f Common multi-CC DL/UL-TCI state ID update and activation with separate DL/UL TCI update

 unifiedSeparateTCI-commonMultiCC-r17 ENUMERATED {supported} OPTIONAL,

 -- 23-10-1m Unified TCI with separate DL/UL TCI update for inter-cell beam management with more than one MAC-CE

 unifiedSeparateTCI-InterCell-r17 SEQUENCE {

 k-DL-PerCC-r17 ENUMERATED {n0, n1, n2, n4},

 k-UL-PerCC-r17 ENUMERATED {n0, n1, n2, n4},

 k-DL-AcrossCC-r17 ENUMERATED {n0, n1, n2, n4},

 k-UL-AcrossCC-r17 ENUMERATED {n0, n1, n2, n4}

 } OPTIONAL,

 -- R1 23-1-2 Inter-cell beam measurement and reporting (for inter-cell BM and mTRP)

 unifiedJointTCI-mTRP-InterCell-BM-r17 SEQUENCE {

 maxNumAdditionalPCI-L1-RSRP-r17 INTEGER (1..7),

 maxNumSSB-ResourceL1-RSRP-AcrossCC-r17 ENUMERATED {n1,n2,n4,n8}

 } OPTIONAL,

 -- R1 23-1-3 MPE mitigation

 mpe-Mitigation-r17 SEQUENCE {

 maxNumP-MPR-RI-pairs-r17 INTEGER (1..4),

 maxNumConfRS-r17 ENUMERATED {n1, n2, n4, n8, n12, n16, n28, n32, n48, n64}

 } OPTIONAL,

 -- R1 23-1-4 UE capability value reporting

 srs-PortReport-r17 SEQUENCE {

 capVal1-r17 ENUMERATED {n1, n2, n4} OPTIONAL,

 capVal2-r17 ENUMERATED {n1, n2, n4} OPTIONAL,

 capVal3-r17 ENUMERATED {n1, n2, n4} OPTIONAL,

 capVal4-r17 ENUMERATED {n1, n2, n4} OPTIONAL

 } OPTIONAL,

 -- R1 23-2-1a Monitoring of individual candidates

 mTRP-PDCCH-individual-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 23-2-1b PDCCH repetition with PDCCH monitoring on any span of up to 3 consecutive OFDM symbols of a slot

 mTRP-PDCCH-anySpan-3Symbols-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 23-2-2 Two QCL TypeD for CORESET monitoring in PDCCH repetition

 mTRP-PDCCH-TwoQCL-TypeD-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 23-3-1-2b CSI-RS processing framework for SRS with two associated CSI-RS resources

 mTRP-PUSCH-CSI-RS-r17 SEQUENCE {

 maxNumPeriodicSRS-r17 INTEGER (1..8),

 maxNumAperiodicSRS-r17 INTEGER (1..8),

 maxNumSP-SRS-r17 INTEGER (0..8),

 numSRS-ResourcePerCC-r17 INTEGER (1..16),

 numSRS-ResourceNonCodebook-r17 INTEGER (1..2)

 } OPTIONAL,

 -- R1 23-3-1a Cyclic mapping for Multi-TRP PUSCH repetition

 mTRP-PUSCH-cyclicMapping-r17 ENUMERATED {typeA,typeB,both} OPTIONAL,

 -- R1 23-3-1b Second TPC field for Multi-TRP PUSCH repetition

 mTRP-PUSCH-secondTPC-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 23-3-1c Two PHR reporting

 mTRP-PUSCH-twoPHR-Reporting-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 23-3-1e A-CSI report

 mTRP-PUSCH-A-CSI-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 23-3-1f SP-CSI report

 mTRP-PUSCH-SP-CSI-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 23-3-1g CG PUSCH transmission

 mTRP-PUSCH-CG-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 23-3-2d Updating two Spatial relation or two sets of power control parameters for PUCCH group

 mTRP-PUCCH-MAC-CE-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 23-3-2e Maximum number of power control parameter sets configured for multi-TRP PUCCH repetition in FR1

 mTRP-PUCCH-maxNum-PC-FR1-r17 INTEGER (3..8) OPTIONAL,

 -- R1 23-4 IntCell-mTRP

 mTRP-inter-Cell-r17 SEQUENCE {

 maxNumAdditionalPCI-Case1-r17 INTEGER (1..7),

 maxNumAdditionalPCI-Case2-r17 INTEGER (0..7)

 } OPTIONAL,

 -- R1 23-5-1 Group based L1-RSRP reporting enhancements

 mTRP-GroupBasedL1-RSRP-r17 SEQUENCE {

 maxNumBeamGroups-r17 INTEGER (1..4),

 maxNumRS-WithinSlot-r17 ENUMERATED {n2,n3,n4,n8,n16,n32,n64},

 maxNumRS-AcrossSlot-r17 ENUMERATED {n8, n16, n32, n64, n128}

 } OPTIONAL,

 -- R1 23-5-2c MAC-CE based update of explicit BFD-RS mTRP-PUCCH-IntraSlot-r17 => per band

 mTRP-BFD-RS-MAC-CE-r17 ENUMERATED {n4, n8, n12, n16, n32, n48, n64 } OPTIONAL,

 -- R1 23-7-1 Basic Features of CSI Enhancement for Multi-TRP

 mTRP-CSI-EnhancementPerBand-r17 SEQUENCE {

 maxNumNZP-CSI-RS-r17 INTEGER (2..8),

 cSI-Report-mode-r17 ENUMERATED {mode1, mode2, both},

 supportedComboAcrossCCs-r17 SEQUENCE (SIZE (1..16)) OF CSI-MultiTRP-SupportedCombinations-r17,

 codebookModeNCJT-r17 ENUMERATED{mode1,mode1And2}

 } OPTIONAL,

 -- R1 23-7-1b Active CSI-RS resources and ports in the presence of multi-TRP CSI

 codebookComboParameterMultiTRP-r17 CodebookComboParameterMultiTRP-r17 OPTIONAL,

 -- R1 23-7-1a Additional CSI report mode 1

 mTRP-CSI-additionalCSI-r17 ENUMERATED{x1,x2} OPTIONAL,

 -- R1 23-7-4 Support of Nmax=2 for Multi-TRP CSI

 mTRP-CSI-N-Max2-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 23-7-5 CMR sharing

 mTRP-CSI-CMR-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 23-8-11 Partial frequency sounding of SRS for non-frequency hopping case

 srs-partialFreqSounding-r17 ENUMERATED {supported} OPTIONAL,

 -- R1-24 feature: Extend beamSwitchTiming for FR2-2

 beamSwitchTiming-v1710 SEQUENCE {

 scs-480kHz ENUMERATED {sym56, sym112, sym192, sym896, sym1344} OPTIONAL,

 scs-960kHz ENUMERATED {sym112, sym224, sym384, sym1792, sym2688} OPTIONAL

 } OPTIONAL,

 -- R1-24 feature: Extend beamSwitchTiming-r16 for FR2-2

 beamSwitchTiming-r17 SEQUENCE {

 scs-480kHz-r17 ENUMERATED {sym896, sym1344} OPTIONAL,

 scs-960kHz-r17 ENUMERATED {sym1792, sym2688} OPTIONAL

 } OPTIONAL,

 -- R1-24 feature: Extend beamReportTiming for FR2-2

 beamReportTiming-v1710 SEQUENCE {

 scs-480kHz-r17 ENUMERATED {sym56, sym112, sym224} OPTIONAL,

 scs-960kHz-r17 ENUMERATED {sym112, sym224, sym448} OPTIONAL

 } OPTIONAL,

 -- R1-24 feature: Extend maximum number of RX/TX beam switch DL for FR2-2

 maxNumberRxTxBeamSwitchDL-v1710 SEQUENCE {

 scs-480kHz-r17 ENUMERATED {n2, n4, n7} OPTIONAL,

 scs-960kHz-r17 ENUMERATED {n1, n2, n4, n7} OPTIONAL

 } OPTIONAL

 ]],

 [[

 -- R1-23-1-4a: Semi-persistent/aperiodic capability value report

 srs-PortReportSP-AP-r17 ENUMERATED {supported} OPTIONAL,

 maxNumberRxBeam-v1720 INTEGER (9..12) OPTIONAL,

 -- R1-23-6-5 Support implicit configuration of RS(s) with two TCI states for beam failure detection

 sfn-ImplicitRS-twoTCI-r17 ENUMERATED {supported} OPTIONAL,

 -- R1-23-6-6 QCL-TypeD collision handling with CORESET with 2 TCI states

 sfn-QCL-TypeD-Collision-twoTCI-r17 ENUMERATED {supported} OPTIONAL,

 -- R1-23-7-1c Basic Features of CSI Enhancement for Multi-TRP - number of CPUs

 mTRP-CSI-numCPU-r17 ENUMERATED {n2, n3, n4} OPTIONAL

 ]],

 [[

 supportRepNumPDSCH-TDRA-DCI-1-2-r17 ENUMERATED {n2, n3, n4, n5, n6, n7, n8, n16} OPTIONAL

 ]],

[[

 codebookParametersetype2DopplerCSI-r18 CodebookParametersetype2DopplerCSI-r18 OPTIONAL,

 codebookParametersfetype2DopplerCSI-r18 CodebookParametersfetype2DopplerCSI-r18 OPTIONAL,

 -- R1 40-1-1a: Unified TCI with joint DL/UL TCI update for single-DCI based intra-cell multi-TRP with multiple activated TCI

 -- codepoints per CC

 tci-JointTCI-UpdateMultiActiveTCI-PerCC-r18 SEQUENCE {

 tci-StateInd-r18 ENUMERATED {withAssignment, withoutAssignment},

 maxNumberActiveJointTCI-PerCC-r18 INTEGER (2..8)

 } OPTIONAL,

 -- R1 40-1-1c: DCI format 1\_1 and if supported 1\_2 configured with TCI selection field

 tci-SelectionDCI-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 40-1-2: Unified TCI with separate DL/UL TCI update for single-DCI based intra-cell multi-TRP with single activated TCI

 -- codepoint per CC

 tci-SeperateTCI-UpdateSingleActiveTCI-PerCC-r18 SEQUENCE {

 maxNumConfigDL-TCI-PerCC-PerBWP-r18 ENUMERATED {n4, n8, n12, n16, n24, n32, n48, n64, n128},

 maxNumConfigUL-TCI-PerCC-PerBWP-r18 ENUMERATED {n4, n8, n12, n16, n24, n32, n48, n64},

 maxNumActiveDL-TCI-AcrossCC-r18 ENUMERATED {n2, n4, n8, n16},

 maxNumActiveUL-TCI-AcrossCC-r18 ENUMERATED {n2, n4, n8, n16}

 } OPTIONAL,

 -- R1 40-1-3: Per aperiodic CSI-RS resource/resource set configuration for TCI selection in S-DCI based MTRP

 tci-SelectionAperiodicCSI-RS-r18 ENUMERATED {perResource, perResourceSet, both} OPTIONAL,

 -- R1 40-1-4: Two TCI states for CJT Tx scheme for PDSCH

 twoTCI-StatePDSCH-CJT-TxScheme-r18 ENUMERATED {cjtSchemeA, cjtSchemeB, both} OPTIONAL,

 -- R1 40-2-3: TAG ID indication via absolute TA command MAC CE

 spCell-TAG-Ind-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 40-2-4: PDCCH order sent by one TRP triggers RACH procedure (specifically PRACH) towards a different TRP based on CFRA for

 -- inter-cell

 interCellCrossTRP-PDCCH-OrderCFRA-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 40-2-4a: PDCCH order sent by one TRP triggers RACH procedure (specifically PRACH) towards a different TRP based on CFRA for

 -- intra-cell

 intraCellCrossTRP-PDCCH-OrderCFRA-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 40-2-9: Overlapping UL transmission reduction

 overlapUL-TransReduction-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 40-4-11: Joint configuration of Rel.18 DMRS ports and Rel.18 dynamic switching between DFT-S-OFDM and CP-OFDM for PUSCH

 jointConfigDMRSPortDynamicSwitching-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 40-5-1a: Comb offset hopping time-domain behavior when repetition factor R>1

 srs-combOffsetInTime-r18 ENUMERATED {srs, rsrs, both} OPTIONAL,

 -- R1 40-5-1b: SRS comb offset hopping combined with legacy group/sequence hopping

 srs-combOffsetCombinedGroupSequence-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 40-5-1c: Comb offset hopping within a subset

 srs-combOffsetHoppingWithinSubset-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 40-5-2a: Smaller cyclic shift granularity for cyclic shift hopping

 srs-cyclicShiftHoppingSmallGranularity-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 40-5-2b: SRS cyclic shift hopping combined with legacy group/sequence hopping

 srs-cyclicShiftCombinedGroupSequence-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 40-5-2c: Cyclic shift hopping within a subset

 cyclicShiftHoppingWithinSubset-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 40-5-3: SRS cyclic shift hopping combined with SRS comb offset hopping

 srs-cyclicShiftCombinedCombOffset-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 40-6-1-1: 2 PTRS ports for single-DCI based STx2P SDM scheme for PUSCH—codebook

 pusch-CB-2PTRS-SingleDCI-STx2P-SDM-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 40-6-1a-1: 2 PTRS ports for single-DCI based STx2P SDM scheme for PUSCH—noncodebook

 pusch-NonCB-2PTRS-SingleDCI-STx2P-SDM-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 40-6-1b: Association between CSI-RS and SRS for noncodebook single-DCI based STx2P SDM scheme for PUSCH

 pusch-NonCB-SingleDCI-STx2P-SDM-CSI-RS-SRS-r18 SEQUENCE {

 maxNumberPeriodicSRS-Resource-PerBWP-r18 INTEGER (1..8),

 maxNumberAperiodicSRS-Resource-PerBWP-r18 INTEGER (1..8),

 maxNumberSemiPersistentSRS-ResourcePerBWP-r18 INTEGER (0..8),

 valueY-SRS-ResourceAssociate-r18 INTEGER (1..16),

 valueX-CSI-RS-ResourceAssociate-r18 INTEGER (1..2)

 } OPTIONAL,

 -- R1 40-6-1-2: New DMRS port entry for single-DCI based SDM scheme

 dmrs-PortEntrySingleDCI-SDM-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 40-6-2-1: 2 PTRS ports for single-DCI based STx2P SFN scheme for PUSCH—codebook

 pusch-CB-2PTRS-SingleDCI-STx2P-SFN-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 40-6-2a-1: 2 PTRS ports for single-DCI based STx2P SFN scheme for PUSCH—codebook

 pusch-NonCB-2PTRS-SingleDCI-STx2P-SFN-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 40-6-2b: Association between CSI-RS and SRS for noncodebook single-DCI based STx2P SFN scheme for PUSCH

 pusch-NonCB-SingleDCI-STx2P-SFN-CSI-RS-SRS-r18 SEQUENCE {

 maxNumberPeriodicSRS-Resource-PerBWP-r18 INTEGER (1..8),

 maxNumberAperiodicSRS-Resource-PerBWP-r18 INTEGER (1..8),

 maxNumberSemiPersistentSRS-ResourcePerBWP-r18 INTEGER (0..8),

 valueY-SRS-ResourceAssociate-r18 INTEGER (1..16),

 valueX-CSI-RS-ResourceAssociate-r18 INTEGER (1..2)

 } OPTIONAL,

 -- R1 40-6-3c: Codebook multi-DCI based STx2P PUSCH+PUSCH –Fully overlapping PUSCHs in time and fully overlapping in frequency

 twoPUSCH-CB-MultiDCI-STx2P-FullTimeFullFreqOverlap-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 40-6-3d: Codebook multi-DCI based STx2P PUSCH+PUSCH – Fully overlapping PUSCHs in time and partially overlapping in frequency

 twoPUSCH-CB-MultiDCI-STx2P-FullTimePartialFreqOverlap-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 40-6-3e: Codebook multi-DCI based STx2P PUSCH+PUSCH – Partially overlapping PUSCHs in time and fully overlapping in frequency

 twoPUSCH-CB-MultiDCI-STx2P-PartialTimeFullFreqOverlap-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 40-6-3f: Codebook multi-DCI based STx2P PUSCH+PUSCH – Partially overlapping PUSCHs in time, partially overlapping in frequency

 twoPUSCH-CB-MultiDCI-STx2P-PartialTimePartialFreqOverlap-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 40-6-3g: Codebook multi-DCI based STx2P PUSCH+PUSCH – Partially overlapping PUSCHs in time, partially or non-overlapping

 -- in frequency

 twoPUSCH-CB-MultiDCI-STx2P-PartialTimeNonFreqOverlap-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 40-6-4a: Dynamic indication of repetition number for SFN scheme for PUCCH

 pucch-RepetitionDynamicIndicationSFN-r18 ENUMERATED {supported} OPTIONAL

 ]]

}

DummyG ::= 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}

}

BeamManagementSSB-CSI-RS ::= SEQUENCE {

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

 maxNumberCSI-RS-Resource ENUMERATED {n0, n4, n8, n16, n32, n64},

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

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

 maxNumberAperiodicCSI-RS-Resource ENUMERATED {n0, n1, n4, n8, n16, n32, n64}

}

DummyH ::= SEQUENCE {

 burstLength INTEGER (1..2),

 maxSimultaneousResourceSetsPerCC INTEGER (1..8),

 maxConfiguredResourceSetsPerCC INTEGER (1..64),

 maxConfiguredResourceSetsAllCC INTEGER (1..128)

}

CSI-RS-ForTracking ::= SEQUENCE {

 maxBurstLength INTEGER (1..2),

 maxSimultaneousResourceSetsPerCC INTEGER (1..8),

 maxConfiguredResourceSetsPerCC INTEGER (1..64),

 maxConfiguredResourceSetsAllCC INTEGER (1..256)

}

CSI-RS-IM-ReceptionForFeedback ::= SEQUENCE {

 maxConfigNumberNZP-CSI-RS-PerCC INTEGER (1..64),

 maxConfigNumberPortsAcrossNZP-CSI-RS-PerCC INTEGER (2..256),

 maxConfigNumberCSI-IM-PerCC ENUMERATED {n1, n2, n4, n8, n16, n32},

 maxNumberSimultaneousNZP-CSI-RS-PerCC INTEGER (1..64),

 totalNumberPortsSimultaneousNZP-CSI-RS-PerCC INTEGER (2..256)

}

CSI-RS-ProcFrameworkForSRS ::= SEQUENCE {

 maxNumberPeriodicSRS-AssocCSI-RS-PerBWP INTEGER (1..4),

 maxNumberAperiodicSRS-AssocCSI-RS-PerBWP INTEGER (1..4),

 maxNumberSP-SRS-AssocCSI-RS-PerBWP INTEGER (0..4),

 simultaneousSRS-AssocCSI-RS-PerCC INTEGER (1..8)

}

CSI-ReportFramework ::= SEQUENCE {

 maxNumberPeriodicCSI-PerBWP-ForCSI-Report INTEGER (1..4),

 maxNumberAperiodicCSI-PerBWP-ForCSI-Report INTEGER (1..4),

 maxNumberSemiPersistentCSI-PerBWP-ForCSI-Report INTEGER (0..4),

 maxNumberPeriodicCSI-PerBWP-ForBeamReport INTEGER (1..4),

 maxNumberAperiodicCSI-PerBWP-ForBeamReport INTEGER (1..4),

 maxNumberAperiodicCSI-triggeringStatePerCC ENUMERATED {n3, n7, n15, n31, n63, n128},

 maxNumberSemiPersistentCSI-PerBWP-ForBeamReport INTEGER (0..4),

 simultaneousCSI-ReportsPerCC INTEGER (1..8)

}

CSI-ReportFrameworkExt-r16 ::= SEQUENCE {

 maxNumberAperiodicCSI-PerBWP-ForCSI-ReportExt-r16 INTEGER (5..8)

}

PTRS-DensityRecommendationDL ::= SEQUENCE {

 frequencyDensity1 INTEGER (1..276),

 frequencyDensity2 INTEGER (1..276),

 timeDensity1 INTEGER (0..29),

 timeDensity2 INTEGER (0..29),

 timeDensity3 INTEGER (0..29)

}

PTRS-DensityRecommendationUL ::= SEQUENCE {

 frequencyDensity1 INTEGER (1..276),

 frequencyDensity2 INTEGER (1..276),

 timeDensity1 INTEGER (0..29),

 timeDensity2 INTEGER (0..29),

 timeDensity3 INTEGER (0..29),

 sampleDensity1 INTEGER (1..276),

 sampleDensity2 INTEGER (1..276),

 sampleDensity3 INTEGER (1..276),

 sampleDensity4 INTEGER (1..276),

 sampleDensity5 INTEGER (1..276)

}

SpatialRelations ::= SEQUENCE {

 maxNumberConfiguredSpatialRelations ENUMERATED {n4, n8, n16, n32, n64, n96},

 maxNumberActiveSpatialRelations ENUMERATED {n1, n2, n4, n8, n14},

 additionalActiveSpatialRelationPUCCH ENUMERATED {supported} OPTIONAL,

 maxNumberDL-RS-QCL-TypeD ENUMERATED {n1, n2, n4, n8, n14}

}

DummyI ::= SEQUENCE {

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

 txSwitchImpactToRx ENUMERATED {true} OPTIONAL

}

CSI-MultiTRP-SupportedCombinations-r17 ::= SEQUENCE {

 maxNumTx-Ports-r17 ENUMERATED {n2, n4, n8, n12, n16, n24, n32},

 maxTotalNumCMR-r17 INTEGER (2..64),

 maxTotalNumTx-PortsNZP-CSI-RS-r17 INTEGER (2..256)

}

-- TAG-MIMO-PARAMETERSPERBAND-STOP

-- ASN1STOP

|  |
| --- |
| *MIMO-ParametersPerBand* field descriptions |
| ***codebookParametersPerBand***For a given frequency band, this field this field indicates the alternative list of *SupportedCSI-RS-Resource* supported for each codebook type. The supported CSI-RS resources indicated by this field are referred by *codebookParametersperBC* in *CA-ParametersNR* to indicate the supported CSI-RS resource per band combination. |
| ***csi-RS-IM-ReceptionForFeedback/ csi-RS-ProcFrameworkForSRS/ csi-ReportFramework***CSI related capabilities which the UE supports on each of the carriers operated on this band. If the network configures the UE with serving cells on both FR1 and FR2 bands these values may be further limited by the corresponding fields in *fr1-fr2-Add-UE-NR-Capabilities*. |
| ***supportNewDMRS-Port***Presence of this field set to *supported1*, *supported2* or *supported3* indicates that the UE supports the new DMRS port entry {0,2,3}. |

#### – *ModulationOrder*

The IE *ModulationOrder* is used to convey the maximum supported modulation order.

*ModulationOrder* information element

-- ASN1START

-- TAG-MODULATIONORDER-START

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

-- TAG-MODULATIONORDER-STOP

-- ASN1STOP

#### – *MRDC-Parameters*

The IE *MRDC-Parameters* contains the band combination parameters specific to MR-DC for a given MR-DC band combination.

*MRDC-Parameters* information element

-- ASN1START

-- TAG-MRDC-PARAMETERS-START

MRDC-Parameters ::= SEQUENCE {

 singleUL-Transmission ENUMERATED {supported} OPTIONAL,

 dynamicPowerSharingENDC ENUMERATED {supported} OPTIONAL,

 tdm-Pattern ENUMERATED {supported} OPTIONAL,

 ul-SharingEUTRA-NR ENUMERATED {tdm, fdm, both} OPTIONAL,

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

 simultaneousRxTxInterBandENDC ENUMERATED {supported} OPTIONAL,

 asyncIntraBandENDC ENUMERATED {supported} OPTIONAL,

 ...,

 [[

 dualPA-Architecture ENUMERATED {supported} OPTIONAL,

 intraBandENDC-Support ENUMERATED {non-contiguous, both} OPTIONAL,

 ul-TimingAlignmentEUTRA-NR ENUMERATED {required} OPTIONAL

 ]]

}

MRDC-Parameters-v1580 ::= SEQUENCE {

 dynamicPowerSharingNEDC ENUMERATED {supported} OPTIONAL

}

MRDC-Parameters-v1590 ::= SEQUENCE {

 interBandContiguousMRDC ENUMERATED {supported} OPTIONAL

}

MRDC-Parameters-v15g0 ::= SEQUENCE {

 simultaneousRxTxInterBandENDCPerBandPair SimultaneousRxTxPerBandPair OPTIONAL

}

MRDC-Parameters-v15n0 ::= SEQUENCE {

 intraBandENDC-Support-UL ENUMERATED {non-contiguous, both} OPTIONAL

}

MRDC-Parameters-v1620 ::= SEQUENCE {

 maxUplinkDutyCycle-interBandENDC-TDD-PC2-r16 SEQUENCE{

 eutra-TDD-Config0-r16 ENUMERATED {n20, n40, n50, n60, n70, n80, n90, n100} OPTIONAL,

 eutra-TDD-Config1-r16 ENUMERATED {n20, n40, n50, n60, n70, n80, n90, n100} OPTIONAL,

 eutra-TDD-Config2-r16 ENUMERATED {n20, n40, n50, n60, n70, n80, n90, n100} OPTIONAL,

 eutra-TDD-Config3-r16 ENUMERATED {n20, n40, n50, n60, n70, n80, n90, n100} OPTIONAL,

 eutra-TDD-Config4-r16 ENUMERATED {n20, n40, n50, n60, n70, n80, n90, n100} OPTIONAL,

 eutra-TDD-Config5-r16 ENUMERATED {n20, n40, n50, n60, n70, n80, n90, n100} OPTIONAL,

 eutra-TDD-Config6-r16 ENUMERATED {n20, n40, n50, n60, n70, n80, n90, n100} OPTIONAL

 } OPTIONAL,

 -- R1 18-2 Single UL TX operation for TDD PCell in EN-DC

 tdm-restrictionTDD-endc-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 18-2a Single UL TX operation for FDD PCell in EN-DC

 tdm-restrictionFDD-endc-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 18-2b Support of HARQ-offset for SUO case1 in EN-DC with LTE TDD PCell for type 1 UE

 singleUL-HARQ-offsetTDD-PCell-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 18-3 Dual Tx transmission for EN-DC with FDD PCell(TDM pattern for dual Tx UE)

 tdm-restrictionDualTX-FDD-endc-r16 ENUMERATED {supported} OPTIONAL

}

MRDC-Parameters-v1630 ::= SEQUENCE {

 -- R4 2-20 Maximum uplink duty cycle for FDD+TDD EN-DC power class 2

 maxUplinkDutyCycle-interBandENDC-FDD-TDD-PC2-r16 SEQUENCE {

 maxUplinkDutyCycle-FDD-TDD-EN-DC1-r16 ENUMERATED {n30, n40, n50, n60, n70, n80, n90, n100} OPTIONAL,

 maxUplinkDutyCycle-FDD-TDD-EN-DC2-r16 ENUMERATED {n30, n40, n50, n60, n70, n80, n90, n100} OPTIONAL

 } OPTIONAL,

 -- R4 2-19 FDD-FDD or TDD-TDD inter-band MR-DC with overlapping or partially overlapping DL spectrum

 interBandMRDC-WithOverlapDL-Bands-r16 ENUMERATED {supported} OPTIONAL

}

MRDC-Parameters-v1700 ::= SEQUENCE {

 condPSCellAdditionENDC-r17 ENUMERATED {supported} OPTIONAL,

 scg-ActivationDeactivationENDC-r17 ENUMERATED {supported} OPTIONAL,

 scg-ActivationDeactivationResumeENDC-r17 ENUMERATED {supported} OPTIONAL

}

MRDC-Parameters-v1770 ::= SEQUENCE {

 -- R4 26-1: Higher Power Limit CA DC

 higherPowerLimitMRDC-r17 ENUMERATED {supported} OPTIONAL

}

-- TAG-MRDC-PARAMETERS-STOP

-- ASN1STOP

#### – *NCR-Parameters*

The IE *NCR-Parameters* is used to indicate the UE capabilities supported by NCR-MT.

*NCR-Parameters* information element

-- ASN1START

-- TAG-NCR-PARAMETERS-START

NCR-Parameters-r18::= SEQUENCE {

 inactiveStateNCR-r18 ENUMERATED {supported} OPTIONAL,

 supportedNumberOfDRBs-NCR-r18 ENUMERATED {n1,n16} OPTIONAL,

 nonDRB-NCR-r18 ENUMERATED {supported} OPTIONAL

}

-- TAG-NCR-PARAMETERS-STOP

-- ASN1STOP

#### – *NRDC-Parameters*

The IE *NRDC-Parameters* contains parameters specific to NR-DC, i.e., which are not applicable to NR SA.

*NRDC-Parameters* information element

-- ASN1START

-- TAG-NRDC-PARAMETERS-START

NRDC-Parameters ::= SEQUENCE {

 measAndMobParametersNRDC MeasAndMobParametersMRDC OPTIONAL,

 generalParametersNRDC GeneralParametersMRDC-XDD-Diff OPTIONAL,

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

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

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

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

 dummy2 OCTET STRING OPTIONAL,

 dummy SEQUENCE {} OPTIONAL

}

NRDC-Parameters-v1570 ::= SEQUENCE {

 sfn-SyncNRDC ENUMERATED {supported} OPTIONAL

}

NRDC-Parameters-v15c0 ::= SEQUENCE {

 pdcp-DuplicationSplitSRB ENUMERATED {supported} OPTIONAL,

 pdcp-DuplicationSplitDRB ENUMERATED {supported} OPTIONAL

}

NRDC-Parameters-v1610 ::= SEQUENCE {

 measAndMobParametersNRDC-v1610 MeasAndMobParametersMRDC-v1610 OPTIONAL

}

NRDC-Parameters-v1700 ::= SEQUENCE {

 f1c-OverNR-RRC-r17 ENUMERATED {supported} OPTIONAL,

 measAndMobParametersNRDC-v1700 MeasAndMobParametersMRDC-v1700

}

-- TAG-NRDC-PARAMETERS-STOP

-- ASN1STOP

#### – *NTN-Parameters*

The IE *NTN-Parameters* is used to convey the subset of UE Radio Access Capability Parameters that apply to NTN access when there is a difference compared to TN access.

*NTN-Parameters* information element

-- ASN1START

-- TAG-NTN-PARAMETERS-START

NTN-Parameters-r17 ::= SEQUENCE {

 inactiveStateNTN-r17 ENUMERATED {supported} OPTIONAL,

 ra-SDT-NTN-r17 ENUMERATED {supported} OPTIONAL,

 srb-SDT-NTN-r17 ENUMERATED {supported} OPTIONAL,

 measAndMobParametersNTN-r17 MeasAndMobParameters OPTIONAL,

 mac-ParametersNTN-r17 MAC-Parameters OPTIONAL,

 phy-ParametersNTN-r17 Phy-Parameters OPTIONAL,

 fdd-Add-UE-NR-CapabilitiesNTN-r17 UE-NR-CapabilityAddXDD-Mode OPTIONAL,

 fr1-Add-UE-NR-CapabilitiesNTN-r17 UE-NR-CapabilityAddFRX-Mode OPTIONAL,

 ue-BasedPerfMeas-ParametersNTN-r17 UE-BasedPerfMeas-Parameters-r16 OPTIONAL,

 son-ParametersNTN-r17 SON-Parameters-r16 OPTIONAL

}

-- TAG-NTN-PARAMETERS-STOP

-- ASN1STOP

|  |
| --- |
| *NTN-Parameters* field descriptions |
| ***fdd-Add-UE-NR-CapabilitiesNTN***NTN related capabilities which the UE supports in NTN differently than in TN. If absent, *fdd-Add-UE-NR-Capabilities* applies to NTN. |
| ***fr1-Add-UE-NR-CapabilitiesNTN***NTN related capabilities which the UE supports in NTN differently than in TN. If absent, *fr1-Add-UE-NR-Capabilities* applies to NTN. |
| ***mac-ParametersNTN***NTN related capabilities which the UE supports in NTN differently than in TN. If absent, *mac-Parameters* applies to NTN. |
| ***measAndMobParametersNTN***NTN related capabilities which the UE supports in NTN differently than in TN. If absent, *measAndMobParameters* applies to NTN. |
| ***phy-ParametersNTN***NTN related capabilities which the UE supports in NTN differently than in TN. If absent, *phy-Parameters* applies to NTN. |
| ***son-ParametersNTN***NTN related capabilities which the UE supports in NTN differently than in TN. If absent, *son-Parameters-r16* applies to NTN. |
| ***ue-BasedPerfMeas-ParametersNTN***NTN related capabilities which the UE supports in NTN differently than in TN. If absent, *ue-BasedPerfMeas-Parameters-r16* applies to NTN. |

#### – *OLPC-SRS-Pos*

The IE *OLPC-SRS-Pos* is used to convey OLPC SRS positioning related parameters specific for a certain band.

*OLPC-SRS-Pos* information element

-- ASN1START

-- TAG-OLPC-SRS-POS-START

OLPC-SRS-Pos-r16 ::= SEQUENCE {

 olpc-SRS-PosBasedOnPRS-Serving-r16 ENUMERATED {supported} OPTIONAL,

 olpc-SRS-PosBasedOnSSB-Neigh-r16 ENUMERATED {supported} OPTIONAL,

 olpc-SRS-PosBasedOnPRS-Neigh-r16 ENUMERATED {supported} OPTIONAL,

 maxNumberPathLossEstimatePerServing-r16 ENUMERATED {n1, n4, n8, n16} OPTIONAL

}

--TAG-OLPC-SRS-POS-STOP

-- ASN1STOP

#### – *PDCP-Parameters*

The IE *PDCP-Parameters* is used to convey capabilities related to PDCP.

*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,

 pdcp-DuplicationSRB ENUMERATED {supported} OPTIONAL,

 pdcp-DuplicationMCG-OrSCG-DRB ENUMERATED {supported} OPTIONAL,

 ...,

 [[

 drb-IAB-r16 ENUMERATED {supported} OPTIONAL,

 non-DRB-IAB-r16 ENUMERATED {supported} OPTIONAL,

 extendedDiscardTimer-r16 ENUMERATED {supported} OPTIONAL,

 continueEHC-Context-r16 ENUMERATED {supported} OPTIONAL,

 ehc-r16 ENUMERATED {supported} OPTIONAL,

 maxNumberEHC-Contexts-r16 ENUMERATED {cs2, cs4, cs8, cs16, cs32, cs64, cs128, cs256, cs512,

 cs1024, cs2048, cs4096, cs8192, cs16384, cs32768, cs65536} OPTIONAL,

 jointEHC-ROHC-Config-r16 ENUMERATED {supported} OPTIONAL,

 pdcp-DuplicationMoreThanTwoRLC-r16 ENUMERATED {supported} OPTIONAL

 ]],

 [[

 longSN-RedCap-r17 ENUMERATED {supported} OPTIONAL,

 udc-r17 SEQUENCE {

 standardDictionary-r17 ENUMERATED {supported} OPTIONAL,

 operatorDictionary-r17 SEQUENCE {

 versionOfDictionary-r17 INTEGER (0..15),

 associatedPLMN-ID-r17 PLMN-Identity

 } OPTIONAL,

 continueUDC-r17 ENUMERATED {supported} OPTIONAL,

 supportOfBufferSize-r17 ENUMERATED {kbyte4, kbyte8} OPTIONAL

 } OPTIONAL

 ]],

 [[

 longSN-NCR-r18 ENUMERATED {supported} OPTIONAL

 ]]

}

-- TAG-PDCP-PARAMETERS-STOP

-- ASN1STOP

#### – *PDCP-ParametersMRDC*

The IE *PDCP-ParametersMRDC* is used to convey PDCP related capabilities for MR-DC.

*PDCP-ParametersMRDC* information element

-- ASN1START

-- TAG-PDCP-PARAMETERSMRDC-START

PDCP-ParametersMRDC ::= SEQUENCE {

 pdcp-DuplicationSplitSRB ENUMERATED {supported} OPTIONAL,

 pdcp-DuplicationSplitDRB ENUMERATED {supported} OPTIONAL

}

PDCP-ParametersMRDC-v1610 ::= SEQUENCE {

 scg-DRB-NR-IAB-r16 ENUMERATED {supported} OPTIONAL

}

-- TAG-PDCP-PARAMETERSMRDC-STOP

-- ASN1STOP

#### – *Phy-Parameters*

The IE *Phy-Parameters* is used to convey the physical layer capabilities.

*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-Parameters-v16a0 ::= SEQUENCE {

 phy-ParametersCommon-v16a0 Phy-ParametersCommon-v16a0 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,

 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,

 interSlotFreqHopping-PUSCH ENUMERATED {supported} OPTIONAL,

 type1-PUSCH-RepetitionMultiSlots 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-DL ENUMERATED {supported} OPTIONAL,

 cbg-TransIndication-UL ENUMERATED {supported} 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,

 bwp-SwitchingDelay ENUMERATED {type1, type2} OPTIONAL,

 ...,

 [[

 dummy ENUMERATED {supported} OPTIONAL

 ]],

 [[

 maxNumberSearchSpaces ENUMERATED {n10} OPTIONAL,

 rateMatchingCtrlResrcSetDynamic ENUMERATED {supported} OPTIONAL,

 maxLayersMIMO-Indication ENUMERATED {supported} OPTIONAL

 ]],

 [[

 spCellPlacement CarrierAggregationVariant OPTIONAL

 ]],

 [[

 -- R1 9-1: Basic channel structure and procedure of 2-step RACH

 twoStepRACH-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 11-1: Monitoring DCI format 1\_2 and DCI format 0\_2

 dci-Format1-2And0-2-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 11-1a: Monitoring both DCI format 0\_1/1\_1 and DCI format 0\_2/1\_2 in the same search space

 monitoringDCI-SameSearchSpace-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 11-10: Type 2 configured grant release by DCI format 0\_1

 type2-CG-ReleaseDCI-0-1-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 11-11: Type 2 configured grant release by DCI format 0\_2

 type2-CG-ReleaseDCI-0-2-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 12-3: SPS release by DCI format 1\_1

 sps-ReleaseDCI-1-1-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 12-3a: SPS release by DCI format 1\_2

 sps-ReleaseDCI-1-2-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 14-8: CSI trigger states containing non-active BWP

 csi-TriggerStateNon-ActiveBWP-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 20-2: Support up to 4 SMTCs configured for an IAB node MT per frequency location, including IAB-specific SMTC window periodicities

 separateSMTC-InterIAB-Support-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 20-3: Support RACH configuration separately from the RACH configuration for UE access, including new IAB-specific offset and scaling factors

 separateRACH-IAB-Support-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 20-5a: Support semi-static configuration/indication of UL-Flexible-DL slot formats for IAB-MT resources

 ul-flexibleDL-SlotFormatSemiStatic-IAB-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 20-5b: Support dynamic indication of UL-Flexible-DL slot formats for IAB-MT resources

 ul-flexibleDL-SlotFormatDynamics-IAB-r16 ENUMERATED {supported} OPTIONAL,

 dft-S-OFDM-WaveformUL-IAB-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 20-6: Support DCI Format 2\_5 based indication of soft resource availability to an IAB node

 dci-25-AI-RNTI-Support-IAB-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 20-7: Support T\_delta reception.

 t-DeltaReceptionSupport-IAB-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 20-8: Support of Desired guard symbol reporting and provided guard symbok reception.

 guardSymbolReportReception-IAB-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 18-8 HARQ-ACK codebook type and spatial bundling per PUCCH group

 harqACK-CB-SpatialBundlingPUCCH-Group-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 19-2: Cross Slot Scheduling

 crossSlotScheduling-r16 SEQUENCE {

 non-SharedSpectrumChAccess-r16 ENUMERATED {supported} OPTIONAL,

 sharedSpectrumChAccess-r16 ENUMERATED {supported} OPTIONAL

 } OPTIONAL,

 maxNumberSRS-PosPathLossEstimateAllServingCells-r16 ENUMERATED {n1, n4, n8, n16} OPTIONAL,

 extendedCG-Periodicities-r16 ENUMERATED {supported} OPTIONAL,

 extendedSPS-Periodicities-r16 ENUMERATED {supported} OPTIONAL,

 codebookVariantsList-r16 CodebookVariantsList-r16 OPTIONAL,

 -- R1 11-6: PUSCH repetition Type A

 pusch-RepetitionTypeA-r16 SEQUENCE {

 sharedSpectrumChAccess-r16 ENUMERATED {supported} OPTIONAL,

 non-SharedSpectrumChAccess-r16 ENUMERATED {supported} OPTIONAL

 } OPTIONAL,

 -- R1 11-4b: DL priority indication in DCI with mixed DCI formats

 dci-DL-PriorityIndicator-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 12-1a: UL priority indication in DCI with mixed DCI formats

 dci-UL-PriorityIndicator-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 16-1e: Maximum number of configured pathloss reference RSs for PUSCH/PUCCH/SRS by RRC for MAC-CE based pathloss reference RS update

 maxNumberPathlossRS-Update-r16 ENUMERATED {n4, n8, n16, n32, n64} OPTIONAL,

 -- R1 18-9: Usage of the PDSCH starting time for HARQ-ACK type 2 codebook

 type2-HARQ-ACK-Codebook-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 16-1g-1: Resources for beam management, pathloss measurement, BFD, RLM and new beam identification across frequency ranges

 maxTotalResourcesForAcrossFreqRanges-r16 SEQUENCE {

 maxNumberResWithinSlotAcrossCC-AcrossFR-r16 ENUMERATED {n2, n4, n8, n12, n16, n32, n64, n128} OPTIONAL,

 maxNumberResAcrossCC-AcrossFR-r16 ENUMERATED {n2, n4, n8, n12, n16, n32, n40, n48, n64, n72, n80, n96, n128, n256}

 OPTIONAL

 } OPTIONAL,

 -- R1 16-2a-4: HARQ-ACK for multi-DCI based multi-TRP - separate

 harqACK-separateMultiDCI-MultiTRP-r16 SEQUENCE {

 maxNumberLongPUCCHs-r16 ENUMERATED {longAndLong, longAndShort, shortAndShort} OPTIONAL

 } OPTIONAL,

 -- R1 16-2a-4: HARQ-ACK for multi-DCI based multi-TRP - joint

 harqACK-jointMultiDCI-MultiTRP-r16 ENUMERATED {supported} OPTIONAL,

 -- R4 9-1: BWP switching on multiple CCs RRM requirements

 bwp-SwitchingMultiCCs-r16 CHOICE {

 type1-r16 ENUMERATED {us100, us200},

 type2-r16 ENUMERATED {us200, us400, us800, us1000}

 } OPTIONAL

 ]],

 [[

 targetSMTC-SCG-r16 ENUMERATED {supported} OPTIONAL,

 supportRepetitionZeroOffsetRV-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 11-12: in-order CBG-based re-transmission

 cbg-TransInOrderPUSCH-UL-r16 ENUMERATED {supported} OPTIONAL

 ]],

 [[

 -- R4 6-3: Dormant BWP switching on multiple CCs RRM requirements

 bwp-SwitchingMultiDormancyCCs-r16 CHOICE {

 type1-r16 ENUMERATED {us100, us200},

 type2-r16 ENUMERATED {us200, us400, us800, us1000}

 } OPTIONAL,

 -- R1 16-2a-8: Indicates that retransmission scheduled by a different CORESETPoolIndex for multi-DCI multi-TRP is not supported.

 supportRetx-Diff-CoresetPool-Multi-DCI-TRP-r16 ENUMERATED {notSupported} OPTIONAL,

 -- R1 22-10: Support of pdcch-MonitoringAnyOccasionsWithSpanGap in case of cross-carrier scheduling with different SCSs

 pdcch-MonitoringAnyOccasionsWithSpanGapCrossCarrierSch-r16 ENUMERATED {mode2, mode3} OPTIONAL

 ]],

 [[

 -- R1 16-1j-1: Support of 2 port CSI-RS for new beam identification

 newBeamIdentifications2PortCSI-RS-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 16-1j-2: Support of 2 port CSI-RS for pathloss estimation

 pathlossEstimation2PortCSI-RS-r16 ENUMERATED {supported} OPTIONAL

 ]],

 [[

 mux-HARQ-ACK-withoutPUCCH-onPUSCH-r16 ENUMERATED {supported} OPTIONAL

 ]],

 [[

 -- R1 31-1: Support of Desired Guard Symbol reporting and provided guard symbol reception.

 guardSymbolReportReception-IAB-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 31-2: support of restricted IAB-DU beam reception

 restricted-IAB-DU-BeamReception-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 31-3: support of recommended IAB-MT beam transmission for DL and UL beam

 recommended-IAB-MT-BeamTransmission-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 31-4: support of case 6 timing alignment indication reception

 case6-TimingAlignmentReception-IAB-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 31-5: support of case 7 timing offset indication reception and case 7 timing at parent-node indication reception

 case7-TimingAlignmentReception-IAB-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 31-6: support of desired DL Tx power adjustment reporting and DL Tx power adjustment reception

 dl-tx-PowerAdjustment-IAB-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 31-7: support of desired IAB-MT PSD range reporting

 desired-ul-tx-PowerAdjustment-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 31-8: support of monitoring DCI Format 2\_5 scrambled by AI-RNTI for indication of FDM soft resource availability to an IAB node

 fdm-SoftResourceAvailability-DynamicIndication-r17 ENUMERATED{supported} OPTIONAL,

 -- R1 31-10: Support of updated T\_delta range reception

 updated-T-DeltaRangeReception-r17 ENUMERATED{supported} OPTIONAL,

 -- R1 30-5: Support slot based dynamic PUCCH repetition indication for PUCCH formats 0/1/2/3/4

 slotBasedDynamicPUCCH-Rep-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 25-1: Support of HARQ-ACK deferral in case of TDD collision

 sps-HARQ-ACK-Deferral-r17 SEQUENCE {

 non-SharedSpectrumChAccess-r17 ENUMERATED {supported} OPTIONAL,

 sharedSpectrumChAccess-r17 ENUMERATED {supported} OPTIONAL

 } OPTIONAL,

 -- R1 23-1-1k Maximum number of configured CC lists (per UE)

 unifiedJointTCI-commonUpdate-r17 INTEGER (1..4) OPTIONAL,

 -- R1 23-2-1c PDCCH repetition with a single span of three contiguous OFDM symbols that is within the first four OFDM symbols in a slot

 mTRP-PDCCH-singleSpan-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 27-23: Support of more than one activated PRS processing windows across all active DL BWPs

 supportedActivatedPRS-ProcessingWindow-r17 ENUMERATED {n2, n3, n4} OPTIONAL,

 cg-TimeDomainAllocationExtension-r17 ENUMERATED {supported} OPTIONAL

 ]],

 [[

 -- R1 25-20: Propagation delay compensation based on Rel-15 TA procedure for TN and licensed

 ta-BasedPDC-TN-NonSharedSpectrumChAccess-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 31-11: Directional Collision Handling in DC operation

 directionalCollisionDC-IAB-r17 ENUMERATED {supported} OPTIONAL

 ]],

 [[

 dummy1 ENUMERATED {supported} OPTIONAL,

 dummy2 ENUMERATED {supported} OPTIONAL,

 dummy3 ENUMERATED {supported} OPTIONAL,

 dummy4 ENUMERATED {supported} OPTIONAL,

 srs-AdditionalRepetition-r17 ENUMERATED {supported} OPTIONAL,

 pusch-Repetition-CG-SDT-r17 ENUMERATED {supported} OPTIONAL

 ]],

 [[

 multiPDSCH-PerSlotType1-CB-Support-r17 ENUMERATED {supported} OPTIONAL

 ]],

 [[

 supportedCSI-RS-ReportSettingList-r18 SupportedCSI-RS-ReportSettingList-r18 OPTIONAL,

 -- R1 43-3: Aperiodic beam indication for access link

 ncr-AperiodicBeamInd-AccessLink-r18 SEQUENCE {

 scs-15kHz-r18 INTEGER (0..1) OPTIONAL,

 scs-30kHz-r18 INTEGER (0..1) OPTIONAL,

 scs-60kHz-r18 INTEGER (0..2) OPTIONAL,

 scs-120kHz-r18 INTEGER (0..2) OPTIONAL

 } OPTIONAL,

 -- R1 43-4: Semi-persistent beam indication for access link

 ncr-Semi-PersistentBeamInd-AccessLink-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 43-5: Simulatenous UL transmission of backhaul link and C-Link

 ncr-SimultaneousUL-BackhaulAndC-Link-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 43-6: Dedicated signalling for backhaul link beam indication

 ncr-BackhaulBeamInd-r18 ENUMERATED {nonUnifiedTCI, unifiedTCI, both} OPTIONAL,

 -- R1 43-8: Adaptive beam for NCR backhaul link/C-link

 ncr-AdaptiveBeamBackhaulAndC-Link-r18 ENUMERATED {nonUnifiedTCI, unifiedTCI, both} OPTIONAL,

 -- R1 49-4a: Nominal RBG size of Configuration 3 for FDRA type 0 for DCI format 1\_3

 nominalRBG-SizeOfConfig-3-FDRA-Type-0-DCI-1-3-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 49-4b: Nominal RBG size of Configuration 3 for FDRA type 0 for DCI format 0\_3

 nominalRBG-SizeOfConfig-3-FDRA-Type-0-DCI-0-3-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 49-4c: Configurable Type-1A fields for DCI format 0\_3/1\_3

 configurableType-1A-FieldsForDCI-0-3-And-1-3-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 49-4d: FDRA Type 1 granularity of 2, 4, 8, or 16 consecutive RBs based RIV for DCI format 1\_3/0\_3

 fdra-Type-1-Gty-2-4-8-16-RBs-RIV-DCI-1-3-And-0-3-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 51-3: Support 5 MHz channel bandwidth with 20 PRB CORESET0

 support-5MHz-ChannelBW-20PRB-CORESET0-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 55-1: Additional SR periodicities

 additionalSR-Periodicities-r18 SEQUENCE {

 scs-30kHz-r18 ENUMERATED {supported} OPTIONAL,

 scs-120kHz-r18 ENUMERATED {supported} OPTIONAL

 } OPTIONAL,

 -- R1 55-5: Enable MAC CE based pathloss RS updates for Type 1 CG-PUSCH

 pathlossRS-UpdateForType1CG-PUSCH-r18 ENUMERATED {supported} OPTIONAL

 ]]

}

Phy-ParametersCommon-v16a0 ::= SEQUENCE {

 srs-PeriodicityAndOffsetExt-r16 ENUMERATED {supported} OPTIONAL

}

Phy-ParametersXDD-Diff ::= SEQUENCE {

 dynamicSFI ENUMERATED {supported} OPTIONAL,

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

 twoDifferentTPC-Loop-PUSCH ENUMERATED {supported} OPTIONAL,

 twoDifferentTPC-Loop-PUCCH ENUMERATED {supported} OPTIONAL,

 ...,

 [[

 dl-SchedulingOffset-PDSCH-TypeA ENUMERATED {supported} OPTIONAL,

 dl-SchedulingOffset-PDSCH-TypeB ENUMERATED {supported} OPTIONAL,

 ul-SchedulingOffset ENUMERATED {supported} OPTIONAL

 ]]

}

Phy-ParametersFRX-Diff ::= SEQUENCE {

 dynamicSFI ENUMERATED {supported} OPTIONAL,

 dummy1 BIT STRING (SIZE (2)) OPTIONAL,

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

 dummy2 BIT STRING (SIZE (2)) OPTIONAL,

 dummy3 BIT STRING (SIZE (2)) OPTIONAL,

 supportedDMRS-TypeDL ENUMERATED {type1, type1And2} OPTIONAL,

 supportedDMRS-TypeUL ENUMERATED {type1, type1And2} OPTIONAL,

 semiOpenLoopCSI ENUMERATED {supported} OPTIONAL,

 csi-ReportWithoutPMI 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,

 pucch-F0-2WithoutFH ENUMERATED {notSupported} OPTIONAL,

 pucch-F1-3-4WithoutFH ENUMERATED {notSupported} OPTIONAL,

 mux-SR-HARQ-ACK-CSI-PUCCH-MultiPerSlot 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 INTEGER (4..16) 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,

 almostContiguousCP-OFDM-UL ENUMERATED {supported} OPTIONAL,

 sp-CSI-RS ENUMERATED {supported} OPTIONAL,

 sp-CSI-IM ENUMERATED {supported} OPTIONAL,

 tdd-MultiDL-UL-SwitchPerSlot ENUMERATED {supported} OPTIONAL,

 multipleCORESET ENUMERATED {supported} OPTIONAL,

 ...,

 [[

 csi-RS-IM-ReceptionForFeedback CSI-RS-IM-ReceptionForFeedback OPTIONAL,

 csi-RS-ProcFrameworkForSRS CSI-RS-ProcFrameworkForSRS OPTIONAL,

 csi-ReportFramework CSI-ReportFramework OPTIONAL,

 mux-SR-HARQ-ACK-CSI-PUCCH-OncePerSlot SEQUENCE {

 sameSymbol ENUMERATED {supported} OPTIONAL,

 diffSymbol ENUMERATED {supported} OPTIONAL

 } OPTIONAL,

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

 mux-MultipleGroupCtrlCH-Overlap ENUMERATED {supported} OPTIONAL,

 dl-SchedulingOffset-PDSCH-TypeA ENUMERATED {supported} OPTIONAL,

 dl-SchedulingOffset-PDSCH-TypeB ENUMERATED {supported} OPTIONAL,

 ul-SchedulingOffset ENUMERATED {supported} OPTIONAL,

 dl-64QAM-MCS-TableAlt ENUMERATED {supported} OPTIONAL,

 ul-64QAM-MCS-TableAlt ENUMERATED {supported} OPTIONAL,

 cqi-TableAlt ENUMERATED {supported} OPTIONAL,

 oneFL-DMRS-TwoAdditionalDMRS-UL ENUMERATED {supported} OPTIONAL,

 twoFL-DMRS-TwoAdditionalDMRS-UL ENUMERATED {supported} OPTIONAL,

 oneFL-DMRS-ThreeAdditionalDMRS-UL ENUMERATED {supported} OPTIONAL

 ]],

 [[

 pdcch-BlindDetectionNRDC SEQUENCE {

 pdcch-BlindDetectionMCG-UE INTEGER (1..15),

 pdcch-BlindDetectionSCG-UE INTEGER (1..15)

 } OPTIONAL,

 mux-HARQ-ACK-PUSCH-DiffSymbol ENUMERATED {supported} OPTIONAL

 ]],

 [[

 -- R1 11-1b: Type 1 HARQ-ACK codebook support for relative TDRA for DL

 type1-HARQ-ACK-Codebook-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 11-8: Enhanced UL power control scheme

 enhancedPowerControl-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 16-1b-1: TCI state activation across multiple CCs

 simultaneousTCI-ActMultipleCC-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 16-1b-2: Spatial relation update across multiple CCs

 simultaneousSpatialRelationMultipleCC-r16 ENUMERATED {supported} OPTIONAL,

 cli-RSSI-FDM-DL-r16 ENUMERATED {supported} OPTIONAL,

 cli-SRS-RSRP-FDM-DL-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 19-3: Maximum MIMO Layer Adaptation

 maxLayersMIMO-Adaptation-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 12-5: Configuration of aggregation factor per SPS configuration

 aggregationFactorSPS-DL-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 16-1g: Resources for beam management, pathloss measurement, BFD, RLM and new beam identification

 maxTotalResourcesForOneFreqRange-r16 SEQUENCE {

 maxNumberResWithinSlotAcrossCC-OneFR-r16 ENUMERATED {n2, n4, n8, n12, n16, n32, n64, n128} OPTIONAL,

 maxNumberResAcrossCC-OneFR-r16 ENUMERATED {n2, n4, n8, n12, n16, n32, n40, n48, n64, n72, n80, n96, n128, n256}

 OPTIONAL

 } OPTIONAL,

 -- R1 16-7: Extension of the maximum number of configured aperiodic CSI report settings

 csi-ReportFrameworkExt-r16 CSI-ReportFrameworkExt-r16 OPTIONAL

 ]],

 [[

 twoTCI-Act-servingCellInCC-List-r16 ENUMERATED {supported} OPTIONAL

 ]],

 [[

 -- R1 22-11: Support of 'cri-RI-CQI' report without non-PMI-PortIndication

 cri-RI-CQI-WithoutNon-PMI-PortInd-r16 ENUMERATED {supported} OPTIONAL

 ]],

 [[

 -- R1 25-11: 4-bits subband CQI for TN and licensed

 cqi-4-BitsSubbandTN-NonSharedSpectrumChAccess-r17 ENUMERATED {supported} OPTIONAL

 ]],

 [[

 multipleCORESET-RedCap-r17 ENUMERATED {supported} OPTIONAL

 ]]

}

Phy-ParametersFR1 ::= SEQUENCE {

 pdcch-MonitoringSingleOccasion ENUMERATED {supported} OPTIONAL,

 scs-60kHz ENUMERATED {supported} OPTIONAL,

 pdsch-256QAM-FR1 ENUMERATED {supported} OPTIONAL,

 pdsch-RE-MappingFR1-PerSymbol ENUMERATED {n10, n20} OPTIONAL,

 ...,

 [[

 pdsch-RE-MappingFR1-PerSlot ENUMERATED {n16, n32, n48, n64, n80, n96, n112, n128,

 n144, n160, n176, n192, n208, n224, n240, n256} OPTIONAL

 ]],

 [[

 -- R1 22-12: PDCCH monitoring with a single span of three contiguous OFDM symbols that is within the first four OFDM symbols in a

 -- slot

 pdcch-MonitoringSingleSpanFirst4Sym-r16 ENUMERATED {supported} OPTIONAL

 ]],

 [[

 -- similar to NTN R1 26-10: K1 range extension defined for ATG as well

 k1-RangeExtensionATG-r18 ENUMERATED {supported} OPTIONAL,

 -- similar to NTN R1 26-5: Increasing the number of HARQ processes defined for ATG as well

 maxHARQ-ProcessNumberATG-r18 ENUMERATED {u16d32, u32d16, u32d32} OPTIONAL,

 -- similar to NTN R1 26-1: Uplink Time and Frequency pre-compensation and timing relationship enhancements defined for ATG as well

 uplinkPreCompensationATG-r18 ENUMERATED {supported} OPTIONAL

 ]]

}

Phy-ParametersFR2 ::= SEQUENCE {

 dummy ENUMERATED {supported} OPTIONAL,

 pdsch-RE-MappingFR2-PerSymbol ENUMERATED {n6, n20} OPTIONAL,

 ...,

 [[

 pCell-FR2 ENUMERATED {supported} OPTIONAL,

 pdsch-RE-MappingFR2-PerSlot ENUMERATED {n16, n32, n48, n64, n80, n96, n112, n128,

 n144, n160, n176, n192, n208, n224, n240, n256} OPTIONAL

 ]],

 [[

 -- R1 16-1c: Support of default spatial relation and pathloss reference RS for dedicated-PUCCH/SRS and PUSCH

 defaultSpatialRelationPathlossRS-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 16-1d: Support of spatial relation update for AP-SRS via MAC CE

 spatialRelationUpdateAP-SRS-r16 ENUMERATED {supported} OPTIONAL,

 maxNumberSRS-PosSpatialRelationsAllServingCells-r16 ENUMERATED {n0, n1, n2, n4, n8, n16} OPTIONAL

 ]]

}

-- TAG-PHY-PARAMETERS-STOP

-- ASN1STOP

|  |
| --- |
| *Phy-ParametersFRX-Diff* field descriptions |
| ***csi-RS-IM-ReceptionForFeedback/ csi-RS-ProcFrameworkForSRS/ csi-ReportFramework***These fields are optionally present in *fr1-fr2-Add-UE-NR-Capabilities* in *UE-NR-Capability*. They shall not be set in any other instance of the IE *Phy-ParametersFRX-Diff*. If the network configures the UE with serving cells on both FR1 and FR2 bands, these parameters, if present, limit the corresponding parameters in *MIMO-ParametersPerBand*. |

#### – *Phy-ParametersMRDC*

The IE *Phy-ParametersMRDC* is used to convey physical layer capabilities for MR-DC.

*Phy-ParametersMRDC* information element

-- ASN1START

-- TAG-PHY-PARAMETERSMRDC-START

Phy-ParametersMRDC ::= SEQUENCE {

 naics-Capability-List SEQUENCE (SIZE (1..maxNrofNAICS-Entries)) OF NAICS-Capability-Entry OPTIONAL,

 ...,

 [[

 spCellPlacement CarrierAggregationVariant OPTIONAL

 ]],

 [[

 -- R1 18-3b: Semi-statically configured LTE UL transmissions in all UL subframes not limited to tdm-pattern in case of TDD PCell

 tdd-PCellUL-TX-AllUL-Subframe-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 18-3a: Semi-statically configured LTE UL transmissions in all UL subframes not limited to tdm-pattern in case of FDD PCell

 fdd-PCellUL-TX-AllUL-Subframe-r16 ENUMERATED {supported} OPTIONAL

 ]]

}

NAICS-Capability-Entry ::= SEQUENCE {

 numberOfNAICS-CapableCC INTEGER(1..5),

 numberOfAggregatedPRB ENUMERATED {n50, n75, n100, n125, n150, n175, n200, n225,

 n250, n275, n300, n350, n400, n450, n500, spare},

 ...

}

-- TAG-PHY-PARAMETERSMRDC-STOP

-- ASN1STOP

|  |
| --- |
| *PHY-ParametersMRDC* field descriptions |
| ***naics-Capability-List***Indicates that UE in MR-DC supports NAICS as defined in TS 36.331 [10]. |

#### – *Phy-ParametersSharedSpectrumChAccess*

The IE *Phy-ParametersSharedSpectrumChAccess* is used to convey the physical layer capabilities specific for shared spectrum channel access.

*Phy-ParametersSharedSpectrumChAccess* information element

-- ASN1START

-- TAG-PHY-PARAMETERSSHAREDSPECTRUMCHACCESS-START

Phy-ParametersSharedSpectrumChAccess-r16 ::= SEQUENCE {

 -- 10-32 (1-2): SS block based SINR measurement (SS-SINR) for unlicensed spectrum

 ss-SINR-Meas-r16 ENUMERATED {supported} OPTIONAL,

 -- 10-33 (2-32a): Semi-persistent CSI report on PUCCH for unlicensed spectrum

 sp-CSI-ReportPUCCH-r16 ENUMERATED {supported} OPTIONAL,

 -- 10-33a (2-32b): Semi-persistent CSI report on PUSCH for unlicensed spectrum

 sp-CSI-ReportPUSCH-r16 ENUMERATED {supported} OPTIONAL,

 -- 10-34 (3-6): Dynamic SFI monitoring for unlicensed spectrum

 dynamicSFI-r16 ENUMERATED {supported} OPTIONAL,

 -- 10-35c (4-19c): SR/HARQ-ACK/CSI multiplexing once per slot using a PUCCH (or HARQ-ACK/CSI piggybacked on a PUSCH) when SR/HARQ-

 -- ACK/CSI are supposed to be sent with different starting symbols in a slot for unlicensed spectrum

 -- 10-35 (4-19): SR/HARQ-ACK/CSI multiplexing once per slot using a PUCCH (or HARQ-ACK/CSI piggybacked on a PUSCH) when SR/HARQ-

 -- ACK/CSI are supposed to be sent with the same starting symbol on the PUCCH resources in a slot for unlicensed spectrum

 mux-SR-HARQ-ACK-CSI-PUCCH-OncePerSlot-r16 SEQUENCE {

 sameSymbol-r16 ENUMERATED {supported} OPTIONAL,

 diffSymbol-r16 ENUMERATED {supported} OPTIONAL

 } OPTIONAL,

 -- 10-35a (4-19a): Overlapping PUCCH resources have different starting symbols in a slot for unlicensed spectrum

 mux-SR-HARQ-ACK-PUCCH-r16 ENUMERATED {supported} OPTIONAL,

 -- 10-35b (4-19b): SR/HARQ-ACK/CSI multiplexing more than once per slot using a PUCCH (or HARQ-ACK/CSI piggybacked on a PUSCH) when

 -- SR/HARQ ACK/CSI are supposed to be sent with the same or different starting symbol in a slot for unlicensed spectrum

 mux-SR-HARQ-ACK-CSI-PUCCH-MultiPerSlot-r16 ENUMERATED {supported} OPTIONAL,

 -- 10-36 (4-28): HARQ-ACK multiplexing on PUSCH with different PUCCH/PUSCH starting OFDM symbols for unlicensed spectrum

 mux-HARQ-ACK-PUSCH-DiffSymbol-r16 ENUMERATED {supported} OPTIONAL,

 -- 10-37 (4-23): Repetitions for PUCCH format 1, 3, and 4 over multiple slots with K = 2, 4, 8 for unlicensed spectrum

 pucch-Repetition-F1-3-4-r16 ENUMERATED {supported} OPTIONAL,

 -- 10-38 (5-14): Type 1 configured PUSCH repetitions over multiple slots for unlicensed spectrum

 type1-PUSCH-RepetitionMultiSlots-r16 ENUMERATED {supported} OPTIONAL,

 -- 10-39 (5-16): Type 2 configured PUSCH repetitions over multiple slots for unlicensed spectrum

 type2-PUSCH-RepetitionMultiSlots-r16 ENUMERATED {supported} OPTIONAL,

 -- 10-40 (5-17): PUSCH repetitions over multiple slots for unlicensed spectrum

 pusch-RepetitionMultiSlots-r16 ENUMERATED {supported} OPTIONAL,

 -- 10-40a (5-17a): PDSCH repetitions over multiple slots for unlicensed spectrum

 pdsch-RepetitionMultiSlots-r16 ENUMERATED {supported} OPTIONAL,

 -- 10-41 (5-18): DL SPS

 downlinkSPS-r16 ENUMERATED {supported} OPTIONAL,

 -- 10-42 (5-19): Type 1 Configured UL grant

 configuredUL-GrantType1-r16 ENUMERATED {supported} OPTIONAL,

 -- 10-43 (5-20): Type 2 Configured UL grant

 configuredUL-GrantType2-r16 ENUMERATED {supported} OPTIONAL,

 -- 10-44 (5-21): Pre-emption indication for DL

 pre-EmptIndication-DL-r16 ENUMERATED {supported} OPTIONAL,

 ...

}

-- TAG-PHY-PARAMETERSSHAREDSPECTRUMCHACCESS-STOP

-- ASN1STOP

#### – *PosSRS-BWA-RRC-Inactive*

The IE *PosSRS-BWA-RRC-Inactive* is used to convey the capabilities supported by the UE for supporting of positioning SRS bandwidth aggregation in RRC\_INACTIVE

*PosSRS-BWA-RRC-Inactive information element*

-- ASN1START

-- TAG-POSSRS-BWA-RRC-INACTIVE-START

PosSRS-BWA-RRC-Inactive-r18 ::=SEQUENCE {

numOfCarriersIntraBandContiguous-r18 ENUMERATED {two, three, twoandthree} OPTIONAL,

 maximumOfAggregatedBW-TwoCarriersFR1-r18 ENUMERATED {mhz80, mhz100, mhz160, mhz200} OPTIONAL,

 maximumOfAggregatedBW-TwoCarriersFR2-r18 ENUMERATED {mhz50, mhz100, mhz200, mhz400, mhz600, mhz800} OPTIONAL,

 maximumOfAggregatedBW-ThreeCarriersFR1-r18 ENUMERATED {mhz80, mhz100, mhz160, mhz200, mhz300} OPTIONAL,

 maximumOfAggregatedBW-ThreeCarriersFR2-r18 ENUMERATED {mhz50, mhz100, mhz200, mhz400, mhz600, mhz800, mhz1000, mhz1200} OPTIONAL,

 maximumOfAggregatedResourceSet-r18 ENUMERATED {n1, n2, n4, n8, n12, n16} OPTIONAL,

 maximumOfAggregatedResourcePeriodic-r18 ENUMERATED {n1, n2, n4, n8, n16, n32, n64} OPTIONAL,

 maximumOfAggregatedResourceSemi-r18 ENUMERATED {n0, n1, n2, n4, n8, n16, n32, n64} OPTIONAL,

 maximumOfAggregatedResourcePeriodicPerSlot-r18 ENUMERATED {n1, n2, n3, n4, n5, n6, n8, n10, n12, n14} OPTIONAL,

 maximumOfAggregatedResourceSemiPerSlot-r18 ENUMERATED {n0, n1, n2, n3, n4, n5, n6, n8, n10, n12, n14} OPTIONAL,

 supportOfSameSRS-PowerReduction-r18 ENUMERATED {supported} OPTIONAL,

 guardPeriod-r18 ENUMERATED {ms0, ms30, ms100, ms140, ms200} OPTIONAL,

 ...

}

-- TAG-POSSRS-BWA-RRC-INACTIVE-STOP

-- ASN1STOP

#### – *PosSRS-RRC-Inactive-OutsideInitialUL-BWP*

The IE *PosSRS-RRC-Inactive-OutsideInitialUL-BWP* is used to convey the capabilities supported by the UE for Positioning SRS transmission in RRC\_INACTIVE state configured outside initial UL BWP.

*PosSRS-RRC-Inactive-OutsideInitialUL-BWP* information element

-- ASN1START

-- TAG-POSSRS-RRC-INACTIVE-OUTSIDEINITIALUL-BWP-START

PosSRS-RRC-Inactive-OutsideInitialUL-BWP-r17::= SEQUENCE {

 -- R1 27-15b: Positioning SRS transmission in RRC\_INACTIVE state configured outside initial UL BWP

 maxSRSposBandwidthForEachSCS-withinCC-FR1-r17 ENUMERATED {mhz5, mhz10, mhz15, mhz20, mhz25, mhz30, mhz35, mhz40,

 mhz45, mhz50, mhz60, mhz70, mhz80, mhz90, mhz100} OPTIONAL,

 maxSRSposBandwidthForEachSCS-withinCC-FR2-r17 ENUMERATED {mhz50, mhz100, mhz200, mhz400} OPTIONAL,

 maxNumOfSRSposResourceSets-r17 ENUMERATED {n1, n2, n4, n8, n12, n16} OPTIONAL,

 maxNumOfPeriodicSRSposResources-r17 ENUMERATED {n1, n2, n4, n8, n16, n32, n64} OPTIONAL,

 maxNumOfPeriodicSRSposResourcesPerSlot-r17 ENUMERATED {n1, n2, n3, n4, n5, n6, n8, n10, n12, n14} OPTIONAL,

 differentNumerologyBetweenSRSposAndInitialBWP-r17 ENUMERATED {supported} OPTIONAL,

 srsPosWithoutRestrictionOnBWP-r17 ENUMERATED {supported} OPTIONAL,

 maxNumOfPeriodicAndSemipersistentSRSposResources-r17 ENUMERATED {n1, n2, n4, n8, n16, n32, n64} OPTIONAL,

 maxNumOfPeriodicAndSemipersistentSRSposResourcesPerSlot-r17 ENUMERATED {n1, n2, n3, n4, n5, n6, n8, n10, n12, n14} OPTIONAL,

 differentCenterFreqBetweenSRSposAndInitialBWP-r17 ENUMERATED {supported} OPTIONAL,

 switchingTimeSRS-TX-OtherTX-r17 ENUMERATED {us100, us140, us200, us300, us500} OPTIONAL,

 -- R1 27-15c: Support of positioning SRS transmission in RRC\_INACTIVE state outside initial BWP with semi-persistent SRS

 maxNumOfSemiPersistentSRSposResources-r17 ENUMERATED {n1, n2, n4, n8, n16, n32, n64} OPTIONAL,

 maxNumOfSemiPersistentSRSposResourcesPerSlot-r17 ENUMERATED {n1, n2, n3, n4, n5, n6, n8, n10, n12, n14} OPTIONAL,

 ...

}

-- TAG-POSSRS-RRC-INACTIVE-OUTSIDEINITIALUL-BWP-STOP

-- ASN1STOP

#### – *PosSRS-TxFrequencyHoppingRRC-Connected*

The IE *PosSRS-TxFequencyHoppingRRC-Connected* is used to convey the capabilities supported by the RRC\_CONNECTED UE for supporting of positioning SRS with Tx frequency hopping for RedCap UEs.

*PosSRS-TxFrequencyHopping information element*

-- ASN1START

-- TAG-POSSRS-TXFREQUENCYHOPPINGRRCCONNECTED-START

PosSRS-TxFrequencyHoppingRRC-Connected-r18 ::= SEQUENCE {

 maximumOfSRS-BandwidthAcorssAllHopsFR1-r18 ENUMERATED {mhz40, mhz50, mhz80, mhz100} OPTIONAL,

 maximumOfSRS-BandwidthAcorssAllHopsFR2-r18 ENUMERATED {mhz100, mhz200, mhz400} OPTIONAL,

 maximumOfTxFH-Hops-r18 ENUMERATED {n2, n3, n4, n5, n6} OPTIONAL,

 rf-TxRetunTimeFR1-r18 ENUMERATED {n70, n140, n210} OPTIONAL,

 rf-TxRetunTimeFR2-r18 ENUMERATED {n35, n70, n140} OPTIONAL,

 switchTimeBetweenActiveBWP-FrequencyHop ENUMERATED {n100, n140, n200, n300, n500} OPTIONAL,

 mumOfOverlappingPRB-r18 ENUMERATED {n0, n1, n2, n4} OPTIONAL,

 maximumOfSRS-ResourcePeriodic-r18 ENUMERATED {n1, n2, n4, n8, n16, n32, n64} OPTIONAL,

 maximumOfSRS-ResourceAperiodic-r18 ENUMERATED {n1, n2, n4, n8, n16, n32, n64} OPTIONAL,

 maximumOfSRS-ResourceSemipersistent-r18 ENUMERATED {n1, n2, n4, n8, n16, n32, n64} OPTIONAL,

 ...

}

-- TAG-POSSRS-TXFREQUENCYHOPPINGRRCCONNECTED-STOP

-- ASN1STOP

#### – *PosSRS-TxFrequencyHoppingRRC-Inactive*

The IE *PosSRS-TxFequencyHoppingRRC-Inactive* is used to convey the capabilities supported by the RRC\_INACTIVE UE for supporting of positioning SRS with Tx frequency hopping for RedCap UEs.

*PosSRS-TxFrequencyHopping information element*

-- ASN1START

-- TAG-POSSRS-TXFREQUENCYHOPPINGRRCINACTIVE-START

PosSRS-TxFrequencyHoppingRRC-Inactive-r18 ::= SEQUENCE {

 maximumOfSRS-BandwidthAcorssAllHops-FR1-r18 ENUMERATED {mhz40, mhz50, mhz80, mhz100} OPTIONAL,

 maximumOfSRS-BandwidthAcorssAllHops-FR2-r18 ENUMERATED {mhz100, mhz200, mhz400} OPTIONAL,

 maximumOfTxFH-Hops-r18 ENUMERATED {n2, n3, n4, n5, n6} OPTIONAL,

 rf-TxRetunTimeFR1-r18 ENUMERATED {n70, n140, n210} OPTIONAL,

 rf-TxRetunTimeFR2-r18 ENUMERATED {n35, n70, n140} OPTIONAL,

 switchTimeBetweenActiveBWP-FrequencyHop ENUMERATED {n100, n140, n200, n300, n500} OPTIONAL,

 mumOfOverlappingPRB-r18 ENUMERATED {n0, n1, n2, n4} OPTIONAL,

 maximumOfSRS-Resource-Periodic-r18 ENUMERATED {n1, n2, n4, n8, n16, n32, n64} OPTIONAL,

 maximumOfSRS-Resource-Semipersistent-r18 ENUMERATED {n1, n2, n4, n8, n16, n32, n64} OPTIONAL,

 ...

}

-- TAG-POSSRS-TXFREQUENCYHOPPINGRRCCINACTIVE-STOP

-- ASN1STOP

#### *– PowSav-Parameters*

The IE *PowSav-Parameters* is used to convey the capabilities supported by the UE for the power saving preferences.

*PowSav-Parameters* information element

-- ASN1START

-- TAG-POWSAV-PARAMETERS-START

PowSav-Parameters-r16 ::= SEQUENCE {

 powSav-ParametersCommon-r16 PowSav-ParametersCommon-r16 OPTIONAL,

 powSav-ParametersFRX-Diff-r16 PowSav-ParametersFRX-Diff-r16 OPTIONAL,

 ...

}

PowSav-Parameters-v1700 ::= SEQUENCE {

 powSav-ParametersFR2-2-r17 PowSav-ParametersFR2-2-r17 OPTIONAL,

 ...

}

PowSav-ParametersCommon-r16 ::= SEQUENCE {

 drx-Preference-r16 ENUMERATED {supported} OPTIONAL,

 maxCC-Preference-r16 ENUMERATED {supported} OPTIONAL,

 releasePreference-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 19-4a: UE assistance information

 minSchedulingOffsetPreference-r16 ENUMERATED {supported} OPTIONAL,

 ...

}

PowSav-ParametersFRX-Diff-r16 ::= SEQUENCE {

 maxBW-Preference-r16 ENUMERATED {supported} OPTIONAL,

 maxMIMO-LayerPreference-r16 ENUMERATED {supported} OPTIONAL,

 ...

}

PowSav-ParametersFR2-2-r17 ::= SEQUENCE {

 maxBW-Preference-r17 ENUMERATED {supported} OPTIONAL,

 maxMIMO-LayerPreference-r17 ENUMERATED {supported} OPTIONAL,

 ...

}

-- TAG-POWSAV-PARAMETERS-STOP

-- ASN1STOP

#### – *ProcessingParameters*

The IE *ProcessingParameters* is used to indicate PDSCH/PUSCH processing capabilities supported by the UE.

*ProcessingParameters* information element

-- ASN1START

-- TAG-PROCESSINGPARAMETERS-START

ProcessingParameters ::= SEQUENCE {

 fallback ENUMERATED {sc, cap1-only},

 differentTB-PerSlot SEQUENCE {

 upto1 NumberOfCarriers OPTIONAL,

 upto2 NumberOfCarriers OPTIONAL,

 upto4 NumberOfCarriers OPTIONAL,

 upto7 NumberOfCarriers OPTIONAL

 } OPTIONAL

}

NumberOfCarriers ::= INTEGER (1..16)

-- TAG-PROCESSINGPARAMETERS-STOP

-- ASN1STOP

#### – *PRS-ProcessingCapabilityOutsideMGinPPWperType*

The IE *PRS-ProcessingCapabilityOutsideMGinPPWperType* is used to indicate DL PRS Processing Capability outside MG capabilities supported by the UE.

*PRS-ProcessingCapabilityOutsideMGinPPWperType* information element

-- ASN1START

-- TAG-PRS-PROCESSINGCAPABILITYOUTSIDEMGINPPWPERType-START

PRS-ProcessingCapabilityOutsideMGinPPWperType-r17 ::= SEQUENCE {

 prsProcessingType-r17 ENUMERATED {type1A, type1B, type2},

 ppw-dl-PRS-BufferType-r17 ENUMERATED {type1, type2, ...},

 ppw-durationOfPRS-Processing-r17 CHOICE {

 ppw-durationOfPRS-Processing1-r17 SEQUENCE {

 ppw-durationOfPRS-ProcessingSymbolsN-r17 ENUMERATED {msDot125, msDot25, msDot5, ms1, ms2, ms4, ms6, ms8, ms12,

 ms16, ms20, ms25, ms30, ms32, ms35, ms40, ms45, ms50},

 ppw-durationOfPRS-ProcessingSymbolsT-r17 ENUMERATED {ms1, ms2, ms4, ms8, ms16, ms20, ms30, ms40, ms80,

 ms160, ms320, ms640, ms1280}

 },

 ppw-durationOfPRS-Processing2-r17 SEQUENCE {

 ppw-durationOfPRS-ProcessingSymbolsN2-r17 ENUMERATED {msDot125, msDot25, msDot5, ms1, ms2, ms3, ms4, ms5,

 ms6, ms8, ms12},

 ppw-durationOfPRS-ProcessingSymbolsT2-r17 ENUMERATED {ms4, ms5, ms6, ms8}

 }

 } OPTIONAL,

 ppw-maxNumOfDL-PRS-ResProcessedPerSlot-r17 SEQUENCE {

 scs15-r17 ENUMERATED {n1, n2, n4, n6, n8, n12, n16, n24, n32, n48, n64} OPTIONAL,

 scs30-r17 ENUMERATED {n1, n2, n4, n6, n8, n12, n16, n24, n32, n48, n64} OPTIONAL,

 scs60-r17 ENUMERATED {n1, n2, n4, n6, n8, n12, n16, n24, n32, n48, n64} OPTIONAL,

 scs120-r17 ENUMERATED {n1, n2, n4, n6, n8, n12, n16, n24, n32, n48, n64} OPTIONAL,

 ...

 },

 ppw-maxNumOfDL-Bandwidth-r17 CHOICE {

 fr1-r17 ENUMERATED {mhz5, mhz10, mhz20, mhz40, mhz50, mhz80, mhz100},

 fr2-r17 ENUMERATED {mhz50, mhz100, mhz200, mhz400}

 } OPTIONAL

}

-- TAG-PRS-PROCESSINGCAPABILITYOUTSIDEMGINPPWPERType-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, eutra, utra-fdd-v1610, ...}

-- TAG-RAT-TYPE-STOP

-- ASN1STOP

#### – *RedCapParameters*

The IE *RedCapParameters* is used to indicate the UE capabilities supported by RedCap UEs.

*RedCapParameters* information element

-- ASN1START

-- TAG-REDCAPPARAMETERS-START

RedCapParameters-r17::= SEQUENCE {

 -- R1 28-1: RedCap UE

 supportOfRedCap-r17 ENUMERATED {supported} OPTIONAL,

 supportOf16DRB-RedCap-r17 ENUMERATED {supported} OPTIONAL

}

RedCapParameters-v1740::= SEQUENCE {

 ncd-SSB-ForRedCapInitialBWP-SDT-r17 ENUMERATED {supported} OPTIONAL

}

-- TAG-REDCAPPARAMETERS-STOP

-- ASN1STOP

#### – *RF-Parameters*

The IE *RF-Parameters* is used to convey RF-related capabilities for NR operation.

*RF-Parameters* information element

-- ASN1START

-- TAG-RF-PARAMETERS-START

RF-Parameters ::= SEQUENCE {

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

 supportedBandCombinationList BandCombinationList OPTIONAL,

 appliedFreqBandListFilter FreqBandList OPTIONAL,

 ...,

 [[

 supportedBandCombinationList-v1540 BandCombinationList-v1540 OPTIONAL,

 srs-SwitchingTimeRequested ENUMERATED {true} OPTIONAL

 ]],

 [[

 supportedBandCombinationList-v1550 BandCombinationList-v1550 OPTIONAL

 ]],

 [[

 supportedBandCombinationList-v1560 BandCombinationList-v1560 OPTIONAL

 ]],

 [[

 supportedBandCombinationList-v1610 BandCombinationList-v1610 OPTIONAL,

 supportedBandCombinationListSidelinkEUTRA-NR-r16 BandCombinationListSidelinkEUTRA-NR-r16 OPTIONAL,

 supportedBandCombinationList-UplinkTxSwitch-r16 BandCombinationList-UplinkTxSwitch-r16 OPTIONAL

 ]],

 [[

 supportedBandCombinationList-v1630 BandCombinationList-v1630 OPTIONAL,

 supportedBandCombinationListSidelinkEUTRA-NR-v1630 BandCombinationListSidelinkEUTRA-NR-v1630 OPTIONAL,

 supportedBandCombinationList-UplinkTxSwitch-v1630 BandCombinationList-UplinkTxSwitch-v1630 OPTIONAL

 ]],

 [[

 supportedBandCombinationList-v1640 BandCombinationList-v1640 OPTIONAL,

 supportedBandCombinationList-UplinkTxSwitch-v1640 BandCombinationList-UplinkTxSwitch-v1640 OPTIONAL

 ]],

 [[

 supportedBandCombinationList-v1650 BandCombinationList-v1650 OPTIONAL,

 supportedBandCombinationList-UplinkTxSwitch-v1650 BandCombinationList-UplinkTxSwitch-v1650 OPTIONAL

 ]],

 [[

 extendedBand-n77-r16 ENUMERATED {supported} OPTIONAL

 ]],

 [[

 supportedBandCombinationList-UplinkTxSwitch-v1670 BandCombinationList-UplinkTxSwitch-v1670 OPTIONAL

 ]],

 [[

 supportedBandCombinationList-v1680 BandCombinationList-v1680 OPTIONAL

 ]],

 [[

 supportedBandCombinationList-v1690 BandCombinationList-v1690 OPTIONAL,

 supportedBandCombinationList-UplinkTxSwitch-v1690 BandCombinationList-UplinkTxSwitch-v1690 OPTIONAL

 ]],

 [[

 supportedBandCombinationList-v1700 BandCombinationList-v1700 OPTIONAL,

 supportedBandCombinationList-UplinkTxSwitch-v1700 BandCombinationList-UplinkTxSwitch-v1700 OPTIONAL,

 supportedBandCombinationListSL-RelayDiscovery-r17 OCTET STRING OPTIONAL, -- Contains PC5 BandCombinationListSidelinkNR-r16

 supportedBandCombinationListSL-NonRelayDiscovery-r17 OCTET STRING OPTIONAL, -- Contains PC5 BandCombinationListSidelinkNR-r16

 supportedBandCombinationListSidelinkEUTRA-NR-v1710 BandCombinationListSidelinkEUTRA-NR-v1710 OPTIONAL,

 sidelinkRequested-r17 ENUMERATED {true} OPTIONAL,

 extendedBand-n77-2-r17 ENUMERATED {supported} OPTIONAL

 ]],

 [[

 supportedBandCombinationList-v1720 BandCombinationList-v1720 OPTIONAL,

 supportedBandCombinationList-UplinkTxSwitch-v1720 BandCombinationList-UplinkTxSwitch-v1720 OPTIONAL

 ]],

 [[

 supportedBandCombinationList-v1730 BandCombinationList-v1730 OPTIONAL,

 supportedBandCombinationList-UplinkTxSwitch-v1730 BandCombinationList-UplinkTxSwitch-v1730 OPTIONAL,

 supportedBandCombinationListSL-RelayDiscovery-v1730 BandCombinationListSL-Discovery-r17 OPTIONAL,

 supportedBandCombinationListSL-NonRelayDiscovery-v1730 BandCombinationListSL-Discovery-r17 OPTIONAL

 ]],

 [[

 supportedBandCombinationList-v1740 BandCombinationList-v1740 OPTIONAL,

 supportedBandCombinationList-UplinkTxSwitch-v1740 BandCombinationList-UplinkTxSwitch-v1740 OPTIONAL

 ]],

 [[

 supportedBandCombinationList-v1760 BandCombinationList-v1760 OPTIONAL,

 supportedBandCombinationList-UplinkTxSwitch-v1760 BandCombinationList-UplinkTxSwitch-v1760 OPTIONAL

 ]],

 [[

 supportedBandCombinationList-v1770 BandCombinationList-v1770 OPTIONAL,

 supportedBandCombinationList-UplinkTxSwitch-v1770 BandCombinationList-UplinkTxSwitch-v1770 OPTIONAL

 ]],

 [[

 supportedBandCombinationList-v1800 BandCombinationList-v1800 OPTIONAL,

 supportedBandCombinationList-UplinkTxSwitch-v1800 BandCombinationList-UplinkTxSwitch-v1800 OPTIONAL,

 supportedBandCombinationListSL-U2U-Relay-r18 SEQUENCE {

 supportedBandCombinationListSL-U2U-RelayDiscovery-r18 OCTET STRING OPTIONAL, -- Contains PC5

 -- BandCombinationListSidelinkNR-r16

 supportedBandCombinationListSL-U2U-DiscoveryExt BandCombinationListSL-Discovery-r17 OPTIONAL

 } OPTIONAL

 ]]

}

RF-Parameters-v15g0 ::= SEQUENCE {

 supportedBandCombinationList-v15g0 BandCombinationList-v15g0 OPTIONAL

}

RF-Parameters-v16a0 ::= SEQUENCE {

 supportedBandCombinationList-v16a0 BandCombinationList-v16a0 OPTIONAL,

 supportedBandCombinationList-UplinkTxSwitch-v16a0 BandCombinationList-UplinkTxSwitch-v16a0 OPTIONAL

}

RF-Parameters-v16c0 ::= SEQUENCE {

 supportedBandListNR-v16c0 SEQUENCE (SIZE (1..maxBands)) OF BandNR-v16c0

}

BandNR ::= SEQUENCE {

 bandNR FreqBandIndicatorNR,

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

 mimo-ParametersPerBand MIMO-ParametersPerBand OPTIONAL,

 extendedCP ENUMERATED {supported} OPTIONAL,

 multipleTCI ENUMERATED {supported} OPTIONAL,

 bwp-WithoutRestriction ENUMERATED {supported} OPTIONAL,

 bwp-SameNumerology ENUMERATED {upto2, upto4} OPTIONAL,

 bwp-DiffNumerology ENUMERATED {upto4} OPTIONAL,

 crossCarrierScheduling-SameSCS ENUMERATED {supported} OPTIONAL,

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

 pusch-256QAM ENUMERATED {supported} OPTIONAL,

 ue-PowerClass ENUMERATED {pc1, pc2, pc3, pc4} OPTIONAL,

 rateMatchingLTE-CRS ENUMERATED {supported} OPTIONAL,

 channelBWs-DL CHOICE {

 fr1 SEQUENCE {

 scs-15kHz BIT STRING (SIZE (10)) OPTIONAL,

 scs-30kHz BIT STRING (SIZE (10)) OPTIONAL,

 scs-60kHz BIT STRING (SIZE (10)) OPTIONAL

 },

 fr2 SEQUENCE {

 scs-60kHz BIT STRING (SIZE (3)) OPTIONAL,

 scs-120kHz BIT STRING (SIZE (3)) OPTIONAL

 }

 } OPTIONAL,

 channelBWs-UL CHOICE {

 fr1 SEQUENCE {

 scs-15kHz BIT STRING (SIZE (10)) OPTIONAL,

 scs-30kHz BIT STRING (SIZE (10)) OPTIONAL,

 scs-60kHz BIT STRING (SIZE (10)) OPTIONAL

 },

 fr2 SEQUENCE {

 scs-60kHz BIT STRING (SIZE (3)) OPTIONAL,

 scs-120kHz BIT STRING (SIZE (3)) OPTIONAL

 }

 } OPTIONAL,

 ...,

 [[

 maxUplinkDutyCycle-PC2-FR1 ENUMERATED {n60, n70, n80, n90, n100} OPTIONAL

 ]],

 [[

 pucch-SpatialRelInfoMAC-CE ENUMERATED {supported} OPTIONAL,

 powerBoosting-pi2BPSK ENUMERATED {supported} OPTIONAL

 ]],

 [[

 maxUplinkDutyCycle-FR2 ENUMERATED {n15, n20, n25, n30, n40, n50, n60, n70, n80, n90, n100} OPTIONAL

 ]],

 [[

 channelBWs-DL-v1590 CHOICE {

 fr1 SEQUENCE {

 scs-15kHz BIT STRING (SIZE (16)) OPTIONAL,

 scs-30kHz BIT STRING (SIZE (16)) OPTIONAL,

 scs-60kHz BIT STRING (SIZE (16)) OPTIONAL

 },

 fr2 SEQUENCE {

 scs-60kHz BIT STRING (SIZE (8)) OPTIONAL,

 scs-120kHz BIT STRING (SIZE (8)) OPTIONAL

 }

 } OPTIONAL,

 channelBWs-UL-v1590 CHOICE {

 fr1 SEQUENCE {

 scs-15kHz BIT STRING (SIZE (16)) OPTIONAL,

 scs-30kHz BIT STRING (SIZE (16)) OPTIONAL,

 scs-60kHz BIT STRING (SIZE (16)) OPTIONAL

 },

 fr2 SEQUENCE {

 scs-60kHz BIT STRING (SIZE (8)) OPTIONAL,

 scs-120kHz BIT STRING (SIZE (8)) OPTIONAL

 }

 } OPTIONAL

 ]],

 [[

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

 ]],

 [[

 -- R1 10: NR-unlicensed

 sharedSpectrumChAccessParamsPerBand-r16 SharedSpectrumChAccessParamsPerBand-r16 OPTIONAL,

 -- R1 11-7b: Independent cancellation of the overlapping PUSCHs in an intra-band UL CA

 cancelOverlappingPUSCH-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 14-1: Multiple LTE-CRS rate matching patterns

 multipleRateMatchingEUTRA-CRS-r16 SEQUENCE {

 maxNumberPatterns-r16 INTEGER (2..6),

 maxNumberNon-OverlapPatterns-r16 INTEGER (1..3)

 } OPTIONAL,

 -- R1 14-1a: Two LTE-CRS overlapping rate matching patterns within a part of NR carrier using 15 kHz overlapping with a LTE carrier

 overlapRateMatchingEUTRA-CRS-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 14-2: PDSCH Type B mapping of length 9 and 10 OFDM symbols

 pdsch-MappingTypeB-Alt-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 14-3: One slot periodic TRS configuration for FR1

 oneSlotPeriodicTRS-r16 ENUMERATED {supported} OPTIONAL,

 olpc-SRS-Pos-r16 OLPC-SRS-Pos-r16 OPTIONAL,

 spatialRelationsSRS-Pos-r16 SpatialRelationsSRS-Pos-r16 OPTIONAL,

 simulSRS-MIMO-TransWithinBand-r16 ENUMERATED {n2} OPTIONAL,

 channelBW-DL-IAB-r16 CHOICE {

 fr1-100mhz SEQUENCE {

 scs-15kHz ENUMERATED {supported} OPTIONAL,

 scs-30kHz ENUMERATED {supported} OPTIONAL,

 scs-60kHz ENUMERATED {supported} OPTIONAL

 },

 fr2-200mhz SEQUENCE {

 scs-60kHz ENUMERATED {supported} OPTIONAL,

 scs-120kHz ENUMERATED {supported} OPTIONAL

 }

 } OPTIONAL,

 channelBW-UL-IAB-r16 CHOICE {

 fr1-100mhz SEQUENCE {

 scs-15kHz ENUMERATED {supported} OPTIONAL,

 scs-30kHz ENUMERATED {supported} OPTIONAL,

 scs-60kHz ENUMERATED {supported} OPTIONAL

 },

 fr2-200mhz SEQUENCE {

 scs-60kHz ENUMERATED {supported} OPTIONAL,

 scs-120kHz ENUMERATED {supported} OPTIONAL

 }

 } OPTIONAL,

 rasterShift7dot5-IAB-r16 ENUMERATED {supported} OPTIONAL,

 ue-PowerClass-v1610 ENUMERATED {pc1dot5} OPTIONAL,

 condHandover-r16 ENUMERATED {supported} OPTIONAL,

 condHandoverFailure-r16 ENUMERATED {supported} OPTIONAL,

 condHandoverTwoTriggerEvents-r16 ENUMERATED {supported} OPTIONAL,

 condPSCellChange-r16 ENUMERATED {supported} OPTIONAL,

 condPSCellChangeTwoTriggerEvents-r16 ENUMERATED {supported} OPTIONAL,

 mpr-PowerBoost-FR2-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 11-9: Multiple active configured grant configurations for a BWP of a serving cell

 activeConfiguredGrant-r16 SEQUENCE {

 maxNumberConfigsPerBWP-r16 ENUMERATED {n1, n2, n4, n8, n12},

 maxNumberConfigsAllCC-r16 INTEGER (2..32)

 } OPTIONAL,

 -- R1 11-9a: Joint release in a DCI for two or more configured grant Type 2 configurations for a given BWP of a serving cell

 jointReleaseConfiguredGrantType2-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 12-2: Multiple SPS configurations

 sps-r16 SEQUENCE {

 maxNumberConfigsPerBWP-r16 INTEGER (1..8),

 maxNumberConfigsAllCC-r16 INTEGER (2..32)

 } OPTIONAL,

 -- R1 12-2a: Joint release in a DCI for two or more SPS configurations for a given BWP of a serving cell

 jointReleaseSPS-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 13-19: Simultaneous positioning SRS and MIMO SRS transmission within a band across multiple CCs

 simulSRS-TransWithinBand-r16 ENUMERATED {n2} OPTIONAL,

 trs-AdditionalBandwidth-r16 ENUMERATED {trs-AddBW-Set1, trs-AddBW-Set2} OPTIONAL,

 handoverIntraF-IAB-r16 ENUMERATED {supported} OPTIONAL

 ]],

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 -- R1 22-5a: Simultaneous transmission of SRS for antenna switching and SRS for CB/NCB /BM for intra-band UL CA

 -- R1 22-5c: Simultaneous transmission of SRS for antenna switching and SRS for antenna switching for intra-band UL CA

 simulTX-SRS-AntSwitchingIntraBandUL-CA-r16 SimulSRS-ForAntennaSwitching-r16 OPTIONAL,

 -- R1 10: NR-unlicensed

 sharedSpectrumChAccessParamsPerBand-v1630 SharedSpectrumChAccessParamsPerBand-v1630 OPTIONAL

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 handoverUTRA-FDD-r16 ENUMERATED {supported} OPTIONAL,

 -- R4 7-4: Report the shorter transient capability supported by the UE: 2, 4 or 7us

 enhancedUL-TransientPeriod-r16 ENUMERATED {us2, us4, us7} OPTIONAL,

 sharedSpectrumChAccessParamsPerBand-v1640 SharedSpectrumChAccessParamsPerBand-v1640 OPTIONAL

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 type1-PUSCH-RepetitionMultiSlots-v1650 ENUMERATED {supported} OPTIONAL,

 type2-PUSCH-RepetitionMultiSlots-v1650 ENUMERATED {supported} OPTIONAL,

 pusch-RepetitionMultiSlots-v1650 ENUMERATED {supported} OPTIONAL,

 configuredUL-GrantType1-v1650 ENUMERATED {supported} OPTIONAL,

 configuredUL-GrantType2-v1650 ENUMERATED {supported} OPTIONAL,

 sharedSpectrumChAccessParamsPerBand-v1650 SharedSpectrumChAccessParamsPerBand-v1650 OPTIONAL

 ]],

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 enhancedSkipUplinkTxConfigured-v1660 ENUMERATED {supported} OPTIONAL,

 enhancedSkipUplinkTxDynamic-v1660 ENUMERATED {supported} OPTIONAL

 ]],

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 maxUplinkDutyCycle-PC1dot5-MPE-FR1-r16 ENUMERATED {n10, n15, n20, n25, n30, n40, n50, n60, n70, n80, n90, n100} OPTIONAL,

 txDiversity-r16 ENUMERATED {supported} OPTIONAL

 ]],

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 -- R1 36-1: Support of 1024QAM for PDSCH for FR1

 pdsch-1024QAM-FR1-r17 ENUMERATED {supported} OPTIONAL,

 -- R4 22-1 support of FR2 HST operation

 ue-PowerClass-v1700 ENUMERATED {pc5, pc6, pc7} OPTIONAL,

 -- R1 24: NR extension to 71GHz (FR2-2)

 fr2-2-AccessParamsPerBand-r17 FR2-2-AccessParamsPerBand-r17 OPTIONAL,

 rlm-Relaxation-r17 ENUMERATED {supported} OPTIONAL,

 bfd-Relaxation-r17 ENUMERATED {supported} OPTIONAL,

 cg-SDT-r17 ENUMERATED {supported} OPTIONAL,

 locationBasedCondHandover-r17 ENUMERATED {supported} OPTIONAL,

 timeBasedCondHandover-r17 ENUMERATED {supported} OPTIONAL,

 eventA4BasedCondHandover-r17 ENUMERATED {supported} OPTIONAL,

 mn-InitiatedCondPSCellChangeNRDC-r17 ENUMERATED {supported} OPTIONAL,

 sn-InitiatedCondPSCellChangeNRDC-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 29-3a: PDCCH skipping

 pdcch-SkippingWithoutSSSG-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 29-3b: 2 search space sets group switching

 sssg-Switching-1BitInd-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 29-3c: 3 search space sets group switching

 sssg-Switching-2BitInd-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 29-3d: 2 search space sets group switching with PDCCH skipping

 pdcch-SkippingWithSSSG-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 29-3e: Support Search space set group switching capability 2 for FR1

 searchSpaceSetGrp-switchCap2-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 26-1: Uplink Time and Frequency pre-compensation and timing relationship enhancements

 uplinkPreCompensation-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 26-4: UE reporting of information related to TA pre-compensation

 uplink-TA-Reporting-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 26-5: Increasing the number of HARQ processes

 max-HARQ-ProcessNumber-r17 ENUMERATED {u16d32, u32d16, u32d32} OPTIONAL,

 -- R1 26-6: Type-2 HARQ codebook enhancement

 type2-HARQ-Codebook-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 26-6a: Type-1 HARQ codebook enhancement

 type1-HARQ-Codebook-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 26-6b: Type-3 HARQ codebook enhancement

 type3-HARQ-Codebook-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 26-9: UE-specific K\_offset

 ue-specific-K-Offset-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 24-1f: Multiple PDSCH scheduling by single DCI for 120kHz in FR2-1

 multiPDSCH-SingleDCI-FR2-1-SCS-120kHz-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 24-1g: Multiple PUSCH scheduling by single DCI for 120kHz in FR2-1

 multiPUSCH-SingleDCI-FR2-1-SCS-120kHz-r17 ENUMERATED {supported} OPTIONAL,

 -- R4 14-4: Parallel PRS measurements in RRC\_INACTIVE state, FR1/FR2 diff

 parallelPRS-MeasRRC-Inactive-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 27-1-2: Support of UE-TxTEGs for UL TDOA

 nr-UE-TxTEG-ID-MaxSupport-r17 ENUMERATED {n1, n2, n3, n4, n6, n8} OPTIONAL,

 -- R1 27-17: PRS processing in RRC\_INACTIVE

 prs-ProcessingRRC-Inactive-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 27-3-2: DL PRS measurement outside MG and in a PRS processing window

 prs-ProcessingWindowType1A-r17 ENUMERATED {option1, option2, option3} OPTIONAL,

 prs-ProcessingWindowType1B-r17 ENUMERATED {option1, option2, option3} OPTIONAL,

 prs-ProcessingWindowType2-r17 ENUMERATED {option1, option2, option3} OPTIONAL,

 -- R1 27-15: Positioning SRS transmission in RRC\_INACTIVE state for initial UL BWP

 srs-AllPosResourcesRRC-Inactive-r17 SRS-AllPosResourcesRRC-Inactive-r17 OPTIONAL,

 -- R1 27-16: OLPC for positioning SRS in RRC\_INACTIVE state - gNB

 olpc-SRS-PosRRC-Inactive-r17 OLPC-SRS-Pos-r16 OPTIONAL,

 -- R1 27-19: Spatial relation for positioning SRS in RRC\_INACTIVE state - gNB

 spatialRelationsSRS-PosRRC-Inactive-r17 SpatialRelationsSRS-Pos-r16 OPTIONAL,

 -- R1 30-1: Increased maximum number of PUSCH Type A repetitions

 maxNumberPUSCH-TypeA-Repetition-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 30-2: PUSCH Type A repetitions based on available slots

 puschTypeA-RepetitionsAvailSlot-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 30-3: TB processing over multi-slot PUSCH

 tb-ProcessingMultiSlotPUSCH-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 30-3a: Repetition of TB processing over multi-slot PUSCH

 tb-ProcessingRepMultiSlotPUSCH-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 30-4: The maximum duration for DM-RS bundling

 maxDurationDMRS-Bundling-r17 SEQUENCE {

 fdd-r17 ENUMERATED {n4, n8, n16, n32} OPTIONAL,

 tdd-r17 ENUMERATED {n2, n4, n8, n16} OPTIONAL

 } OPTIONAL,

 -- R1 30-6: Repetition of PUSCH transmission scheduled by RAR UL grant and DCI format 0\_0 with CRC scrambled by TC-RNTI

 pusch-RepetitionMsg3-r17 ENUMERATED {supported} OPTIONAL,

 sharedSpectrumChAccessParamsPerBand-v1710 SharedSpectrumChAccessParamsPerBand-v1710 OPTIONAL,

 -- R4 25-2: Parallel measurements on cells belonging to a different NGSO satellite than a serving satellite without scheduling restrictions

 -- on normal operations with the serving cell

 parallelMeasurementWithoutRestriction-r17 ENUMERATED {supported} OPTIONAL,

 -- R4 25-5: Parallel measurements on multiple NGSO satellites within a SMTC

 maxNumber-NGSO-SatellitesWithinOneSMTC-r17 ENUMERATED {n1, n2, n3, n4} OPTIONAL,

 -- R1 26-10: K1 range extension

 k1-RangeExtension-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 35-1: Aperiodic CSI-RS for tracking for fast SCell activation

 aperiodicCSI-RS-FastScellActivation-r17 SEQUENCE {

 maxNumberAperiodicCSI-RS-PerCC-r17 ENUMERATED {n8, n16, n32, n48, n64, n128, n255},

 maxNumberAperiodicCSI-RS-AcrossCCs-r17 ENUMERATED {n8, n16, n32, n64, n128, n256, n512, n1024}

 } OPTIONAL,

 -- R1 35-2: Aperiodic CSI-RS bandwidth for tracking for fast SCell activation for 10MHz UE channel bandwidth

 aperiodicCSI-RS-AdditionalBandwidth-r17 ENUMERATED {addBW-Set1, addBW-Set2} OPTIONAL,

 -- R1 28-1a: RRC-configured DL BWP without CD-SSB or NCD-SSB

 bwp-WithoutCD-SSB-OrNCD-SSB-RedCap-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 28-3: Half-duplex FDD operation type A for (e)RedCap UE

 halfDuplexFDD-TypeA-RedCap-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 27-15b: Positioning SRS transmission in RRC\_INACTIVE state configured outside initial UL BWP

 posSRS-RRC-Inactive-OutsideInitialUL-BWP-r17 PosSRS-RRC-Inactive-OutsideInitialUL-BWP-r17 OPTIONAL,

 -- R4 15-3 UE support of CBW for 480kHz SCS

 channelBWs-DL-SCS-480kHz-FR2-2-r17 BIT STRING (SIZE (8)) OPTIONAL,

 channelBWs-UL-SCS-480kHz-FR2-2-r17 BIT STRING (SIZE (8)) OPTIONAL,

 -- R4 15-4 UE support of CBW for 960kHz SCS

 channelBWs-DL-SCS-960kHz-FR2-2-r17 BIT STRING (SIZE (8)) OPTIONAL,

 channelBWs-UL-SCS-960kHz-FR2-2-r17 BIT STRING (SIZE (8)) OPTIONAL,

 -- R4 17-1 UL gap for Tx power management

 ul-GapFR2-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 25-4: One-shot HARQ ACK feedback triggered by DCI format 1\_2

 oneShotHARQ-feedbackTriggeredByDCI-1-2-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 25-5: PHY priority handling for one-shot HARQ ACK feedback

 oneShotHARQ-feedbackPhy-Priority-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 25-6: Enhanced type 3 HARQ-ACK codebook feedback

 enhancedType3-HARQ-CodebookFeedback-r17 SEQUENCE {

 enhancedType3-HARQ-Codebooks-r17 ENUMERATED {n1, n2, n4, n8},

 maxNumberPUCCH-Transmissions-r17 ENUMERATED {n1, n2, n3, n4, n5, n6, n7}

 } OPTIONAL,

 -- R1 25-7: Triggered HARQ-ACK codebook re-transmission

 triggeredHARQ-CodebookRetx-r17 SEQUENCE {

 minHARQ-Retx-Offset-r17 ENUMERATED {n-7, n-5, n-3, n-1, n1},

 maxHARQ-Retx-Offset-r17 ENUMERATED {n4, n6, n8, n10, n12, n14, n16, n18, n20, n22, n24}

 } OPTIONAL

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 -- R4 22-2 support of one shot large UL timing adjustment

 ue-OneShotUL-TimingAdj-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 25-2: Repetitions for PUCCH format 0, and 2 over multiple slots with K = 2, 4, 8

 pucch-Repetition-F0-2-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 25-11a: 4-bits subband CQI for NTN and unlicensed

 cqi-4-BitsSubbandNTN-SharedSpectrumChAccess-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 25-16: HARQ-ACK with different priorities multiplexing on a PUCCH/PUSCH

 mux-HARQ-ACK-DiffPriorities-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 25-20a: Propagation delay compensation based on Rel-15 TA procedure for NTN and unlicensed

 ta-BasedPDC-NTN-SharedSpectrumChAccess-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 33-2b: DCI-based enabling/disabling ACK/NACK-based feedback for dynamic scheduling for multicast

 ack-NACK-FeedbackForMulticastWithDCI-Enabler-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 33-2e: Multiple G-RNTIs for group-common PDSCHs

 maxNumberG-RNTI-r17 INTEGER (2..8) OPTIONAL,

 -- R1 33-2f: Dynamic multicast with DCI format 4\_2

 dynamicMulticastDCI-Format4-2-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 33-2i: Supported maximal modulation order for multicast PDSCH

 maxModulationOrderForMulticast-r17 CHOICE {

 fr1-r17 ENUMERATED {qam256, qam1024},

 fr2-r17 ENUMERATED {qam64, qam256}

 } OPTIONAL,

 -- R1 33-3-1: Dynamic Slot-level repetition for group-common PDSCH for TN and licensed

 dynamicSlotRepetitionMulticastTN-NonSharedSpectrumChAccess-r17 ENUMERATED {n8, n16} OPTIONAL,

 -- R1 33-3-1a: Dynamic Slot-level repetition for group-common PDSCH for NTN and unlicensed

 dynamicSlotRepetitionMulticastNTN-SharedSpectrumChAccess-r17 ENUMERATED {n8, n16} OPTIONAL,

 -- R1 33-4-1: DCI-based enabling/disabling NACK-only based feedback for dynamic scheduling for multicast

 nack-OnlyFeedbackForMulticastWithDCI-Enabler-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 33-5-1b: DCI-based enabling/disabling ACK/NACK-based feedback for dynamic scheduling for multicast

 ack-NACK-FeedbackForSPS-MulticastWithDCI-Enabler-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 33-5-1h: Multiple G-CS-RNTIs for SPS group-common PDSCHs

 maxNumberG-CS-RNTI-r17 INTEGER (2..8) OPTIONAL,

 -- R1 33-10: Support group-common PDSCH RE-level rate matching for multicast

 re-LevelRateMatchingForMulticast-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 36-1a: Support of 1024QAM for PDSCH with maximum 2 MIMO layers for FR1

 pdsch-1024QAM-2MIMO-FR1-r17 ENUMERATED {supported} OPTIONAL,

 -- R4 14-3 PRS measurement without MG

 prs-MeasurementWithoutMG-r17 ENUMERATED {cpLength, quarterSymbol, halfSymbol, halfSlot} OPTIONAL,

 -- R4 25-7: The number of target LEO satellites the UE can monitor per carrier

 maxNumber-LEO-SatellitesPerCarrier-r17 INTEGER (3..4) OPTIONAL,

 -- R1 27-3-3 DL PRS Processing Capability outside MG - buffering capability

 prs-ProcessingCapabilityOutsideMGinPPW-r17 SEQUENCE (SIZE(1..3)) OF PRS-ProcessingCapabilityOutsideMGinPPWperType-r17 OPTIONAL,

 -- R1 27-15a: Positioning SRS transmission in RRC\_INACTIVE state for initial UL BWP with semi-persistent SRS

 srs-SemiPersistent-PosResourcesRRC-Inactive-r17 SEQUENCE {

 maxNumOfSemiPersistentSRSposResources-r17 ENUMERATED {n1, n2, n4, n8, n16, n32, n64},

 maxNumOfSemiPersistentSRSposResourcesPerSlot-r17 ENUMERATED {n1, n2, n3, n4, n5, n6, n8, n10, n12, n14}

 } OPTIONAL,

 -- R2: UE support of CBW for 120kHz SCS

 channelBWs-DL-SCS-120kHz-FR2-2-r17 BIT STRING (SIZE (8)) OPTIONAL,

 channelBWs-UL-SCS-120kHz-FR2-2-r17 BIT STRING (SIZE (8)) OPTIONAL

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 -- R1 30-4a: DM-RS bundling for PUSCH repetition type A

 dmrs-BundlingPUSCH-RepTypeA-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 30-4b: DM-RS bundling for PUSCH repetition type B

 dmrs-BundlingPUSCH-RepTypeB-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 30-4c: DM-RS bundling for TB processing over multi-slot PUSCH

 dmrs-BundlingPUSCH-multiSlot-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 30-4d: DMRS bundling for PUCCH repetitions

 dmrs-BundlingPUCCH-Rep-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 30-4e: Enhanced inter-slot frequency hopping with inter-slot bundling for PUSCH

 interSlotFreqHopInterSlotBundlingPUSCH-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 30-4f: Enhanced inter-slot frequency hopping for PUCCH repetitions with DMRS bundling

 interSlotFreqHopPUCCH-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 30-4g: Restart DM-RS bundling

 dmrs-BundlingRestart-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 30-4h: DM-RS bundling for non-back-to-back transmission

 dmrs-BundlingNonBackToBackTX-r17 ENUMERATED {supported} OPTIONAL

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 -- R1 33-5-1e: Dynamic Slot-level repetition for SPS group-common PDSCH for multicast

 maxDynamicSlotRepetitionForSPS-Multicast-r17 ENUMERATED {n8, n16} OPTIONAL,

 -- R1 33-5-1g: DCI-based enabling/disabling NACK-only based feedback for SPS group-common PDSCH for multicast

 nack-OnlyFeedbackForSPS-MulticastWithDCI-Enabler-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 33-5-1i: Multicast SPS scheduling with DCI format 4\_2

 sps-MulticastDCI-Format4-2-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 33-5-2: Multiple SPS group-common PDSCH configuration on PCell

 sps-MulticastMultiConfig-r17 INTEGER (1..8) OPTIONAL,

 -- R1 33-6-1: DL priority indication for multicast in DCI

 priorityIndicatorInDCI-Multicast-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 33-6-1a: DL priority configuration for SPS multicast

 priorityIndicatorInDCI-SPS-Multicast-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 33-6-2: Two HARQ-ACK codebooks simultaneously constructed for supporting HARQ-ACK codebooks with different priorities

 -- for unicast and multicast at a UE

 twoHARQ-ACK-CodebookForUnicastAndMulticast-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 33-6-3: More than one PUCCH for HARQ-ACK transmission for multicast or for unicast and multicast within a slot

 multiPUCCH-HARQ-ACK-ForMulticastUnicast-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 33-9: Supporting unicast PDCCH to release SPS group-common PDSCH

 releaseSPS-MulticastWithCS-RNTI-r17 ENUMERATED {supported} OPTIONAL

 ]],

 [[

 -- R1 41-3-1a UE automomous TA adjustment when cell-reselection happens

 posUE-TA-AutoAdjustment-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 41-4-6a support a Rel-17 single DCI scheduling positioning SRS resource sets across the linked carriers

 -- for SRS bandwidth aggregation in RRC\_CONNECTED state

 posJointTriggerBySingleDCI-RRC-Connected-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 41-5-1a PRS measurement with Rx frequency hopping in RRC\_INACTIVE for RedCap UEs

 dl-PRS-MeasurementWithRxFH-RRC-InactiveforRedCap-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 41-5-1b PRS measurement with Rx frequency hopping in RRC\_IDLE for RedCap UEs

 dl-PRS-MeasurementWithRxFH-RRC-IdleforRedCap-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 42-4: Cell DTX and/or DRX operation based on RRC configuration

 nes-CellDTX-DRX-r18 ENUMERATED {cellDTXonly, cellDRXonly, both} OPTIONAL,

 -- R1 42-5: Cell DTX/DRX operation triggered by DCI format 2\_9

 nes-CellDTX-DRX-DCI2-9-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 45-6: UE-based TA measurement

 ue-TA-Measurement-r18 INTEGER (1..8) OPTIONAL,

 -- R1 45-7: TA indication in cell switch command

 ta-IndicationCellSwitch-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 50-1: Multi-PUSCHs for Configured Grant

 multiPUSCH-CG-r18 ENUMERATED {n16, n32} OPTIONAL,

 -- R1 50-1a: Multiple active multi-PUSCHs configured grant configurations for a BWP of a serving cell

 multiPUSCH-ActiveConfiguredGrant-r18 SEQUENCE {

 maxNumberConfigsPerBWP ENUMERATED {n1, n2, n4, n8, n12},

 maxNumberConfigsAllCC-FR1 INTEGER (2..32),

 maxNumberConfigsAllCC-FR2 INTEGER (2..32)

 } OPTIONAL,

 -- R1 50-2: UCI indication of unused CG-PUSCH transmission occasions

 cg-PUSCH-UTO-UCI-Ind-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 50-3: PDCCH monitoring resumption after UL NACK

 pdcch-MonitoringResumptionAfterUL-NACK-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 51-1: support for 3MHz channel bandwidth

 support-3MHz-ChannelBW-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 51-2: support 12 PRB CORESET0

 support-12PRB-CORESET0-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 52-1: Reception of NR PDCCH candidates overlapping with LTE CRS REs

 nr-PDCCH-OverlapLTE-CRS-RE-r18 SEQUENCE {

 overlapInRE-r18 ENUMERATED {oneSymbolNoOverlap, someOrAllSymOverlap},

 overlapInSymbol-r18 ENUMERATED {symbol2,symbol1And2}

 } OPTIONAL,

 -- Editor's Note: someOrAllSymOverlap considers to be supported in overlapInRE-r18 only if RAN4 performance requirements for

 -- someOrAllSymOverlap are not defined

 -- R1 52-1a: Reception of NR PDCCH candidates overlapping with LTE CRS REs with multiple non-overlapping CRS rate matching patterns

 nr-PDCCH-OverlapLTE-CRS-RE-MultiPatterns-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 52-1b: NR PDCCH reception that overlaps with LTE CRS within a single span of 3 consecutive OFDM symbols that is within the

 -- first 4 OFDM symbols in a slot

 nr-PDCCH-OverlapLTE-CRS-RE-Span-3-4-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 52-2: Two LTE-CRS overlapping rate matching patterns within NR 15 kHz carrier overlapping with LTE carrier (regardless of

 -- support or configuration of multi-TRP)

 twoRateMatchingEUTRA-CRS-patterns-3-4-r18 SEQUENCE {

 maxNumberPatterns-r18 INTEGER (2..6),

 maxNumberNon-OverlapPatterns-r18 INTEGER (1..3)

 } OPTIONAL,

 -- R1 52-2a: Two LTE-CRS overlapping rate matching patterns with two different values of coresetPoolIndex within NR 15 kHz carrier

 -- overlapping with LTE carrier

 overlapRateMatchingEUTRA-CRS-Patterns-3-4-Diff-CS-Pool-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 53-3: Support RLM/BM/BFD measurements based on NCD-SSB within active BWP

 ncd-SSB-BWP-Wor-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 53-4: Support Support RLM/BM/BFD measurements based on CSI-RS when CD-SSB is outside active BWP

 rlm-BM-BFD-CSI-RS-OutsideActiveBWP-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 55-3: Multiple PUSCHs scheduling by single DCI for non-consecutive slots in FR1

 multiPUSCH-SingleDCI-NonConsSlots-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 55-2d: single-symbol DL-PRS used in RTT-based Propagation delay compensation

 pdc-maxNumberPRS-ResourceProcessedPerSlot-r18 SEQUENCE {

 fr1-r18 SEQUENCE {

 scs-15kHz-r18 ENUMERATED {n1, n2, n4, n6, n8, n12, n16, n24, n32, n48, n64} OPTIONAL,

 scs-30kHz-r18 ENUMERATED {n1, n2, n4, n6, n8, n12, n16, n24, n32, n48, n64} OPTIONAL,

 scs-60kHz-r18 ENUMERATED {n1, n2, n4, n6, n8, n12, n16, n24, n32, n48, n64} OPTIONAL

 },

 fr2-r18 SEQUENCE {

 scs-60kHz-r18 ENUMERATED {n1, n2, n4, n6, n8, n12, n16, n24, n32, n48, n64} OPTIONAL,

 scs-120kHz-r18 ENUMERATED {n1, n2, n4, n6, n8, n12, n16, n24, n32, n48, n64} OPTIONAL

 }

 } OPTIONAL,

 -- R4 27-2: LowerMSD for inter-band NR CA and EN-DC

 lowerMSD-r18 SEQUENCE (SIZE (1..maxLowerMSD-r18)) OF LowerMSD-r18 OPTIONAL,

 -- R4 31-2 Beam sweeping factor reduction for FR2 unknown SCell activation

 beamSweepingFactorReduction-r18 SEQUENCE {

 reduceForCellDetection ENUMERATED {n1, n2, n4, n6},

 reduceForSSB-L1-RSRP-Meas INTEGER (0..7)

 } OPTIONAL,

 -- R4 35-2: the requirements defined for ATG UE with antenna array or omni-direction antenna requirements.

 antennaArrayType-r18 ENUMERATED {supported} OPTIONAL,

 locationBasedCondHandoverATG-r18 ENUMERATED {supported} OPTIONAL,

 -- R4 35-3: rated maximum output power value range from 23dBm to 40dBm with 1dB as granularity at maximum modulation order and full

 -- PRB configurations.

 maxOutputPowerATG-r18 INTEGER (1..18) OPTIONAL,

 eventA4BasedCondHandoverNES-r18 ENUMERATED {supported} OPTIONAL,

 nesBasedCondHandoverWithDCI-r18 ENUMERATED {supported} OPTIONAL,

 rachLessHandoverNTN-r18 ENUMERATED {supported} OPTIONAL,

 locationBasedCondHandoverEMC-r18 ENUMERATED {supported} OPTIONAL,

 mt-CG-SDT-r18 ENUMERATED {supported} OPTIONAL,

 -- R2: Preconfigured SRS in RRC\_INACTIVE state in validity area for initial UL BWP

 posSRS-PreconfigureRRC-InactiveInitialUL-BWP-r18 ENUMERATED {supported} OPTIONAL,

 -- R2: Preconfigured SRS in RRC\_INACTIVE state in validity area for configured outside UL BWP

 posSRS-PreconfigureRRC-InactiveOutsideInitialUL-BWP-r18 ENUMERATED {supported} OPTIONAL,

 cg-SDT-PeriodicityExt-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 41-3-1: SRS for positioning configuration in multiple cells for UEs in RRC\_INACTIVE state for initial UL BWP

 posSRS-ValidityAreaRRC-InactiveInitialUL-BWP-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 41-3-2: SRS for positioning configuration in multiple cells for UEs in RRC\_INACTIVE state for configured outside initial UL BWP

 posSRS-ValidityAreaRRC-InactiveOutsideInitialUL-BWP-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 41-5-1:PRS measurement with Rx frequency hopping within a MG and measurement reporting RRC\_CONNECTED for RedCap UEs

 dl-PRS-MeasurementWithRxFH-RRC-ConnectedForRedCap-r18 DL-PRS-MeasurementWithRxFH-RRC-Connected-r18 OPTIONAL,

 -- R1 41-5-2: Support of positioning SRS with Tx frequency hopping in RRC\_CONNECTED for RedCap UEs

 posSRS-TxFH-RRC-ConnectedForRedCap-r18 PosSRS-TxFrequencyHoppingRRC-Connected-r18 OPTIONAL,

 -- R1 41-5-2a: Support of positioning SRS with Tx frequency hopping in RRC\_INACTIVE for RedCap UEs

 posSRS-TxFH-RRC-InactiveForRedCap-r18 PosSRS-TxFrequencyHoppingRRC-Inactive-r18 OPTIONAL,

 -- R1 41-4-8: Support of Positioning SRS bandwidth aggregation in RRC\_INACTIVE

 posSRS-BWA-RRC-Inactive-r18 PosSRS-BWA-RRC-Inactive-r18 OPTIONAL

 ]]

}

BandNR-v16c0 ::= SEQUENCE {

 pusch-RepetitionTypeA-v16c0 ENUMERATED {supported} OPTIONAL,

 ...

}

LowerMSD-r18 ::= SEQUENCE {

 aggressorband1-r18 FreqBandIndicatorNR,

 aggressorband2-r18 FreqBandIndicatorNR OPTIONAL,

 msd-Information-r18 SEQUENCE (SIZE (1..maxLowerMSDInfo-r18)) OF MSD-Information-r18

}

MSD-Information-r18 ::= SEQUENCE {

 msd-Type-r18 ENUMERATED {harmonic, harmonicMixing, crossBandIsolation, imd2, imd3, imd4, imd5, all, spare8, spare7,

 spare6, spare5,spare4, spare3, spare2, spare1},

 msd-PowerClass-r18 ENUMERATED {pc1dot5, pc2, pc3},

 msd-Class-r18 ENUMERATED {classI, classII, classIII, classIV, classV, classVI, classVII, classVIII }

}

-- Editor note: The power class related part can be updated further pending RAN4 discussion.

-- TAG-RF-PARAMETERS-STOP

-- ASN1STOP

|  |
| --- |
| *RF-Parameters* field descriptions |
| ***appliedFreqBandListFilter***In this field the UE mirrors the *FreqBandList* that the NW provided in the capability enquiry, if any, as described in clause 5.6.1.4. The UE filtered the band combinations in the *supportedBandCombinationList* in accordance with this *appliedFreqBandListFilter*. The UE does not include this field if the UE capability is requested by E-UTRAN and the network request includes the field *eutra-nr-only* [10]. |
| ***supportedBandCombinationList***A list of band combinations that the UE supports for NR (and NR-DC, if requested). The *FeatureSetCombinationId*:s in this list refer to the *FeatureSetCombination* entries in the *featureSetCombinations* list in the *UE-NR-Capability* IE. The UE does not include this field if the UE capability is requested by E-UTRAN and the network request includes the field *eutra-nr-only* [10]. |
| ***supportedBandCombinationListSidelinkEUTRA-NR***A list of band combinations that the UE supports for NR sidelink communication only, for joint NR sidelink communication and V2X sidelink communication, or for V2X sidelink communication only. The UE does not include this field if the UE capability is requested by E-UTRAN (see TS 36.331[10]) and the network request includes the field *eutra-nr-only*. |
| ***supportedBandCombinationListSL-NonRelayDiscovery***A list of band combinations that the UE supports for NR sidelink non-relay discovery. The encoding is defined in PC5 *BandCombinationListSidelinkNR-r16.* |
| ***supportedBandCombinationListSL-RelayDiscovery***A list of band combinations that the UE supports for NR sidelink relay discovery. The encoding is defined in PC5 *BandCombinationListSidelinkNR-r16.* |
| ***supportedBandCombinationListSL-U2U-DiscoveryExt***This field indicates the band parameter in *BandCombinationListSL-Discovery-r17* that the UE supports for NR U2U sidelink relay discovery in a band included in *supportedBandCombinationListSL-U2U-RelayDiscovery*. |
| ***supportedBandCombinationListSL-U2U-RelayDiscovery***A list of band combinations that the UE supports for NR U2U sidelink relay discovery. The encoding is defined in PC5 *BandCombinationListSidelinkNR-r16.* |
| ***supportedBandCombinationList-UplinkTxSwitch***A list of band combinations that the UE supports dynamic uplink Tx switching for NR UL CA and SUL. The *FeatureSetCombinationId*:s in this list refer to the *FeatureSetCombination* entries in the *featureSetCombinations* list in the *UE-NR-Capability* IE. The UE does not include this field if the UE capability is requested by E-UTRAN and the network request includes the field *eutra-nr-only* [10]. |
| ***supportedBandListNR***A list of NR bands supported by the UE. If *supportedBandListNR-v16c0* is included, the UE shall include the same number of entries, and listed in the same order, as in *supportedBandListNR* (without suffix). |

#### – *RF-ParametersMRDC*

The IE *RF-ParametersMRDC* is used to convey RF related capabilities for MR-DC.

*RF-ParametersMRDC* information element

-- ASN1START

-- TAG-RF-PARAMETERSMRDC-START

RF-ParametersMRDC ::= SEQUENCE {

 supportedBandCombinationList BandCombinationList OPTIONAL,

 appliedFreqBandListFilter FreqBandList OPTIONAL,

 ...,

 [[

 srs-SwitchingTimeRequested ENUMERATED {true} OPTIONAL,

 supportedBandCombinationList-v1540 BandCombinationList-v1540 OPTIONAL

 ]],

 [[

 supportedBandCombinationList-v1550 BandCombinationList-v1550 OPTIONAL

 ]],

 [[

 supportedBandCombinationList-v1560 BandCombinationList-v1560 OPTIONAL,

 supportedBandCombinationListNEDC-Only BandCombinationList OPTIONAL

 ]],

 [[

 supportedBandCombinationList-v1570 BandCombinationList-v1570 OPTIONAL

 ]],

 [[

 supportedBandCombinationList-v1580 BandCombinationList-v1580 OPTIONAL

 ]],

 [[

 supportedBandCombinationList-v1590 BandCombinationList-v1590 OPTIONAL

 ]],

 [[

 supportedBandCombinationListNEDC-Only-v15a0 SEQUENCE {

 supportedBandCombinationList-v1540 BandCombinationList-v1540 OPTIONAL,

 supportedBandCombinationList-v1560 BandCombinationList-v1560 OPTIONAL,

 supportedBandCombinationList-v1570 BandCombinationList-v1570 OPTIONAL,

 supportedBandCombinationList-v1580 BandCombinationList-v1580 OPTIONAL,

 supportedBandCombinationList-v1590 BandCombinationList-v1590 OPTIONAL

 } OPTIONAL

 ]],

 [[

 supportedBandCombinationList-v1610 BandCombinationList-v1610 OPTIONAL,

 supportedBandCombinationListNEDC-Only-v1610 BandCombinationList-v1610 OPTIONAL,

 supportedBandCombinationList-UplinkTxSwitch-r16 BandCombinationList-UplinkTxSwitch-r16 OPTIONAL

 ]],

 [[

 supportedBandCombinationList-v1630 BandCombinationList-v1630 OPTIONAL,

 supportedBandCombinationListNEDC-Only-v1630 BandCombinationList-v1630 OPTIONAL,

 supportedBandCombinationList-UplinkTxSwitch-v1630 BandCombinationList-UplinkTxSwitch-v1630 OPTIONAL

 ]],

 [[

 supportedBandCombinationList-v1640 BandCombinationList-v1640 OPTIONAL,

 supportedBandCombinationListNEDC-Only-v1640 BandCombinationList-v1640 OPTIONAL,

 supportedBandCombinationList-UplinkTxSwitch-v1640 BandCombinationList-UplinkTxSwitch-v1640 OPTIONAL

 ]],

 [[

 supportedBandCombinationList-UplinkTxSwitch-v1670 BandCombinationList-UplinkTxSwitch-v1670 OPTIONAL

 ]],

 [[

 supportedBandCombinationList-v1700 BandCombinationList-v1700 OPTIONAL,

 supportedBandCombinationList-UplinkTxSwitch-v1700 BandCombinationList-UplinkTxSwitch-v1700 OPTIONAL

 ]],

 [[

 supportedBandCombinationList-v1720 BandCombinationList-v1720 OPTIONAL,

 supportedBandCombinationListNEDC-Only-v1720 SEQUENCE {

 supportedBandCombinationList-v1700 BandCombinationList-v1700 OPTIONAL,

 supportedBandCombinationList-v1720 BandCombinationList-v1720 OPTIONAL

 } OPTIONAL,

 supportedBandCombinationList-UplinkTxSwitch-v1720 BandCombinationList-UplinkTxSwitch-v1720 OPTIONAL

 ]],

 [[

 supportedBandCombinationList-v1730 BandCombinationList-v1730 OPTIONAL,

 supportedBandCombinationListNEDC-Only-v1730 BandCombinationList-v1730 OPTIONAL,

 supportedBandCombinationList-UplinkTxSwitch-v1730 BandCombinationList-UplinkTxSwitch-v1730 OPTIONAL

 ]],

 [[

 supportedBandCombinationList-v1740 BandCombinationList-v1740 OPTIONAL,

 supportedBandCombinationListNEDC-Only-v1740 BandCombinationList-v1740 OPTIONAL,

 supportedBandCombinationList-UplinkTxSwitch-v1740 BandCombinationList-UplinkTxSwitch-v1740 OPTIONAL

 ]],

 [[

 supportedBandCombinationList-v1770 BandCombinationList-v1770 OPTIONAL,

 supportedBandCombinationList-UplinkTxSwitch-v1770 BandCombinationList-UplinkTxSwitch-v1770 OPTIONAL

 ]],

 [[

 supportedBandCombinationList-v1800 BandCombinationList-v1800 OPTIONAL,

 supportedBandCombinationList-UplinkTxSwitch-v1800 BandCombinationList-v1800 OPTIONAL

 ]]

}

RF-ParametersMRDC-v15g0 ::= SEQUENCE {

 supportedBandCombinationList-v15g0 BandCombinationList-v15g0 OPTIONAL,

 supportedBandCombinationListNEDC-Only-v15g0 BandCombinationList-v15g0 OPTIONAL

}

RF-ParametersMRDC-v15n0 ::= SEQUENCE {

supportedBandCombinationList-v15n0 BandCombinationList-v15n0 OPTIONAL

}

RF-ParametersMRDC-v16e0 ::= SEQUENCE {

supportedBandCombinationList-UplinkTxSwitch-v16e0 BandCombinationList-UplinkTxSwitch-v16e0 OPTIONAL

}

-- TAG-RF-PARAMETERSMRDC-STOP

-- ASN1STOP

|  |
| --- |
| *RF-ParametersMRDC* field descriptions |
| ***appliedFreqBandListFilter***In this field the UE mirrors the *FreqBandList* that the NW provided in the capability enquiry, if any. The UE filtered the band combinations in the *supportedBandCombinationList* in accordance with this *appliedFreqBandListFilter*. |
| ***supportedBandCombinationList***A list of band combinations that the UE supports for (NG)EN-DC, or both (NG)EN-DC and NE-DC. The *FeatureSetCombinationId*:s in this list refer to the *FeatureSetCombination* entries in the *featureSetCombinations* list in the *UE-MRDC-Capability* IE. |
| ***supportedBandCombinationListNEDC-Only, supportedBandCombinationListNEDC-Only-v1610***A list of band combinations that the UE supports only for NE-DC. The *FeatureSetCombinationId*:s in this list refer to the *FeatureSetCombination* entries in the *featureSetCombinations* list in the *UE-MRDC-Capability* IE. |
| ***supportedBandCombinationList-UplinkTxSwitch***A list of band combinations that the UE supports dynamic UL Tx switching for (NG)EN-DC. The *FeatureSetCombinationId*:s in this list refer to the *FeatureSetCombination* entries in the *featureSetCombinations* list in the *UE-MRDC-Capability* IE. |

#### – *RLC-Parameters*

The IE *RLC-Parameters* is used to convey capabilities related to RLC.

*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,

 ...,

 [[

 extendedT-PollRetransmit-r16 ENUMERATED {supported} OPTIONAL,

 extendedT-StatusProhibit-r16 ENUMERATED {supported} OPTIONAL

 ]],

 [[

 am-WithLongSN-RedCap-r17 ENUMERATED {supported} OPTIONAL

 ]],

 [[

 am-WithLongSN-NCR-r18 ENUMERATED {supported} OPTIONAL

 ]]

}

-- TAG-RLC-PARAMETERS-STOP

-- ASN1STOP

#### – *SDAP-Parameters*

The IE *SDAP-Parameters* is used to convey capabilities related to SDAP.

*SDAP-Parameters* information element

-- ASN1START

-- TAG-SDAP-PARAMETERS-START

SDAP-Parameters ::= SEQUENCE {

 as-ReflectiveQoS ENUMERATED {true} OPTIONAL,

 ...,

 [[

 sdap-QOS-IAB-r16 ENUMERATED {supported} OPTIONAL,

 sdapHeaderIAB-r16 ENUMERATED {supported} OPTIONAL

 ]],

 [[

 sdap-QOS-NCR-r18 ENUMERATED {supported} OPTIONAL,

 sdap-HeaderNCR-r18 ENUMERATED {supported} OPTIONAL

 ]]

}

-- TAG-SDAP-PARAMETERS-STOP

-- ASN1STOP

#### – *SharedSpectrumChAccessParamsPerBand*

The IE *SharedSpectrumChAccessParamsPerBand* is used to convey shared channel access related parameters specific for a certain frequency band (not per feature set or band combination).

*SharedSpectrumChAccessParamsPerBand* information element

-- ASN1START

-- TAG-SHAREDSPECTRUMCHACCESSPARAMSPERBAND-START

SharedSpectrumChAccessParamsPerBand-r16 ::= SEQUENCE {

 -- R1 10-1: UL channel access for dynamic channel access mode

 ul-DynamicChAccess-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 10-1a: UL channel access for semi-static channel access mode

 ul-Semi-StaticChAccess-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 10-2: SSB-based RRM for dynamic channel access mode

 ssb-RRM-DynamicChAccess-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 10-2a: SSB-based RRM for semi-static channel access mode

 ssb-RRM-Semi-StaticChAccess-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 10-2b: MIB reading on unlicensed cell

 mib-Acquisition-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 10-2c: SSB-based RLM for dynamic channel access mode

 ssb-RLM-DynamicChAccess-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 10-2d: SSB-based RLM for semi-static channel access mode

 ssb-RLM-Semi-StaticChAccess-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 10-2e: SIB1 reception on unlicensed cell

 sib1-Acquisition-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 10-2f: Support monitoring of extended RAR window

 extRA-ResponseWindow-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 10-2g: SSB-based BFD/CBD for dynamic channel access mode

 ssb-BFD-CBD-dynamicChannelAccess-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 10-2h: SSB-based BFD/CBD for semi-static channel access mode

 ssb-BFD-CBD-semi-staticChannelAccess-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 10-2i: CSI-RS-based BFD/CBD for NR-U

 csi-RS-BFD-CBD-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 10-7: UL channel access for 10 MHz SCell

 ul-ChannelBW-SCell-10mhz-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 10-10: RSSI and channel occupancy measurement and reporting

 rssi-ChannelOccupancyReporting-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 10-11:SRS starting position at any OFDM symbol in a slot

 srs-StartAnyOFDM-Symbol-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 10-20: Support search space set configuration with freqMonitorLocation-r16

 searchSpaceFreqMonitorLocation-r16 INTEGER (1..5) OPTIONAL,

 -- R1 10-20a: Support coreset configuration with rb-Offset

 coreset-RB-Offset-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 10-23:CGI reading on unlicensed cell for ANR functionality

 cgi-Acquisition-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 10-25: Enable configured UL transmissions when DCI 2\_0 is configured but not detected

 configuredUL-Tx-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 10-27: Wideband PRACH

 prach-Wideband-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 10-29: Support available RB set indicator field in DCI 2\_0

 dci-AvailableRB-Set-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 10-30: Support channel occupancy duration indicator field in DCI 2\_0

 dci-ChOccupancyDuration-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 10-8: Type B PDSCH length {3, 5, 6, 8, 9, 10, 11, 12, 13} without DMRS shift due to CRS collision

 typeB-PDSCH-length-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 10-9: Search space set group switching with explicit DCI 2\_0 bit field trigger or with implicit PDCCH decoding with DCI 2\_0 monitoring

 searchSpaceSwitchWithDCI-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 10-9b: Search space set group switching with implicit PDCCH decoding without DCI 2\_0 monitoring

 searchSpaceSwitchWithoutDCI-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 10-9d: Support Search space set group switching capability 2

 searchSpaceSwitchCapability2-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 10-14: Non-numerical PDSCH to HARQ-ACK timing

 non-numericalPDSCH-HARQ-timing-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 10-15: Enhanced dynamic HARQ codebook

 enhancedDynamicHARQ-codebook-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 10-16: One-shot HARQ ACK feedback

 oneShotHARQ-feedback-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 10-17: Multi-PUSCH UL grant

 multiPUSCH-UL-grant-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 10-26: CSI-RS based RLM for NR-U

 csi-RS-RLM-r16 ENUMERATED {supported} OPTIONAL,

 dummy ENUMERATED {supported} OPTIONAL,

 -- R1 10-31: Support of P/SP-CSI-RS reception with CSI-RS-ValidationWith-DCI-r16 configured

 periodicAndSemi-PersistentCSI-RS-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 10-3: PRB interlace mapping for PUSCH

 pusch-PRB-interlace-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 10-3a: PRB interlace mapping for PUCCH

 pucch-F0-F1-PRB-Interlace-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 10-12: OCC for PRB interlace mapping for PF2 and PF3

 occ-PRB-PF2-PF3-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 10-13a: Extended CP range of more than one symbol for CG-PUSCH

 extCP-rangeCG-PUSCH-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 10-18: Configured grant with retransmission in CG resources

 configuredGrantWithReTx-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 10-21a: Support using ED threshold given by gNB for UL to DL COT sharing

 ed-Threshold-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 10-21b: Support UL to DL COT sharing

 ul-DL-COT-Sharing-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 10-24: CG-UCI multiplexing with HARQ ACK

 mux-CG-UCI-HARQ-ACK-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 10-28: Configured grant with Rel-16 enhanced resource configuration

 cg-resourceConfig-r16 ENUMERATED {supported} OPTIONAL

}

SharedSpectrumChAccessParamsPerBand-v1630 ::= SEQUENCE {

 -- R4 4-1: DL reception in intra-carrier guardband

 dl-ReceptionIntraCellGuardband-r16 ENUMERATED {supported} OPTIONAL,

 -- R4 4-2: DL reception when gNB does not transmit on all RB sets of a carrier as a result of LBT

 dl-ReceptionLBT-subsetRB-r16 ENUMERATED {supported} OPTIONAL

}

SharedSpectrumChAccessParamsPerBand-v1640 ::= SEQUENCE {

 -- 10-26b(1-4): CSI-RS based RRM measurement with associated SS-block

 csi-RSRP-AndRSRQ-MeasWithSSB-r16 ENUMERATED {supported} OPTIONAL,

 -- 10-26c(1-5): CSI-RS based RRM measurement without associated SS-block

 csi-RSRP-AndRSRQ-MeasWithoutSSB-r16 ENUMERATED {supported} OPTIONAL,

 -- 10-26d(1-6): CSI-RS based RS-SINR measurement

 csi-SINR-Meas-r16 ENUMERATED {supported} OPTIONAL,

 -- 10-26e(1-8): RLM based on a mix of SS block and CSI-RS signals within active BWP

 ssb-AndCSI-RS-RLM-r16 ENUMERATED {supported} OPTIONAL,

 -- 10-26f(1-9): CSI-RS based contention free RA for HO

 csi-RS-CFRA-ForHO-r16 ENUMERATED {supported} OPTIONAL

}

SharedSpectrumChAccessParamsPerBand-v1650 ::= SEQUENCE {

 -- Extension of R1 10-9 capability to configure up to 16 instead of 4 cells or cell groups, respectively

 extendedSearchSpaceSwitchWithDCI-r16 ENUMERATED {supported} OPTIONAL

}

SharedSpectrumChAccessParamsPerBand-v1710 ::= SEQUENCE {

 -- R1 25-12: UE initiated semi-static channel occupancy with dependent configurations

 ul-Semi-StaticChAccessDependentConfig-r17 ENUMERATED {supported} OPTIONAL,

 -- R1 25-13: UE initiated semi-static channel occupancy with independent configurations

 ul-Semi-StaticChAccessIndependentConfig-r17 ENUMERATED {supported} OPTIONAL

}

-- TAG-SHAREDSPECTRUMCHACCESSPARAMSPERBAND-STOP

-- ASN1STOP

#### – *SidelinkParameters*

The IE *SidelinkParameters* is used to convey capabilities related to NR and V2X sidelink communications.

*SidelinkParameters* information element

-- ASN1START

-- TAG-SIDELINKPARAMETERS-START

SidelinkParameters-r16 ::= SEQUENCE {

 sidelinkParametersNR-r16 SidelinkParametersNR-r16 OPTIONAL,

 sidelinkParametersEUTRA-r16 SidelinkParametersEUTRA-r16 OPTIONAL

}

SidelinkParametersNR-r16 ::= SEQUENCE {

 rlc-ParametersSidelink-r16 RLC-ParametersSidelink-r16 OPTIONAL,

 mac-ParametersSidelink-r16 MAC-ParametersSidelink-r16 OPTIONAL,

 fdd-Add-UE-Sidelink-Capabilities-r16 UE-SidelinkCapabilityAddXDD-Mode-r16 OPTIONAL,

 tdd-Add-UE-Sidelink-Capabilities-r16 UE-SidelinkCapabilityAddXDD-Mode-r16 OPTIONAL,

 supportedBandListSidelink-r16 SEQUENCE (SIZE (1..maxBands)) OF BandSidelink-r16 OPTIONAL,

 ...,

 [[

 relayParameters-r17 RelayParameters-r17 OPTIONAL

 ]],

 [[

 -- R1 32-x: Use of new P0 parameters for open loop power control

 p0-OLPC-Sidelink-r17 ENUMERATED {supported} OPTIONAL

 ]],

 [[

 pdcp-ParametersSidelink-r18 PDCP-ParametersSidelink-r18 OPTIONAL

 ]]

}

SidelinkParametersEUTRA-r16 ::= SEQUENCE {

 sl-ParametersEUTRA1-r16 OCTET STRING OPTIONAL,

 sl-ParametersEUTRA2-r16 OCTET STRING OPTIONAL,

 sl-ParametersEUTRA3-r16 OCTET STRING OPTIONAL,

 supportedBandListSidelinkEUTRA-r16 SEQUENCE (SIZE (1..maxBandsEUTRA)) OF BandSidelinkEUTRA-r16 OPTIONAL,

 ...

}

RLC-ParametersSidelink-r16 ::= SEQUENCE {

 am-WithLongSN-Sidelink-r16 ENUMERATED {supported} OPTIONAL,

 um-WithLongSN-Sidelink-r16 ENUMERATED {supported} OPTIONAL,

 ...

}

MAC-ParametersSidelink-r16 ::= SEQUENCE {

 mac-ParametersSidelinkCommon-r16 MAC-ParametersSidelinkCommon-r16 OPTIONAL,

 mac-ParametersSidelinkXDD-Diff-r16 MAC-ParametersSidelinkXDD-Diff-r16 OPTIONAL,

 ...

}

UE-SidelinkCapabilityAddXDD-Mode-r16 ::= SEQUENCE {

 mac-ParametersSidelinkXDD-Diff-r16 MAC-ParametersSidelinkXDD-Diff-r16 OPTIONAL

}

MAC-ParametersSidelinkCommon-r16 ::= SEQUENCE {

 lcp-RestrictionSidelink-r16 ENUMERATED {supported} OPTIONAL,

 multipleConfiguredGrantsSidelink-r16 ENUMERATED {supported} OPTIONAL,

 ...,

 [[

 drx-OnSidelink-r17 ENUMERATED {supported} OPTIONAL

 ]],

 [[

 sl-LBT-FailureDectectionRecovery-r18 ENUMERATED {supported} OPTIONAL

 ]]

}

MAC-ParametersSidelinkXDD-Diff-r16 ::= SEQUENCE {

 multipleSR-ConfigurationsSidelink-r16 ENUMERATED {supported} OPTIONAL,

 logicalChannelSR-DelayTimerSidelink-r16 ENUMERATED {supported} OPTIONAL,

 ...

}

BandSidelinkEUTRA-r16 ::= SEQUENCE {

 freqBandSidelinkEUTRA-r16 FreqBandIndicatorEUTRA,

 -- R1 15-7: Transmitting LTE sidelink mode 3 scheduled by NR Uu

 gnb-ScheduledMode3SidelinkEUTRA-r16 SEQUENCE {

 gnb-ScheduledMode3DelaySidelinkEUTRA-r16 ENUMERATED {ms0, ms0dot25, ms0dot5, ms0dot625, ms0dot75, ms1,

 ms1dot25, ms1dot5, ms1dot75, ms2, ms2dot5, ms3, ms4,

 ms5, ms6, ms8, ms10, ms20}

 } OPTIONAL,

 -- R1 15-9: Transmitting LTE sidelink mode 4 configured by NR Uu

 gnb-ScheduledMode4SidelinkEUTRA-r16 ENUMERATED {supported} OPTIONAL

}

BandSidelink-r16 ::= SEQUENCE {

 freqBandSidelink-r16 FreqBandIndicatorNR,

 --15-1

 sl-Reception-r16 SEQUENCE {

 harq-RxProcessSidelink-r16 ENUMERATED {n16, n24, n32, n48, n64},

 pscch-RxSidelink-r16 ENUMERATED {value1, value2},

 scs-CP-PatternRxSidelink-r16 CHOICE {

 fr1-r16 SEQUENCE {

 scs-15kHz-r16 BIT STRING (SIZE (16)) OPTIONAL,

 scs-30kHz-r16 BIT STRING (SIZE (16)) OPTIONAL,

 scs-60kHz-r16 BIT STRING (SIZE (16)) OPTIONAL

 },

 fr2-r16 SEQUENCE {

 scs-60kHz-r16 BIT STRING (SIZE (16)) OPTIONAL,

 scs-120kHz-r16 BIT STRING (SIZE (16)) OPTIONAL

 }

 } OPTIONAL,

 extendedCP-RxSidelink-r16 ENUMERATED {supported} OPTIONAL

 } OPTIONAL,

 --15-2

 sl-TransmissionMode1-r16 SEQUENCE {

 harq-TxProcessModeOneSidelink-r16 ENUMERATED {n8, n16},

 scs-CP-PatternTxSidelinkModeOne-r16 CHOICE {

 fr1-r16 SEQUENCE {

 scs-15kHz-r16 BIT STRING (SIZE (16)) OPTIONAL,

 scs-30kHz-r16 BIT STRING (SIZE (16)) OPTIONAL,

 scs-60kHz-r16 BIT STRING (SIZE (16)) OPTIONAL

 },

 fr2-r16 SEQUENCE {

 scs-60kHz-r16 BIT STRING (SIZE (16)) OPTIONAL,

 scs-120kHz-r16 BIT STRING (SIZE (16)) OPTIONAL

 }

 },

 extendedCP-TxSidelink-r16 ENUMERATED {supported} OPTIONAL,

 harq-ReportOnPUCCH-r16 ENUMERATED {supported} OPTIONAL

 } OPTIONAL,

 --15-4

 sync-Sidelink-r16 SEQUENCE {

 gNB-Sync-r16 ENUMERATED {supported} OPTIONAL,

 gNB-GNSS-UE-SyncWithPriorityOnGNB-ENB-r16 ENUMERATED {supported} OPTIONAL,

 gNB-GNSS-UE-SyncWithPriorityOnGNSS-r16 ENUMERATED {supported} OPTIONAL

 } OPTIONAL,

 --15-10

 sl-Tx-256QAM-r16 ENUMERATED {supported} OPTIONAL,

 --15-11

 psfch-FormatZeroSidelink-r16 SEQUENCE {

 psfch-RxNumber ENUMERATED {n5, n15, n25, n32, n35, n45, n50, n64},

 psfch-TxNumber ENUMERATED {n4, n8, n16}

 } OPTIONAL,

 --15-12

 lowSE-64QAM-MCS-TableSidelink-r16 ENUMERATED {supported} OPTIONAL,

 --15-15

 enb-sync-Sidelink-r16 ENUMERATED {supported} OPTIONAL,

 ...,

 [[

 --15-3

 sl-TransmissionMode2-r16 SEQUENCE {

 harq-TxProcessModeTwoSidelink-r16 ENUMERATED {n8, n16},

 scs-CP-PatternTxSidelinkModeTwo-r16 ENUMERATED {supported} OPTIONAL,

 dl-openLoopPC-Sidelink-r16 ENUMERATED {supported} OPTIONAL

 } OPTIONAL,

 --15-5

 congestionControlSidelink-r16 SEQUENCE {

 cbr-ReportSidelink-r16 ENUMERATED {supported} OPTIONAL,

 cbr-CR-TimeLimitSidelink-r16 ENUMERATED {time1, time2}

 } OPTIONAL,

 --15-22

 fewerSymbolSlotSidelink-r16 ENUMERATED {supported} OPTIONAL,

 --15-23

 sl-openLoopPC-RSRP-ReportSidelink-r16 ENUMERATED {supported} OPTIONAL,

 --13-1

 sl-Rx-256QAM-r16 ENUMERATED {supported} OPTIONAL

 ]],

 [[

 ue-PowerClassSidelink-r16 ENUMERATED {pc2, pc3, spare6, spare5, spare4, spare3, spare2, spare1}

 OPTIONAL

 ]],

 [[

 --32-4a

 sl-TransmissionMode2-RandomResourceSelection-r17 SEQUENCE {

 harq-TxProcessModeTwoSidelink-r17 ENUMERATED {n8, n16},

 scs-CP-PatternTxSidelinkModeTwo-r17 CHOICE {

 fr1-r17 SEQUENCE {

 scs-15kHz-r17 BIT STRING (SIZE (16)) OPTIONAL,

 scs-30kHz-r17 BIT STRING (SIZE (16)) OPTIONAL,

 scs-60kHz-r17 BIT STRING (SIZE (16)) OPTIONAL

 },

 fr2-r17 SEQUENCE {

 scs-60kHz-r17 BIT STRING (SIZE (16)) OPTIONAL,

 scs-120kHz-r17 BIT STRING (SIZE (16)) OPTIONAL

 }

 } OPTIONAL,

 extendedCP-Mode2Random-r17 ENUMERATED {supported} OPTIONAL,

 dl-openLoopPC-Sidelink-r17 ENUMERATED {supported} OPTIONAL

 } OPTIONAL,

 --32-4b

 sync-Sidelink-v1710 SEQUENCE {

 sync-GNSS-r17 ENUMERATED {supported} OPTIONAL,

 gNB-Sync-r17 ENUMERATED {supported} OPTIONAL,

 gNB-GNSS-UE-SyncWithPriorityOnGNB-ENB-r17 ENUMERATED {supported} OPTIONAL,

 gNB-GNSS-UE-SyncWithPriorityOnGNSS-r17 ENUMERATED {supported} OPTIONAL

 } OPTIONAL,

 --32-4c

 enb-sync-Sidelink-v1710 ENUMERATED {supported} OPTIONAL,

 --32-5a-2

 rx-IUC-Scheme1-PreferredMode2Sidelink-r17 ENUMERATED {supported} OPTIONAL,

 --32-5a-3

 rx-IUC-Scheme1-NonPreferredMode2Sidelink-r17 ENUMERATED {supported} OPTIONAL,

 --32-5b-2

 rx-IUC-Scheme2-Mode2Sidelink-r17 ENUMERATED {n5, n15, n25, n32, n35, n45, n50, n64} OPTIONAL,

 --32-6-1

 rx-IUC-Scheme1-SCI-r17 ENUMERATED {supported} OPTIONAL,

 --32-6-2

 rx-IUC-Scheme1-SCI-ExplicitReq-r17 ENUMERATED {supported} OPTIONAL

 ]],

 [[

 -- R4 45-2: SL reception in intra-carrier guard band

 sl-ReceptionIntraCarrierGuardBand-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 41-1-2: Receiving SL-PRS in a shared resource pool

 sl-PRS-RxInSharedResourcePool-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 41-1-3: Receiving SL-PRS in a dedicated resource pool

 sl-PRS-RxInDedicatedResourcePool-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 41-1-4a: Transmitting SL-PRS in a shared resource pool

 sl-PRS-TxInSharedResourcePool-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 41-1-4b: Transmitting SL-PRS scheme 1 in a dedicated resource pool

 sl-PRS-TxScheme1-InDedicatedResourcePool-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 41-1-4c: Transmitting SL-PRS mode 2 in a dedicated resource pool

 sl-PRS-TxScheme2-InDedicatedResourcePool-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 41-1-5: SL-PRS congestion control in a dedicated resource pool

 sl-PRS-CongestionCtrl-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 41-1-8: Support of random selection in a dedicated resource pool

 sl-PRS-TxRandomSelection-r18 ENUMERATED {supported} OPTIONAL,

 -- R1 41-1-17: Open loop SL pathloss based power control for SL-PRS and associated PSCCH and SL RSRP report for dedicated resource pool

 sl-PathlossBasedOLPC-SL-RSRP-Report-r18 ENUMERATED {supported} OPTIONAL

 ]]

}

RelayParameters-r17 ::= SEQUENCE {

 relayUE-Operation-L2-r17 ENUMERATED {supported} OPTIONAL,

 remoteUE-Operation-L2-r17 ENUMERATED {supported} OPTIONAL,

 remoteUE-PathSwitchToIdleInactiveRelay-r17 ENUMERATED {supported} OPTIONAL,

 ...,

 [[

 relayUE-U2U-OperationL2-r18 ENUMERATED {supported} OPTIONAL,

 remoteUE-U2U-OperationL2-r18 ENUMERATED {supported} OPTIONAL,

 remoteUE-U2N-PathSwitchOperationL2-r18 ENUMERATED {supported} OPTIONAL,

 multipathRemoteUE-PC5L2-r18 ENUMERATED {supported} OPTIONAL,

 multipathRelayUE-PC5L2-r18 ENUMERATED {supported} OPTIONAL,

 multipathRelayUE-N3C-r18 ENUMERATED {supported} OPTIONAL,

 multipathRemoteUE-N3C-r18 ENUMERATED {supported} OPTIONAL,

 remoteUE-IndirectPathAddChangeToIdleInactiveRelay-r18 ENUMERATED {supported} OPTIONAL,

 pdcp-DuplicationMoreThanOneUuRLC-r18 ENUMERATED {supported} OPTIONAL

 ]]

}

PDCP-ParametersSidelink-r18 ::= SEQUENCE {

 pdcp-DuplicationSRB-sidelink-r18 ENUMERATED {supported} OPTIONAL,

 pdcp-DuplicationDRB-sidelink-r18 ENUMERATED {supported} OPTIONAL,

 ...

}

-- TAG-SIDELINKPARAMETERS-STOP

-- ASN1STOP

|  |
| --- |
| *SidelinkParametersEUTRA* field descriptions |
| ***sl-ParametersEUTRA1, sl-ParametersEUTRA2, sl-ParametersEUTRA3***This field includes IE of *SL-Parameters-v1430* (where *v2x-eNB-Scheduled-r14* and *V2X-SupportedBandCombination-r14* shall not be included), *SL-Parameters-v1530* (where *V2X-SupportedBandCombination-r1530* shall not be included) and *SL-Parameters-v1540* respectively defined in 36.331 [10]. It is used for reporting the per-UE capability for V2X sidelink communication. |

#### – *SimultaneousRxTxPerBandPair*

The IE *SimultaneousRxTxPerBandPair* contains the simultaneous Rx/Tx UE capability for each band pair in a band combination.

***SimultaneousRxTxPerBandPair* information element**

-- ASN1START

-- TAG-SIMULTANEOUSRXTXPERBANDPAIR-START

SimultaneousRxTxPerBandPair ::= BIT STRING (SIZE (3..496))

-- TAG-SIMULTANEOUSRXTXPERBANDPAIR-STOP

-- ASN1STOP

#### – *SON-Parameters*

The IE *SON-Parameters* contains SON related parameters.

*SON-Parameters* information element

-- ASN1START

-- TAG-SON-PARAMETERS-START

SON-Parameters-r16 ::= SEQUENCE {

 rach-Report-r16 ENUMERATED {supported} OPTIONAL,

 ...,

 [[

 rlfReportCHO-r17 ENUMERATED {supported} OPTIONAL,

 rlfReportDAPS-r17 ENUMERATED {supported} OPTIONAL,

 success-HO-Report-r17 ENUMERATED {supported} OPTIONAL,

 twoStepRACH-Report-r17 ENUMERATED {supported} OPTIONAL,

 pscell-MHI-Report-r17 ENUMERATED {supported} OPTIONAL,

 onDemandSI-Report-r17 ENUMERATED {supported} OPTIONAL

 ]],

 [[

 spr-Report-r18 ENUMERATED {supported} OPTIONAL,

 successIRAT-HO-Report-r18 ENUMERATED {supported} OPTIONAL

 ]]

}

-- TAG-SON-PARAMETERS-STOP

-- ASN1STOP

#### – *SpatialRelationsSRS-Pos*

The IE *SpatialRelationsSRS-Pos* is used to convey spatial relation for SRS for positioning related parameters.

*SpatialRelationsSRS-Pos* information element

-- ASN1START

-- TAG-SPATIALRELATIONSSRS-POS-START

SpatialRelationsSRS-Pos-r16 ::= SEQUENCE {

 spatialRelation-SRS-PosBasedOnSSB-Serving-r16 ENUMERATED {supported} OPTIONAL,

 spatialRelation-SRS-PosBasedOnCSI-RS-Serving-r16 ENUMERATED {supported} OPTIONAL,

 spatialRelation-SRS-PosBasedOnPRS-Serving-r16 ENUMERATED {supported} OPTIONAL,

 spatialRelation-SRS-PosBasedOnSRS-r16 ENUMERATED {supported} OPTIONAL,

 spatialRelation-SRS-PosBasedOnSSB-Neigh-r16 ENUMERATED {supported} OPTIONAL,

 spatialRelation-SRS-PosBasedOnPRS-Neigh-r16 ENUMERATED {supported} OPTIONAL

}

--TAG-SPATIALRELATIONSSRS-POS-STOP

-- ASN1STOP

#### – *SRS-AllPosResourcesRRC-Inactive*

The IE *SRS-AllPosResourcesRRC-Inactive* is used to convey SRS positioning related parameters specific for a certain band.

*SRS-AllPosResourcesRRC-Inactive* information element

-- ASN1START

-- TAG-SRS-ALLPOSRESOURCESRRC-INACTIVE-START

SRS-AllPosResourcesRRC-Inactive-r17 ::= SEQUENCE {

 srs-PosResourcesRRC-Inactive-r17 SEQUENCE {

 -- R1 27-15: Positioning SRS transmission in RRC\_INACTIVE state for initial UL BWP

 maxNumberSRS-PosResourceSetPerBWP-r17 ENUMERATED {n1, n2, n4, n8, n12, n16},

 maxNumberSRS-PosResourcesPerBWP-r17 ENUMERATED {n1, n2, n4, n8, n16, n32, n64},

 maxNumberSRS-ResourcesPerBWP-PerSlot-r17 ENUMERATED {n1, n2, n3, n4, n5, n6, n8, n10, n12, n14},

 maxNumberPeriodicSRS-PosResourcesPerBWP-r17 ENUMERATED {n1, n2, n4, n8, n16, n32, n64},

 maxNumberPeriodicSRS-PosResourcesPerBWP-PerSlot-r17 ENUMERATED {n1, n2, n3, n4, n5, n6, n8, n10, n12, n14},

 dummy1 ENUMERATED {n1, n2, n4, n8, n16, n32, n64 },

 dummy2 ENUMERATED {n1, n2, n3, n4, n5, n6, n8, n10, n12, n14}

 }

}

-- TAG-SRS-ALLPOSRESOURCESRRC-INACTIVE-STOP

-- ASN1STOP

|  |
| --- |
| *SRS-AllPosResourcesRRC-Inactive* field descriptions |
| ***dummy1, dummy2***The fields are not used in the specification and the network ignores the received values. |

#### – *SRS-SwitchingTimeNR*

The IE *SRS-SwitchingTimeNR* is used to indicate the SRS carrier switching time supported by the UE for one NR band pair.

*SRS-SwitchingTimeNR information element*

-- ASN1START

-- TAG-SRS-SWITCHINGTIMENR-START

SRS-SwitchingTimeNR ::= SEQUENCE {

 switchingTimeDL ENUMERATED {n0us, n30us, n100us, n140us, n200us, n300us, n500us, n900us} OPTIONAL,

 switchingTimeUL ENUMERATED {n0us, n30us, n100us, n140us, n200us, n300us, n500us, n900us} OPTIONAL

}

-- TAG-SRS-SWITCHINGTIMENR-STOP

-- ASN1STOP

#### – *SRS-SwitchingTimeEUTRA*

The IE *SRS-SwitchingTimeEUTRA* is used to indicate the SRS carrier switching time supported by the UE for one E-UTRA band pair.

*SRS-SwitchingTimeEUTRA information element*

-- ASN1START

-- TAG-SRS-SWITCHINGTIMEEUTRA-START

SRS-SwitchingTimeEUTRA ::= SEQUENCE {

 switchingTimeDL ENUMERATED {n0, n0dot5, n1, n1dot5, n2, n2dot5, n3, n3dot5, n4, n4dot5, n5, n5dot5, n6, n6dot5, n7}

 OPTIONAL,

 switchingTimeUL ENUMERATED {n0, n0dot5, n1, n1dot5, n2, n2dot5, n3, n3dot5, n4, n4dot5, n5, n5dot5, n6, n6dot5, n7}

 OPTIONAL

}

-- TAG-SRS-SWITCHINGTIMEEUTRA-STOP

-- ASN1STOP

#### – *SupportedBandwidth*

The IE *SupportedBandwidth* is used to indicate the channel bandwidth supported by the UE on one carrier of a band of a band combination.

*SupportedBandwidth* information element

-- ASN1START

-- TAG-SUPPORTEDBANDWIDTH-START

SupportedBandwidth ::= CHOICE {

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

 fr2 ENUMERATED {mhz50, mhz100, mhz200, mhz400}

}

SupportedBandwidth-v1700 ::= CHOICE {

 fr1-r17 ENUMERATED {mhz5, mhz10, mhz15, mhz20, mhz25, mhz30, mhz35, mhz40, mhz45, mhz50, mhz60, mhz70, mhz80, mhz90, mhz100},

 fr2-r17 ENUMERATED {mhz50, mhz100, mhz200, mhz400, mhz800, mhz1600, mhz2000}

}

-- TAG-SUPPORTEDBANDWIDTH-STOP

-- ASN1STOP

#### – *UE-BasedPerfMeas-Parameters*

The IE *UE-BasedPerfMeas-Parameters* contains UE-based performance measurement parameters.

*UE-BasedPerfMeas-Parameters* information element

-- ASN1START

-- TAG-UE-BASEDPERFMEAS-PARAMETERS-START

UE-BasedPerfMeas-Parameters-r16 ::= SEQUENCE {

 barometerMeasReport-r16 ENUMERATED {supported} OPTIONAL,

 immMeasBT-r16 ENUMERATED {supported} OPTIONAL,

 immMeasWLAN-r16 ENUMERATED {supported} OPTIONAL,

 loggedMeasBT-r16 ENUMERATED {supported} OPTIONAL,

 loggedMeasurements-r16 ENUMERATED {supported} OPTIONAL,

 loggedMeasWLAN-r16 ENUMERATED {supported} OPTIONAL,

 orientationMeasReport-r16 ENUMERATED {supported} OPTIONAL,

 speedMeasReport-r16 ENUMERATED {supported} OPTIONAL,

 gnss-Location-r16 ENUMERATED {supported} OPTIONAL,

 ulPDCP-Delay-r16 ENUMERATED {supported} OPTIONAL,

 ...,

 [[

 sigBasedLogMDT-OverrideProtect-r17 ENUMERATED {supported} OPTIONAL,

 multipleCEF-Report-r17 ENUMERATED {supported} OPTIONAL,

 excessPacketDelay-r17 ENUMERATED {supported} OPTIONAL,

 earlyMeasLog-r17 ENUMERATED {supported} OPTIONAL

 ]],

 [[

 loggedMDT-PNI-NPN-r18 ENUMERATED {supported} OPTIONAL,

 loggedMDT-SNPN-r18 ENUMERATED {supported} OPTIONAL

 ]]

}

-- TAG-UE-BASEDPERFMEAS-PARAMETERS-STOP

-- ASN1STOP

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

The IE *UE-CapabilityRAT-ContainerList* contains a list of radio access technology specific capability containers.

*UE-CapabilityRAT-ContainerList* information element

-- ASN1START

-- TAG-UE-CAPABILITYRAT-CONTAINERLIST-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-CAPABILITYRAT-CONTAINERLIST-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 *rat-Type* set to *nr*: the encoding of UE capabilities is defined in *UE-NR-Capability*.For *rat-Type* set to *eutra-nr*: the encoding of UE capabilities is defined in *UE-MRDC-Capability*.For *rat-Type* set to *eutra*: the encoding of UE capabilities is defined in *UE-EUTRA-Capability* specified in TS 36.331 [10].For *rat-Type* set to *utra-fdd*: the octet string contains the INTER RAT HANDOVER INFO message defined in TS 25.331 [45]. |

#### – *UE-CapabilityRAT-RequestList*

The IE *UE-CapabilityRAT-RequestList* is used to request UE capabilities for one or more RATs from the UE.

*UE-CapabilityRAT-RequestList* information element

-- ASN1START

-- TAG-UE-CAPABILITYRAT-REQUESTLIST-START

UE-CapabilityRAT-RequestList ::= SEQUENCE (SIZE (1..maxRAT-CapabilityContainers)) OF UE-CapabilityRAT-Request

UE-CapabilityRAT-Request ::= SEQUENCE {

 rat-Type RAT-Type,

 capabilityRequestFilter OCTET STRING OPTIONAL, -- Need N

 ...

}

-- TAG-UE-CAPABILITYRAT-REQUESTLIST-STOP

-- ASN1STOP

|  |
| --- |
| *UE-CapabilityRAT-Request* field descriptions |
| ***capabilityRequestFilter***Information by which the network requests the UE to filter the UE capabilities.For *rat-Type* set to *nr* or *eutra-nr*: the encoding of the *capabilityRequestFilter* is defined in *UE-CapabilityRequestFilterNR*.For *rat-Type* set to *eutra*: the encoding of the *capabilityRequestFilter* is defined by *UECapabilityEnquiry* message defined in TS36.331 [10], in which *RAT-Type* in *UE-CapabilityRequest* includes only '*eutra'*. |
| ***rat-Type***The RAT type for which the NW requests UE capabilities. |

#### – *UE-CapabilityRequestFilterCommon*

The IE *UE-CapabilityRequestFilterCommon* is used to request filtered UE capabilities. The filter is common for all capability containers that are requested.

*UE-CapabilityRequestFilterCommon* information element

-- ASN1START

-- TAG-UE-CAPABILITYREQUESTFILTERCOMMON-START

UE-CapabilityRequestFilterCommon ::= SEQUENCE {

 mrdc-Request SEQUENCE {

 omitEN-DC ENUMERATED {true} OPTIONAL, -- Need N

 includeNR-DC ENUMERATED {true} OPTIONAL, -- Need N

 includeNE-DC ENUMERATED {true} OPTIONAL -- Need N

 } OPTIONAL, -- Need N

 ...,

 [[

 codebookTypeRequest-r16 SEQUENCE {

 type1-SinglePanel-r16 ENUMERATED {true} OPTIONAL, -- Need N

 type1-MultiPanel-r16 ENUMERATED {true} OPTIONAL, -- Need N

 type2-r16 ENUMERATED {true} OPTIONAL, -- Need N

 type2-PortSelection-r16 ENUMERATED {true} OPTIONAL -- Need N

 } OPTIONAL, -- Need N

 uplinkTxSwitchRequest-r16 ENUMERATED {true} OPTIONAL -- Need N

 ]],

 [[

 requestedCellGrouping-r16 SEQUENCE (SIZE (1..maxCellGroupings-r16)) OF CellGrouping-r16 OPTIONAL -- Cond NRDC

 ]],

 [[

 fallbackGroupFiveRequest-r17 ENUMERATED {true} OPTIONAL -- Need N

 ]],

 [[

 lowerMSDRequest-r18 SEQUENCE {

 pc1dot5-r18 ENUMERATED {true} OPTIONAL, -- Need N

 pc2-r18 ENUMERATED {true} OPTIONAL, -- Need N

 pc3-r18 ENUMERATED {true} OPTIONAL -- Need N

 } OPTIONAL -- Need N

 ]]

}

CellGrouping-r16 ::= SEQUENCE {

 mcg-r16 SEQUENCE (SIZE (1..maxBands)) OF FreqBandIndicatorNR,

 scg-r16 SEQUENCE (SIZE (1..maxBands)) OF FreqBandIndicatorNR,

 mode-r16 ENUMERATED {sync, async}

}

-- TAG-UE-CAPABILITYREQUESTFILTERCOMMON-STOP

-- ASN1STOP

-- Editor Note: The power class related part can be updated further pending RAN4 discussion.

|  |
| --- |
| *UE-CapabilityRequestFilterCommon field descriptions* |
| ***codebookTypeRequest***Only if this field is present, the UE includes *SupportedCSI-RS-Resource* supported for the codebook type(s) requested within this field (i.e. type I single/multi-panel, type II and type II port selection) into *codebookVariantsList*, *codebookParametersPerBand* and *codebookParametersPerBC*. If this field is present and none of the codebook types is requested within this field (i.e. empty field), the UE includes *SupportedCSI-RS-Resource* supported for all codebook types into *codebookVariantsList*, *codebookParametersPerBand* and *codebookParametersPerBC*. |
| ***fallbackGroupFiveRequest***Only if this field is present, the UE supporting FR2 CA bandwidth class from fallback group 5 shall include band combinations with FR2 CA bandwidth class from fallback group 5, and shall omit band combinations with FR2 CA bandwidth class from fallback group 2 or 3 (see TS 38.101-2 [39]) with same or lower capabilities. |
| ***includeNE-DC***Only if this field is present, the UE supporting NE-DC shall indicate support for NE-DC in band combinations and include feature set combinations which are applicable to NE-DC. Band combinations supporting both NE-DC and (NG)EN-DC shall be included in *supportedBandCombinationList*, band combinations supporting only NE-DC shall be included in *supportedBandCombinationListNEDC-Only*. |
| ***includeNR-DC***Only if this field is present, the UE supporting NR-DC shall indicate support for NR-DC in band combinations and include feature set combinations which are applicable to NR-DC. |
| ***lowerMSDRequest***Only if this field is present, the UE supporting lower MSD shall indicate the lower MSD capability or the requested power class if supported. Otherwise, the UE supporting lower MSD shall indicate the lower MSD capability for the highest supported power class of the band combination including victim band and aggressor band(s). |
| ***mode***The mode of NR-DC operation that the NW is interested in for this cell grouping. The value *sync* means that the UE only indicates NR-DC support for band combinations for which it supports synchronous NR-DC with the requested cell grouping. The value *async* means that the UE only indicates NR-DC support for band combinations for which it supports asynchronous NR-DC with the requested cell grouping. |
| ***omitEN-DC***Only if this field is present, the UE shall omit band combinations and feature set combinations which are only applicable to (NG)EN-DC. |
| ***requestedCellGrouping***The NR-DC cell groupings that the NW is interested in, i.e., the bands that it might use in an MCG and the bands that it might use in an SCG. Only if this field is present, the UE indicates NR-DC support for band combinations for which it supports the requested cell grouping, i.e., in which it supports at least one of the *mcg* bands on MCG and at least one of the *scg* bands on the SCG. In its *supportedBandCombinationList*, the UE indicates which of its NR-DC band combinations supports which of the requested cell groupings. The first element in this list is referred to by ID#0, the second by ID#1 and so on. If this field is absent, the UE only includes band combinations for which it supports NR-DC with only FR1 bands in MCG and only FR2 bands in SCG.Example 1: *requestedCellGrouping* is set to *mcg*=[n1, n7, n41, n66] and *scg*=[n78, n261]. This assumes that the NW would always use CA among n1, n7, n41 and n66 (depending on which are deployed on a given site) whereas with n78 and/or n261 the NW may need to use DC. With this filter a UE may report a band combination n1A-n7A-n78A for NR-DC only if it supports that serving cells for n1 and n7 are in the MCG and a serving cell for n78 is in the SCG. The UE may also report a band combination n41C-n261M for NR-DC provided that it supports a serving cell for n41 in the MCG and a serving cell for n261 in the SCG.Example 2: One *requestedCellGrouping* is set to *mcg*=[n1, n7, n41, n66] and s*cg*=[n78, n261] and another *requestedCellGrouping* is set to *mcg*=[n1, n7, n66] and s*cg*=[ n41, n78, n261]. This assumes that the NW uses sometimes CA among n1, n7, n41 and n66 (as in example 1) and sometimes CA among n1, n7 and n66 but DC towards one or several of n41, n78, n261. If a UE supports n1A-n41A-n78A only if n41A and n78A are in the same cell group, this UE may only indicate cell grouping ID#1 (not #0) in its BC. |
| ***uplinkTxSwitchRequest***Only if this field is present, the UE supporting dynamic UL Tx switching shall indicate support for UL Tx switching in band combinations which are applicable to inter-band UL CA, SUL and (NG)EN-DC. |

|  |  |
| --- | --- |
| Conditional Presence | Explanation |
| *NRDC* | The field is optionally present, Need N, if *includeNR-DC* is included. It is absent otherwise. |

#### – *UE-CapabilityRequestFilterNR*

The IE *UE-CapabilityRequestFilterNR* is used to request filtered UE capabilities.

*UE-CapabilityRequestFilterNR* information element

-- ASN1START

-- TAG-UE-CAPABILITYREQUESTFILTERNR-START

UE-CapabilityRequestFilterNR ::= SEQUENCE {

 frequencyBandListFilter FreqBandList OPTIONAL, -- Need N

 nonCriticalExtension UE-CapabilityRequestFilterNR-v1540 OPTIONAL

}

UE-CapabilityRequestFilterNR-v1540 ::= SEQUENCE {

 srs-SwitchingTimeRequest ENUMERATED {true} OPTIONAL, -- Need N

 nonCriticalExtension UE-CapabilityRequestFilterNR-v1710 OPTIONAL

}

UE-CapabilityRequestFilterNR-v1710 ::= SEQUENCE {

 sidelinkRequest-r17 ENUMERATED {true} OPTIONAL, -- Need N

 nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- TAG-UE-CAPABILITYREQUESTFILTERNR-STOP

-- ASN1STOP

#### – *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 [26].

*UE-MRDC-Capability* information element

-- ASN1START

-- TAG-UE-MRDC-CAPABILITY-START

UE-MRDC-Capability ::= SEQUENCE {

 measAndMobParametersMRDC MeasAndMobParametersMRDC OPTIONAL,

 phy-ParametersMRDC-v1530 Phy-ParametersMRDC OPTIONAL,

 rf-ParametersMRDC RF-ParametersMRDC,

 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,

 featureSetCombinations SEQUENCE (SIZE (1..maxFeatureSetCombinations)) OF FeatureSetCombination OPTIONAL,

 pdcp-ParametersMRDC-v1530 PDCP-ParametersMRDC OPTIONAL,

 lateNonCriticalExtension OCTET STRING (CONTAINING UE-MRDC-Capability-v15g0) OPTIONAL,

 nonCriticalExtension UE-MRDC-Capability-v1560 OPTIONAL

}

-- Regular non-critical extensions:

UE-MRDC-Capability-v1560 ::= SEQUENCE {

 receivedFilters OCTET STRING (CONTAINING UECapabilityEnquiry-v1560-IEs) OPTIONAL,

 measAndMobParametersMRDC-v1560 MeasAndMobParametersMRDC-v1560 OPTIONAL,

 fdd-Add-UE-MRDC-Capabilities-v1560 UE-MRDC-CapabilityAddXDD-Mode-v1560 OPTIONAL,

 tdd-Add-UE-MRDC-Capabilities-v1560 UE-MRDC-CapabilityAddXDD-Mode-v1560 OPTIONAL,

 nonCriticalExtension UE-MRDC-Capability-v1610 OPTIONAL

}

UE-MRDC-Capability-v1610 ::= SEQUENCE {

 measAndMobParametersMRDC-v1610 MeasAndMobParametersMRDC-v1610 OPTIONAL,

 generalParametersMRDC-v1610 GeneralParametersMRDC-v1610 OPTIONAL,

 pdcp-ParametersMRDC-v1610 PDCP-ParametersMRDC-v1610 OPTIONAL,

 nonCriticalExtension UE-MRDC-Capability-v1700 OPTIONAL

}

UE-MRDC-Capability-v1700 ::= SEQUENCE {

 measAndMobParametersMRDC-v1700 MeasAndMobParametersMRDC-v1700,

 nonCriticalExtension UE-MRDC-Capability-v1730 OPTIONAL

}

UE-MRDC-Capability-v1730 ::= SEQUENCE {

 measAndMobParametersMRDC-v1730 MeasAndMobParametersMRDC-v1730 OPTIONAL,

 nonCriticalExtension UE-MRDC-Capability-v1800 OPTIONAL

}

UE-MRDC-Capability-v1800 ::= SEQUENCE {

 -- R4 33-2: Support network control of requirementnetwork applicability for UE supporting interBandMRDC-WithOverlapDL-Bands-r16

 requirementTypeIndication-r18 ENUMERATED {supported} OPTIONAL,

 nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- Late non-critical extensions:

UE-MRDC-Capability-v15g0 ::= SEQUENCE {

 rf-ParametersMRDC-v15g0 RF-ParametersMRDC-v15g0 OPTIONAL,

 nonCriticalExtension UE-MRDC-Capability-v15n0 OPTIONAL

}

UE-MRDC-Capability-v15n0 ::= SEQUENCE {

 rf-ParametersMRDC-v15n0 RF-ParametersMRDC-v15n0 OPTIONAL,

-- Following field is only for REL-15 late non-critical extensions

 lateNonCriticalExtension OCTET STRING OPTIONAL,

 nonCriticalExtension UE-MRDC-Capability-v16e0 OPTIONAL

}

UE-MRDC-Capability-v16e0 ::= SEQUENCE {

 rf-ParametersMRDC-v16e0 RF-ParametersMRDC-v16e0 OPTIONAL,

 nonCriticalExtension SEQUENCE {} OPTIONAL

}

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

 measAndMobParametersMRDC-XDD-Diff MeasAndMobParametersMRDC-XDD-Diff OPTIONAL,

 generalParametersMRDC-XDD-Diff GeneralParametersMRDC-XDD-Diff OPTIONAL

}

UE-MRDC-CapabilityAddXDD-Mode-v1560 ::= SEQUENCE {

 measAndMobParametersMRDC-XDD-Diff-v1560 MeasAndMobParametersMRDC-XDD-Diff-v1560 OPTIONAL

}

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

 measAndMobParametersMRDC-FRX-Diff MeasAndMobParametersMRDC-FRX-Diff

}

GeneralParametersMRDC-XDD-Diff ::= SEQUENCE {

 splitSRB-WithOneUL-Path ENUMERATED {supported} OPTIONAL,

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

 srb3 ENUMERATED {supported} OPTIONAL,

 dummy ENUMERATED {supported} OPTIONAL,

 ...

}

GeneralParametersMRDC-v1610 ::= SEQUENCE {

 f1c-OverEUTRA-r16 ENUMERATED {supported} OPTIONAL

}

-- TAG-UE-MRDC-CAPABILITY-STOP

-- ASN1STOP

|  |
| --- |
| *UE-MRDC-Capability* field descriptions |
| ***featureSetCombinations***A list of *FeatureSetCombination*:s for *supportedBandCombinationList* and *supportedBandCombinationListNEDC-Only* in *UE-MRDC-Capability*. The *FeatureSetDownlink*:s and *FeatureSetUplink*:s referred to from these *FeatureSetCombination*:s are defined in the *featureSets* list in *UE-NR-Capability*. |

#### – *UE-NR-Capability*

The IE *UE-NR-Capability* is used to convey the NR UE Radio Access Capability Parameters, see TS 38.306 [26].

*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,

 measAndMobParameters MeasAndMobParameters 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,

 featureSetCombinations SEQUENCE (SIZE (1..maxFeatureSetCombinations)) OF FeatureSetCombination OPTIONAL,

 lateNonCriticalExtension OCTET STRING (CONTAINING UE-NR-Capability-v15c0) OPTIONAL,

 nonCriticalExtension UE-NR-Capability-v1530 OPTIONAL

}

-- Regular non-critical Rel-15 extensions:

UE-NR-Capability-v1530 ::= SEQUENCE {

 fdd-Add-UE-NR-Capabilities-v1530 UE-NR-CapabilityAddXDD-Mode-v1530 OPTIONAL,

 tdd-Add-UE-NR-Capabilities-v1530 UE-NR-CapabilityAddXDD-Mode-v1530 OPTIONAL,

 dummy ENUMERATED {supported} OPTIONAL,

 interRAT-Parameters InterRAT-Parameters OPTIONAL,

 inactiveState ENUMERATED {supported} OPTIONAL,

 delayBudgetReporting ENUMERATED {supported} OPTIONAL,

 nonCriticalExtension UE-NR-Capability-v1540 OPTIONAL

}

UE-NR-Capability-v1540 ::= SEQUENCE {

 sdap-Parameters SDAP-Parameters OPTIONAL,

 overheatingInd ENUMERATED {supported} OPTIONAL,

 ims-Parameters IMS-Parameters OPTIONAL,

 fr1-Add-UE-NR-Capabilities-v1540 UE-NR-CapabilityAddFRX-Mode-v1540 OPTIONAL,

 fr2-Add-UE-NR-Capabilities-v1540 UE-NR-CapabilityAddFRX-Mode-v1540 OPTIONAL,

 fr1-fr2-Add-UE-NR-Capabilities UE-NR-CapabilityAddFRX-Mode OPTIONAL,

 nonCriticalExtension UE-NR-Capability-v1550 OPTIONAL

}

UE-NR-Capability-v1550 ::= SEQUENCE {

 reducedCP-Latency ENUMERATED {supported} OPTIONAL,

 nonCriticalExtension UE-NR-Capability-v1560 OPTIONAL

}

UE-NR-Capability-v1560 ::= SEQUENCE {

 nrdc-Parameters NRDC-Parameters OPTIONAL,

 receivedFilters OCTET STRING (CONTAINING UECapabilityEnquiry-v1560-IEs) OPTIONAL,

 nonCriticalExtension UE-NR-Capability-v1570 OPTIONAL

}

UE-NR-Capability-v1570 ::= SEQUENCE {

 nrdc-Parameters-v1570 NRDC-Parameters-v1570 OPTIONAL,

 nonCriticalExtension UE-NR-Capability-v1610 OPTIONAL

}

-- Late non-critical Rel-15 extensions:

UE-NR-Capability-v15c0 ::= SEQUENCE {

 nrdc-Parameters-v15c0 NRDC-Parameters-v15c0 OPTIONAL,

 partialFR2-FallbackRX-Req ENUMERATED {true} OPTIONAL,

 nonCriticalExtension UE-NR-Capability-v15g0 OPTIONAL

}

UE-NR-Capability-v15g0 ::= SEQUENCE {

 rf-Parameters-v15g0 RF-Parameters-v15g0 OPTIONAL,

 nonCriticalExtension UE-NR-Capability-v15j0 OPTIONAL

}

UE-NR-Capability-v15j0 ::= SEQUENCE {

 -- Following field is only for REL-15 late non-critical extensions

 lateNonCriticalExtension OCTET STRING OPTIONAL,

 nonCriticalExtension UE-NR-Capability-v16a0 OPTIONAL

}

-- Regular non-critical Rel-16 extensions:

UE-NR-Capability-v1610 ::= SEQUENCE {

 inDeviceCoexInd-r16 ENUMERATED {supported} OPTIONAL,

 dl-DedicatedMessageSegmentation-r16 ENUMERATED {supported} OPTIONAL,

 nrdc-Parameters-v1610 NRDC-Parameters-v1610 OPTIONAL,

 powSav-Parameters-r16 PowSav-Parameters-r16 OPTIONAL,

 fr1-Add-UE-NR-Capabilities-v1610 UE-NR-CapabilityAddFRX-Mode-v1610 OPTIONAL,

 fr2-Add-UE-NR-Capabilities-v1610 UE-NR-CapabilityAddFRX-Mode-v1610 OPTIONAL,

 bh-RLF-Indication-r16 ENUMERATED {supported} OPTIONAL,

 directSN-AdditionFirstRRC-IAB-r16 ENUMERATED {supported} OPTIONAL,

 bap-Parameters-r16 BAP-Parameters-r16 OPTIONAL,

 referenceTimeProvision-r16 ENUMERATED {supported} OPTIONAL,

 sidelinkParameters-r16 SidelinkParameters-r16 OPTIONAL,

 highSpeedParameters-r16 HighSpeedParameters-r16 OPTIONAL,

 mac-Parameters-v1610 MAC-Parameters-v1610 OPTIONAL,

 mcgRLF-RecoveryViaSCG-r16 ENUMERATED {supported} OPTIONAL,

 resumeWithStoredMCG-SCells-r16 ENUMERATED {supported} OPTIONAL,

 resumeWithStoredSCG-r16 ENUMERATED {supported} OPTIONAL,

 resumeWithSCG-Config-r16 ENUMERATED {supported} OPTIONAL,

 ue-BasedPerfMeas-Parameters-r16 UE-BasedPerfMeas-Parameters-r16 OPTIONAL,

 son-Parameters-r16 SON-Parameters-r16 OPTIONAL,

 onDemandSIB-Connected-r16 ENUMERATED {supported} OPTIONAL,

 nonCriticalExtension UE-NR-Capability-v1640 OPTIONAL

}

UE-NR-Capability-v1640 ::= SEQUENCE {

 redirectAtResumeByNAS-r16 ENUMERATED {supported} OPTIONAL,

 phy-ParametersSharedSpectrumChAccess-r16 Phy-ParametersSharedSpectrumChAccess-r16 OPTIONAL,

 nonCriticalExtension UE-NR-Capability-v1650 OPTIONAL

}

UE-NR-Capability-v1650 ::= SEQUENCE {

 mpsPriorityIndication-r16 ENUMERATED {supported} OPTIONAL,

 highSpeedParameters-v1650 HighSpeedParameters-v1650 OPTIONAL,

 nonCriticalExtension UE-NR-Capability-v1690 OPTIONAL

}

UE-NR-Capability-v1690 ::= SEQUENCE {

 ul-RRC-Segmentation-r16 ENUMERATED {supported} OPTIONAL,

 nonCriticalExtension UE-NR-Capability-v1700 OPTIONAL

}

-- Late non-critical extensions from Rel-16 onwards:

UE-NR-Capability-v16a0 ::= SEQUENCE {

 phy-Parameters-v16a0 Phy-Parameters-v16a0 OPTIONAL,

 rf-Parameters-v16a0 RF-Parameters-v16a0 OPTIONAL,

 nonCriticalExtension UE-NR-Capability-v16c0 OPTIONAL

}

UE-NR-Capability-v16c0 ::= SEQUENCE {

 rf-Parameters-v16c0 RF-Parameters-v16c0 OPTIONAL,

 nonCriticalExtension UE-NR-Capability-v16d0 OPTIONAL

}

UE-NR-Capability-v16d0 ::= SEQUENCE {

 featureSets-v16d0 FeatureSets-v16d0 OPTIONAL,

 nonCriticalExtension SEQUENCE {} OPTIONAL

}

-- Regular non-critical Rel-17 extensions:

UE-NR-Capability-v1700 ::= SEQUENCE {

 inactiveStatePO-Determination-r17 ENUMERATED {supported} OPTIONAL,

 highSpeedParameters-v1700 HighSpeedParameters-v1700 OPTIONAL,

 powSav-Parameters-v1700 PowSav-Parameters-v1700 OPTIONAL,

 mac-Parameters-v1700 MAC-Parameters-v1700 OPTIONAL,

 ims-Parameters-v1700 IMS-Parameters-v1700 OPTIONAL,

 measAndMobParameters-v1700 MeasAndMobParameters-v1700,

 appLayerMeasParameters-r17 AppLayerMeasParameters-r17 OPTIONAL,

 redCapParameters-r17 RedCapParameters-r17 OPTIONAL,

 ra-SDT-r17 ENUMERATED {supported} OPTIONAL,

 srb-SDT-r17 ENUMERATED {supported} OPTIONAL,

 gNB-SideRTT-BasedPDC-r17 ENUMERATED {supported} OPTIONAL,

 bh-RLF-DetectionRecovery-Indication-r17 ENUMERATED {supported} OPTIONAL,

 nrdc-Parameters-v1700 NRDC-Parameters-v1700 OPTIONAL,

 bap-Parameters-v1700 BAP-Parameters-v1700 OPTIONAL,

 musim-GapPreference-r17 ENUMERATED {supported} OPTIONAL,

 musimLeaveConnected-r17 ENUMERATED {supported} OPTIONAL,

 mbs-Parameters-r17 MBS-Parameters-r17,

 nonTerrestrialNetwork-r17 ENUMERATED {supported} OPTIONAL,

 ntn-ScenarioSupport-r17 ENUMERATED {gso, ngso} OPTIONAL,

 sliceInfoforCellReselection-r17 ENUMERATED {supported} OPTIONAL,

 ue-RadioPagingInfo-r17 UE-RadioPagingInfo-r17 OPTIONAL,

 -- R4 17-2 UL gap pattern for Tx power management

 ul-GapFR2-Pattern-r17 BIT STRING (SIZE (4)) OPTIONAL,

 ntn-Parameters-r17 NTN-Parameters-r17 OPTIONAL,

 nonCriticalExtension UE-NR-Capability-v1740 OPTIONAL

}

UE-NR-Capability-v1740 ::= SEQUENCE {

 redCapParameters-v1740 RedCapParameters-v1740,

 nonCriticalExtension UE-NR-Capability-v1750 OPTIONAL

}

UE-NR-Capability-v1750 ::= SEQUENCE {

 crossCarrierSchedulingConfigurationRelease-r17 ENUMERATED {supported} OPTIONAL,

 nonCriticalExtension UE-NR-Capability-v1800 OPTIONAL

}

-- Regular non-critical Rel-18 extensions:

UE-NR-Capability-v1800 ::= SEQUENCE {

 airToGroundNetwork-r18 ENUMERATED {supported} OPTIONAL,

 eRedCapParameters-r18 ERedCapParameters-r18 OPTIONAL,

 ncr-Parameters-r18 NCR-Parameters-r18 OPTIONAL,

 softSatelliteSwitchResyncNTN-r18 ENUMERATED {supported} OPTIONAL,

 hardSatelliteSwitchResyncNTN-r18 ENUMERATED {supported} OPTIONAL,

 mt-SDT-r18 ENUMERATED {supported} OPTIONAL,

 mt-SDT-NTN-r18 ENUMERATED {supported} OPTIONAL,

 inDeviceCoexIndAutonomousDenial-r18 ENUMERATED {supported} OPTIONAL,

 inDeviceCoexIndFDM-r18 ENUMERATED {supported} OPTIONAL,

 inDeviceCoexIndTDM-r18 ENUMERATED {supported} OPTIONAL,

 musim-GapPriorityPreference-r18 ENUMERATED {supported} OPTIONAL,

 musim-CapabilityRestriction-r18 ENUMERATED {supported} OPTIONAL,

 multiRx-FR2-Preference-r18 ENUMERATED {supported} OPTIONAL,

 ra-InsteadCG-SDT-r18 ENUMERATED {supported} OPTIONAL,

 resumeAfterSDT-Release-r18 ENUMERATED {supported} OPTIONAL,

 additionalBSR-Table-r18 ENUMERATED {supported} OPTIONAL,

 delayStatusReport-r18 ENUMERATED {supported} OPTIONAL,

 disableCG-RetransmissionMonitoring-r18 ENUMERATED {supported} OPTIONAL,

 enhancedDRX-r18 ENUMERATED {supported} OPTIONAL,

 pdu-SetDiscard-r18 ENUMERATED {supported} OPTIONAL,

 psi-BasedDiscard-r18 ENUMERATED {supported} OPTIONAL,

 ul-TrafficInfo-r18 ENUMERATED {supported} OPTIONAL,

 aerialParameters-r18 AerialParameters-r18 OPTIONAL,

 nonCriticalExtension SEQUENCE{} OPTIONAL

}

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

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

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

 measAndMobParametersXDD-Diff MeasAndMobParametersXDD-Diff OPTIONAL

}

UE-NR-CapabilityAddXDD-Mode-v1530 ::= SEQUENCE {

 eutra-ParametersXDD-Diff EUTRA-ParametersXDD-Diff

}

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

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

 measAndMobParametersFRX-Diff MeasAndMobParametersFRX-Diff OPTIONAL

}

UE-NR-CapabilityAddFRX-Mode-v1540 ::= SEQUENCE {

 ims-ParametersFRX-Diff IMS-ParametersFRX-Diff OPTIONAL

}

UE-NR-CapabilityAddFRX-Mode-v1610 ::= SEQUENCE {

 powSav-ParametersFRX-Diff-r16 PowSav-ParametersFRX-Diff-r16 OPTIONAL,

 mac-ParametersFRX-Diff-r16 MAC-ParametersFRX-Diff-r16 OPTIONAL

}

BAP-Parameters-r16 ::= SEQUENCE {

 flowControlBH-RLC-ChannelBased-r16 ENUMERATED {supported} OPTIONAL,

 flowControlRouting-ID-Based-r16 ENUMERATED {supported} OPTIONAL

}

BAP-Parameters-v1700 ::= SEQUENCE {

 bapHeaderRewriting-Rerouting-r17 ENUMERATED {supported} OPTIONAL,

 bapHeaderRewriting-Routing-r17 ENUMERATED {supported} OPTIONAL

}

MBS-Parameters-r17 ::= SEQUENCE {

 maxMRB-Add-r17 INTEGER (1..16) OPTIONAL

}

-- TAG-UE-NR-CAPABILITY-STOP

-- ASN1STOP

|  |
| --- |
| *UE-NR-Capability* field descriptions |
| ***featureSetCombinations***A list of *FeatureSetCombination:s* for *supportedBandCombinationList* in *UE-NR-Capability*. The *FeatureSetDownlink:s* and *FeatureSetUplink:s* referred to from these *FeatureSetCombination:s* are defined in the *featureSets* list in *UE-NR-Capability*. |

|  |
| --- |
| *UE-NR-Capability-v1540 field descriptions* |
| ***fr1-fr2-Add-UE-NR-Capabilities***This instance of *UE-NR-CapabilityAddFRX-Mode* does not include any other fields than *csi-RS-IM-ReceptionForFeedback*/ *csi-RS-ProcFrameworkForSRS*/ *csi-ReportFramework*. |

#### – *UE-RadioPagingInfo*

The IE *UE-RadioPagingInfo* contains UE capability information needed for paging.

*UE-RadioPagingInfo* information element

-- ASN1START

-- TAG-UE-RADIOPAGINGINFO-START

UE-RadioPagingInfo-r17 ::= SEQUENCE {

 -- R1 29-1: Paging enhancement

 pei-SubgroupingSupportBandList-r17 SEQUENCE (SIZE (1..maxBands)) OF FreqBandIndicatorNR OPTIONAL,

 ...

}

-- TAG-UE-RADIOPAGINGINFO-STOP

-- ASN1STOP

End of the change