**3GPP TSG-RAN WG4 Meeting # 111 R4-2410712**

Fukuoka, Japan, May 20 – May 24, 2024

**Agenda item:** 9

**Source:** CMCC

**Title:** Rel-18 RAN4 UE feature list for NR (version 5)

**Document for:** Approval

1. Introduction

This contribution includes the RAN4 UE feature list for Rel-18 NR. The previous Rel-18 RAN4 UE feature list is R4-2321797, R4-232199, R4-2403842, and R4-2406680.

1. NR\_ENDC\_RF\_FR1\_enh2

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| **Features** | **Index** | **Feature group** | **Components** | **Prerequisite feature groups** | **Need for the gNB to know if the feature is supported** | **Applicable to the capability signalling exchange between UEs (V2X WI only)”.** | **Consequence if the feature is not supported by the UE** | **Type****(the ‘type’ definition from UE features should be based on the granularity of 1) Per UE or 2) Per Band or 3) Per BC or 4) Per FS or 5) Per FSPC)** | **Need of FDD/TDD differentiation** | **Need of FR1/FR2 differentiation** | **Capability interpretation for mixture of FDD/TDD and/or FR1/FR2** | **Note** | **Mandatory/Optional** |
|  27. NR\_ENDC\_RF\_FR1\_enh2 | 27-1 | TxDiversity for 4Tx | Indicates UE supports Tx diversity for 4Tx for the band configured. |  | Yes | N/A | UE doesn’t support 4Tx Tx diversity for the band configured | Per FS | No | FR1 only | N/A |  | Optional with capability signalling |
| 27. NR\_ENDC\_RF\_FR1\_enh2 | 27-2 | LowerMSD for inter-band NR CA and EN-DC  | Indicates whether the UE supports lower maximum sensitivity degradation when the band is the victim band with sensitivity degradation as specified in 38.101-1 and 38.101-3. The victim band and associated aggressor band(s) are within at least one of inter-band CA or EN-DC band combinations supported by the UE.This feature includes following components:1) The aggressor band which causes sensitivity degradation to the victim band. 2) The additional aggressor band only when the sensitivity degradation to the victim band is caused by IMD of another two bands. 3) MSD type, including harmonic, harmonic mixing, cross band isolation, IMD2, IMD3, IMD4, IMD5 and ‘all’. Value ‘all’ indicates the MSD capability class is applicable for all MSD types defined in this release, which are applicable to the associated victim band/aggressor band(s). 4) The applicable power class for the lower MSD capability. 5) The lower MSD capability class as specified in 7.3A.7 in 38.101-1 and in 7.3B.2.3.7 in 38.101-3. | ~~No~~ | Yes | N/A | The UE shall comply with the minimum requirements for MSD. | Per band  | No |  FR1 only | Support mixture of FDD/TDD |  | Optional with capability signalling |
| 27. NR\_ENDC\_RF\_FR1\_enh2 | 27-3 | SU-MIMO 8Rx receiver | Indicates the UE supported SU-MIMO 8Rx receiver type:1) Baseline SU-MIMO 8Rx receiver: 8Rx receivers for SU-MIMO transmissions with support of up to 8 layers with joint 8Rx MIMO detector2)      Simplified SU-MIMO 8Rx receiver: 8Rx receivers for SU-MIMO transmissions with support of up to 4 layers with two joint 4Rx MIMO detectors |  | No | N/A | The UE doesn’t support 8Rx reception | Per UE | No | FR1 only | N/A |  | Optional without UE capability signaling |

1. NR\_channel\_raster\_enh

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| 28. NR\_channel\_raster\_enh | 28-1 | Enhanced channel raster | The UE supports the requirements for UE channel bandwidths located on the enhanced channel raster of a band as specified in TS 38.101-1, TS 38.101-5 |  | Yes |  | UE may not support requirements for UE specific channel bandwidths located on enhanced channel raster;configuring a narrower UE-specific channel bandwidth inside a wider gNB channel bandwidth may not be possible. | Per Band | No | FR1 only | The feature is supported for applicable bands in FDD-TDD and FR1/FR2 combinations | Applies only for bands with a 100 kHz channel raster for both TN and NTN.Should be early implementable from Rel-16. | Mandatory with capability signaling for all Rel-18 UEs for certain bands as defined in 38.101-1 and 38.101-5Optional otherwiseFFS for (e)RedCap |

1. NR\_RF\_FR2\_req\_Ph3

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| 29. NR\_RF\_FR2\_req\_Ph3 | 29-1 | Beam correspondence in initial access and RRC\_INACTIVE  | R18 and onward UE shall support beam correspondence in initial access and RRC\_INACTIVE and satisfy the corresponding spherical coverage requirement for initial access and RRC\_INACTIVE as specified in 38.101-2 |  | No |  | UE performance in initial access and RRC\_INACTIVE in FR2 cannot be guaranteed | N/A | N/A | FR2 only |  |  | Mandatory without capability signaling from Rel-18 |

1. NR\_FR2\_multiRX\_DL

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| Features | Index | Feature group | Components | Prerequisite feature groups | Need for the gNB to know if the feature is supported | Applicable to the capability signalling exchange between UEs (V2X WI only)”. | **Consequence if the feature is not supported by the UE** | **Type****(the ‘type’ definition from UE features should be based on the granularity of 1) Per UE or 2) Per Band or 3) Per BC or 4) Per FS or 5) Per FSPC)** | Need of FDD/TDD differentiation | Need of FR1/FR2 differentiation | Capability interpretation for mixture of FDD/TDD and/or FR1/FR2 | Note | Mandatory/Optional |
| 30. NR\_FR2\_multiRX\_DL | 30-1 | Supports scheduling restriction relaxation and measurement restriction relaxation | * Supports simultaneous reception of CSI-RS for layer 1 measurement and PDSCH with different QCL Type-D on overlapping OFDM symbols.
* Supports Simultaneous layer 1 measurement of CSI-RS overlapping with another CSI-RS with different QCL Type-D on overlapping OFDM symbol(s).
 | 16-2c, 23-5-1, at least one of 16-2a, 16-2b-1, 16-2b-2 and 16-2b-3 | Yes | N/A |  | Per FSPC | TDD only | FR2-1 only |  | Note: It can be supported for PC3 only. | Optional with capability signalling |
| 30. NR\_FR2\_multiRX\_DL | 30-2 | Fast beam sweeping for layer-1 measurement when the UE is in multi-Rx operation | * Supports beam sweeping factor reduction for SSB-based layer-1 measurement for activated serving cell when the UE is in multi-Rx operation.
 |  | Yes | N/A |  | Per band | TDD only | FR2-1 only |  | Candidate values for Component 2: {2,4,6} for FR2-1Note: It is only supported for power class 3. | Optional with capability signalling |
| 30. NR\_FR2\_multiRX\_DL | 30-3 | Supports Indication of multi-Rx operation preference | * Indicates whether the UE supports providing multi-Rx operation preference for FR2
 |  | Yes | N/A |  | Per UE | TDD only | FR2-1 only |  | Note 1: It is only supported for power class 3. | Optional with capability signalling |

1. NR\_RRM\_enh3

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| 31. NR\_RRM\_enh3 | 31-1 | Enhanced L3 measurement reporting for unknown SCell activation if the valid L3 measurement results are available | Support of reporting valid L3 measurement results triggered by the SCell activation command |  | Yes | N/A | UE does not support reporting valid L3 measurement results triggered by SCell activation command | Per UE | No | No | N/A | UE is required to meet the shortened SCell activation delay requirement in TS38.133 [section 8.x.y] if the feature is supported, including single SCell activation, single PUCCH SCell activation, and multiple SCell activation with/without PUCCH SCell. | Optional with capability signaling |
| 31. NR\_RRM\_enh3 | 31-2 | Beam sweeping factor reduction for FR2 unknown SCell activation | Support of reducing beam sweeping factor for cell detection if UE has full set (N=8) of beam sweeping during AGC settling part during FR2-1 unknown SCell activation procedureSupport of reducing beam sweeping factor for SSB based L1-RSRP measurement if UE has full set (N=8) of beam sweeping during AGC settling part during FR2-1 unknown SCell activation procedure |  | Yes | N/A | UE does not support beam sweeping factor reduction for cell detection during FR2-1 unknown SCell activation.UE does not support beam sweeping factor reduction for SSB based L1-RSRP measurement during FR2-1 unknown SCell activation. | Per Band | TDD onl | FR2-1 only | N/A | UE is required to meet the shortened SCell activation delay requirement in TS38.133 [section 8.x.y] if the feature is supported.Candidate values for beam sweeping reduction for cell detection during FR2-1 unknown SCell activation are 1,2,4, or 6. [Agreed in WF R4-2310081]Candidate values for beam sweeping reduction for SSB based L1-RSRP measurement during FR2-1 unknown SCell activation are 0,1,2,3,4,5,6, or 7. [Agreed in WF R4-2310081] | Optional with capability signaling |
| 31. NR\_RRM\_enh3 | 31-3 | Shorter measurement interval for unknown SCell activation | (1) Support of using SSB periodicity instead of SMTC periodicity for the measurement interval during unknown SCell activation when the SMTC is only configured in measurement object for enhanced unknown SCell activation requirement.(2) Support of performing L1-RSRP measurement in non-DRX mode even DRX is configured during unknown SCell activation |  | Yes | N/A | UE does not use SSB periodicity instead of SMTC periodicity for the measurement interval during unknown SCell activation when the SMTC is only configured in MO for enhanced unknown Scell activation requirement.UE does not support performing L1-RSRP measurement in non-DRX mode even DRX is configured during unknown SCell activation | Per UE | No | No | N/A | UE is required to meet the shortened SCell activation delay requirement in TS38.133 [section 8.x.y] if the feature is supported. | Optional with capability signaling |

1. NR\_MG\_enh2

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| **Features** | **Index** | **Feature group** | **Components** | **Prerequisite feature groups** | **Need for the gNB to know if the feature is supported** | **Applicable to the capability signalling exchange between UEs (V2X WI only)”.** | **Consequence if the feature is not supported by the UE** | **Type** | **Need of FDD/TDD differentiation** | **Need of FR1/FR2 differentiation** | **Capability interpretation for mixture of FDD/TDD and/or FR1/FR2** | **Note** | **Mandatory/Optional** |
| 32. NR\_MG\_enh2 | 32-1 | Concurrent gaps with Pre-MG in a FR | Support of multiple per-UE (or per-FR) measurement gap patterns with at least one per-UE (or per-FR) Pre-MG. Details in Clause [9.1.x.2] of TS 38.133.  | 19-3-x and 19-2x = 1 or 2  | Yes | No | UE behaviour is undefined if the network configures concurrent MGs where at least one of the gaps is a Pre-MG | Per UE | No | No | N.A |  | Optional with capability signalling  |
| 32. NR\_MG\_enh2 | 32-2 | Support for dynamic collisions | Support RRM requirements for handling dynamic collisions between a Pre-MG and another measurement gap or Pre-MG. | 32-1 | Yes | No | UE is not expected to meet RRM requirements for dynamic collisions | Per UE | No | No | N.A |  | Optional with capability signalling  |
| 32. NR\_MG\_enh2 | 32-3 | Concurrent gaps with NCSG in a FR | Support of multiple per-UE (or per-FR) measurement gap patterns with at least one per-UE (or per-FR) NCSG. Details in clause [9.1.y.2] of TS 38.133.  | 19-1 and 19-2 | Yes | No | UE behaviour is undefined if the network configures concurrent MGs where at least one of the gaps is a NCSG | Per UE | No | No | N.A |  | Optional with capability signalling  |
| 32. NR\_MG\_enh2 | 32-4 | Inter-RAT EUTRAN measurements without gap and outside active DL BWP | Support inter-RAT EUTRAN measurements outside active DL BWP for nogap-noncsg  | 19-1b | Yes | NA | UE does not meet the requirements of inter-RAT EUTRAN measurements without gap in TS 38.133 and the UE behavior is unknown to network | Per UE | No | No | N.A |  | Optional with capability signalling |
| 32. NR\_MG\_enh2 | 32-5 | Inter-RAT EUTRAN measurement without gap and within active DL BWP | Support of inter-RAT EUTRAN measurements without gap when CRS is completely contained within UE’s active DL BWP |  | Yes | No | Measurement gap will be needed for inter-RAT EUTRAN measurements | Per UE | No | FR1 only | N.A |  | Optional with capability signalling |
| 32. NR\_MG\_enh2 | 32-6 | Effective measurement window for inter-RAT EUTRAN measurements | Support configuration of effective measurement window for inter-RAT EUTRAN measurements, including offset, duration and periodicity.  | 32-4 or 32-5 | Yes | No | UE is not allowed to cause scheduling restriction defined in TS 38.133 for 32-4 or 32-5 | Per UE | No | No | N.A | * A bitmap for 6 effective measurement window (EMW) patterns defined in TS 38.133.
* #0 and #1 are mandatory, if UE supports EMW feature.

Other patterns are optionalNote: If UE supports 32-6 or 32-7 and UE requires scheduling restriction, UE should support this FG | Optional with capability signalling |
| 32. NR\_MG\_enh2 | 32-7 | Simultaneous reception of NR data and EUTRAN CRS with different numerology | Support concurrent inter-RAT measurement on EUTRAN cell in non-DSS and PDCCH or PDSCH reception from the serving cell with a different numerology |  32-4 or 32-5 | Yes | No | scheduling restriction is applicable | Per UE | No | FR1 only | N.A |  | Optional with capability signalling |

Table 2: Rel-18 LTE UE features for NR\_MG\_enh2 WI.

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| 32. NR\_MG\_enh2 | x-y | interRAT-NeedForInterruptionNR-r18 | Support of inter-RAT NR measurements without gap with or without interruption when the interRAT-NeedForGapsNR-r16 is false.Note: This feature already has a defined UE capability: ‘interRAT-NeedForInterruptionNR-r18’. The intention of adding this FG is only keep consistency between 38.822 and 36.306. | interRAT-NeedForGapsNR-r16 | Yes | NA | The UE does not support inter-RAT NR measurements without gap with or without interruption for performing inter-RAT NR measurement without gap | [Per target band per BC]Note: the same granularity as interRAT-NeedForGapsNR-r16 | No | No | NA | Candidate value: “{no-gap-with-interruption, no-gap-no-interruption}” | Optional with capability signalling |
| 32. NR\_MG\_enh2 | x-z | Simultaneous reception of EUTRAN data and NR SSB with different numerology | Support concurrent SSB-based inter-RAT measurement on NR cell and PDCCH or PDSCH reception from the serving cell with a different numerology | x-y | Yes | NA | scheduling restriction is applicable | Per UE | No | FR1 only | NA |  | Optional with capability signalling |

1. NonCol\_intraB\_ENDC\_NR\_CA

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| 33. NonCol\_intraB\_ENDC\_NR\_CA | 33-1 | Support of intra-band non-collocated NR CA operation | Indicates the UE supports TDD-TDD intra-band non-collocated NR-CA operation with MTTD/MRTD requirements according to Table 7.5.4.1/Table 7.6.4-2 in 38.133 [5] and UE RF requirements for intra-band non-collocated NR-CA including 7.10A in 38.101-1 [2]. And the UE also supports TDD-TDD intra-band NR-CA operation with MRTD according to Table 7.6.4-1 in 38.133 and UE RF requirements for intra-band NR-CA except for 7.10A in 38.101-1 [2]. |  | Yes | N/A | Intra-band non-collocated NR CA operation is not supported. The UE supports TDD-TDD intra-band NR-CA operation with MRTD according to Table 7.6.4-1 in 38.133 and UE RF requirements for intra-band NR-CA except for 7.10A in 38.101-1. | Per BC | N/A | FR1 only | N/A | Supported for band n77/n78 only | Optional with capability signaling |
| 33. NonCol\_intraB\_ENDC\_NR\_CA | 33-2 | Support network control of requirement applicability for UE supporting interBandMRDC-WithOverlapDL-Bands-r16 | For Rel-18, introduce a new UE capability which indicates support network control of requirement applicability for UE supporting interBandMRDC-WithOverlapDL-Bands-r16. This field is only applicable to the UE indicating interBandMRDC-WithOverlapDL-Bands-r16.. | 2-19(Rel-16 RAN4 feature) | Yes | N/A | The UE will support “interBandMRDC-WithOverlapDL-Bands-r16” only which means in Rel-18 the network can’t enforce modification on the UE types | per UE | N/A | FR1 Only | N/A |  | Optional with capability signalling |

1. NR\_HST\_FR2\_enh

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| 34.NR\_HST\_FR2\_enh | 34-1 | Support of NR FR2 HST with simultaneous DL reception with two different QCL TypeD RSs  | 1) Support of enhanced RF requirement to support FR2-1 PC6 UEs with simultaneous DL signals reception with two different QCL TypeD RSs2) Support of enhanced RRM requirement to support FR2-1 PC6 UEs with simultaneous DL signals reception associated with two different QCL TypeD RSs | 22-1 | Yes | N/A | UE does not support FR2 high speed train scenario with simultaneous DL reception with two different QCL TypeD RSs | Per Band | No | FR2 only | N/A | A single indication element is used to indicate for the components for 34-1. The UE capability reported in this feature is applied when highSpeedDeploymentTypeFR2-r17 is configured by network as bidirectional | Optional with capability signaling |
| 34.NR\_HST\_FR2\_enh | 34-2 | Enhanced FR2 HST RRM requirements for intra-band CA and inter-frequency measurements in connected mode | 1) Support of the RRM requirement for intra-band CA operation in connected mode to support FR2 high speed up to 350 km/h, as specified in TS 38.1332) Support of the RRM requirement for enhanced inter-frequency measurements in connected mode to support FR2 high speed up to 350 km/h, as specified in TS 38.133 | 22-1 | Yes | N/A | The performance of intra-frequency measurement on SCC and/or inter-frequency measurements in connected mode for NR FR2 HST scenario cannot be guaranteed | Per band | No | FR2 only | N/A |   | Optional with capability signaling |
| 34.NR\_HST\_FR2\_enh | 34-3 | Enhanced FR2 HST RRM requirements for inter-frequency measurement in Idle and Inactive mode | Support of the RRM requirement for inter-frequency measurements in idle and Inactive mode to support FR2 high speed up to 350 km/h, as specified in TS 38.133 | 22-1 | No | N/A | The performance of inter-frequency measurement in idle and Inactive mode for FR2 HST scenario cannot be guaranteed | N/A | No | FR2 only | N/A |   | Optional without capability signaling |
| 34.NR\_HST\_FR2\_enh | 34-4 | Support of enhanced MAC CE for TCI state switch indication for FR2 HST | 1. Support of enhanced one-shot large UL transmit timing adjustment requirement to support FR2-1 PC6 UEs, as specified in TS 38.133 based on [the cross-RRH TCI state indication for UE-specific PDCCH MAC CE] 2. Support of enhanced TCI state switching delay requirewments based on new MAC CE for TCI state switch indication named as [the cross-RRH TCI state indication for UE-specific PDCCH MAC CE] in HST FR2 scenario, as specified in TS 38.133.  | 22-1 | Yes | N/A | UE does not support enhanced MAC CE for TCI state switch indication for FR2 HST | Per Band | No | FR2 only | N/A |  The naming of MAC CE for [the cross-RRH TCI state indication for UE-specific PDCCH] depends on RAN2 | Optional with capability signalling |

1. NR\_ATG

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| 35. NR\_ATG | 35-1 | Enhanced RRM requirements for measurements in IDLE and INACTIVE modes | Indicate the support of enhanced inter-frequency cell re-selection requirements for ATG (as specific in TS 38.133 Table 4.2D.2.4-2) |  | no | N/A | If UE does not support the capability, legacy measurement requirements (as specified in TS 38.133, Table 4.2D.2.4-1) are applied. | Per UE | No | FR1 only | N/A |  | Optional without capability signaling |
| 35. NR\_ATG | 35-2 | Antenna type | Indicate whether UE supports the RF and RRM requirements with antenna array as specified in TS 38.101-1 section 6.1J, 7.1J and TS 38.133. If the field is absent, the RF and RRM requirements with omni-directional antenna applies as specified in TS 38.101-1 section 6.1J, 7.1J and TS 38.133.  |  | yes | N/A | If UE does not support this feature group, performance cannot be guaranteed.  | Per Band | No | FR1 only | N/A |  | Mandatory with capability signaling for UE supports NR communication via ATG |
| 35. NR\_ATG | 35-3 | Rated max output power | Indicate the support of rated maximum output power at maximum modulation order and full PRB configurations |  | yes | N/A | If UE does not support the capability, network does not know ATG UE’s maximum output power. | Per band | No | FR1 only | N/A | Value range from 23dBm to 40dBm with 1dB as granularity | Mandatory with capability signaling for UE supports NR communication via ATG |
| 35. NR\_ATG | 35-4 | ATG specific P-max | Indicate the support of ATG specific P-max configured by network.  |  | no | N/A | If UE does not support ATG specific P-max value, ATG UE can’t identify configured maximum output power PCMAX,f,c | Per UE | No | FR1 only | N/A | Value range from -21dBm to 42dBm | Mandatory without capability signaling for UE supports NR communication via ATG |

1. NR\_demod\_enh3

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| **Features** | **Index** | **Feature group** | **Components** | **Prerequisite feature groups** | **Need for the gNB to know if the feature is supported** | **Applicable to the capability signalling exchange between UEs (V2X WI only)”.** | **Consequence if the feature is not supported by the UE** | **Type****(the ‘type’ definition from UE features should be based on the granularity of 1) Per UE or 2) Per Band or 3) Per BC or 4) Per FS or 5) Per FSPC)** | **Need of FDD/TDD differentiation** | **Need of FR1/FR2 differentiation** | **Capability interpretation for mixture of FDD/TDD and/or FR1/FR2** | **Note** | **Mandatory/Optional** |
| 36. NR\_demod\_enh3 | 36-1 | MU-MIMO Interference Mitigation advanced receiver  | R-ML (reduced complexity ML) receivers with enhanced inter-user interference suppression, for MU-MIMO up to *maxNumberMIMO-LayersPDSCH* layers across target and co-scheduled UEs with 2 RX and 4RX antennas, when co-scheduled UE(s)’ modulation order is explicitly signaled by DCI index 1-5 in Table 7.3.1.2.2-12 of TS38.212. | 3-4 | Yes | N/A | UE not capable of advanced receiver to suppress inter-user inference in MU-MIMO  | Per UENote: UE supports R-ML on MU-MIMO on single carrier operation. UE optionally supports R-ML on MU-MIMO on one or more carriers in CA, NE-DC, NR-DC and EN-DC operation  | No | FR1 only | N/A |  | Optional with capability signaling |
| 36. NR\_demod\_enh3 | 36-2a | MU-MIMO Interference Mitigation advanced receiver with modulation order detection  | R-ML (reduced complexity ML) receivers with enhanced inter-user interference suppression for MU-MIMO for 2 layers across target and co-scheduled UEs with 2RX and 4RX when the co-scheduled UE information with DCI index 6 or 7 in Table 7.3.1.2.2-12 of TS38.212 is signalled.  | 36-1 | No | N/A | UE not capable of advanced receiver to suppress inter-user inference in MU-MIMO with modulation order detection | N/A | No | FR1 only | N/A |  | Optional without capability signaling |
| 36. NR\_demod\_enh3 | 36-2b | MU-MIMO Interference Mitigation advanced receiver with modulation order detection | R-ML (reduced complexity ML) receivers with enhanced inter-user interference suppression for MU-MIMO for 2 layers across target and co-scheduled UEs with 2RX and *maxNumberMIMO-LayersPDSCH* layers across target and co-scheduled UEs with 4RX when the co-scheduled UE information with DCI index 6 in Table 7.3.1.2.2-12 of TS38.212 is signalled. | 36-1 | No | N/A | UE not capable of advanced receiver to suppress inter-user inference in MU-MIMO with modulation order detection | N/A | No | FR1 only | N/A |  | Optional without capability signaling |

1. NR\_pos\_enh2

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| **Features** | **Index** | **Feature group** | **Components** | **Prerequisite feature groups** | **Need for the gNB to know if the feature is supported** | **Applicable to the capability signalling exchange between UEs (V2X WI only)”.** | **Consequence if the feature is not supported by the UE** | **Type****(the ‘type’ definition from UE features should be based on the granularity of 1) Per UE or 2) Per Band or 3) Per BC or 4) Per FS or 5) Per FSPC)** | **Need of FDD/TDD differentiation** | **Need of FR1/FR2 differentiation** | **Capability interpretation for mixture of FDD/TDD and/or FR1/FR2** | **Note** | **Mandatory/Optional** |
| 37.NR\_pos\_enh2 | 37-1 | Support of reduced number of samples for PRS based positioning measurements with frequency hopping for RRC\_CONNECTED | 1. Support of reduced number of samples in PRS based positioning measurements with frequency hopping | RAN1 feature 28-1 or 48-1, 27-3-1, 41-5-1 | No | NA | RedCap UE does not support reduced number of samples for PRS based positioning measurements with frequency hopping | Per Band | No | No | NA | Component 1 candidate value: true/falseNeed for the LMF to know if the feature is supported: True | Optional with capability signalling |
| 37.NR\_pos\_enh2 | 37-1A | Support of reduced number of samples for PRS based positioning measurements with frequency hopping for RRC\_IDLE and RRC\_INACTIVE | 1. Support of reduced number of samples in PRS based positioning measurements with frequency hopping | RAN1 feature 28-1 or 48-1, 27-3-1, 41-5-1 | No | NA | RedCap UE does not support reduced number of samples for PRS based positioning measurements with frequency hopping | Per Band | No | No | NA | Component 1 candidate value: true/falseNeed for the LMF to know if the feature is supported: True | Optional with capability signalling |
| 37.NR\_pos\_enh2 | 37-2 | Support of reduced number of samples in positioning measurements with PRS bandwidth aggregation for RRC\_CONNECTED | 1. Support of reduced number of samples in positioning measurements with PRS bandwidth aggregation | Component 1 RAN1 feature 41-4-1 | No | NA | UE does not support reduced number of samples in positioning measurements with PRS bandwidth aggregation | Per Band | No | No | NA | Component 1 candidate value: true/falseNeed for the LMF to know if the feature is supported: True | Optional with capability signalling |
| 37.NR\_pos\_enh2 | 37-2A | Support of reduced number of samples in positioning measurements with PRS bandwidth aggregation for RRC\_IDLE and RRC\_INACTIVE | 1. Support of reduced number of samples in positioning measurements with PRS bandwidth aggregation | Component 1 RAN1 feature 41-4-1 | No | NA | UE does not support reduced number of samples in positioning measurements with PRS bandwidth aggregation | Per Band | No | No | NA | Component 1 candidate value: true/falseNeed for the LMF to know if the feature is supported: True | Optional with capability signalling |

1. NR\_MC\_enh

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| **Features** | **Index** | **Feature group** | **Components** | **Prerequisite feature groups** | **Need for the gNB to know if the feature is supported** | **Applicable to the capability signalling exchange between UEs (V2X WI only)”.** | **Consequence if the feature is not supported by the UE** | **Type****(the ‘type’ definition from UE features should be based on the granularity of 1) Per UE or 2) Per Band or 3) Per BC or 4) Per FS or 5) Per FSPC)** | **Need of FDD/TDD differentiation** | **Need of FR1/FR2 differentiation** | **Capability interpretation for mixture of FDD/TDD and/or FR1/FR2** | **Note** | **Mandatory/Optional** |
| 38. NR\_MC\_enh  | 38-1 | Switching period for dynamic UL Tx switching across up to 4 bands in case of inter-band CA, SUL up to two TAGs | UE to indicate support of dynamic UL Tx switching across up to 4 bands for inter-band UL CA, or SUL.switchingPeriodFor2T-r18 indicates the length of 2Tx-2Tx switching period. switchingPeriodFor1T-r18 indicates the length of 1Tx-2Tx switching and/or 1Tx-1Tx switching period, as specified in TS 38.101-1. n35us represents 35 us, n140us represents 140us, and n210us represents 210us, as specified in TS 38.101-1. |   | Yes  |   | UL Tx switching across more than 2 bands cannot be supported for the band pair in the band combination  | Per BC, details are up to RAN2 | No need  | Applicable only to FR1  |   |   | Optional with capability signaling  |
| 38. NR\_MC\_enh  | 38-2 | Application of DL interruptions due to dynamic UL Tx switching | 1. Capability to indicate that for the band where DL interruption is needed, the RRM interruption requirements defined in RAN4 shall be applied for duplex mode combinations except the combinations- SUL+TDD- TDD+TDD CA with the same UL-DL pattern  | 38-1 | Yes  | N/A  | UL Tx switching where DL interruption is needed cannot be supported.  | Per BC | No | FR1 only  | Support mixture of FDD/TDD  |  Note: Field encoded as a bit map, where bit N is set to "1" if DL interruption on band N will occur during uplink Tx switching as specified in TS 38.133 [5]. The leading / leftmost bit (bit 0) corresponds to the first band of this band combination, the next bit corresponds to the second band of this band combination and so on. | Optional with capability signaling  |
| 38. NR\_MC\_enh  | 38-3  | Switching Period for unaffected Band for Dual UL | SwitchingPeriodUnaffectedBandDualUL indicate for a given band pair {band X and band Y}, whether/how the switching period is to be applied on band X, Y, Z, when a UL Tx switching is triggered from band pair {band X and band Z} to band pair {band Y and band Z}, as defined in 38.101-1. If absent for band Z, the UE is not required to transmit on any UL bands during the switching period reported for the band pair of band X and band Y, as defined in 38.101-1-      maintainedUL-Trans-r18 indicates that the UE is capable of uplink transmission on band Z and is not required to transmit on band X and Y during the switching period reported for the band pair of band X and band Y, as specified in 38.101-1.  -      periodOnULBands-r18 indicates the switching period to be applied on any UL bands as specified in 38.101-1. n35us represents 35 us, n140us represents 140us, and n210us represents 210us. -      Band Z corresponds to the zth entry in the uplinkTxSwitchingPeriodUnaffectedBandDualUL-List-r18, which includes the UL band of this band combination excluding band X and band Y listed in the same order of the band combination. | 38-1 | Yes  | N/A  | UL Tx switching across more than 2 bands cannot be supported for the band pair in the band combination. | Per BC | No | FR1 only  | Support mixture of FDD/TDD  |  Component 3 candidate value: {35us, 140 us, 210us} | Optional with capability signaling  |
| 38. NR\_MC\_enh  | 38-4 | Additional switching Period for switching case across three or four bands for Dual UL | 1. Indicate additionally the supported Tx switching period for switching case across three or four band, when Rel-18 UL Tx switching is configured by uplinkTxSwitchingMoreBands-r18. If the capability is not reported, the switching period reported in switchingPeriodFor2T-r18 or switchingPeriodFor1T-r18 applies, as specified in TS 38.214 and TS 38.101-1. | 38-1 | Yes  | N/A  | UL Tx switching across more than 2 bands cannot be supported for the band pair in the band combination. | Per BC | No | FR1 only  | Support mixture of FDD/TDD  |  Component 1 candidate value: {35us, 140 us, 210us} | Optional with capability signaling  |
| ~~38.~~~~NR\_MC\_enh~~ | ~~38-5~~ | ~~[preferredBandPairs for four-band switching case]~~ | ~~[1. Support the indication of the switching period can be improved to min {max(Tswitch\_A-C, Tswitch\_B-D), max(Tswitch\_A-D, Tswitch\_B-C)} assuming UE’s preferred (switched-from, switched-to) band pairs for parallel UL transmission switching for a band combination consisting of four different bands.]~~ | ~~38-1~~ | ~~Yes~~ | ~~N/A~~ | ~~[Network can only assume the maximum switch period]~~ | ~~Per BC~~ | ~~No~~ | ~~FR1 only~~ | ~~Support mixture of FDD/TDD~~ | ~~[Note: Detailed information can refer to the LS to RAN2 in R4-2317609]~~ | ~~Optional with capability signalling~~ |
| 38. NR\_MC\_enh  | 38-5 | UL-MIMO coherence capability for dynamic Tx switching between 2Tx-2Tx switching among up to 4 bands | 1. Apply UL-MIMO coherence for the 2Tx-capable UL band(s). Rel-17 signalling on UL-MIMO coherence capability for 2Tx-2Tx switching is reused | 38-1Rel-17 RAN4 UE FG 16-5, 16-6 | Yes | N/A | The existing Rel-15 per band UE capability pusch-TransCoherence is applicable to each of the 2Tx-capable UL band(s) for Tx switching | Per BC | No | FR1 only | Support mixture of FDD/TDD | Note: Detailed information can refer to the LS to RAN2 in R4-2217741. | Optional with capability signalling  |
| 38. NR\_MC\_enh  | 38-6 | Switching period restriction for fallback band combination | Indicates whether the same value of switching period is applicable to the fallback band combinations for given band combination supporting uplink Tx switching across up to four bands. When the field is included for a band combination, it represents the largest value, i.e. 210us is supported for each band pair in all fallback band combinations for a given band combination supporting UL Tx switching across up to 4 bands. | 38-1 | Yes | N/A | The same switching period reported for each band pair in this band combination is supported for the same band pair in all the fallback band combinations. | Per BC | No | FR1 only | Support mixture of FDD/TDD |  | Optional with capability signaling |

1. NR\_Mob\_enh2

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| **Features** | **Index** | **Feature group** | **Components** | **Prerequisite feature groups** | **Need for the gNB to know if the feature is supported** | **Applicable to the capability signalling exchange between UEs (V2X WI only)”.** | **Consequence if the feature is not supported by the UE** | **Type****(the ‘type’ definition from UE features should be based on the granularity of 1) Per UE or 2) Per Band or 3) Per BC or 4) Per FS or 5) Per FSPC)** | **Need of FDD/TDD differentiation** | **Need of FR1/FR2 differentiation** | **Capability interpretation for mixture of FDD/TDD and/or FR1/FR2** | **Note** | **Mandatory/Optional** |
| 39.NR\_Mob\_enh2 | 39-1 | SSB based L1-RSRP measurements for multiple cells with RTD > CP  | Capability of simultaneous L1-RSRP measurements for more than one cell when the max RTD among the cells on the same frequency layer or in the same active BWP is larger than CP length of the cell on the frequency layer or in the same active BWP. | 45-1 from RAN1 Rel-18 feature list or 39-2 or 39-2a | Yes | No | The corresponding RAN4 requirements may not be satisfied when the max RTD among the cells on the same frequency layer or in the same active BWP is larger than CP length of the cell on the frequency layer or in the same active BWP. | Per BC | No | No  | N/A |  | Optional with capability signaling |
| 39.NR\_Mob\_enh2 | 39-2 | SSB based inter-frequency L1-RSRP measurements without measurement gaps | Capability of SSB based inter-frequency L1-RSRP measurements on SSBs within active DL BWP without measurement gaps (without interruption on serving cell(s)) for LTM | 45-1a from RAN1 Rel-18 feature list  | Yes | No | UE does not support inter-frequency L1-RSRP measurements without measurement gaps | Per BC | No | No | N/A |  | Optional with capability signaling |
| 39.NR\_Mob\_enh2 | 39-2a | SSB based inter-frequency L1-RSRP measurements with measurement gaps | Capability of SSB based inter-frequency L1-RSRP measurements with measurement gaps for LTM | 45-1a from RAN1 Rel-18 feature list | Yes | No | UE does not support inter-frequency L1-RSRP measurements with measurement gaps | Per UE | No | No | N/A |  | Optional with capability signaling |
| 39.NR\_Mob\_enh2 | 39-3-1 | Number of frequency layers for L1-RSRP measurement | 1. The max number of frequency layers UE can measure for intra- and inter-frequency without measurement gaps L1-RSRP measurement

2. The max number of frequency layers UE can measure for inter-frequency L1-RSRP measurement with measurement gaps  | 1. Component 1: 45-1 from RAN1 Rel-18 feature list and/or 39-2 2. Component 2: 39-2a | Yes | No | NW does not know the max number of frequency layers UE can measure | Per BC | No | No | N/A | 1. Candidate values Component 1: {1,2,3,4,5,6,7,8}2. Candidate values Component 2: {1,2,3,4,5,6,7,8} | Mandatory with capability signaling if UE supports 45-1, 39-2 and/or 39-2a |
| 39.NR\_Mob\_enh2 | 39-3-2 | Number of neighbour cells to be measured per frequency layer | 1. The max number of neighbour cells UE can measure for L1-RSRP per frequency layer for intra-frequency or inter-frequency without measurement gaps

2. The max number of neighbour cells UE can measure for L1-RSRP per frequency layer for inter-frequency with measurement gaps | 1. Component 1: 45-1 from RAN1 Rel-18 feature list or 39-2 2. Component 2: 39-2a | Yes | No | There is no limitation on the number of neighbour cells per frequency layer for L1 measurement. | Per BC | No | No | N/A | 1. Candidate values Component 1: {1,2,3,4,5,6,7,8}2. Candidate values Component 2: {1,2,3,4,5,6,7,8}Note: it is RAN4 understanding that RAN1 feature 45-1 and 45-1a is for number of cell that can be configured for L1 measurement. What RAN4 is discussing here is for number of cells on which UE can actually perform L1 measurement. | Optional with capability signaling |
| 39.NR\_Mob\_enh2 | 39-3-3 | Number of total cells to be measured | The max number of total cells of serving cells and neighboring cells across all frequency layers of intra-frequency and inter-frequency without measurement gaps for L1 measurement. | 45-1 from RAN1 Rel-18 feature list or 39-2 | Yes | No | There is no limitation on the number of total cells of serving cells and neighboring cells across all frequency layers of intra-frequency and inter-frequency without measurement gaps for L1 measurement.  | Per BC | No | No | N/A | candidate values: {1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24}Note: when same PCI is present in serving and candidates, one PCI is counted only once in total cells | Optional with capability signaling |
| 39.NR\_Mob\_enh2 | 39-3-4 | Number of SSB resources for L1-RSRP measurement within a slot | The max number of SSB resources for L1-RSRP measurement that UE can measure within a slot across candidate cells for intra- and inter-frequency without gap L1-RSRP measurement | 45-1 from RAN1 Rel-18 feature list or 39-2 | Yes | No | There is no limitation on the number of SSB resources of intra-frequency and inter-frequency without measurement gaps for L1 measurement within a slot. | Per BC | No | Yes | N/A | Candidate value: {1,2,3,4,5,6,7,8,16,32, 48,64}Note: It is also counted in FG 2-24 | Optional with capability signaling |
| 39.NR\_Mob\_enh2 | 39-3-5 | Number of SSB resources for L1-RSRP measurement per frequency layer | 1. The max number of SSB resources UE can measure for L1-RSRP per frequency layer for intra-frequency or inter-frequency without measurement gaps

2. The max number of SSB resources UE can measure for L1-RSRP per frequency layer for inter-frequency with measurement gaps | 1. Component 1: 45-1 from RAN1 Rel-18 feature list or 39-2 2. Component 2: 39-2a | Yes | No | There is no limitation on the number of SSB resources per frequency layer for L1 measurement. | Per BC | No | No | N/A | Candidate value of Component 1: {1,2,3,4,5,6,7,8}Candidate value of Component 2: {1,2,3,4,5,6,7,8} | Optional with capability signaling |
| 39.NR\_Mob\_enh2 | 39-3-6 | Number of total SSB resources to be measured | The max number of total SSB resources of serving cells and neighboring cells across all frequency layers of intra-frequency and inter-frequency without measurement gaps for L1 measurement. | 45-1 from RAN1 Rel-18 feature list or 39-2 | Yes | No | There is no limitation on the total number of SSB resources of serving cells and neighboring cells across all frequency layers of intra-frequency and inter-frequency without measurement gaps for L1 measurement. | PerBC | No | No | N/A | Candidate values:{2,4,8,12,16,32,64}Note: the value should be not smaller than UE capability of beamManagementSSB-CSI-RS (Component 2 of 2-24) | Optional with capability signaling |
| 39.NR\_Mob\_enh2 | 39-4 | Interruption on DL slot(s) due to PDCCH- ordered RACH transmission | Capability on whether UE may cause interruption on DL slot(s) on serving cells due to PDCCH-ordered RACH transmission | 45-5 | Yes | No | UE does not cause interruptions on DL slots on serving cells due to PDCCH-ordered RACH transmission | Per band pair (between the target band for RACH transmission and band under UE’s current band combo) per band combination | No | No | N/A |  | Optional with capability signaling |
| 39.NR\_Mob\_enh2 | 39-4a | Interruption due to RF retuning for PDCCH- ordered RACH | Indicates the interruption length (Y ms) due to RF re-tuning for PDCCH ordered RACH of which the resources are not fully contained in any of UE’s configured UL BWP(s) of active serving cells | 45-5 | Yes | No | PDCCH-order RACH for LTM is not supported if the PRACH bandwidth is outside of any configured BWP | Per band pair (between the target band for RACH transmission and band under UE’s current band combo) per band combination | No | No | N/A | Candidate values for interruption length Y = 0.25, 0.5, 1 and 2 | Optional with capability signaling |
| 39.NR\_Mob\_enh2 | 39-5 | RF/BB preparation time for PDCCH-order RACH | Indicates the RF/BB preparation time for PDCCH ordered RACH of which the resources are not fully contained in any of UE’s configured UL BWP(s) of active serving cells | 45-5 | Yes | No | PDCCH-order RACH for LTM is not supported if the PRACH bandwidth is outside of any configured BWP | Per band pair (between the target band for RACH transmission and band under UE’s current band combo) per band combination | No | No  | N/A | Candidate values:{ 1ms,3ms,5ms,10ms } | Optional with capability signaling |
| 39.NR\_Mob\_enh2 | 39-6 | Fast processing of LTM candidate cell RRC configuration | 1. Indicates the maximum number of serving cell(s) and candidate cell(s), including serving SpCell(s), serving SCell(s) in MCG and SCG, SpCell in LTMCandidateConfig(s) and Scell(s) in LTMCandidateConfig(s) for MCG and SCG, that UE can store the configurations.2. Indicates the maximum number of LTMCandidateConfigs that UE can support fast processing. | 45-3a or 45-4a in RAN1 feature list | Yes | No | TLTM\_RRC-processing delay (refer to TS 38.133) will not be skipped, i.e., 10ms | Per UE | No | Yes | N/A | Component 1: Candidate values:{2,3,4,5,6,7.8,9,10,11,12, 16}Component 2: {1,2,3,4}Note: The conditions for fast processing of an LTM candidate cell RRC configuration is defined in section 6.3 in 38.133. | Optional with capability signaling |
| 39.NR\_Mob\_enh2 | 39-7 | Faster UE processing time during cell switch | Capability of reduced TLTM\_processing delay (refer to TS 38.133)].1. Support of reduced TLTM\_processing for cell switch from FR1 to FR1.
2. Support of reduced TLTM\_processing for cell switch from FR2 to FR2.
3. Support of reduced TLTM\_processing for cell switch from FR1/FR2 to FR2/FR1.
 |  | Yes | No | TLTM\_processing delay will not be reduced, i.e., 20ms for intra-FR cell switch and 40ms for inter-FR cell switch | Per UE | No | No | N/A | Candidate values of Component 1 and component 2: {10ms, 15ms}Candidate values of Component 3: {20ms, 30ms} | Optional with capability signaling |
| 39.NR\_Mob\_enh2 | 39-8 | Measurement validation based on EMR measurement during connection setup/resume | Indicate UE supporting measurement validation and report based on EMR measurement during connection setup/resume for fast CA/DC setup | *idleInactiveNR-MeasReport-r16* or *idleInactiveEUTRA-MeasReport-r16* | Yes | N/A | UE does not support EMR measurement validation during connection setup/resume and reporting for fast CA/DC | Per-UE  | No | Yes | N/A |  | Optional with capability signaling |
| 39.NR\_Mob\_enh2 | 39-9 | Measurement validation based on non-EMR measurement during connection setup/resume | Indicate UE supporting measurement validation based on non-EMR measurement during IDLE/INACTIVE state and reporting for fast CA/DC setup |  | Yes | N/A | UE does not support non-EMR measurement validation during connection setup/resume and reporting for fast CA/DC | Per-UE  | No | Yes | N/A |  | Optional with capability signaling |

1. NR\_NTN\_enh

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| **Features** | **Index** | **Feature group** | **Components** | **Prerequisite feature groups** | **Need for the gNB to know if the feature is supported** | **Applicable to the capability signalling exchange between UEs (V2X WI only)”.** | **Consequence if the feature is not supported by the UE** | **Type****(the ‘type’ definition from UE features should be based on the granularity of 1) Per UE or 2) Per Band or 3) Per BC or 4) Per FS or 5) Per FSPC)** | **Need of FDD/TDD differentiation** | **Need of FR1/FR2 differentiation** | **Capability interpretation for mixture of FDD/TDD and/or FR1/FR2** | **Note** | **Mandatory/Optional** |
| 40.NR\_NTN\_enh | 40-1 | VSAT UE type in NTN | Support of fixed or mobile VSAT (Very Small Aperture Terminal) UE typea) Type 1: a fixed VSAT, which can only be fixed.b) Type 2: a mobile VSAT, which is capable to move.A VSAT (Very Small Aperture Terminal) UE as defined in TS 38.101-5 shall indicate support of this capability with only one type.  |  | Yes | N/A | The network doesn’t know the VSAT UE type | Per UE | N/A | FR2 | N/A | Support receiving access control indication in system informationThe feature group is applied to FR2-NTN | Optional with capability signalling |
| 40.NR\_NTN\_enh | 40-2 | Beam steering  | Support of beam steering capability1. Type 1: Fully electronically-steered beam UEs
2. Type 2: Fully mechanically-steered beam UEs

A VSAT (Very Small Aperture Terminal) UE as defined in TS 38.101-5 shall indicate support of this capability with only one type. |  | Yes  | N/A | Beam steering is not supported.  | Per UE | N/A | FR2 | N/A | The capability is not applicable for UE other than VSAT.The feature group is applied to FR2-NTN | Optional with capability signaling |

1. NR\_cov\_enh2

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| **Features** | **Index** | **Feature group** | **Components** | **Prerequisite feature groups** | **Need for the gNB to know if the feature is supported** | **Applicable to the capability signalling exchange between UEs (V2X WI only)”.** | **Consequence if the feature is not supported by the UE** | **Type****(the ‘type’ definition from UE features should be based on the granularity of 1) Per UE or 2) Per Band or 3) Per BC or 4) Per FS or 5) Per FSPC)** | **Need of FDD/TDD differentiation** | **Need of FR1/FR2 differentiation** | **Capability interpretation for mixture of FDD/TDD and/or FR1/FR2** | **Note** | **Mandatory/Optional** |
| 41.NR\_cov\_enh2 | 41-1 | Support of ΔPPowerClass reporting mechanism | Support of ΔPPowerClass /ΔPPowerClass, CA/ΔPPowerClass, EN-DC/ΔPPowerClass, NR-DC reporting which is triggered upon uplink duty cycle exceedance or upon return to the power class after the duty cycle exceedance, as specified in TS 38.101-1 and TS 38.101-3. | No | Yes | N/A | UE does not support of report on the ΔPPowerClass  | Per UE | No | FR1 only | N/A | Component 1 candidate values:        * Type 1: The UE can only report ∆PPowerClass  for non-CA operation

Type 2: The UE can report ∆PPowerClass  for non-CA operation, and the UE can also report ∆PPowerClass/ ΔPPowerClass,CA/∆PPowerClass,EN-DC/∆PPowerClass,NR-DC for CA operation. | Optional with capability signalling |
| 41.NR\_cov\_enh2 | 41-2 | Power boosting for DFT-s-OFDM pi/2 BPSK and QPSK transmissions without modified spectrum flatness requirement  | 1. Support of UE power boosting for DFT-s-OFDM pi/2 BPSK and QPSK without modified spectrum flatness requirement for PC3 and PC2 MPR reduction, when applicable as defined in 6.2 of TS 38.101-1.The power boosting is only enabled when signalled via RCC *powerBoostPi2BPSKRel18* for BPSK and *powerBoostQPSKRel18* for QPSK | 1-6, 1-7 | Yes | N/A | UE cannot power boost without modified spectrum flatness requirement | Per FS | NO | FR1 only | N/A | The feature can be supported in below scenarios:RAN4 intends for the UE to be able support any or all scenarios below:Case 1: FR1 single band with single uplink CC configured in the band where power boosting capability is indicated in this band.Case 2: FR1 DL CA with a single uplink CC configured in a band where power boosting capability is indicated. The power boosting feature can be configured in this FR1 NR band.Case 3: FR1 inter-band UL CA/DC, where a single CC is configured in the uplink bands where power boosting capability is indicated. The power boosting feature can be configured only in one of the bands where capability is indicated.Case 4: FR1+FR2 UL CA, FR1+FR2 DC, where a single CC is configured in the uplink bands where power boosting capability is indicated. The power boosting feature can be configured in the FR1 NR band. | Optional with capability signalling |
| 41.NR\_cov\_enh2 | 42-3 | Power boosting for DFT-s-OFDM pi/2 BPSK and QPSK transmissions with modified spectrum flatness requirement shaping | 1. Support of UE power boosting for DFT-s-OFDM pi/2 BPSK and QPSK with modified spectrum flatness requirement for PC3 and PC2 MPR reduction, when applicable as defined in 6.2 of TS 38.101-1. The power boosting is only enabled when signalled via RCC *powerBoostPi2BPSKRel18* for BPSK and *powerBoostQPSKRel18* for QPSK | 1-6, 1-7 | Yes | N/A | UE cannot power boost with modified spectrum flatness requirement | Per FS | NO | FR1 only | N/A | The feature can be supported in below scenarios:RAN4 intends for the UE to be able support any or all scenarios below:Case 1: FR1 single band with single uplink CC configured in the band where power boosting capability is indicated in this band.Case 2: FR1 DL CA with a single uplink CC configured in a band where power boosting capability is indicated. The power boosting feature can be configured in this FR1 NR band.Case 3: FR1 inter-band UL CA/DC, where a single CC is configured in the uplink bands where power boosting capability is indicated. The power boosting feature can be configured only in one of the bands where capability is indicated.Case 4: FR1+FR2 UL CA, FR1+FR2 DC, where a single CC is configured in the uplink bands where power boosting capability is indicated. The power boosting feature can be configured in the FR1 NR band. | Optional with capability signalling |

1. Netw\_Energy\_NR

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| **Features** | **Index** | **Feature group** | **Components** | **Prerequisite feature groups** | **Need for the gNB to know if the feature is supported** | **Applicable to the capability signalling exchange between UEs (V2X WI only)”.** | **Consequence if the feature is not supported by the UE** | **Type****(the ‘type’ definition from UE features should be based on the granularity of 1) Per UE or 2) Per Band or 3) Per BC or 4) Per FS or 5) Per FSPC)** | **Need of FDD/TDD differentiation** | **Need of FR1/FR2 differentiation** | **Capability interpretation for mixture of FDD/TDD and/or FR1/FR2** | **Note** | **Mandatory/Optional** |
| 42.Netw\_Energy\_NR | 42-1 | SCell without SS/PBCH block for inter-band CA | Support of SCell without SS/PBCH block for inter-band CA |  | Yes | NA | UE cannot support SCell without SS/PBCH block for inter-band CA  | per FS | NA | FR1 only | NA | For each band within the BC, UE indicates if it supports the SSB-less operation when this band is the reference band and other band(s) in the BC as the SSB-less band(s).If UE indicate “support” for this band, it means all other bands within the BC can be configured as SSB-less bands.  | Optional with capability signaling |

1. NR\_DualTxRx\_MUSIM

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| **Features** | **Index** | **Feature group** | **Components** | **Prerequisite feature groups** | **Need for the gNB to know if the feature is supported** | **Applicable to the capability signalling exchange between UEs (V2X WI only)”.** | **Consequence if the feature is not supported by the UE** | **Type****(the ‘type’ definition from UE features should be based on the granularity of 1) Per UE or 2) Per Band or 3) Per BC or 4) Per FS or 5) Per FSPC)** | **Need of FDD/TDD differentiation** | **Need of FR1/FR2 differentiation** | **Capability interpretation for mixture of FDD/TDD and/or FR1/FR2** | **Note** | **Mandatory/Optional** |
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1. 4Rx\_low\_NR\_band\_handheld\_3Tx\_NR\_CA\_ENDC

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| **Features** | **Index** | **Feature group** | **Components** | **Prerequisite feature groups** | **Need for the gNB to know if the feature is supported** | **Applicable to the capability signalling exchange between UEs (V2X WI only)”.** | **Consequence if the feature is not supported by the UE** | **Type****(the ‘type’ definition from UE features should be based on the granularity of 1) Per UE or 2) Per Band or 3) Per BC or 4) Per FS or 5) Per FSPC)** | **Need of FDD/TDD differentiation** | **Need of FR1/FR2 differentiation** | **Capability interpretation for mixture of FDD/TDD and/or FR1/FR2** | **Note** | **Mandatory/Optional** |
| 44.4Rx\_low\_NR\_band\_handheld\_3Tx\_NR\_CA\_ENDC | 44-1 | TxDiversity for 2Tx | Indicates UE supports 2Tx Tx diversity for the band configured  |  | Yes | N/A | UE doesn’t support 2Tx Tx diversity for the band configured | Per FS | No | FR1 only | N/A | Early implementable from Rel-17 | Optional with capability signalling |

1. NR\_SL\_enh2

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| **Features** | **Index** | **Feature group** | **Components** | **Prerequisite feature groups** | **Need for the gNB to know if the feature is supported** | **Applicable to the capability signalling exchange between UEs (V2X WI only)”.** | **Consequence if the feature is not supported by the UE** | **Type****(the ‘type’ definition from UE features should be based on the granularity of 1) Per UE or 2) Per Band or 3) Per BC or 4) Per FS or 5) Per FSPC)** | **Need of FDD/TDD differentiation** | **Need of FR1/FR2 differentiation** | **Capability interpretation for mixture of FDD/TDD and/or FR1/FR2** | **Note** | **Mandatory/Optional** |
| 45.NR\_SL\_enh2 | 45-1 | Power class for sidelink CA | Indicates power class the UE supports when operating according to this band combination used for sidelink. If the field is absent, the UE supports the default power class. If this power class is higher than the power class that the UE supports on the individual bands of this band combination (ue-PowerClassSidelink-r16 in BandNR), the latter determines maximum TX power available in each band. The UE sets the power class parameter only in band combinations that are applicable as specified in TS 38.101-1. |  | Yes | Yes | UE cannot transmit in proper power class as specified in 38.101-1 | Per BC | No | FR1 only | N/A |  | Optional with capability signalling |
| 45.NR\_SL\_enh2 | 45-2 | SL reception in intra-carrier guard band | Capability of reception in the non-zero intra-cell guardband between contiguous RB sets in SL wideband carrier operation wider than 20MHz when LBT is successful only in a subset of RB sets |  | Yes | Yes | UE cannot receive in the intra-cell guard band specified in 38.101-1 | Per band | No | FR1 only | N/A | The candidate values are true and false | Optional with capability signalling |
| 45.NR\_SL\_enh2 | 45-3 | Power class for sidelink unlicensed | This parameter indicates the supported power class for this band used for sidelink unlicensed. If the field is absent, the UE supports the default power class in TS 38.101-1, Table 6.2E.1F-1. |  | Yes | Yes | UE cannot transmit in proper power class as specified in 38.101-1, e.g., power class 5 | Per Band | No | FR1 only | N/A |  | Optional with capability signalling |