**3GPP TSG RAN WG1 #110bis-e R1-2210488**

**e-Meeting, October 10th – 19th, 2022**

**Agenda item:** 8.16

**Source:** Moderators (AT&T, NTT DOCOMO, INC.)

**Title:** Updated RAN1 UE features list for Rel-17 NR after RAN1 #110bis-e

**Document for:** Endorsement

1. Introduction

This contribution includes the updated RAN1 UE features list for Rel-17 NR after RAN1 #110bis-e meeting.

1. NR\_FeMIMO

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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 (Sidelink 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 |
| 23. NR\_FeMIMO | 23-1-1 | Unified TCI with joint DL/UL TCI update for intra-cell beam management | 1. Joint DL/UL TCI update with their components: (configuration mechanism, QCL rules, applicable source and target signals) 2. The maximum number of configured joint TCI states per BWP per CC in a band 3. One MAC-CE activated joint TCI state per CC in a band 4. TCI state indication for update and activationa) MAC CE based TCI state indication for one active TCI state 5. The maximum number of MAC-CE activated joint TCI states across all CC(s) in a band |  | Yes |  | Unified TCI with joint DL/UL TCI update for intra-cell beam management is not supported | Per band | n/a | n/a | n/a | Component 2 candidate value {8, 12, 16, 24, 32, 48, 64, 128}  Component 5 candidate value {1, 2, 4, 8, 16}  If a UE supports FG 23-1-1a, the signalled component values (except component 5) also apply to inter-cell beam management  Note: activated joint TCI state(s) include all PDCCH/PDSCH receptions and PUSCH/PUCCH transmissions | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-1-1a | Unified TCI with joint DL/UL TCI update for inter-cell beam management | 1. Support of unified TCI with joint DL/UL TCI update for inter-cell beam management  2. Support K additional MAC-CE activated joint TCI states per CC in a band  3. Support K additional MAC-CE activated joint TCI states across all CC(s) in a band | 23-1-2, 23-1-1 | Yes |  | Unified TCI with joint DL/UL TCI update for inter-cell beam management is not supported | Per band | n/a | n/a | n/a | Component candidate values for K: {0,1,2,4}  Note: A UE that supports 23-1-1a supports K additional MAC-CE activated joint TCI states across all CC(s) in a band in addition to the maximum number of MAC-CE activated joint TCI states across all CC(s) in a band signalled in FG 23-1-1. The signalled value in component 3 of 23-1-1a plus the signalled value in component 5 of 23-1-1 determine the maximum number of MAC-CE activated joint TCI states across all CC(s) in a band that are applied to intra and inter-cell beam management jointly. | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-1-1b | Unified TCI with joint DL/UL TCI update for intra- and inter-cell beam management with more than one MAC-CE activated joint TCI state per CC | 1. TCI state indication for update and activation  b) MAC-CE+DCI-based TCI state indication (use of DCI formats 1\_1/1\_2 with DL assignment) c) MAC-CE+DCI-based TCI state indication (use of DCI formats 1\_1/1\_2 without DL assignment) 2. The minimum beam application time in Y symbols per SCS 3. The maximum number of MAC-CE activated joint TCI states per CC in a band | 23-1-1 | Yes |  | Unified TCI with joint DL/UL TCI update for intra- and inter-cell beam management with more than one MAC-CE activated joint TCI state per CC is not supported | Per band | n/a | n/a | n/a | Component 2 candidate values: {1, 2, 4, 7, 14, 28, 42, 56, 70, 84, 98, 112, 224, 336}, where {84, 98, 112, 224, 336 } only can be indicated in FR2  Component 3 candidate values: {2, 3, 4, 5, 6, 7, 8}  Note: The maximum number of MAC-CE activated joint TCI states across all CC(s) in a band for more than one MAC-CE activated joint TCI state is signaled in 23-1-1, component 5  Note: activated joint TCI state(s) include all PDCCH/PDSCH receptions and PUSCH/PUCCH | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-1-1c | SCell BFR with unified TCI framework | 1. Support of SCell BFR with unified TCI framework |  | Yes |  | SCell BFR with unified TCI framework is not supported | Per band | n/a | n/a | n/a | The maximum number of CCs configured with SCell BFR with unified TCI framework in a band with SpCell BFR is given by FG 16-1f, in this case FG 16-1f includes SpCell | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-1-1d | Per BWP TCI state pool configuration for CA mode | 1. Support of TCI state pool configuration per BWP for CA mode | 23-1-1 | Yes |  | Per BWP TCI state pool configuration for CA mode is not supported | Per band | n/a | n/a | n/a |  | Optional with capability signaling |
| 23. NR\_FeMIMO | 23-1-1e | TCI state pool configuration with TCI pool sharing for CA mode | 1. Support of reference BWP/CC configured with reference TCI state pool shared by a set of BWP/CC  2. The maximum number of configured joint TCI state pools across all BWPs and all CCs in a band | 23-1-1 | Yes |  | TCI state pool configuration with TCI pool sharing for CA mode is not supported | Per band | n/a | n/a | n/a | Component 2 candidate values: {1, 2, 4, 8}  A UE that supports 23-1-1 together with CA must support this FG | Optional with capability signaling |
| 23. NR\_FeMIMO | 23-1-1f | Common multi-CC TCI state ID update and activation | Common multi-CC TCI state ID update and activation | 23-1-1 | Yes |  | Common multi-CC TCI state ID update and activation is not supported | Per band | n/a | n/a | n/a |  | Optional with capability signaling |
| 23. NR\_FeMIMO | 23-1-1g | Beam misalignment between the DL source RS in the TCI state | Beam misalignment between the DL source RS in the TCI state to provide spatial relation indication and the PL-RS | 23-1-1 | Yes |  | Beam misalignment between the DL source RS in the TCI state is not supported | Per band | n/a | n/a | n/a | FR2 only | Optional with capability signaling |
| 23. NR\_FeMIMO | 23-1-1h | Association between TCI state and UL PC settings for PUCCH, PUSCH, and SRS | For PUCCH, PUSCH, and SRS, association between TCI state and UL PC settings except for PL RS | 23-1-1 | Yes |  | Association between TCI state and UL PC settings for PUCCH, PUSCH, and SRS is not supported | Per band | n/a | n/a | n/a |  | Optional with capability signaling |
| 23. NR\_FeMIMO | 23-1-1i | Indication/configuration of R17 TCI states for aperiodic CSI-RS, PDCCH, PDSCH | Support of indication/configuration of R17 TCI states for aperiodic CSI-RS, PDCCH, PDSCH (except for TRS and for CORESET #0 and the respective PDSCH reception) reusing the Rel-15/16 signaling/configuration design(s) | 23-1-1 | Yes |  | Indication/configuration of R17 TCI states for aperiodic CSI-RS, PDCCH, PDSCH reusing the Rel-15/16 signaling/configuration design(s) is not supported | Per band | n/a | n/a | n/a | Note: This has no impact on detail signaling design for SRS TCI indication | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-1-1m | Indication/configuration of R17 TCI states for SRS | Support of indication/configuration of R17 TCI states for SRS (except for periodic/semi-persistent SRS for BM) reusing the Rel-15/16 signaling/configuration design(s) | 23-1-1 | Yes |  | Indication/configuration of R17 TCI states for SRS reusing the Rel-15/16 signaling/configuration design(s) is not supported | Per band | n/a | n/a | n/a | Note: This has no impact on detail signaling design for SRS TCI indication | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-1-1j | Indication/configuration of R17 TCI states for CORESET #0 | Support of indication/configuration of R17 TCI states for CORESET #0 and the respective PDSCH reception reusing the Rel-15/16 signaling/configuration design(s) | 23-1-1 | Yes |  | Support of indication/configuration of R17 TCI states for CORESET #0 and the respective PDSCH reception reusing the Rel-15/16 signaling/configuration design(s) is not supported | Per band | n/a | n/a | n/a |  | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-1-1k | Maximum number of configured CC lists | Maximum number of configured CC lists per cell group for common multi-CC TCI state ID update and activation | 23-1-1f or 23-10-1f | Yes |  | Common multi-CC TCI state ID update and activation is not supported | Per UE | n/a | n/a | n/a | Component candidate values: {1,2,3,4} | Optional with capability signaling |
| 23. NR\_FeMIMO | 23-1-2 | Inter-cell beam measurement and reporting (for inter-cell BM and mTRP) | 1. Support of L1-RSRP measurement and reporting on SSB(s) with PCI(s) different from serving cell PCI  2. Support of up to K SSBRI-RSRP pairs in one report where a pair is associated with a PCI different from serving cell PCI can be reported  3. The maximum number of RRC-configured PCI(s) different from serving cell PCI for L1-RSRP measurement  4. The max number of SSB resources configured to measure L1-RSRP within a slot with PCI(s) same as or different from serving cell PCI across all CC |  | Yes |  | Inter-cell beam measurement and reporting (for inter-cell BM and mTRP) is not supported | per band | n/a | n/a | n/a | Component 3 candidate values: {1, 2, 3, 4, 5, 6, 7}  Component 4 candidate values: {1, 2, 4, 8}  Note: K is equal to maxNumberNonGroupBeamReporting  Note: component 4 is also counted in FG16-1g/16-1g-1 | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-1-3 | MPE mitigation | 1. Support of enhanced PHR reporting which includes pairs of (P-MPR, SSBRI/CRI)  2. Maximum number of reported P-MPR and SSBRI/CRI pairs  3. Maximum number of candidate RS(s) configured in a RRC pool for MPE mitigation |  | Yes |  | Enhanced PHR reporting is not supported | Per Band | n/a | n/a | n/a | Component 2 candidate values: {1,2,3, 4}  Component 3 candidate values: {1, 2, 4, 8, 12, 16, 28, 32, 48, 64}  Note: FR2 only  Note: Component 3 is also counted in FG16-1g/16-1g-1 | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-1-4 | UE capability value reporting | 1. Supported UE capability value and corresponding max number of SRS ports for each UE capability value |  | Yes |  | UE capability value reporting is not supported | per band | n/a | n/a | n/a | Component 1 candidate values: Up to 4 value each with one value of {1,2,4}  Note: the reported list contains only unique value | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-1-4a | Semi-persistent/aperiodic capability value report | Support of Semi-persistent/aperiodic capability value report | 23-1-4,  2-22 or 2-23 or 2-23a  or 16-1a-1 or 16-1a-4 or 16-1a-5 | Yes |  | Semi-persistent/aperiodic capability value report is not supported | Per band | n/a | n/a | n/a | Note: UE that supports this FG, supports capability value reporting together with the AP/SP L1-RSRP/L1-SINR reporting(s) that UE supports in Rel-15/16, reported by FG2-22. FG2-23, FG2-23a, FG16-1a-1, FG16-1a-4 and FG16-1a-5 | Optional with capability signaling |
| 23. NR\_FeMIMO | 23-2-1 | PDCCH repetition | 1. Support of intra-slot PDCCH repetition based on two linked SS sets associated with corresponding CORESETs including PDCCH repetition for Type 3 CSS  2. Required number of BDs for the two PDCCH candidates  3. Support max number of overlaps when one of the linked PDCCH candidates uses the same set of CCEs as an individual (unlinked) PDCCH candidate per scheduled component carrier per slot |  | Yes |  | PDCCH repetition is not supported | Per FS | n/a | n/a | n/a | Component 2 candidate values: 2 or 3  Component 3 candidate values: {1,2,3, 5, 10, 20, 40}  Note: UE supports PDCCH repetition for the following (basic) PDCCH monitoring capability: For type 1 CSS with dedicated RRC configuration, type 3 CSS, and UE-SS, the monitoring occasion is within the first 3 OFDM symbols of a slot  Note: for component 3, each unique pair of overlaps is counted as one.  Note: This FG does not include supporting Two QCL-TypeD in time-domain overlapping CORESETs in FR2. | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-2-1a | Monitoring of individual candidates | Support of monitoring of individual candidates when one of the linked PDCCH candidates uses the same set of CCEs as an individual (unlinked) PDCCH candidate, and they both are associated with the same DCI size, scrambling, and CORESET | 23-2-1 | Yes |  | Monitoring of individual candidates is not supported | Per band | n/a | n/a | n/a |  | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-2-1b | PDCCH repetition with PDCCH  monitoring on any span of up to 3 consecutive OFDM symbols of a slot | Support of PDCCH repetition for PDCCH monitoring on any span of up to 3 consecutive OFDM symbols of a slot | 3-2  23-2-1 | Yes |  | PDCCH repetition with PDCCH  monitoring on any span of up to 3 consecutive OFDM symbols of a slot is not supported | Per Band | n/a | FR1 only | n/a | Applicable to 15KHz SCS only | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-2-1c | PDCCH repetition with PDCCH monitoring with a single span of three contiguous OFDM symbols that is within the first four OFDM symbols in a slot | Support of PDCCH repetition for PDCCH monitoring with a single span of three contiguous OFDM symbols that is within the first four OFDM symbols in a slot | 22-12  23-2-1 | Yes |  | PDCCH repetition with PDCCH monitoring with a single span of three contiguous OFDM symbols that is within the first four OFDM symbols in a slot is not supported | Per UE | No | FR1 only | No | Applicable to 15KHz SCS only | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-2-1d | PDCCH repetition for Case 2 PDCCH monitoring with a span gap | 1. Support of PDCCH repetition for PDCCH monitoring of any occasions with span gap as defined in FG 3-5b.  2. Supported mode of PDCCH repetition  3. X per CC  4. X across all CCs | 3-5b, 23-2-1 | Yes |  | PDCCH repetition for Case 2 PDCCH monitoring with a span gap is not supported | Per FS | n/a | n/a | n/a | This capability is necessary for each SCS.  Component 2 candidate values: {intra-span, inter-span, both}  Component 3 candidate values: {4, 8, 16, 32, 44, 64, no limit}  Component 4 candidate values: {4, 8, 16, 32, 44, 64, 128, 256, 512, no limit}  Note:   * Components 3 and 4 are reported only if UE supports inter-span PDCCH repetition. * The limit (X) is associated with the total number of linked candidates of which the first candidate is received and the second one has not been received at any given span, where “received” and “not been received” is wrt the end of the corresponding span of PDCCH candidate. * The limit X is indicated as a total count assuming count 1 for AL=1; 2 for AL=2; 4 for AL=4 or 8 or 16. * Candidate value “no limit” does not imply BD limit can be exceeded | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-2-1e | PDCCH repetition for Rel-16 PDCCH monitoring | 1. Support of PDCCH repetition with Rel-16 PDCCH monitoring capability as defined in FG 11-2 family.  2. Supported mode of PDCCH repetition  3. X per CC  4. X across all CCs | 11-2, 23-2-1 | Yes |  | PDCCH repetition for Rel-16 PDCCH monitoring is not supported | Per FS | n/a | n/a | n/a | This capability is signalled for SCS 15 kHz and 30 kHz.  Component2: {intra-span, inter-span, both}  Component3: {4, 8, 16, 32, 44, 64, no limit}  Component 4: {4, 8, 16, 32, 44, 64, 128, 256, 512, no limit}  Note:   * Components 3 and 4 are reported only if UE supports inter-span PDCCH repetition. * The limit X is associated with the total number of linked candidates of which the first candidate is received and the second one has not been received at any given span, where “received” and “not been received” is wrt the end of the corresponding span of PDCCH candidate. * The limit X is indicated as a total count assuming count 1 for AL=1; 2 for AL=2; 4 for AL=4 or 8 or 16. * Candidate value “no limit” does not imply BD limit can be exceeded | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-2-2 | Two QCL TypeD for CORESET monitoring in PDCCH repetition | Support of determining two QCL-TypeD for time-domain overlapping CORESETs in the same CC or for intra-band CA when UE is configured with PDCCH repetition | 23-2-1 | Yes |  | Two QCL TypeD for CORESET monitoring in PDCCH repetition is not supported | Per band | n/a | FR2 only | n/a |  | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-2-4 | Simultaneous configuration of PDCCH repetition and multi-DCI based multi-TRP | Support of simultaneous configuration of PDCCH repetition and multi-DCI based multi-TRP | 23-2-1, 16-2a | Yes |  | Simultaneous configuration of PDCCH repetition and multi-DCI based multi-TRP is not supported | Per FS | n/a | n/a | n/a | Note: Two linked PDCCH candidates are not expected to be associated with different CORESETPoolIndex values | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-3-1 | Multi-TRP PUSCH repetition (type A) -codebook based | 1. Support of multi-TRP PUSCH repetition (based on PUSCH repetition type A)  - sequential mapping for repetitions larger than 2  - cyclic mapping for 2 repetitions  2. Support of two SRS resource sets with usage set to 'codebook'  3. Supported number of SRS resources in one SRS resource set | 2-14 | Yes |  | Multi-TRP PUSCH repetition (type A) is not supported for codebook based | per FS | n/a | n/a | n/a | Component 3 candidate values: {1,2 ,4}  Note: If value 4 is reported for component 3, UE also reports value 4 in FG 16-5c. | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-3-1-2 | Multi-TRP PUSCH repetition (type A) - non-codebook based | 1. Support of multi-TRP PUSCH repetition for non-codebook based PUSCH (based on PUSCH repetition type A)  - sequential mapping for repetitions larger than 2  - cyclic mapping for 2 repetitions  2. Support of two SRS resource sets with usage set to 'nonCodebook'  3. Supported number of SRS resources in one SRS resource set | 2-15 | Yes |  | Multi-TRP PUSCH repetition (type A) is not supported for non-codebook based | per FS | n/a | n/a | n/a | Component 3: {1,2,3,4} | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-3-1-2a | Two associated CSI-RS resources | Support of up to two NZP CSI-RS resources associated with the two SRS resource sets for non-codebook-based mTRP PUSCH | 2-15a, 23-3-1-2 | Yes |  | Two associated CSI-RS resources are not supported | Per Band | n/a | n/a | n/a |  | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-3-1-2b | CSI-RS processing framework for SRS with two associated CSI-RS resources | 1. Maximum number of periodic SRS resources associated with first and second CSI-RS per BWP  2. Maximum number of aperiodic SRS resources associated with first and second CSI-RS per BWP  3. Maximum number of semi-persistent SRS resources associated with first and second CSI-RS per BWP  4. UE can process Y SRS resources associated with first and second CSI-RS resources simultaneously in a CC. Includes P/SP/A SRS  5. UE can process up to X CSI-RS resources associated with SRS for non-codebook based transmission simultaneously | 23-3-1-2a | Yes |  | CSI-RS processing framework for SRS with two associated CSI-RS resources is not supported | Per Band | n/a | n/a | n/a | Component 1: {1 to 8}  Component 2: {1 to 8}  Component 3: {0 to 8}  Component 4: {1 to 16}  Component 5: {1,2} | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-3-1a | Cyclic mapping for Multi-TRP PUSCH repetition | Support of cyclic mapping when the number of repetitions is larger than 2 | 23-3-1 or 23-3-1-2 | Yes |  | Cyclic mapping for Multi-TRP PUSCH repetition is not supported | Per Band | n/a | n/a | n/a | Candidate component values: {for repetition Type A, for repetition Type B, both} | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-3-1b | Second TPC field for Multi-TRP PUSCH repetition | Support of second TPC field for per TRP closed-loop power control for PUSCH with DCI formats 0\_1 / 0\_2 | 23-3-1 or 23-3-1-2 | Yes |  | Second TPC field for Multi-TRP PUSCH repetition is not supported | Per band | n/a | n/a | n/a |  | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-3-1c | Two PHR reporting | Support of PHR reporting related to M-TRP PUSCH repetition (calculate two PHRs (at least corresponding to the CC that applies m-TRP PUSCH repetitions), each associated with a first PUSCH occasion corresponding to each SRS resource set, and report two PHRs.) | 23-3-1 or 23-3-1-2 | Yes |  | Two PHR reporting is not supported | Per Band | n/a | n/a | n/a |  | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-3-1e | A-CSI report | Support of A-CSI report on two PUSCH repetitions | 23-3-1 or 23-3-1-2 | Yes |  | A-CSI report on two PUSCH repetitions is not supported | Per band | n/a | n/a | n/a |  | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-3-1f | SP-CSI report | Support of SP-CSI report on two PUSCH repetitions | 23-3-1 or 23-3-1-2 | Yes |  | SP-CSI report on two PUSCH repetitions is not supported | Per band | n/a | n/a | n/a |  | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-3-1g | CG PUSCH transmission | Support of CG PUSCH transmission towards M-TRPs using a single CG configuration (Use same beam mapping principals as dynamic grant PUSCH repetition scheme.) | 23-3-1 or 23-3-1-2 | Yes |  | CG PUSCH transmission towards M-TRPs using a single CG configuration is not supported | Per Band | n/a | n/a | n/a |  | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-3-1-1 -codebook based | Multi-TRP PUSCH repetition (type B) | 1. Support of multi-TRP PUSCH repetition (based on PUSCH repetition type B) for codebook based  - sequential mapping for repetitions larger than 2  - cyclic mapping for 2 repetitions  2. Support of two SRS resource sets with usage set to ‘codebook’  3. Supported number of SRS resources in one SRS resource set | 2-14, 11-5 | Yes |  | Codebook based multi-TRP PUSCH repetition (type B) is not supported | Per FSPC | No | No | No | Component 3 candidate values: {1,2,4} | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-3-1-3 | Multi-TRP PUSCH repetition (type B) – non-codebook based | 1. Support of multi-TRP PUSCH repetition (based on PUSCH repetition type B) for non-codebook based  - sequential mapping for repetitions larger than 2  - cyclic mapping for 2 repetitions  2. support of two SRS resource sets with usage set to ‘nonCodebook’  3. supported number of SRS resources in one SRS resource set | 2-15, 11-5 | Yes |  | Non-codebook based multi-TRP PUSCH repetition (type B) is not supported | Per FSPC | No | No | No | Component 3 candidate values: {1,2,3,4} | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-3-2 | Multi-TRP PUCCH repetition scheme 1 (inter-slot) | 1. Support of PUCCH repetition scheme 1 (inter-slot repetition)- sequential mapping for repetitions larger than 2  - cyclic mapping for 2 repetitions  2. Support of up to two PUCCH power control parameter sets/spatial relation info per PUCCH resource  3. Supported PUCCH formats for this scheme |  | Yes |  | PUCCH repetition scheme 1 (inter-slot repetition) is not supported | Per band | n/a | n/a | n/a | Component 3 candidate values: {PF0/2, PF1/3/4, PF0-4}  Note: power control parameter sets (w/o spatial relation info) only apply to FR1  Note: spatial relation info only applies to FR2 | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-3-2b | Cyclic mapping for multi-TRP PUCCH repetition | Support of cyclic mapping for beam mapping/power control parameter set mapping for PUCCH repetitions scheme 1 and/or 3 when the number of repetitions is larger than 2 | 23-3-2 | Yes |  | Cyclic mapping for multi-TRP PUCCH repetition is not supported | Per band | n/a | n/a | n/a |  | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-3-2c | Second TPC field for multi-TRP PUCCH repetition | Support of second TPC field for per TRP closed-loop power control for PUCCH with DCI formats 1\_1 / 1\_2 | 23-3-2 | Yes |  | Second TPC field for multi-TRP PUCCH repetition is not supported | Per band | n/a | n/a | n/a |  | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-3-2d | Updating two Spatial relation or two sets of power control parameters for PUCCH group | Support of updating two Spatial Relation Info’s / two sets of power control parameters for a group of PUCCH resources in a CC by MAC-CE | 23-3-2 | Yes |  | Updating two Spatial relation or two sets of power control parameters for PUCCH group is not supported | Per Band | n/a | n/a | n/a |  | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-3-2e | Maximum number of power control parameter sets configured for multi-TRP PUCCH repetition in FR1 | Maximum number of power control parameter sets configured for multi-TRP PUCCH repetition in FR1 | 23-3-2 | Yes |  | Maximum number of power control parameter sets configured for multi-TRP PUCCH repetition in FR1 is not supported | Per Band | n/a | FR1 only | n/a | Candidate values: {3 to 8} | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-3-3 | Multi-TRP PUCCH repetition-intra-slot | 1. Support of PUCCH repetition scheme 3 (intra-slot repetition)  - sequential mapping for repetitions larger than 2  - cyclic mapping for 2 repetitions  2. Support of up to two PUCCH power control parameter sets/spatial relation info per PUCCH resource  3. Supported PUCCH formats for this scheme |  | Yes |  | PUCCH repetition scheme 3 (intra-slot repetition) is not supported | Per FS | n/a | n/a | n/a | Component 3 candidate values: {PF0/2, PF1/3/4, PF0-4}  Note: power control parameter sets (w/o spatial relation info) only apply to FR1  Note: spatial relation info only applies to FR2 | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-4 | IntCell-mTRP | 1. Support of RRC configuration of additional PCI different from serving cell associated with the TCI state and/or QCL-info  2. The maximum number of configured additional PCIs per CC is X1 (Case 1) when each configuration of SSB time domain positions and periodicity of the additional PCIs is the same as SSB time domain positions and periodicity of the serving cell PCI  3. The maximum number of configured additional PCIs per CC is X2 (Case 2) when the configurations of SSB time domain positions and periodicity of the additional PCIs is not according to Case 1 | 16-2a | Yes |  | IntCell-mTRP is not supported | Per band | n/a | n/a | n/a | Component 2 candidate values: {1,2,3,4,5,6,7}  Component 3 candidate values: {0,1,2,3,4,5,6,7}  Note: case1 and case2 cannot be enabled simultaneously as any configuration that is not based on Case 1 is defined as Case 2 | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-5-1 | Group based L1-RSRP reporting enhancements | 1. Max number N of beam groups (M=2 beams per beam group) in a single L1-RSRP reporting instance based on measurement on two CMR resource sets  2. Maximum number of SSB and CSI-RS resources for measurement in both CMR sets within a slot across all CCs  3. Maximum number of configured SSB and CSI-RS resources for measurement in both CMR sets across all CCs |  | Yes |  | Group based L1-RSRP reporting enhancements are not supported | Per band | n/a | n/a | n/a | Component 1 candidate values: {1,2,3,4}  Component 2 candidate values: {2,3,4,8,16,32,64}  Component 3 candidate values: {8, 16, 32, 64, 128}  Note: component 2 and 3 are also counted in FG 16-1g and 16-1g-1 | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-5-2 | MTRP BFR based on two BFD-RS sets | 1. Maximum number of supported measured BFD-RS resources per set per BWP  2. The maximum number of CCs per band configured with BFR (including spCell/SCell/MTRP BFR in Rel-15/16/17)  3. Supported maximum number of measured BFD-RS resources across two BFD-RS sets per BWP |  | Yes |  | MTRP BFR based on two BFD-RS sets is not supported | Per band | n/a | n/a | n/a | Component 1 candidate values: {1, 2}  Component 2 candidate values: {1, 2, 3, 4, 5, 6, 7, 8, 9}  Component 3 candidate values: {2,3,4}  Note: component 3 is also counted in FG 16-1g and 16-1g-1 | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-5-2a | PUCCH-SR resources for MTRP BFRQ | 1. Max number of PUCCH-SR resources for MTRP BFRQ per cell group |  | Yes |  | PUCCH-SR resources for MTRP BFRQ is not supported | Per UE | No | Yes | No | Component candidate values: {1, 2}  Note: A UE that supports FG 23-5-2 must indicate this FG is supported with at least component candidate value 1 | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-5-2b | Association between a BFD-RS resource set on SpCell and a PUCCH SR resource | Support of association between a BFD-RS resource set on SpCell and a PUCCH SR resource | 23-5-2a | Yes |  | Association between a BFD-RS resource set on SpCell and a PUCCH SR resource is not supported | Per UE | No | Yes | No |  | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-5-2c | MAC-CE based update of explicit BFD-RS | 1. Support of MAC-CE based update of explicit BFD-RS for mTRP BFR 2. Maximum number of configured candidate BFD-RS per BWP for MAC-CE based update | 23-5-2 | Yes |  | MAC-CE based update of explicit BFD-RS is not supported | Per UE | No | Yes | No | Component 2 candidate values: {4, 8, 12, 16, 32, 48, 64} | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-6-1 | SFN scheme A (scheme 1) for PDSCH and PDCCH | 1. Support of SFN scheme A for PDCCH scheduling SFN Scheme A PDSCH |  | Yes |  | SFN scheme A (scheme 1) for PDSCH and PDCCH is not supported | per FS | n/a | n/a | n/a |  | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-6-1-1 | SFN scheme A (scheme 1) for PDCCH only | Support of SFN scheme A for PDCCH scheduling single TRP PDSCH |  | Yes |  | SFN scheme A (scheme 1) for PDCCH only is not supported | Per FS | n/a | n/a | n/a |  | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-6-1a | Dynamic switching - scheme A | Support of dynamic switching between single-TRP and PDSCH SFN scheme A by TCI state field in DCI formats 1\_1, 1\_2 | 23-6-1 or 23-6-1b | Yes |  | Dynamic switching - scheme A is not supported | per FS | n/a | n/a | n/a |  | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-6-1b | SFN scheme A (scheme 1) for PDSCH only | 1. Support of SFN scheme A for PDSCH scheduled by single TRPPDCCH |  | Yes |  | SFN scheme A (scheme 1) for PDSCH only is not supported | per FS | n/a | n/a | n/a |  | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-6-2 | SFN scheme B (TRP based pre-compensation) for PDSCH and PDCCH | 1. Support of SFN scheme B for PDCCH scheduling SFN Scheme B PDSCH |  | Yes |  | SFN scheme B (TRP based pre-compensation) for PDSCH and PDCCH is not supported | per FS | n/a | n/a | n/a |  | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-6-2a | Dynamic switching - scheme B | Support of dynamic switching between single-TRP and PDSCH SFN scheme B by TCI state field in DCI formats 1\_1, 1\_2 | 23-6-2 or 23-6-2b | Yes |  | Dynamic switching – scheme B is not supported | per FS | n/a | n/a | n/a |  | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-6-2b | SFN scheme B (TRP based pre-compensation) for PDSCH only | 1. Support of SFN scheme B for PDSCH scheduled by single TRP PDCCH |  | Yes |  | SFN scheme B (TRP based pre-compensation) for PDSCH only is not supported | per FS | n/a | n/a | n/a |  | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-6-3 | Simultaneous activation of two TCI states for PDCCH across multiple CCs (HST/URLLC) | Support of simultaneous activation of two TCI states for CORESETs with the same CORESET ID in all BWPs across a set of configured component carriers by single MAC-CE | 23-6-1 or 23-6-2 or 23-6-1-1 | Yes |  | Simultaneous activation of two TCI states for PDCCH across multiple CCs is not supported | Per UE | No | Yes | No |  | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-6-4 | Default DL beam setup for SFN | 1. Support of PDSCH reception using default beam for Rel-17 enhanced SFN scheme when PDSCH is scheduled with offset less than threshold  2. Support PDSCH reception using default beam for Rel-17 enhanced SFN scheme when TCI field is not present in DCI format 1\_0/1\_1/1\_2 when PDSCH is scheduled with offset equal or larger than the threshold, if applicable  3. Support aperiodic CSI-RS reception using default beam for Rel-17 enhanced SFN scheme when scheduling offset is less than threshold | 23-6-1 or 23-6-2 | Yes |  | Default DL beam setup for SFN when enableTwoDefaultDCI-states is configured is not supported | Per band | n/a | n/a | n/a | Note: FR2 only for component 1 and 3 only | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-6-4a | Default UL beam setup for SFN PDCCH | 1. Support of single-TRP PUCCH transmission using default beam when enhanced SFN PDCCH transmission scheme is configured  2. Support of single-TRP PUSCH transmission using default beam when enhanced SFN PDCCH transmission scheme is configured  3. Support of single-TRP SRS resource transmission using default beam when enhanced SFN PDCCH transmission scheme is configured | 23-6-1 or 23-6-2 or 23-6-1-1 | Yes |  | Default UL beam setup for SFN PDCCH is not supported | Per band | n/a | FR2 only | n/a |  | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-6-5 | Support implicit configuration of RS(s) with two TCI states for beam failure detection | Support RS(s) with two TCI states configured implicitly for beam failure detection enhancement for HST |  | Yes | N/A |  | Per band | n/a | n/a |  |  | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-6-6 | QCL-TypeD collision handling with CORESET with 2 TCI states | Support of identifying two QCL-TypeD properties for multiple overlapping CORESETs when a CORESET is activated with two TCI states which overlaps with another CORESET. |  | Yes | N/A |  | Per band | n/a | n/a |  |  | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-7-1 | Basic Features of CSI Enhancement for Multi-TRP | 1. Support of NZP CSI-RS resource pairs used as CMR (channel measurement resource) pairs for NCJT measurement hypothesis: Support of N=1 2. Maximum number of NZP CSI-RS resources in one CSI-RS resource set: Ks,max 3. CSI report mode selection of mode 1 with X=0 and/or mode 2 4. A list of supported combinations, up to 16, across all CCs simultaneously, where each combination is 5. Maximum number of Tx ports in one NZP CSI-RS resource associated with an NCJT measurement hypothesis 6. Maximum total number of CMRs for NCJT measurement 7. Maximum total number of Tx ports of NZP CSI-RS resources associated with NCJT measurement hypotheses 8. Supported codebook modes for NCJT CSI |  | Yes |  | CSI Enhancement for Multi-TRP is not supported | Per band and per BC | n/a | n/a | n/a | Component 2 candidate value set: {2, 3, 4, 5, 6, 7, 8}  Component 3 candidate value set: { mode 1 with X=0, mode 2, both}  Component 4 candidate values:   1. {2, 4, 8, 12, 16, 24, 32} 2. {2,3,4 … 64} 3. {2,3,4, …, 256}   Component 5 candidate values: {mode 1, both mode 1 and mode 2} | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-7-1c | Basic Features of CSI Enhancement for Multi-TRP – number of CPUs | Number of CPUs occupied by a pair of CMRs for NCJT CSI hypotheses | 23-7-1 | Yes |  |  | Per band | n/a | n/a | n/a | Component candidate values: {2,3 ,4}  Note: Maximum number of CPUs is reported in FG 2-35 | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-7-1b | Active CSI-RS resources and ports in the presence of multi-TRP CSI | 1. List of codebook combinations  2. List of {max number of ports per resource, max number of resources, max number of total ports} for each codebook combination | 23-7-1 | Yes |  |  | Per band and per BC | n/a | n/a | n/a | Component 1 candidate values:  Codebook 1 = {‘NCJT’, NCJT+Type 1 SP (for sTRP)}  {Codebook 2, Codebook 3} = {(NULL, NULL}), {“Rel 16 combinations in FG 16-8”}, {“New Rel17 combinations in FG 23-9-5”}}  Component 2 candidate values:  - Maximum 16 triplets for each codebook combination  - Max # of Tx ports in one resource: {2, 4,8,12,16,24,32}  - Max # resources: {1 to 64}  - Max # total ports: {4 to 256}  Note 1: A CMR pair configured for NCJT will be counted as two activated resources, a CMR configured for sTRP will be counted as one activated resource for a triplet.  Note2: This capability is relevant only when UE is configured with NCJT CSI in at least one CSI report setting in at least one CC in the band and/or band combination. | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-7-1a | Additional CSI report mode 1 | Maximum value of numberOfSingleTRP-CSI-Mode1 | 23-7-1 | Yes |  | CSI report mode 1 with X=1, or X=2 is not supported | Per Band | n/a | n/a | n/a | Component 1 candidate value set: { X=1, X=2}  Note: UE reports this capability only when UE reports “mode 1 with X=0” or “both” for component 3 of FG 23-7-1 | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-7-4 | Support of Nmax=2 for Multi-TRP CSI | Support of maximum number of CMR pairs Nmax=2 configured in NZP-CSI-RS-ResourceSet for a given CSI report setting | 23-7-1 | Yes |  | Nmax=2 for Multi-TRP CSI is not supported | Per band | n/a | n/a | n/a |  | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-7-5 | CMR sharing | Support a NZP CSI-RS resource referred by both a CMR pair configured for Rel-17 Multi-TRP CSI enhancement and a single CMR configured for Single-TRP measurement in a CSI reporting setting | 23-7-1 | Yes |  | CMR sharing is not supported | Per band | n/a | FR2 only | n/a |  | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-8-1 | SRS triggering offset enhancement | The maximum number of configured available slots offsets for determining aperiodic SRS location based on available slot | 2-52 | Yes |  | SRS triggering offset enhancement is not supported | Per band | n/a | n/a | n/a | Candidate 1 component values: {1, 2, 4} | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-8-2 | Triggering SRS only in DCI 0\_1/0\_2 | Support of triggering SRS in DCI 0\_1/0\_2 without data and without CSI | 2-52 | Yes |  | Triggering SRS only in DCI 0\_1/0\_2 is not supported | per band | n/a | n/a | n/a |  | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-8-3 | SRS Antenna switching for >4Rx | 1. Support of SRS antenna switching xTyR with y>4  2. Report the entry number of the first-listed band with UL in the band combination that affects this DL  3. Report the entry number of the first-listed band with UL in the band combination that switches together with this UL | 2-55 | Yes |  | SRS Antenna switching for >4Rx is not supported | Per FS | n/a | n/a | n/a | Component 1 candidate values: a combination from the set {t1r1, t2r2, t1r2, t4r4, t2r4, t1r4, t2r6, t1r6, t4r8, t2r8, t1r8}  Note: For any indicated value, x shall be equal to or smaller than the one associated with the largest y  Component 2 candidate values: {1 to 32}  Component 3 candidate values: {1 to 32}  Component 2 and Component 3 are optional. If reported, the reported values for component 2 and component 3 are not valid for the same values of xTyR in component 1 reported with Rel-15/16 UE capability reporting | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-8-4 | Maximum 2 SP and 1 periodic SRS sets for antenna switching | Support of maximum 2 SP SRS resource sets and maximum 1 periodic SRS resource set for antenna switching | 2-53 | Yes |  | Maximum 2 SP and 1 periodic SRS sets for antenna switching is not supported | Per FS | n/a | n/a | n/a | Note1:   * Applies for all supported xTyR where y<=8 * For xTyR where y>4, if UE does NOT support this feature, support maximum one SRS resource set for periodic SRS and maximum one SRS resource set for semi-persistent SRS * For xTyR where y<=4, if UE does not support this feature, follow Rel-15 on the number of resource sets for periodic and semi-persistent SRS * The two SP-SRS resource sets are not activated at the same time | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-8-5 | Increased repetition for SRS | Support of increased repetition patterns (8, 10, 12, 14 symbols) for SRS resource | 10-11, 2-52 | Yes |  | Increased repetition for SRS is not suported | Per band | n/a | n/a | n/a |  | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-8-6 | Partial frequency sounding of SRS with frequency hopping | Support of partial frequency sounding for SRS with frequency hopping | 2-52 | Yes |  | Partial frequency sounding of SRS with frequency hopping is not suported | Per band | n/a | n/a | n/a |  | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-8-7 | Start RB location hopping for partial frequency SRS | Support of start RB location hopping in partial frequency SRS transmission across different SRS frequency hopping periods for periodic/semi-persistent/aperiodoc SRS | 23-8-6 | Yes |  | Start RB location hopping for partial frequency SRS is not suported | Per band | n/a | n/a | n/a |  | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-8-8 | Comb-8 SRS | Support of comb-8 for SRS other than for positioning |  | Yes |  | comb-8 for SRS other than for positioning is not suported | Per band | n/a | n/a | n/a |  | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-8-9 | Extension of aperiodic SRS configuration for 1T4R, 1T2R and 2T4R | Support of 4 aperiodic SRS resource sets for 1T4R and 2 aperiodic resource sets for 1T2R/2T4R. | 2-53, 2-55 | Yes |  | Extension of aperiodic SRS configuration for 1T4R, 1T2R and 2T4R is not supported | Per FS | N/A | N/A | N/A | Note: When UE only supports part of {1T4R, 1T2R, 2T4R}, this FG is only applicable to the antenna switching configuration(s) that UE supports | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-8-10 | 1 aperiodic SRS resource set for 1T4R | Support of 1 aperiodic SRS resource sets for 1T4R. | 10-11, 2-55 | Yes |  | 1 aperiodic SRS resource set for 1T4R is not supported | Per FS | n/a | n/a | n/a |  | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-8-11 | Partial frequency sounding of SRS for non-frequency hopping case | Support of partial frequency sounding for SRS for non-frequency hopping case. | 23-8-6 | Yes |  | Partial frequency sounding of SRS for non-frequency hopping case is not supported | Per band | n/a | n/a | n/a |  | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-9-1 | Basic Features of Further Enhanced Port-Selection Type II Codebook (FeType-II) | 1. {Max # of Tx ports in one resource, Max # of resources and total # of Tx ports} to support Port-selection FeType-II with M=1 and R=1 2. Support rank 1,2 3. Support parameter combinations with M=1 | 2-35 | Yes |  | Further Enhanced Port-Selection Type II Codebook (FeType-II) is not suported | Per band and per BC | n/a | n/a | n/a | Component 1 candidate values:   * Maximum 16 triplets * Max # of Tx ports in one resource: {4,8,12,16,24,32} * Max # resources: {1 to 64} * Max # total ports: {4 to 256} | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-9-5 | Active CSI-RS resources and ports for mixed codebook types in any slot | 1. List of codebook combinations 2. List of {max number of ports per resource, max number of resources, max number of total ports} for each codebook combination | 23-9-1, 16-3a, 2-36, 2-40, 2-41, 23-9-2, 23-9-4 | Yes |  | Active CSI-RS resources and ports for mixed codebook types in any slot is not suported | Per band and per BC | n/a | n/a | n/a | Component 1 candidate values:  Codebook 1 = {Type I SP, Type I MP}  {Codebook 2, Codebook 3} = {{FeType II PS M=1, NULL},{FeType II PS M=2 R=1, NULL}, {FeType II PS M=2 R=2, NULL}, {Type II, FeType II PS M=1}, {Type II, FeType II PS M=2 R=1} ,{eType II R=1, FeType II PS M=1},{eType II R=1, FeType II PS M=2 R=1}}  Component 2 candidate values:  - Maximum 16 triplets for each codebook combination  - Max # of Tx ports in one resource: {4,8,12,16,24,32}  - Max # resources: {1 to 64}  - Max # total ports: {4 to 256}  Note 1：if a UE reports one or more codebook combinations in 23-9-5, then usage of active CSI-RS resources and ports for multiple codebooks in any slot is allowed only within those combinations  Note 2: For coexisting of mixed codebooks in any slot, gNB need to honor 16-8, 23-9-5 and per-codebook capability 2-36/40/41, 16-3a, and 23-9-1/23-9-2/23-9-4  Note 3: Up to 4 combinations for component 1 | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-9-2 | Support of M=2 and R=1 for FeType-II | 1. {Max # of Tx ports in one resource, Max # of resources and total # of Tx ports} to support Port-selection FeType-II with M=2 and R=1  2. Support parameter combinations with M=2 | 23-9-1 | Yes |  | M=2 and R=1 for FeType-II is not suported | per band and per BC | n/a | n/a | n/a | Component 1 candidate values  - Maximum 8 triplets  - Max # of Tx ports in one resource: {4,8,12,16,24,32}  - Max # resources: {1 to 64}  - Max # total ports: {4 to 256} | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-9-3 | Support of rank 3, 4 for FeType-II | Support of rank 3, 4 for FeType-II | 23-9-1 | Yes |  | Rank 3, 4 for FeType-II is not suported | Per band | n/a | n/a | n/a |  | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-9-4 | Support of R = 2 for FeType-II | 1. Support of R = 2 for FeType-II  2. {Max # of Tx ports in one resource, Max # of resources and total # of Tx ports} to support Port-selection FeType-II with M=2 and R=2 | 23-9-2 | Yes |  | R = 2 for FeType-II is not suported | per band and per BC | n/a | n/a | n/a | Component 2 candidate values:  • Maximum 8 triplets  • Max # of Tx ports in one resource: {4,8,12,16,24,32}  • Max # resources: {1 to 64}  • Max # total ports: {4 to 256} | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-10-1 | Unified TCI with separate DL/UL TCI update for intra-cell beam management | 1. Separate DL/UL TCI update with their components: (configuration mechanism, QCL rules, applicable source and target signals) 2. The maximum number of configured DL TCI states per BWP per CC 3. The maximum number of configured UL TCI states per BWP per CC 4. One MAC-CE activated DL TCI state per CC in a band 5. One MAC-CE activated UL TCI state per CC in a band 6. TCI state indication for update and activationa) MAC CE based TCI state indication for one active DL/UL TCI state 7. The maximum number of MAC-CE activated DL TCI states across all CC(s) in a band 8. The maximum number of MAC-CE activated UL TCI states across all CC(s) in a band | 23-1-1 | Yes |  | Unified TCI with separate DL/UL TCI update for intra-cell beam management is not supported | per band | n/a | n/a | n/a | Component 2 candidate value {4, 8, 12, 16, 24, 32, 48, 64, 128}  Component 3 candidate value {4, 8, 12, 16, 24, 32, 48, 64}  Component 7 candidate value {1, 2, 4, 8, 16}  Component 8 candidate value {1, 2, 4, 8, 16}  If a UE supports FG 23-10-1m, the signalled component values (except components 7 and 8) apply to intra- and inter-cell beam management jointly | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-10-1b | Unified TCI with separate DL/UL TCI update for intra-cell beam management with more than one MAC-CE activated separate TCI state per CC | 1. TCI state indication for update and activation b) MAC-CE+DCI-based TCI state indication (use of DCI formats 1\_1/1\_2 with DL assignment) c) MAC-CE+DCI-based TCI state indication (use of DCI formats 1\_1/1\_2 without DL assignment) 2. The minimum beam application time in Y symbols per SCS 3. The maximum number of MAC-CE activated DL TCI states per CC in a band 4. The maximum number of MAC-CE activated UL TCI states per CC in a band | 23-10-1 | Yes |  | Unified TCI with separate DL/UL TCI update for intra-cell beam management with more than one MAC-CE activated separate TCI state per CC is not supported | per band | n/a | n/a | n/a | If a UE supports FG 23-10-1m, the signalled component values also apply to inter-cell beam management | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-10-1d | Per BWP DL/UL-TCI state pool configuration for CA mode | 1. Support of DL/UL TCI state pool configuration per BWP for CA mode | 23-10-1 | Yes |  |  | per band | n/a | n/a | n/a |  | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-10-1e | TCI state pool configuration with DL/UL-TCI pool sharing for CA mode | 1. Support of reference BWP/CC configured with reference TCI state pool shared by a set of BWP/CC 2. The maximum number of configured DL TCI state pools across all BWPs and all CCs in a band 3. The maximum number of configured UL TCI state pools across all BWPs and all CCs in a band |  | Yes |  | TCI state pool configuration with DL/UL-TCI pool sharing for CA mode is not supported | per band | n/a | n/a | n/a | Component 2 candidate values: {1, 2, 4, 8}  Component 3 candidate values: {1, 2, 4, 8} | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-10-1f | Common multi-CC DL/UL-TCI state ID update and activation with separate DL/UL TCI update | Common multi-CC DL/UL-TCI state ID update and activation | 23-10-1 | Yes |  | Common multi-CC DL/UL-TCI state ID update and activation with separate DL/UL TCI update is not supported | per band | n/a | n/a | n/a |  | Optional with capability signalling |
| 23. NR\_FeMIMO | 23-10-1m | Unified TCI with separate DL/UL TCI update for inter-cell beam management with more than one MAC-CE activated separate TCI state per CC | Support of unified TCI with separate DL/UL TCI update for inter-cell beam management with more than one MAC-CE activated separate TCI state per CC  2. Support K additional MAC-CE activated DL TCI states per CC in a band  3. Support K additional MAC-CE activated UL TCI states per CC in a band  4. Support K additional MAC-CE activated DL TCI states across all CC(s) in a band  5. Support K additional MAC-CE activated UL TCI states across all CC(s) in a band | 23-10-1 | Yes |  | Unified TCI with separate DL/UL TCI update for inter-cell beam management with more than one MAC-CE activated separate TCI state per CC is not supported | per band | n/a | n/a | n/a | Component candidate values for K: {0,1,2,4}  Note: A UE that supports 23-10-1m supports K additional MAC-CE activated DL and K additional MAC-CE activated UL TCI states across all CC(s) in a band in addition to the maximum number of MAC-CE activated DL and UL TCI states across all CC(s) in a band signalled in FG 23-10-1. The signalled value in component 4 (5) of 23-10-1m plus the signalled value in component 7 (8) of 23-10-1 determine the maximum number of MAC-CE activated DL (UL) TCI states across all CC(s) in a band that are applied to intra and inter-cell beam management jointly. | Optional with capability signalling |

1. NR\_ext\_to\_71GHz

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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 (Sidelink 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 |
| 24. NR\_ext\_to\_71GHz | 24-1 | Basic FR2-2 DL support | 1. Support reception of 120kHz subcarrier spacing for DL data and control channels, SSB, and reference signals in FR2-2 for non-initial access |  | Yes | N/A | FR2-2 is not supported | per band | N/A | N/A | N/A | A UE that supports FR2-2 must indicate this FG is supported | Optional with capability signalling |
| 24. NR\_ext\_to\_71GHz | 24-1a | Basic FR2-2 UL support | 1. PRACH with 120KHz SCS and length 139  2. Support transmission of 120kHz subcarrier spacing for UL data and control channels and reference signals in FR2-2 | 24-1 | Yes | N/A | UL in FR2-2 is not supported | per band | N/A | N/A | N/A |  | Optional with capability signalling |
| 24. NR\_ext\_to\_71GHz | 24-1b | Wideband PRACH for 120 kHz in FR2-2 | Enhanced PRACH design for operation by adopting a single long ZC sequence, with ZC sequence equal to 1151 for 120kHz and ZC sequence equal to 571 for 120kHz | 24-1a | Yes | N/A | Wideband PRACH for 120 kHz in FR2-2 is not supported | Per band | N/A | N/A | N/A | This FG is only applicable when PSD limitation applies within FR2-2 based on the regional regulations | Optional withcapability signalling |
| 24. NR\_ext\_to\_71GHz | 24-1c | Multi-RB support  PUCCH format 0/1/4 for 120 kHz in FR2-2 | 1. Support multi-RB PUCCH format 4 for 120 kHz  2. Support multi-RB PUCCH format 0/1 for 120 kHz | 24-1a | Yes | N/A | Multi-RB support  PUCCH format 0/1/4 for 120 kHz in FR2-2 is not supported | Per band | N/A | N/A | N/A | This FG is only applicable when PSD limitation applies within FR2-2 based on the regional regulations | Optional with capability signalling |
| 24. NR\_ext\_to\_71GHz | 24-1d | Multiple PDSCH scheduling by single DCI for 120kHz in FR2-2 | 1. Multi-PDSCH scheduling by single DCI for the operation with 120 kHz SCS  2. HARQ enhancements for both type 1 and type 2 HARQ codebook for supporting multi-PDSCH scheduling with singe DCI | 24-1 | Yes | N/A | Multiple PDSCH scheduling by single DCI for 120kHz is not supported in FR2-2 | Per band | N/A | N/A | N/A |  | Optional with capability signalling |
| 24. NR\_ext\_to\_71GHz | 24-1f | Multiple PDSCH scheduling by single DCI for 120kHz in FR2-1 | 1. Multi-PDSCH scheduling by single DCI for the operation with 120 kHz SCS  2. HARQ enhancements for both type 1 and type 2 HARQ codebook for supporting multi-PDSCH scheduling with singe DCI |  | Yes | N/A | Multiple PDSCH scheduling by single DCI for 120kHz is not supported in FR2-1 | Per band | N/A | N/A | N/A |  | Optional with capability signalling |
| 24. NR\_ext\_to\_71GHz | 24-1e | Multiple PUSCH scheduling by single DCI for 120kHz in FR2-2 | 1. Multi-PUSCH scheduling by single DCI for the operation with 120 kHz SCS | 24-1a | Yes | N/A | Multiple PUSCH scheduling by single DCI for 120kHz is not supported in FR2-2 | Per band | N/A | N/A | N/A |  | Optional with capability signalling |
| 24. NR\_ext\_to\_71GHz | 24-1g | Multiple PUSCH scheduling by single DCI for 120kHz in FR2-1 | 1. Multi-PUSCH scheduling by single DCI for the operation with 120 kHz SCS with non-contiguous allocation |  | Yes | N/A | Multiple PUSCH scheduling by single DCI for 120kHz is not supported in FR2-1 with non-contiguous allocation | Per band | N/A | N/A | N/A |  | Optional with capability signalling |
| 24. NR\_ext\_to\_71GHz | 24-2 | 120KHz SSB support for initial access in FR2-2 | 1. Support 120KHz SSB for initial access in FR2-2 | 24-1, 24-1a | Yes | N/A | 120KHz SSB based initial access in FR2-2 is not supported | per band | N/A | N/A | N/A |  | Optional with capability signalling |
| 24. NR\_ext\_to\_71GHz | 24-3 | 480KHz SSB support for initial access in FR2-2 | 1. Support 480KHz SSB for initial access in FR2-2 | 24-2, 24-4, 24-4a | Yes | N/A | 480KHz SSB based initial access in FR2-2 is not supported | per band | N/A | N/A | N/A |  | Optional with capability signalling |
| 24. NR\_ext\_to\_71GHz | 24-4 | 480KHz SCS support for DL | 1. 480KHz SCS for DL data and control channels, SSB, and reference signal reception in FR2-2 for non-initial access  2. Multiple-slot PDCCH monitoring for 480KHz with (Xs,Ys) = (4,1)  3. Multi- PDSCH scheduling by single DCI for the operation with 480 kHz SCS and corresponding HARQ enhancements  4. Within the Ys = 1 slot (with Xs=4), monitoring of type 1 CSS with dedicated RRC configuration, type 3 CSS, and UE-SS with a maximum of two monitoring spans per slot with a span duration of Y symbols and a minimum gap of X symbols between the start of two spans, where (X,Y) = (4, 3) and (7, 3) are supported  5. Processing one unicast DCI scheduling DL and one unicast DCI scheduling UL per slot group of Xs slots per scheduled CC for FDD  6. Processing one unicast DCI scheduling DL and 2 unicast DCI scheduling UL per slot group of Xs slots per scheduled CC for TDD  7. For type 1 CSS without dedicated RRC configuration and for type 0, 0A, and 2 CSS, the configured monitoring occasion(s) can be any OFDM symbol(s) of any slot(s) of the slot group, and the actual monitoring occasion for any one of Type 1- CSS without dedicated RRC configuration, or Types 0, 0A, or 2 CSS is within a single span of three consecutive OFDM symbols within a single slot of the slot group. | 24-1 | Yes | N/A | 480KHz SCS for DL is not supported | Perband | N/A | N/A | N/A |  | Optional with capability signalling |
| 24. NR\_ext\_to\_71GHz | 24-4a | 480KHz SCS support for UL | 1. PRACH with 480KHz and length 139  2. 480KHz SCS for UL data and control channels and reference signal transmission in FR2-2  3. Multi-PUSCH scheduling by single DCI for the operation with 480 kHz SCS | 24-1a, 24-4 | Yes | N/A | 480KHz SCS support for UL is not supported | Per band | N/A | N/A | N/A |  | Optional with capability signalling |
| 24. NR\_ext\_to\_71GHz | 24-4b | Wideband PRACH for 480 kHz in FR2-2 | PRACH with 480KHz and length 571 | 24-4a | Yes | N/A | Wideband PRACH for 480 kHz in FR2-2 is not supported | Per band | N/A | N/A | N/A | This FG is only applicable when PSD limitation applies within FR2-2 based on the regional regulations | Optional with capability signalling |
| 24. NR\_ext\_to\_71GHz | 24-4c | Multi-RB PUCCH format 0/1/4 for 480 kHz in FR2-2 | Support multi-RB PUCCH format 0/1/4 for 480 kHz | 24-4a | Yes | N/A | Multi-RB PUCCH format 0/1/4 for 480 kHz in FR2-2 is not supported | Per band | N/A | N/A | N/A | This FG is only applicable when PSD limitation applies within FR2-2 based on the regional regulations | Optional with capability signalling |
| 24. NR\_ext\_to\_71GHz | 24-4f | Enhanced PDCCH monitoring for 480KHz in FR2-2 | 1. Multiple-slot PDCCH monitoring for 480KHz with (Xs,Ys)=(4,2)  2.) Within each of the Ys = 2 slots (with Xs=4), monitoring of type 1 CSS with dedicated RRC configuration, type 3 CSS, and UE-SS in the first 3 OFDM symbols of each slot | 24-4 | Yes | N/A | Enhanced PDCCH monitoring for 480KHz in FR2-2 is not supported | Per band | N/A | N/A | N/A |  | Optional with capability signalling |
| 24. NR\_ext\_to\_71GHz | 24-5 | 960KHz SCS support for DL | 1. 960KHz SCS for DL data and control channels, SSB, and reference signal reception in FR2-2 for non-initial access  2. Multiple-slot PDCCH monitoring for 960KHz with (Xs,Ys)=(8,1)  3. MultiPDSCH scheduling by single DCI for the operation with 960 kHz SCS and corresponding HARQ enhancements  4. Within the Ys = 1 slot (with Xs=8), monitoring of type 1 CSS with dedicated RRC configuration, type 3 CSS, and UE-SS with a span duration of Y symbols and a minimum gap of X symbols between the start of two spans, where (X,Y)= (7, 3) is supported  5. Processing one unicast DCI scheduling DL and one unicast DCI scheduling UL per slot group of Xs slots per scheduled CC for FDD  6. Processing one unicast DCI scheduling DL and 2 unicast DCI scheduling UL per slot group of Xs slots per scheduled CC for TDD  7. For type 1 CSS without dedicated RRC configuration and for type 0, 0A, and 2 CSS, the configured monitoring occasion(s) can be any OFDM symbol(s) of any slot(s) of the slot group, and the actual monitoring occasion for any one of Type 1- CSS without dedicated RRC configuration, or Types 0, 0A, or 2 CSS is within a single span of three consecutive OFDM symbols within a single slot of the slot group. | 24-1 | Yes | N/A | 960KHz SCS support for DL is not supported | Per band | N/A | N/A | N/A |  | Optional with capability signalling |
| 24. NR\_ext\_to\_71GHz | 24-5a | 960KHz SCS support for UL | 1. PRACH with 960KHz and length 139  2. 960KHz SCS for UL data and control channels and reference signal transmission in FR2-2  3. Multi-PUSCH scheduling by single DCI for the operation with 960 kHz SCS | 24-1a, 24-5 | Yes | N/A | 960KHz SCS support for UL is not supported | Per band | N/A | N/A | N/A |  | Optional with capability signalling |
| 24. NR\_ext\_to\_71GHz | 24-5c | Multi-RB PUCCH format 0/1/4 for 960 kHz in FR2-2 | Support multi-RB PUCCH format 0/1/4 for 960 kHz | 24-5a | Yes | N/A | Multi-RB PUCCH format 0/1/4 for 960 kHz in FR2-2 is not supported | Per band | N/A | N/A | N/A | This FG is only applicable when PSD limitation applies within FR2-2 based on the regional regulations | Optional with capability signalling |
| 24. NR\_ext\_to\_71GHz | 24-5f | Enhanced PDCCH monitoring for 960KHz in FR2-2 | 1. Multiple-slot PDCCH monitoring for 960KHz with (Xs,Ys)  2.) Within each of the Ys = 2 (with Xs=4) or Ys = 4 (with Xs=8) slots, monitoring of type 1 CSS with dedicated RRC configuration, type 3 CSS, and UE-SS in the first 3 OFDM symbols of each slot or within the Ys = 1 (with Xs=4) slot, monitoring of type 1 CSS with dedicated RRC configuration, type 3 CSS, and UE-SS with a span duration of Y symbols and a minimum gap of X symbols between the start of two spans, where (X,Y) = (7, 3) | 24-5 | Yes | N/A | Enhanced PDCCH monitoring for 960KHz is not supported | Per band | N/A | N/A | N/A | Component 1 candidate values: one or more of {(4,1), (4,2), (8,4)} | Optional with capability signalling |
| 24. NR\_ext\_to\_71GHz | 24-6 | Type 1 channel access procedure in uplink for FR2-2 with shared spectrum channel access | 1. Support Type 1 channel access procedure  2. Support LBT performed per channel, as defined in 37.213 Clause 4.4 | 24-1a | Yes | N/A | Type 1 channel access procedure in uplink for FR2-2 with shared spectrum channel access is not supported | per band | N/A | N/A | N/A | A UE that supports FR2-2 must indicate this FG is supported when required by regulation | Optional with capability signalling |
| 24. NR\_ext\_to\_71GHz | 24-7 | Type 2 channel access procedure in uplink for FR2-2 with shared spectrum channel access | 1. Support Type 2 channel access procedure  2. Support LBT performed per channel, as defined in 37.213 Clause 4.4 | 24-1a, 24-6 | Yes | N/A | Type 2 channel access procedure in uplink for FR2-2 with shared spectrum channel access is not supported | per band | N/A | N/A | N/A | A UE that supports FR2-2 must indicate this FG is supported when required by regulation | Optional with capability signalling |
| 24. NR\_ext\_to\_71GHz | 24-8 | 32 DL HARQ processes for FR 2-2 | Support 32 HARQ processes in DL for 120/480/960 kHz | 24-1 | Yes | N/A | 32 DL HARQ processes for FR 2-2 is not supported | Per band | N/A | N/A | N/A | A UE supporting 32 maximum number of HARQ processes for 480/960 kHz SCS for DL shall support 32 as the maximum number of HARQ processes for 120 kHz SCS for DL in FR2-2 | Optional with capability signalling |
| 24. NR\_ext\_to\_71GHz | 24-8b | 32 DL HARQ processes for FR 2-2 - maximum number of component carriers | Maximum number of component carriers that can be configured with 32 DL HARQ processes | 24-8 | Yes | N/A |  | Per BC | N/A | N/A | N/A | Candidate component values: {1,2,3,4,6,8,16,32} | Optional with capability signalling |
| 24. NR\_ext\_to\_71GHz | 24-9 | 32 UL HARQ processes for FR 2-2 | Support 32 HARQ processes in UL for 120/480/960 kHz | 24-1 | Yes | N/A | 32 UL HARQ processes for FR 2-2 is not supported | Per band | N/A | N/A | N/A | A UE supporting 32 maximum number of HARQ processes for 480/960 kHz SCS for UL shall support 32 as the maximum number of HARQ processes for 120 kHz SCS for UL in FR2-2 | Optional with capability signalling |
| 24. NR\_ext\_to\_71GHz | 24-9b | 32 UL HARQ processes for FR 2-2 - maximum number of component carriers | Maximum number of component carriers that can be configured with 32 UL HARQ processes | 24-9 | Yes | N/A |  | Per BC | N/A | N/A | N/A | Candidate component values: {1,2,3,4,5,8,16,32} | Optional with capability signalling |
| 24. NR\_ext\_to\_71GHz | 24-10 | Reduced beam switching time delay | Support of reduced beam switching time delay d = 56 symbols for 480 kHz SCS |  | Yes | N/A | Reduced beam switching time delay d = 56 symbols is not supported for 480kHz SCS | per band | N/A | N/A | N/A | If this capability is not reported and the UE supports both FG 24-4 and 24-5, the default value of 112 symbols is assumed | Optional with capability signalling |
| 24. NR\_ext\_to\_71GHz | 24-11a | Capability on the number of CCs for monitoring a maximum number of BDs and non-overlapped CCEs when configured with DL CA with Rel-17 PDCCH monitoring capability on all the serving cells | Capability on the number of CCs for monitoring a maximum number of BDs and non-overlapped CCEs when configured with DL CA with Rel-17 PDCCH monitoring capability on all the serving cells | 24-4 or 24-5 | Yes | N/A | Capability on the number of CCs for monitoring a maximum number of BDs and non-overlapped CCEs when configured with DL CA with Rel-17 PDCCH monitoring capability on all the serving cells is not supported | Per BC | N/A | N/A | N/A | Candidate values: {4, 5, …, 16} | Optional with capability signaling |
| 24. NR\_ext\_to\_71GHz | 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 | Supported combination(s) of (pdcch-BlindDetectionCA-R15, pdcch-BlindDetectionCA-R17) | 24-4 or 24-5 | Yes | N/A | Number of carriers for CCE/BD scaling with DL CA with mix of Rel. 17 and Rel. 15 PDCCH monitoring capabilities on different carriers is not supported | Per BC | N/A | N/A | N/A | Candidate values for pdcch-BlindDetectionCA-R15: 1 to 15  Candidate values for pdcch-BlindDetectionCA-R17: 1 to 15  Range of pdcch-BlindDetectionCA-R15 + pdcch-BlindDetectionCA-R17: {4, 5, …, 16} | Optional with capability |
| 24. NR\_ext\_to\_71GHz | 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 | Supported combination(s) of (pdcch-BlindDetectionCA-R16, pdcch-BlindDetectionCA-R17) | 24-4 or 24-5 | Yes | N/A | Number of carriers for CCE/BD scaling with DL CA with mix of Rel. 17 and Rel. 16 PDCCH monitoring capabilities on different carriers is not supported | Per BC | N/A | N/A | N/A | Candidate values for pdcch-BlindDetectionCA-R16: 1 to 15  Candidate values for pdcch-BlindDetectionCA-R17: 1 to 15  Range of pdcch-BlindDetectionCA-R16 + pdcch-BlindDetectionCA-R17: {3, 4, 5, …, 16} | Optional with capability |
| 24. NR\_ext\_to\_71GHz | 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 | Supported combination(s) of (pdcch-BlindDetectionCA-R15, pdcch-BlindDetectionCA-R16, pdcch-BlindDetectionCA-R17) | 24-4 or 24-5 | Yes | N/A | 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 is not supported | Per BC | N/A | N/A | N/A | Candidate values for pdcch-BlindDetectionCA-R15: 1 to 15  Candidate values for pdcch-BlindDetectionCA-R16: 1 to 15  Candidate values for pdcch-BlindDetectionCA-R17: 1 to 15  Range of pdcch-BlindDetectionCA-R15 + pdcch-BlindDetectionCA-R16+ pdcch-BlindDetectionCA-R17: {3,4, 5, …, 16} | Optional with capability |
| 24. NR\_ext\_to\_71GHz | 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 | * 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 * Supported combination of (*pdcch-BlindDetectionMCG-UE-r17*, *pdcch-BlindDetectionSCG-UE-r17*) | 24-4 or 24-5 | Yes | N/A | 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 is not supported | Per BC | N/A | N/A | N/A | Maximum number of supported combinations is {1,…,16}  If the UE reports pdcch-BlindDetectionCA-r17,  - Candidate values for pdcch-BlindDetectionMCG-UE-r17 is 1 to pdcch-BlindDetectionCA-r17-1  - Candidate values for pdcch-BlindDetectionSCG-UE-r17 is 1 to pdcch-BlindDetectionCA-r17-1  - pdcch-BlindDetectionMCG-UE-r17 + pdcch-BlindDetectionSCG-UE-r17 >= pdcch-BlindDetectionCA-r17  Otherwise, the value of pdcch-BlindDetectionMCG-UE-r17 or of pdcch-BlindDetectionSCG-UE-r17 is {1, 2, 3} | Optional with capability |
| 24. NR\_ext\_to\_71GHz | 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 | Supported combination(s) of (*pdcch-BlindDetectionMCG-UE-r15*, *pdcch-BlindDetectionSCG-UE-r15, pdcch-BlindDetectionMCG-UE-r17*, *pdcch-BlindDetectionSCG-UE-r17*) | 24-4 or 24-5 | Yes | N/A | 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 is not supported | Per BC | N/A | N/A | N/A | Maximum number of supported combinations is {1,…,16}  One combination of (*pdcch-BlindDetectionMCG-UE-r15, pdcch-BlindDetectionSCG-UE-r15, pdcch-BlindDetectionMCG-UE-r17, pdcch-BlindDetectionSCG-UE-r17*) corresponds to one combination of (*pdcch-BlindDetectionCA-r15, pdcch-BlindDetectionCA-r17*)  If the UE reports pdcch-BlindDetectionCA-r15,  - Candidate values for pdcch-BlindDetectionMCG-UE-r15 is 0 to pdcch-BlindDetectionCA-r15  - Candidate values for pdcch-BlindDetectionSCG-UE-r15 is 0 to pdcch-BlindDetectionCA-r15  - pdcch-BlindDetectionMCG-UE-r15 + pdcch-BlindDetectionSCG-UE-r15>= pdcch-BlindDetectionCA-r15  Otherwise,  - Candidate values for pdcch-BlindDetectionMCG-UE-r15 is {0, 1, 2, 3}  - Candidate values for pdcch-BlindDetectionSCG-UE-r15 is {0, 1, 2, 3}  If the UE reports pdcch-BlindDetectionCA-r17,  - Candidate values for pdcch-BlindDetectionMCG-UE-r17 is 0 to pdcch-BlindDetectionCA-r17  - Candidate values for pdcch-BlindDetectionSCG-UE-r17 is 0 to pdcch-BlindDetectionCA-r17  - pdcch-BlindDetectionMCG-UE-r17 + pdcch-BlindDetectionSCG-UE-r17>= pdcch-BlindDetectionCA-r17  Otherwise,  - Candidate values for pdcch-BlindDetectionMCG-UE-r17 is {0, 1, 2, 3}  - Candidate values for pdcch-BlindDetectionSCG-UE-r17 is {0, 1, 2, 3} | Optional with capability |
| 24. NR\_ext\_to\_71GHz | 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 | Supported combination(s) of (*pdcch-BlindDetectionMCG-UE-r16*, *pdcch-BlindDetectionSCG-UE-r16, pdcch-BlindDetectionMCG-UE-r17*, *pdcch-BlindDetectionSCG-UE-r17*) | 24-4 or 24-5 | Yes | N/A | 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 is not supported | Per BC | N/A | N/A | N/A | Maximum number of supported combinations is {1,…,16}  One combination of (*pdcch-BlindDetectionMCG-UE-r16, pdcch-BlindDetectionSCG-UE-r16, pdcch-BlindDetectionMCG-UE-r17, pdcch-BlindDetectionSCG-UE-r17*) corresponds to one combination of (*pdcch-BlindDetectionCA-r16, pdcch-BlindDetectionCA-r17*)  If the UE reports pdcch-BlindDetectionCA-r16,  - Candidate values for pdcch-BlindDetectionMCG-UE-r16 is 0 to pdcch-BlindDetectionCA-r16  - Candidate values for pdcch-BlindDetectionSCG-UE-r16 is 0 to pdcch-BlindDetectionCA-r16  - pdcch-BlindDetectionMCG-UE-r15 + pdcch-BlindDetectionSCG-UE-r16>= pdcch-BlindDetectionCA-r16  Otherwise,  - Candidate values for pdcch-BlindDetectionMCG-UE-r16 is {0, 1}  - Candidate values for pdcch-BlindDetectionSCG-UE-r16 is {0, 1}  If the UE reports pdcch-BlindDetectionCA-r17,  - Candidate values for pdcch-BlindDetectionMCG-UE-r17 is 0 to pdcch-BlindDetectionCA-r17  - Candidate values for pdcch-BlindDetectionSCG-UE-r17 is 0 to pdcch-BlindDetectionCA-r17  - pdcch-BlindDetectionMCG-UE-r17 + pdcch-BlindDetectionSCG-UE-r17>= pdcch-BlindDetectionCA-r17  Otherwise,  - Candidate values for pdcch-BlindDetectionMCG-UE-r17 is {0, 1, 2}  - Candidate values for pdcch-BlindDetectionSCG-UE-r17 is {0, 1, 2} | Optional with capability |
| 24. NR\_ext\_to\_71GHz | 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 | Supported combination(s) of (*pdcch-BlindDetectionMCG-UE-r15*, *pdcch-BlindDetectionSCG-UE-r15, pdcch-BlindDetectionMCG-UE-r16*, *pdcch-BlindDetectionSCG-UE-r16, pdcch-BlindDetectionMCG-UE-r17*, *pdcch-BlindDetectionSCG-UE-r17*) | 24-4 or 24-5 | Yes | N/A | 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 is not supported | Per BC | N/A | N/A | N/A | Maximum number of supported combinations is {1,…,16}  One combination of (*pdcch-BlindDetectionMCG-UE-r15, pdcch-BlindDetectionSCG-UE-r15,pdcch-BlindDetectionMCG-UE-r16, pdcch-BlindDetectionSCG-UE-r16, pdcch-BlindDetectionMCG-UE-r17, pdcch-BlindDetectionSCG-UE-r17*) corresponds to one combination of (*pdcch-BlindDetectionCA-r15, pdcch-BlindDetectionCA-r16, pdcch-BlindDetectionCA-r17*)  If the UE reports pdcch-BlindDetectionCA-r15,  - Candidate values for pdcch-BlindDetectionMCG-UE-r15 is 0 to pdcch-BlindDetectionCA-r15  - Candidate values for pdcch-BlindDetectionSCG-UE-r15 is 0 to pdcch-BlindDetectionCA-r15  - pdcch-BlindDetectionMCG-UE-r15 + pdcch-BlindDetectionSCG-UE-r15>= pdcch-BlindDetectionCA-r15  Otherwise,  - Candidate values for pdcch-BlindDetectionMCG-UE-r15 is {0, 1}  - Candidate values for pdcch-BlindDetectionSCG-UE-r15 is {0, 1}  If the UE reports pdcch-BlindDetectionCA-r16,  - Candidate values for pdcch-BlindDetectionMCG-UE-r16 is 0 to pdcch-BlindDetectionCA-r16  - Candidate values for pdcch-BlindDetectionSCG-UE-r16 is 0 to pdcch-BlindDetectionCA-r16  - pdcch-BlindDetectionMCG-UE-r15 + pdcch-BlindDetectionSCG-UE-r16>= pdcch-BlindDetectionCA-r16  Otherwise,  - Candidate values for pdcch-BlindDetectionMCG-UE-r16 is {0, 1}  - Candidate values for pdcch-BlindDetectionSCG-UE-r16 is {0, 1}  If the UE reports pdcch-BlindDetectionCA-r17,  - Candidate values for pdcch-BlindDetectionMCG-UE-r17 is 0 to pdcch-BlindDetectionCA-r17  - Candidate values for pdcch-BlindDetectionSCG-UE-r17 is 0 to pdcch-BlindDetectionCA-r17  - pdcch-BlindDetectionMCG-UE-r17 + pdcch-BlindDetectionSCG-UE-r17>= pdcch-BlindDetectionCA-r17  Otherwise,  - Candidate values for pdcch-BlindDetectionMCG-UE-r17 is {0, 1}  - Candidate values for pdcch-BlindDetectionSCG-UE-r17 is {0, 1} | Optional with capability |

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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 (Sidelink 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 |
| 25. NR\_IIOT\_URLLC\_enh | 25-1 | SPS HARQ-ACK deferral in case of TDD collision | 1. Identify HARQ-ACK bits of active SPS configurations for deferral in the initial PUCCH slot  2. Determination of the target PUCCH slot for SPS HARQ-ACK deferral  3. Multiplexing and transmission of deferred SPS HARQ-ACK information in the target PUCCH slot  4. Handling of the collision for the same HARQ process due to deferred SPS HARQ-ACK | 5-18 | Yes | N/A |  | Per UE | No  (TDD only) | No | N/A | Reporting type of FG 25-1 is per UE with licensed/unlicensed and TN/NTN differentiation, detail signalling is up to RAN2  Note: the differentiation as mentioned above are not common differentiation types, and are not described in 38.306 Annex. RAN1 does not imply to formally introduce these as new differentiations. RAN2 can decide the signalling as long as the intention is reflected | Optional with capability signaling |
| 25. NR\_IIOT\_URLLC\_enh | 25-2 | Repetitions for PUCCH format 0, and 2 over multiple slots with K = 2, 4, 8 | Repetitions for PUCCH format 0 and 2 over multiple slots with K = 2, 4, 8 | 4-23 | Yes | N/A |  | Per band | N/A | N/A | N/A |  | Optional with capability signaling |
| 25. NR\_IIOT\_URLLC\_enh | 25-3 | Repetitions for PUCCH format 0, 1, 2, 3 and 4 over multiple PUCCH subslots with configured K = 2, 4, 8 | Repetitions for PUCCH format 0, 1, 2, 3 and 4 over multiple PUCCH subslots with RRC configured repetition factor K = 2, 4, 8  Note: The support of FG 25-3 doesn’t imply an increase of the maximum number of PUCCHs per slot that supported by the UE | 4-23  11-3 | Yes | N/A |  | Per FS | N/A | N/A | N/A |  | Optional with capability signaling |
| 25. NR\_IIOT\_URLLC\_enh | 25-3a | Repetitions for PUCCH format 0, 1, 2, 3 and 4 over multiple PUCCH subslots using dynamic repetition indication | Repetitions for PUCCH format 0, 1, 2, 3 and 4 over multiple PUCCH subslots based on dynamic repetition indication.  Note: Dynamic PUCCH repetition factor indication is only supported for HARQ-ACK | 25-3 | Yes | N/A |  | Per FS | N/A | N/A | N/A |  | Optional with capability signaling |
| 25. NR\_IIOT\_URLLC\_enh | 25-3b | Inter-subslot frequency hopping for PUCCH repetitions | 1. Support inter-subslot frequency hopping for PUCCH repetition operation of PUCCH Formats 0, 1, 2, 3 and 4 for 7OS slot-based PUCCH configurations.  2. Support inter-subslot frequency hopping for PUCCH repetition operation of PUCCH Format 0 and Format 2 for 2OS slot-based PUCCH configurations | 25-3 | Yes | N/A |  | Per FS | N/A | N/A | N/A |  | Optional with capability signaling |
| 25. NR\_IIOT\_URLLC\_enh | 25-4 | One-shot HARQ ACK feedback triggered by DCI format 1\_2 | 1. Support feedback of type 3 HARQ-ACK codebook, triggered by a DCI 1\_2 scheduling a PDSCH  2. Support feedback of type 3 HARQ-ACK codebook, triggered by a DCI 1\_2 without scheduling a PDSCH using a reserved FDRA value | 10-16  11-1 | Yes | N/A |  | Per band | N/A | N/A | N/A |  | Optional with capability signaling |
| 25. NR\_IIOT\_URLLC\_enh | 25-5 | PHY priority handling for one-shot HARQ ACK feedback | Support transmission of type 3 HARQ-ACK codebook using the first or second PUCCH configuration based on PHY priority indication in the triggering DCI | 10-16  11-4 | Yes | N/A |  | Per band | N/A | N/A | N/A |  | Optional with capability signaling |
| 25. NR\_IIOT\_URLLC\_enh | 25-6 | Enhanced type 3 HARQ-ACK codebook feedback | 1. Support feedback of enhanced type 3 HARQ-ACK codebook, triggered by a DCI 1\_1 and DCI format 1\_2 (for a UE supporting DCI format 1\_2, 11-1)  2. Support configuration of up to 8 enhanced type 3 HARQ-ACK codebooks.  3. Support feedback of a dynamically selected enhanced type 3 HARQ-ACK codebook based on triggering information in DCI 1\_1 and DCI 1\_2 (for a UE supporting DCI format 1\_2, 11-1)  4. Support transmission of enhanced type 3 HARQ-ACK codebook using the first or second PUCCH configuration based on PHY priority indication in the triggering DCI (for a UE supporting two HARQ-ACK codebooks / PUCCH config in 11-4)  5. Supported maximum number of actual PUCCH transmissions for type 3 or enhanced type 3 HARQ-ACK codebook feedback within a slot | 10-16 | Yes | N/A |  | Per band | N/A | N/A | N/A | For component 2, the UE indicates its capability in the number of enhanced type 3 HARQ-ACK codebooks: {1, 2, 4, 8}  For component 3, the dynamic indication is only supported if the UE for component 2 supports more than one enhanced type 3 HARQ-ACK codebook to be configured  Candidate values for component 5 is: {1, 2, 3, 4, 5, 6, 7}. | Optional with capability signaling |
| 25. NR\_IIOT\_URLLC\_enh | 25-7 | Triggered HARQ-ACK codebook re-transmission | 1. Support HARQ-ACK re-transmission from an earlier PUCCH slot based on the triggering information in DCI format 1\_1 and DCI format 1\_2 (for a UE supporting DCI format 1\_2, 11-1)  2. Support the related PHY priority handling in terms of HARQ-ACK codebook selection and the applicable PUCCH configuration (for a UE supporting two HARQ-ACK codebooks / PUCCH config in 11-4)  3. Supported minimum value M for the HARQ re-tx offset  4. Supported maximum value N for the HARQ re-tx offset |  | Yes | N/A |  | Per band | N/A | N/A | N/A | Candidate values for component 3 is: M = {-7, -5, …, 1}  Candidate values for component 4 is: N= {4, 6, …, 24}  Note: The minimum requirement for Component 3 and Component 4 of FG 25-7 is valid for HARQ CBs consisted of HARQ Processes with a single HARQ bit per HARQ Process ID | Optional with capability signaling |
| 25. NR\_IIOT\_URLLC\_enh | 25-8 | Semi-static HARQ-ACK codebook for sub-slot PUCCH | Semi-static (Type 1) HARQ-ACK codebook for sub-slot based PUCCH configuration | 4-11, 11-3 | Yes | N/A |  | Per FS | N/A | N/A | N/A |  | Optional with capability signaling |
| 25. NR\_IIOT\_URLLC\_enh | 25-9 | Semi-static PUCCH cell switching for a single PUCCH group only | 1. Semi-static PUCCH cell switching using configured time-domain domain pattern of applicable PUCCH cell / carrier for a single PUCCH group only. This component indicates one of the candidate values {only primary PUCCH group can support PUCCH cell switch, only secondary PUCCH group can support PUCCH cell switch, either primary or secondary PUCCH group can support PUCCH cell switch}  2. For the PUCCH group supporting semi-static PUCCH cell switch, for a BC, the UE reports one or multiple of supported configuration(s) of PUCCH group config, where each supported configuration includes the following information   * one or multiple carrier type pairs that can support PUCCH cell switch, where the carrier type are selected from {FR1 licensed TDD, FR2 licensed TDD} |  | Yes | N/A |  | Per BC | N/A  (TDD only) | N/A | N/A | Note: this feature applies to cells in the same TAG only  If UE supporting this FG also supports both FGs 6-9 and 6-9a or both FGs 22-7b and 22-7c or FGs 22-6 or 22-6a when UE is not configured with two NR PUCCH groups, the UE supports the cases of both same and different numerologies between switchable cells. Otherwise, the UE supports the case of same numerology between switchable cells | Optional with capability signaling |
| 25. NR\_IIOT\_URLLC\_enh | 25-9a | Semi-static PUCCH cell switching for two PUCCH groups | Semi-static PUCCH cell switching using configured time-domain domain pattern of applicable PUCCH cell / carrier  For the BC, the UE reports one or multiple of supported configuration(s) of {primary PUCCH group config, secondary PUCCH group config} where for each supported configuration,   * The “primary PUCCH group config” includes following information:   + one or multiple carrier type pairs that can support PUCCH cell switch, where the carrier type are selected from {FR1 licensed TDD, FR2 licensed TDD} * The “secondary PUCCH group config” includes following information:   + one or multiple carrier type pairs that can support PUCCH cell switch, where the carrier type are selected from {FR1 licensed TDD, FR2 licensed TDD} |  | Yes | N/A |  | Per BC | N/A  (TDD only) | N/A | N/A | Note: this feature applies to cells in the same TAG only  If UE supporting this FG also supports both FGs 6-9 and 6-9a or both FGs 22-7b and 22-7c, the UE supports the cases of both same and different numerologies between switchable cells. Otherwise, the UE supports the case of same numerology between switchable cells | Optional with capability signaling |
| 25. NR\_IIOT\_URLLC\_enh | 25-10 | PUCCH cell switching based on dynamic indication for same length of overlapping PUCCH slots/sub-slots for a single PUCCH group only | 1. PUCCH cell switching based on dynamic indication in the DCI scheduling the PUCCH for same length (in physical time) of overlapping PUCCH slots/sub-slots for a single PUCCH group only. This component indicates one of the candidate values {only primary PUCCH group can support PUCCH cell switch, only secondary PUCCH group can support PUCCH cell switch, either primary or secondary PUCCH group can support PUCCH cell switch}  2. For the PUCCH group supporting PUCCH cell switching based on dynamic indication in the DCI scheduling the PUCCH for same length (in physical time) of overlapping PUCCH slots/sub-slots, for a BC, the UE reports one or multiple of supported configuration(s) of PUCCH group config, where each supported configuration includes the following information   * one or multiple carrier type pairs that can support PUCCH cell switch, where the carrier type are selected from {FR1 licensed TDD, FR2 licensed TDD} |  | Yes | N/A |  | Per BC | N/A (TDD only) | N/A | N/A | Note: this feature applies to cells in the same TAG only  If UE supporting this FG also supports both FGs 6-9 and 6-9a or both FGs 22-7b and 22-7c or FGs 22-6 or 22-6a when UE is not configured with two NR PUCCH groups, the UE supports the cases of both same and different numerologies between switchable cells. Otherwise, the UE supports the case of same numerology between switchable cells | Optional with capability signaling |
| 25. NR\_IIOT\_URLLC\_enh | 25-10a | PUCCH cell switching based on dynamic indication for different length of overlapping PUCCH slots/sub-slots for a single PUCCH group only | 1. PUCCH cell switching based on dynamic indication in the DCI scheduling the PUCCH for different length (in physical time) of overlapping PUCCH slots/sub-slots for a single PUCCH group only. This component indicates one of the candidate values {only primary PUCCH group can support PUCCH cell switch, only secondary PUCCH group can support PUCCH cell switch, either primary or secondary PUCCH group can support PUCCH cell switch}  2. For the PUCCH group supporting PUCCH cell switching based on dynamic indication in the DCI scheduling the PUCCH for different length (in physical time) of overlapping PUCCH slots/sub-slots, for a BC, the UE reports one or multiple of supported configuration(s) of PUCCH group config, where each supported configuration includes the following information   * one or multiple carrier type pairs that can support PUCCH cell switch, where the carrier type are selected from {FR1 licensed TDD, FR2 licensed TDD} |  | Yes | N/A |  | Per BC | N/A  (TDD only) | N/A | N/A | Note: this feature applies to cells in the same TAG only  If UE supporting this FG also supports both FGs 6-9 and 6-9a or both FGs 22-7b and 22-7c or FGs 22-6 or 22-6a when UE is not configured with two NR PUCCH groups, the UE supports the cases of both same and different numerologies between switchable cells. Otherwise, the UE supports the case of same numerology between switchable cells | Optional with capability signaling |
| 25. NR\_IIOT\_URLLC\_enh | 25-10b | PUCCH cell switching based on dynamic indication for same length of overlapping PUCCH slots/sub-slots for two PUCCH groups | PUCCH cell switching based on dynamic indication in the DCI scheduling the PUCCH for same length (in physical time) of overlapping PUCCH slots/sub-slots for two PUCCH groups  For the BC, the UE reports one or multiple of supported configuration(s) of {primary PUCCH group config, secondary PUCCH group config} where for each supported configuration,   * The “primary PUCCH group config” includes following information:   + one or multiple carrier type pairs that can support PUCCH cell switch, where the carrier type are selected from {FR1 licensed TDD, FR2 licensed TDD} * The “secondary PUCCH group config” includes following information:   + one or multiple carrier type pairs that can support PUCCH cell switch, where the carrier type are selected from {FR1 licensed TDD, FR2 licensed TDD} |  | Yes | N/A |  | Per BC | N/A  (TDD only) | N/A | N/A | Note: this feature applies to cells in the same TAG only  If UE supporting this FG also supports both FGs 6-9 and 6-9a or both FGs 22-7b and 22-7c, the UE supports the cases of both same and different numerologies between switchable cells. Otherwise, the UE supports the case of same numerology between switchable cells | Optional with capability signaling |
| 25. NR\_IIOT\_URLLC\_enh | 25-10c | PUCCH cell switching based on dynamic indication for different length of overlapping PUCCH slots/sub-slots for two PUCCH groups | PUCCH cell switching based on dynamic indication in the DCI scheduling the PUCCH for different length (in physical time) of overlapping PUCCH slots/sub-slots for two PUCCH groups  For the BC, the UE reports one or multiple of supported configuration(s) of {primary PUCCH group config, secondary PUCCH group config} where for each supported configuration,   * The “primary PUCCH group config” includes following information:   + one or multiple carrier type pairs that can support PUCCH cell switch, where the carrier type are selected from {FR1 licensed TDD, FR2 licensed TDD} * The “secondary PUCCH group config” includes following information:   + one or multiple carrier type pairs that can support PUCCH cell switch, where the carrier type are selected from {FR1 licensed TDD, FR2 licensed TDD} |  | Yes | N/A |  | Per BC | N/A  (TDD only) | N/A | N/A | Note: this feature applies to cells in the same TAG only  If UE supporting this FG also supports both FGs 6-9 and 6-9a or both FGs 22-7b and 22-7c, the UE supports the cases of both same and different numerologies between switchable cells. Otherwise, the UE supports the case of same numerology between switchable cells | Optional with capability signaling |
| 25. NR\_IIOT\_URLLC\_enh | 25-11 | 4-bits subband CQI | Subband CQI reporting with 4 bits per subband |  | Yes | N/A |  | Per UE | No | No | N/A | This FG is reported for TN and licensed | Optional with capability signaling |
| 25. NR\_IIOT\_URLLC\_enh | 25-11a | 4-bits subband CQI for NTN and unlicensed | Subband CQI reporting with 4 bits per subband for NTN and unlicensed |  | Yes | N/A |  | Per band | N/A | N/A | N/A | This FG is reported for NTN and unlicensed | Optional with capability signaling |
| 25. NR\_IIOT\_URLLC\_enh | 25-12 | UE initiating a semi-static channel occupancy with configurations dependent on gNB semi-static channel access configurations | 1. Support initiating a semi-static channel access occupancy by the UE where the corresponding period is the same as, integer multiple of, or inter-factor of the period configured for a semi-static channel occupancy that can be initiated by gNB.  2. Sensing to initiate a semi-static CO or transmit after a gap greater than 16us from any transmission burst within a UE-initiated CO  3. Determination of COT initiator assumption based on rules for configured UL  4. Validating COT initiator assumption indicated in UL scheduling DCI | 10-1a | Yes | N/A |  | Per band | N/A | N/A | N/A | The signaling is per band but is only expected for a band where shared spectrum channel access must be used | Optional with capability signaling |
| 25. NR\_IIOT\_URLLC\_enh | 25-13 | UE initiating a semi-static channel occupancy with independent configurations from gNB semi-static channel access configurations | Support initiating a semi-static channel access occupancy by the UE where the corresponding period is independently configured from the period configured for a semi-static channel occupancy that can be initiated by gNB. | 10-1a, 25-12 | Yes | N/A |  | Per band | N/A | N/A | N/A | The signaling is per band but is only expected for a band where shared spectrum channel access must be used | Optional with capability signaling |
| 25. NR\_IIOT\_URLLC\_enh | 25-14 | PHY prioritization of overlapping low-priority DG-PUSCH and high-priority CG-PUSCH | 1. Support PHY prioritization for the case where low-priority DG-PUSCH collides with high-priority CG-PUSCH  2. Configuration of PHY priority level for CG PUSCH, and dynamic indication of priority level for dynamic PUSCH with a single DCI format  3. Maximum number of supported carriers on the band across a set of contiguous carriers for the reported FS of that band |  | Yes | N/A |  | Per FS  Per FS is selected because implementation may need extra hardware resource and/or memory. Per FS is selected also because in case UE reports support this FG in UL inter-band CA e.g., FR1+FR2 | N/A | N/A | N/A | Candidate value set for component 3: {1, 2, …, 16} | Optional with capability signaling |
| 25. NR\_IIOT\_URLLC\_enh | 25-15 | PHY prioritization of overlapping high-priority DG-PUSCH and low-priority CG-PUSCH | 1. Support PHY prioritization of overlapping high-priority dynamic grant PUSCH and low-priority configured grant PUSCH on a BWP of a serving cell  2. Configuration of PHY priority level for CG PUSCH, and dynamic indication of priority level for dynamic PUSCH with a single DCI format  3. Additional number of symbols (d1) needed beyond the PUSCH preparation time for cancelling a low priority UL transmission.  4. Additional number of symbols (d3) needed on top of Rel-16 cancellation time (which results N2+d1+d3 in total cancellation time).  5. Maximum number of supported carriers on the band across a set of contiguous carriers for the reported FS of that band |  | Yes | N/A |  | Per FS  Per FS is selected because implementation may need extra hardware resource and/or memory. Per FS is selected also because in case UE reports support this FG in UL inter-band CA e.g., FR1+FR2 | N/A | N/A | N/A | Candidate value set for component 3: {0, 1, 2}  Candidate value set for component 4: d3 = {0, 1, …, } symbol(s) upon UE capability report, where for SCS=15/30/60/120kHz, respectively.  Candidate value set for component 5: {1, 2, …, 16} | Optional with capability signaling |
| 25. NR\_IIOT\_URLLC\_enh | 25-16 | HARQ-ACK with different priorities multiplexing on a PUCCH/PUSCH | 1. Support multiplexing a high-priority HARQ-ACK and a low-priority HARQ-ACK into a PUCCH. Support separate coding for the two HARQ-ACKs.  3. Support multiplexing a low-priority HARQ-ACK, a high-priority HARQ-ACK and a high-priority SR into a PUCCH.  4. Support multiplexing a low-priority HARQ-ACK in a high-priority PUSCH (conveying UL-SCH only). Support separate beta\_offset values for this priority combination.  5. Support multiplexing a high-priority HARQ-ACK in a low-priority PUSCH (conveying UL-SCH only). Support separate beta\_offset values for this priority combination.  6. Support multiplexing a low-priority HARQ-ACK, a high-priority PUSCH, a high-priority HARQ-ACK and/or CSI.  7. Support multiplexing a high-priority HARQ-ACK, a low-priority PUSCH, a low-priority HARQ-ACK and/or CSI. | 11-4 | Yes | N/A |  | Per band | N/A | N/A | N/A |  | Optional with capability signaling |
| 25. NR\_IIOT\_URLLC\_enh | 25-18 | Parallel PUCCH and PUSCH transmission across CCs in inter-band CA | Support simultaneous PUCCH and PUSCH transmissions of different priority on different cells for inter-band CA. | 6-6 | Yes | N/A |  | Per BC | N/A | N/A | N/A |  | Optional with capability signaling |
| 25. NR\_IIOT\_URLLC\_enh | 25-19 | RTT-based Propagation delay compensation based on CSI-RS for tracking and SRS | Support RTT-based Propagation delay compensation for time synchronization of the Uu interface based on CSI-RS for tracking and SRS | 2-51, 2-53 | Yes | N/A |  | Per FS | N/A | N/A | N/A |  | Optional with capability signaling |
| 25. NR\_IIOT\_URLLC\_enh | 25-19a | RTT-based Propagation delay compensation based on DL PRS for RTT-based PDC and SRS | 1. Support RTT-based Propagation delay compensation for time synchronization of the Uu interface based on DL PRS and SRS  2. Max number of DL PRS Resources in DL PRS Resource Set for PDC  Values = {1, 2, 4, 8, 16, 32, 64}  Note: 16, 32, 64 are only applicable to FR2 bands  3. Max number of DL PRS resources that UE can process in a slot.  a) FR1 bands: {1, 2, 4, 6, 8, 12, 16, 24, 32, 48, 64} for each SCS: 15kHz, 30kHz, 60kHz  b) FR2 bands: {1, 2, 4, 6, 8, 12, 16, 24, 32, 48, 64} for each SCS: 60kHz, 120kHz | 2-53 | Yes | N/A |  | Per FS | N/A | N/A | N/A |  | Optional with capability signaling |
| 25. NR\_IIOT\_URLLC\_enh | 25-19b | Support of PRS as spatial relation RS for SRS | Support of PRS as spatial relation RS for SRS | 25-19a | Yes | N/A |  | Per FS | N/A | N/A (FR2 only) | N/A |  | Optional with capability signaling |
| 25. NR\_IIOT\_URLLC\_enh | 25-20 | Propagation delay compensation based on legacy TA procedure | Support propagation delay compensation based on legacy TA procedure |  | Yes | N/A |  | Per UE | no | no | N/A | This FG is reported for TN and licensed | Optional with capability signaling |
| 25. NR\_IIOT\_URLLC\_enh | 25-20a | Propagation delay compensation based on legacy TA procedure for NTN and unlicensed | Support propagation delay compensation based on legacy TA procedure for NTN and unlicensed |  | Yes | N/A |  | Per band | N/A | N/A | N/A | This FG is reported for NTN and unlicensed | Optional with capability signaling |

1. NR\_NTN\_solutions

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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 (Sidelink 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 |
| 26. NR\_NTN\_solutions | 26-1 | Uplink Time and Frequency pre-compensation and timing relationship enhancements | 1. Support of UE specific TA calculation based on its GNSS-acquired position and the serving satellite ephemeris. 2. Support of common TA calculation according to the parameters provided by the network (UE considers common TA as 0 if the parameters are not provided) 3. For TA update in RRC\_CONNECTED state, support of combination of both open (i.e. UE autonomous TA estimation, and common TA estimation) and closed (i.e., received TA commands) control loops 4. Support of pre-compensation of the calculated TA in its uplink transmissions 5. Support of estimating UE-gNB RTT and delaying the start of RAR window by UE-gNB RTT 6. Support of frequency pre-compensation to counter shift the Doppler experienced on the service link 7. Support of determining timing of the scheduling of PUSCH, PUCCH and PDCCH ordered PRACH, CSI reference resource, transmission of aperiodic SRS activation of TA command, first PUSCH transmission in CG Type 2 with cell-specific K\_offset if indicated 8. Support of determining timing of the UE action and assumption on a downlink configuration carried by MAC CE command by K\_mac if it is indicated and determining the timing of PDCCH monitoring in recovery search space using K-mac during beam failure recovery procedure 9. Support of UE receiving cell-specific K\_offset/K\_mac in system information |  | Yes | No | Release 17 NR UE cannot communicate via satellite | per band | No | No | No | An NTN UE is required to at least support UE specific TA and frequency calculation based at least on its GNSS-acquired position and the serving satellite ephemeris  Note: This UE feature group is applicable only for bands in Table 5.2.2-1 in TS 38.101-5 and HAPS operation bands in Clause 5.2 of TS 38.104 | Optional with capability signalling  For UE supports NR communication via satellite, UE must indicate this FG is supported. |
| 26. NR\_NTN\_solutions | 26-4 | UE reporting of information related to TA pre-compensation | 1. Support UE reporting of information related to TA pre-compensation | 26-1 | Yes | No | UE does not support reporting of information related to TA pre-compensation for NR communication via satellite | Per band | No | No | No | Note: The exact content of UE reporting of information about the TA pre-compensation is up to RAN2  Note: This UE feature group is applicable only for bands in Table 5.2.2-1 in TS 38.101-5 and HAPS operation bands in Clause 5.2 of TS 38.104 | Optionalwith capability signalling |
| 26. NR\_NTN\_solutions | 26-5 | Increasing the number of HARQ processes | 1. The maximal supported HARQ process number is X for UL and Y for DL |  | Yes | No | Increased number of HARQ processes is not supported for NR communication via satellite | Per band | No | No | No | Candidate component values for (X,Y): {(16,32),(32,16),(32,32)}  Note: This UE feature group is applicable only for bands in Table 5.2.2-1 in TS 38.101-5 and HAPS operation bands in Clause 5.2 of TS 38.104 | Optional with capability signalling |
| 26. NR\_NTN\_solutions | 26-6 | Type-2 HARQ codebook enhancement | 1. Support of type-2 HARQ codebook enhancements when there are feedback-disabled HARQ processes | *harq-FeedbackDisabled* | Yes | No | Type-2 HARQ codebook enhancement is not supported for NR communication via satellite | per band | No | No | No | Note: This UE feature group is applicable only for bands in Table 5.2.2-1 in TS 38.101-5 and HAPS operation bands in Clause 5.2 of TS 38.104 | Optional with capability signalling |
| 26. NR\_NTN\_solutions | 26-6a | Type-1 HARQ codebook enhancement | 1. Support of Type-1 HARQ codebook enhancements when there are feedback-disabled HARQ processes | *harq-FeedbackDisabled* | Yes | No | Type-1 HARQ codebook enhancement is not supported for NR communication via satellite | per band | No | No | No | Note: This UE feature group is applicable only for bands in Table 5.2.2-1 in TS 38.101-5 and HAPS operation bands in Clause 5.2 of TS 38.104 | Optional with capability signalling |
| 26. NR\_NTN\_solutions | 26-6b | Type-3 HARQ codebook enhancement | 1. Support of Type-3 HARQ codebook enhancements when there are feedback-disabled HARQ processes | *harq-FeedbackDisabled* | Yes | No | Type-3 HARQ codebook enhancement is not supported for NR communication via satellite | per band | No | No | No | Note: This UE feature group is applicable only for bands in Table 5.2.2-1 in TS 38.101-5 and HAPS operation bands in Clause 5.2 of TS 38.104 | Optional with capability signalling |
| 26. NR\_NTN\_solutions | 26-8 | Support of polarization signalling in NR NTN | 1. Support polarization indication reception in SIB indicating DL and/or UL polarization information using respective polarization type parameters to indicate: RHCP or LHCP or linear 2. Support polarization signalling for target serving cell in handover command message 3. Support polarization signalling for non-serving cell in RRM measurement configuration |  | No | No | UE does not support polarization indication | Per band | No | No | No | Note: This UE feature group is applicable only for bands in Table 5.2.2-1 in TS 38.101-5 and HAPS operation bands in Clause 5.2 of TS 38.104 | Optional without capability signalling |
| 26. NR\_NTN\_solutions | 26-9 | UE-specific K\_offset | 1. Support of reception of UE-specific K\_offset via MAC-CE 2. Support of determining the timing of PUSCH, PUCCH, CSI reference resource, transmission of aperiodic SRS, activation of TA command, first PUSCH transmission in CG Type 2 with UE-specific Koffset | 26-1, 26-4 | Yes | No | UE-specific K\_offset reception is not supported for NR communication via satellite | Per band | No | No | No | Note: This UE feature group is applicable only for bands in Table 5.2.2-1 in TS 38.101-5 and HAPS operation bands in Clause 5.2 of TS 38.104 | Optional with capability signalling |
| 26. NR\_NTN\_solutions | 26-10 | K1 range extension | 1. 1. Support of extended K1 value range of (0..31) for unpaired spectrum |  | Yes | No | K1 range extension is not supported | Per band | No | No | No | Note: This UE feature group is applicable only for bands in Table 5.2.2-1 in TS 38.101-5 and HAPS operation bands in Clause 5.2 of TS 38.104 | Optional with capability signalling |

1. NR\_pos\_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 (Sidelink 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\_pos\_enh | 27-1-1 | UE-RxTEGs for UE-assisted DL TDOA and/or Multi-RTT positioning | 1. Support of UE-RxTEGs for UE-assisted DL TDOA and/or Multi-RTT positioning  2. The maximum number of UE-RxTEG, which is supported and reported by UE for UE assisted DL TDOA and/or Multi-RTT positioning | 13-1, one or more of {13-3, 13-4} | No |  | UE-RxTEG reporting is not supported and no assumption can be made on the UE Rx timing errors for the measurements | per band | n/a | n/a | n/a | Component 1 candidate values: {UE-assisted DL TDOA, Multi-RTT positioning, UE-assisted DL TDOA and Multi-RTT positioning}  Component 2 candidate values: {1, 2, 3, 4, 6, 8}  Note: a single value is reported when both multi-RTT and DL-TDOA are supported  Need for location server to know if the feature is supported  If the UE does not include RxTEG-ID associated with a measurement, no assumption can be made on the UE Rx timing errors for this measurement  Note: The “per band” reporting on this capability does not imply, that the RxTEG IDs in the measurement report are grouped per band; In the measurement report, the RxTEG ID can span from 0, up to 31 | Optional with capability signaling |
| 27. NR\_pos\_enh | 27-1-2 | Support of UE-TxTEGs for UL TDOA | The maximum number of UE-TxTEG for SRS resource for positioning, which is supported and reported by UE for UL TDOA | 13-8 | Yes |  | UE-TxTEGs for UL TDOA is not supported and no assumption can be made on the UE Tx timing error for the SRS resource for positioning | per band | n/a | n/a | n/a | The candidate values are {1,2,3,4,6,8}  Need for location server to know if the feature is supported  Note: It should support the serving gNB to request the UE to provide the association information of UL SRS resources for positioning with Tx TEGs to the serving gNB for UL TDOA  Note: If the UE does not include TxTEG-ID associated with a SRS resource for positioning, no assumption can be made on the UE Tx timing error for this SRS resource for positioning. | Optional with capability signaling |
| 27. NR\_pos\_enh | 27-1-2a | Support of UE-TxTEGs for Multi-RTT positioning | The maximum number of UE-TxTEG, which is supported and reported by UE for Multi-RTT positioning | 13-4, 13-8 | No |  | UE-TxTEGs for Multi-RTT positioning is not supported and no assumption can be made on the UE Tx timing error for the SRS resource for positioning | per band | n/a | n/a | n/a | The candidate values are {1,2,3,4,6,8}  Need for location server to know if the feature is supported  If the UE does not include TxTEG-ID associated with a measurement, no assumption can be made on the UE Tx timing errors for this SRS resource for positioning  Note: It should support the LMF to request the UE to provide the association information of UL SRS resources for positioning with Tx TEGs directly to the LMF for Multi-RTT if Multi-RTT is supported by UE | Optional with capability signaling |
| 27. NR\_pos\_enh | 27-1-3 | Support of UE-RxTxTEGs for Multi-RTT | The maximum number of UE-RxTxTEG, which is supported and reported by UE for Multi-RTT positioning | 13-4 and 13-8 | No |  | UE RxTx for Multi-RTT is not supported and no assumption can be made on the UE RxTx timing error for the measurement | per band | n/a | n/a | n/a | The candidate values are {1, 2, 4, 6, 8, 12, 16, 24, 32, 36, 48, 64}  Need for location server to know if the feature is supported  If the UE does not include RxTxTEG-ID associated with a measurement, no assumption can be made on the UE RxTx timing errors for this measurement  Note: The “per band” reporting on this capability does not imply, that the RxTxTEG IDs in the measurement report are grouped per band; In the measurement report, the RxTxTEG ID can span from 0, up to 255 | Optional with capability signaling |
| 27. NR\_pos\_enh | 27-1-4 | Support of UE Rx TEGs for measuring the same DL PRS resource | The maximum number of different UE-RxTEGs that a UE can support to measure the same DL PRS of a TRP | 27-1-1 | No |  | Up to 1 RxTEG is used to measure the same DL PRS resource of a TRP | per band | n/a | n/a | n/a | The candidate values are {2, 3, 4, 6, 8}  Need for location server to know if the feature is supported | Optional with capability signaling |
| 27. NR\_pos\_enh | 27-1-4a | Support of UE Rx TEGs for measuring the same DL PRS resource simultaneously | The maximum number of UE Rx TEGs for measuring the same DL PRS resource simultaneously | 27-1-4 | No |  | No assumption can be made regarding multiple Rx TEGs measuring the same DL PRS resource simultaneously | Per band | n/a | n/a | n/a | The candidate values are {1,2,3,4,6,8}  Need for location server to know if the feature is supported. | Optional with capability signaling |
| 27. NR\_pos\_enh | 27-2-1 | DL PRS RSRPP measurement report of the first path for UE-assisted DL-AoD | 1.) Support of measuring and reporting the PRS RSRPP of the first path for DL-AoD positioning method  2.) The maximum number of first path PRS RSRPP per TRP | 13-5 | No |  | DL PRS RSRPP measurement report of the first path for UE-assisted DL-AoD is not supported | per band | n/a | n/a | n/a | Component 2 candidate values: 1, 2,4,8,16,24  Need for location server to know if the feature is supported  The maximum number of first path PRS RSRP per TRP should be less than or equal to the maximum number of PRS RSRP (27-2-2) | Optional with capability signaling |
| 27. NR\_pos\_enh | 27-2-2 | DL PRS RSRP reporting for more than 8 measurements for UE-assisted DL-AoD positioning | Support reporting K> 8 DL PRS RSRP measurements per TRP. | 13-5 | No |  | UE report of more than 8 DL PRS-RSRP is not supported. | Per UE | n/a | Yes | n/a | The candidate values are {16, 24}  Note: Multiple RSRPs corresponding to same or different Rx Beam index should be able to be reported for a given PRS resource for different timestamps.  Need for location server to know if the feature is supported  The maximum number of reported DL PRS RSRP in the capability signaling should be no less than the maximum number of reported DL PRS RSRPP of the first path in the capability signaling | Optional with capability signaling |
| 27. NR\_pos\_enh | 27-3-1 | M-sample measurements in RRC\_CONNECTED | The capability to support reporting a measurement based on measuring M=1 or 2 samples (instances) of a DL PRS resource set | 13-1 | No |  | If the UE does not provide the capability, the UE is assumed to support M=4 only | per band | n/a | n/a | n/a | Need for location server to know if the feature is supported  Note: this feature is supported for both UE-assisted and UE based positioning | Optional with capability signaling |
| 27. NR\_pos\_enh | 27-3-2 | DL PRS measurement outside MG and in a PRS processing window | 1. Supported PRS processing types subject to the UE determining that DL PRS to be higher priority for PRS measurement outside MG and in a PRS processing window  2. Support of priority handing options of PRS: Option1, Option2 or Option3   * + 1. Option 1: Support of “st1” and “st3” defined in clause 5.1.6.5 of TS 38.214     2. Option 2: Support of “st1”, “st2”, and “st3” defined in clause 5.1.6.5 of TS 38.214     3. Option 3: Support of “st1” only defined in clause 5.1.6.5 of TS 38.214 | 13-1 | Yes |  | DL PRS measurement outside MG and in a PRS processing window is not supported | per band | n/a | n/a | n/a | Component 1 candidate values: One or more of {Type 1A, Type 1B, Type 2}  Component 2 candidate values: {option1, option2, option3}  Need for location server to know if the feature is supported  Note: Component 2 can be reported per supported band for each type supported by the UE, details left to RAN2  Note:   * Type 1A refers to the determination of prioritization between DL PRS and other DL signals/channels in all OFDM symbols within the PRS processing window. The DL signals/channels from all DL CCs (per UE) are affected across LTE and NR * Type 1B refers to the determination of prioritization between DL PRS and other DL signals/channels in all OFDM symbols within the PRS processing window. The DL signals/channels from a certain band are affected * Type 2 refers to the determination of prioritization between DL PRS and other DL signals/channels only in DL PRS symbols within the PRS processing window   Note: When the UE determines higher priority for other DL signals/channels over the PRS measurement/processing, the UE is not expected to measure/process DL PRS which is applicable to all of the above capability options  Note: Within a PRS processing window, UE measurement is inside the active DL BWP with PRS having the same numerology as the active DL BWP  Note: Support of configuration of PRS processing window in RRC and support of using DL MAC CE to activate/deactivate the PRS processing window for PRS measurements is part of the FG , but no dedicated signaling is required.  A UE that supports FG 27-3-3 must indicate this FG is supported | Optional with capability signaling |
| 27. NR\_pos\_enh | 27-3-3 | DL PRS Processing Capability outside MG - buffering capability | 1. DL PRS buffering capability  a) Type 1 – sub-slot/symbol level buffering  b) Type 2 – slot level buffering  2a. Duration of DL PRS symbols N in units of ms a UE can process every T ms assuming maximum DL PRS bandwidth in MHz, which is supported and reported by UE  2b. Duration of DL PRS symbols N2 in units of ms a UE can process inT2 ms assuming maximum DL PRS bandwidth in MHz, which is supported and reported by UE  3. Max number of DL PRS resources that UE can process in a slot  4. Maximum DL PRS bandwidth in MHz, which is supported and reported by UE for PRS measurement outside MG within the PPW | 27-3-2 | Yes |  | DL PRS measurement outside MG and in a PRS processing window is not supported | Per band | n/a | n/a | n/a | Component 1 candidate values: {Type 1, Type 2}  Component 2a candidate values:   1. T: {1, 2, 4, 8, 16, 20, 30, 40, 80, 160, 320, 640, 1280} ms 2. N: {0.125, 0.25, 0.5, 1, 2, 4, 6, 8, 12, 16, 20, 25, 30, 32, 35, 40, 45, 50} ms   Candidate 2b component values:  a) N2: {0.125, 0.25, 0.5, 1, 2, 3, 4, 5, 6, 8, 12} ms  b) T2: {4, 5, 6, 8} ms  Component 3 candidate values:  FR1 bands: {1, 2, 4, 6, 8, 12, 16, 24, 32, 48, 64} for each SCS: 15kHz, 30kHz, 60kHz  FR2 bands: {1, 2, 4, 6, 8, 12, 16, 24, 32, 48, 64} for each SCS: 60kHz, 120kHz  Component 4 candidate values:  FR1 bands: {5, 10, 20, 40, 50, 80, 100}  FR2 bands: {50, 100, 200, 400}  Need for location server to know if the feature is supported  Note 1:The (N, T) UE capabilities are interpreted as legacy (N, T) in FG 13-1, and the UE is expected to receive the PRS within the PRS processing window and but the processing of the received PRS may be outside a PRS processing window.    The (N2, T2) UE capabilities are interpreted such that the UE is capable of measuring up to N2 ms PRS within a PPW and is capable of completing the PRS processing within the PPW, e.g., if the time duration from the last symbol of the measured PRS resource(s) inside the PPW, to the end of PPW is not smaller than T2 ms    Note 3: UE shall support either component 2a and component 2b , but not both for each supported type in a band  Note 4: A UE shall declare PRS processing capabilities of each of the supported Type-1A, Type-1B, Type-2” capabilities in case it supports multiple types in a band  A UE that supports FG 27-3-2 must indicate this FG is supported | Optional with capability signaling |
| 27. NR\_pos\_enh | 27-4-1 | LOS/NLOS Indicator for UE-assisted positioning | 1. Support reporting LoS/NLoS indicator type to LMF  2. LOS/NLOS indicator granularity | one of 13-5,13-6, or 13-11 | No |  | LOS/NLOS Indicator for UE-assisted positioning is not supported | Per UE | n/a | n/a | n/a | Component 1 candidate values: {hard value, hard+soft value}  Component 2 candidate values: {trpSpecific, resourceSpecific, both}  Note: a single value is reported when both multi-RTT and DL-TDOA are supported  Need for location server to know if the feature is supported | Optional with capability signaling |
| 27. NR\_pos\_enh | 27-6 | DL PRS processing capabilities in RRC inactive state | 1. DL PRS buffering capability  a) Type 1 – sub-slot/symbol level buffering  b) Type 2 – slot level buffering  2. Duration of DL PRS symbols N in units of ms a UE can process every T ms assuming maximum DL PRS bandwidth in MHz, which is supported and reported by UE  3. Max number of DL PRS resources that UE can process in a slot |  | No |  | DL PRS processing in RRC inactive state is not supported | Per band | n/a | n/a | n/a | Component 1 candidate values: {Type 1, Type 2}  Component 2 candidate values:  T: {8, 16, 20, 30, 40, 80, 160, 320, 640, 1280} ms  N: {0.125, 0.25, 0.5, 1, 2, 4, 6, 8, 12, 16, 20, 25, 30, 32, 35, 40, 45, 50} ms  Component 3 candidate values:  FR1 bands: {1, 2, 4, 6, 8, 12, 16, 24, 32, 48, 64} for each SCS: 15kHz, 30kHz, 60kHz  FR2 bands: {1, 2, 4, 6, 8, 12, 16, 24, 32, 48, 64} for each SCS: 60kHz, 120kHz  Need for location server to know if the feature is supported  Note: Having the PRS processing capabilities in RRC\_INACTIVE state does not imply that LMF is aware of or controlling UE RRC state | Optional with capability signaling |
| 27. NR\_pos\_enh | 27-7 | Multiple measurement instances which can be included in a single measurement report | Support of mutiple measurement instances which can be included in a single measurement report |  | No |  | Multiple measurement instances which can be included in a single measurement report are not supported | Per UE | No | No | No |  | Optional with capability signaling |
| 27. NR\_pos\_enh | 27-8 | Support of PRS TEG association information for UE-based DL-TDOA | Support of reception of association between PRS and TRP Tx TEG for UE-based positioning | 13-1 | No |  | Positioning calculation assistance data containing association between PRS and TRP Tx TEG is not supported by UE | Per UE | n/a | n/a | n/a | Need for location server to know if the feature is supported. | Optional with capability signaling |
| 27. NR\_pos\_enh | 27-9 | Support of lower Rx beam sweeping factor | 1. Support of the lower Rx beam sweeping factor than 8 for FR2  2. Number of Rx beam sweeping factors |  | No |  | UE only supports 8 as the Rx beam sweeping factor defined by RAN4. | Per band | n/a | n/a  FR2 only | n/a | Component 2 candidate values: {1,2,4,6}  Need for location server to know if the feature is supported | Optional with capability signaling |
| 27. NR\_pos\_enh | 27-10 | Support of UL MAC CE based MG activation request for PRS measurements | 1. Support of using UL MAC CE to request measurement gap activation/deactivation for PRS measurements: The information in the UL MAC CE for MG activation request by the UE can be one ID associated with the preconfiguration of the MG  2. Support of preconfiguration of MGs in RRC signaling for PRS measurements: Each MG in the preconfiguration is associated with an ID | 27-11 | Yes |  | Using UL MAC CE to indicate measurement gap for PRS measurements to the gNB is not supported. | Per UE | No | No | No |  | Optional with capability signaling |
| 27. NR\_pos\_enh | 27-10a | Low latency MG activation request for PRS measurements | support of low latency MG activation request for PRS measurements | 27-10, 27-11 | No |  | Low latency MG activation request for PRS measurements is not supported | Per UE | No | No | No | Need for location server to know if the feature is supported  Note: RAN1 understands that FG 27-10a is intended only for the LMF to know, and that the current prerequisite FGs of FG 27-10a are capabilities only for the gNB to know. It is up to RAN2 to decide whether such a FG dependency is meaningful from signaling description perspective, and whether and how it can be captured in RAN2 specifications. | Optional with capability signaling |
| 27. NR\_pos\_enh | 27-11 | Support of DL MAC CE based MG activation for PRS measurements | 1. Support of preconfiguration of MGs in RRC signaling for PRS measurements: Each MG in the preconfiguration is associated with an ID  2. Support of using DL MAC CE to activate/deactivate the MG for PRS measurements: The DL MAC CE for MG activation indicates the ID associated with the preconfigured MG |  | Yes |  | Using DL MAC CE to activate the preconfigured MG for PRS measurements is not supported | Per UE | No | No | No |  | Optional with capability signaling. |
| 27. NR\_pos\_enh | 27-12 | LOS/NLOS indicator for UE-based positioning assistance data | Support reception of the assistance data containing the LOS/NLOS indicator.  1. LOS/NLOS indicator type  2. LOS/NLOS indicator granularity |  | No |  | LOS/NLOS indicator for UE-based positioning assistance data is not supported | Per UE | No | No | No | Component 1 candidate values: {hardValue+softValue, hardValue}  Component 2 candidate values: {resourceSpecific, trpSpecific}  Need for location server to know if the feature is supported. | Optional with capability signaling. |
| 27. NR\_pos\_enh | 27-13 | Additional path reporting for UE-assisted DL-TDOA | 1. Support of additional detected path timing reporting for K>2 additional paths for UE-assisted DL-TDOA  2. Support of RSRPP reporting for additional paths if UE supports FG 27-13a |  | No |  | Additional path reporting for UE-assisted DL-TDOA is not supported | Per UE | No | No | No | Component 1 candidate values: {4, 6, 8}  Need for location server to know if the feature is supported. | Optional with capability signaling. |
| 27. NR\_pos\_enh | 27-13a | First path RSRPP reporting for UE-assisted DL-TDOA | 1. Support of RSRPP reporting for first path | 13-1 | No |  | First path RSRPP reporting for UE-assisted DL-TDOA is not supported | per band | n/a | n/a | n/a | Need for location server to know if the feature is supported. | Optional with capability signaling. |
| 27. NR\_pos\_enh | 27-14 | Additional path reporting for Multi-RTT | 1. Support of additional detected path timing reporting for K>2 additional paths for Multi-RTT  2. Support of RSRPP reporting for additional paths if UE supports FG 27-14a |  | No |  | Additional path reporting for Multi-RTT is not supported | Per UE | No | No | No | Component 1 candidate values: {4, 6, 8}  Need for location server to know if the feature is supported. | Optional with capability signaling. |
| 27. NR\_pos\_enh | 27-14a | First path RSRPP reporting for Multi-RTT | 1. Support of RSRPP reporting for first path | 13-1 | No |  | First path RSRPP reporting for Multi-RTT is not supported | per band | n/a | n/a | n/a | Need for location server to know if the feature is supported. | Optional with capability signaling. |
| 27. NR\_pos\_enh | 27-15 | Positioning SRS transmission in RRC\_INACTIVE state for initial UL BWP | 1. Max number of SRS Resource Sets for positioning supported by UE  2. Max number of P/SPSRS Resources for positioning  3. Max number of P/SPSRS Resources for positioning per slot  4. Max number of periodic SRS Resources for positioning  5. Max number of periodic SRS Resources for positioning per slot |  | Yes |  | Positioning SRS transmission in RRC\_INACTIVE state for initial UL BWP is not supported | Per band | n/a | n/a | n/a | Component 1 candidate values: {1, 2, 4, 8, 12, 16}  Component 2 candidate values: {1,2,4,8,16,32,64}  Component 3 candidate values: {1, 2, 3, 4, 5, 6, 8, 10, 12, 14}  Component 4 candidate values: {1,2,4,8,16,32,64}  Component 5 candidate values: {1, 2, 3, 4, 5, 6, 8, 10, 12, 14}  Note: OLPC for SRS for positioning based on SSB from the last serving cell (the cell that releases UE from connection) is part of this FG. No dedicated capability signaling is intended for this component  Need for location server to know if the feature is supported | Optional with capability signaling |
| 27. NR\_pos\_enh | 27-15b | Positioning SRS transmission in RRC\_INACTIVE state configured outside initial UL BWP | 1. Maximum SRS bandwidth supported for each SCS that UE supports within a single CC 2. Max number of SRS Resource Sets for positioning supported by UE 3. Max number of periodic SRS Resources for positioning 4. Max number of periodic SRS Resources for positioning per slot 5. Support of ifferent numerology between the SRS and the initial UL BWP 6. Support of SRS operation without restriction on the BW: BW of the SRS may not include BW of the CORESET#0 and SSB 7. Max number of P/SP SRS Resources for positioning 8. Max number of P/SP SRS Resources for positioning per slot 9. Support a different center frequenecy between the SRS for positioning and the initial UL BWP 10. Switching time between SRS Tx and other Tx in initial UL BWP or Rx in initial DL BWP | 27-15 | Yes |  | Positioning SRS transmission in RRC\_INACTIVE state configured outside initial UL BWP is not supported | Per band | n/a | n/a | n/a | Component 1 candidate values:   1. FR1 bands: {5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 60, 70, 80, 90, 100} 2. FR2 bands: {50, 100, 200, 400}   Component 2 candidate values: {1, 2, 4, 8, 12, 16}  Component 3 candidate values: {1,2,4,8,16,32,64}  Component 4 candidate values: {1, 2, 3, 4, 5, 6, 8, 10, 12, 14}  Component 7 candidate values: {1,2,4,8,16,32,64}  Component 8 candidate values: {1, 2, 3, 4, 5, 6, 8, 10, 12, 14}  Component 10 candidate values: {100us, 140us, 200us, 300us, 500us}  Note 1: The SRS should have a locationAndBandwidth, SCS, CP, defined the same way as a legacy BWP.  Note 2: If component 9 is not signaled, the UE only supports same center frequency between the SRS for positioning and initial UL BWP  Note 3: If component 5 is not signaled, the UE only supports same numerology between the SRS and the initial UL BWP  Note 4: If component 6 is not signaled, the UE supports only SRS BW that include the BW of the CORESET #0 and SSB.  Need for location server to know if the feature is supported | Optional with capability signaling |
| 27. NR\_pos\_enh | 27-15a | Support of positioning SRS transmission in RRC\_INACTIVE state for initial BWP with semi-persistent SRS | 1. Max number of semi-persistent SRS Resources for positioning  2. Max number of semi-persistent SRS Resources for positioning per slot | 27-15 | Yes |  | Positioning SRS transmission in RRC\_INACTIVE state for initial BWP with semi-persistent SRS is not supported | Per band | n/a | n/a | n/a | Component 1 candidate values: {1,2,4,8,16,32,64}  Component 2 candidate values: {1, 2, 3, 4, 5, 6, 8, 10, 12, 14}  Need for location server to know if the feature is supported | Optional with capability signaling |
| 27. NR\_pos\_enh | 27-15c | Support of positioning SRS transmission in RRC\_INACTIVE state outside initial BWP with semi-persistent SRS | 1. Max number of semi-persistent SRS Resources for positioning  2. Max number of semi-persistent SRS Resources for positioning per slot | 27-15 | Yes |  | Positioning SRS transmission in RRC\_INACTIVE state outside initial BWP with semi-persistent SRS is not supported | Per band | n/a | n/a | n/a | Component 1 candidate values: {1,2,4,8,16,32,64}  Component 2 candidate values: {1, 2, 3, 4, 5, 6, 8, 10, 12, 14}  Need for location server to know if the feature is supported | Optional with capability signaling |
| 27. NR\_pos\_enh | 27-16 | OLPC for positioning SRS in RRC\_INACTIVE state - gNB | Same asRRC  OLPC-SRS-Pos-r16 | 27-15 | Yes |  | OLPC for positioning SRS in RRC\_INACTIVE state is not supported (gNB) | Per band | n/a | n/a | n/a |  | Optional with capability signaling |
| 27. NR\_pos\_enh | 27-16a | OLPC for positioning SRS in RRC\_INACTIVE state – location server | Same as LPP  OLPC-SRS-Pos-r16 | 27-15 | No |  | OLPC for positioning SRS in RRC\_INACTIVE state is not supported (location server) | Per band | n/a | n/a | n/a | Need for location server to know if the feature is supported.  Support of OLPC in RRC\_INACTIVE state does not imply that LMF is aware of or controlling UE RRC state | Optional with capability signaling |
| 27. NR\_pos\_enh | 27-17 | PRS processing in RRC\_INACTIVE | Support of PRS processing in RRC\_INACTIVE | 13-1 | Yes |  | PRS processing in RRC\_INACTIVE is not supported | per band | n/a | n/a | n/a | Note: UE supporting this feature shall support at least one from DL RSTD, DL PRS-RSRP, or UE Rx – Tx time difference measurement | Optional with capability signaling. |
| 27. NR\_pos\_enh | 27-18a | Support of PRS measurement in RRC\_INACTIVE state for DL-TDOA | Support of PRS measurement in RRC\_INACTIVE state for DL-TDOA - location server | 13-3, 27-6 | No |  | PRS measurement in RRC\_INACTIVE state for DL-TDOA is not supported | per band | n/a | n/a | n/a | Need for location server to know if the feature is supported.  Note: Applicable for both UE-assisted and UE-based DL-TDOA  Note: PRS capabilities for DL-TDOA measurement and reporting described in FGs in 13-3, 13-3a, 13-3b, 13-6, 13-13 are the same for RRC Inactive.  Support of PRS processing measurement in RRC\_INACTIVE state does not imply that LMF is aware of or controlling UE RRC state | Optional with capability signaling. |
| 27. NR\_pos\_enh | 27-18b | Support of PRS measurement in RRC\_INACTIVE state for DL-AoD | Support of PRS measurement in RRC\_INACTIVE state for DL-AoD - location server | 13-2, 27-6 | No |  | PRS measurement in RRC\_INACTIVE state for DL-AoD is not supported | per band | n/a | n/a | n/a | Need for location server to know if the feature is supported.  Note: Applicable for both UE-assisted and UE-based DL-AoD  Note: PRS capabilities for DL-AOD measurement and reporting described in FGs 13-2, 13-2a, 13-2b, 13-5, 13-13 are the same for RRC Inactive.  Support of PRS processing measurement in RRC\_INACTIVE state does not imply that LMF is aware of or controlling UE RRC state | Optional with capability signaling. |
| 27. NR\_pos\_enh | 27-18c | Support of PRS measurement in RRC\_INACTIVE state for Multi-RTT | 1. Support of PRS measurement in RRC\_INACTIVE state for Multi-RTT - location server | 13-4, 13-11, 27-6 | No |  | PRS measurement in RRC\_INACTIVE state for for Multi-RTT is not supported | per band | n/a | n/a | n/a | Need for location server to know if the feature is supported.  Note: PRS capabilities for Multi-RTT measurement and reporting described in FGs in 13-4, 13-4a, 13-4b, 13-11, 13-11a, 13-14 are the same for RRC Inactive  Support of PRS processing measurement in RRC\_INACTIVE state does not imply that LMF is aware of or controlling UE RRC state | Optional with capability signaling. |
| 27. NR\_pos\_enh | 27-19 | Spatial relation for positioning SRS in RRC\_INACTIVE state - gNB | Same as*RRC*  *SpatialRelationsSRS-Pos-r16* | 27-15 | Yes |  | Spatial relation for positioning SRS in RRC\_INACTIVE state is not supported (gNB) | Per band | n/a | FR2 only | n/a |  | Optional with capability signalling |
| 27. NR\_pos\_enh | 27-19a | Spatial relation for positioning SRS in RRC\_INACTIVE state – location server | Same as *LPP*  *SpatialRelationsSRS-Pos-r16* | 27-15 | No |  | Spatial relation for positioning SRS in RRC\_INACTIVE state is not supported (location server) | Per band | n/a | FR2 only | n/a | Need for location server to know if the feature is supported.  Support of spatial relation in RRC\_INACTIVE state does not imply that LMF is aware of or controlling UE RRC state | Optional with capability signalling |
| 27. NR\_pos\_enh | 27-20 | PRS subset association for UE assisted DL-AoD | 1. Support of assistance data enhancement to indicate a subset of PRS resources for each PRS resource for the purpose of prioritization of DL-AoD reporting.  2. Supported resource set relationship for the target PRS resource and the associated subset |  | No |  | PRS subset association for DL-AoD is not supported by the UE. | Per UE | n/a | n/a | n/a | Component 2 candidate values: {sameSet, DifferentSet, sameOrDifferentSet}  Need for location server to know | Optional with capability signaling. |
| 27. NR\_pos\_enh | 27-21 | PRS boresight direction for UE-assisted DL-AoD | Support of assistance data enhancement to indicate the boresight direction of a PRS resource for UE-assisted DL-AoD. |  | No |  | UE-assisted DL-AoD with boresight direction of each DL-PRS is not supported. | Per UE | n/a | n/a | n/a | Need for location server to know | Optional with capability signaling. |
| 27. NR\_pos\_enh | 27-22 | PRS beam pattern for UE-based DL-AoD | Support of PRS beam pattern for DL-AoD |  | No |  | UE-based DL-AoD with PRS beam pattern is not supported. | Per UE | n/a | n/a | n/a | Need for location server to know | Optional with capability signaling. |
| 27. NR\_pos\_enh | 27-23 | Support of more than one activated PRS processing windows across all active DL BWPs | 1. Number of supported activated PRS processing windows | 27-3-2 | Yes |  | Only one activated PRS processing window is supported. | Per UE | No | No | No | Candidate values:{2, 3, 4} | Optional with capability signaling |

1. NR\_redcap

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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 (Sidelink 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 |
| 28. NR\_redcap | 28-1 | RedCap UE | 1. Maximum FR1 RedCap UE bandwidth is 20 MHz.  2. Maximum FR2 RedCap UE bandwidth is 100 MHz.  3. Early indication of RedCap UE in Msg.1 for 4-step RACH  4. Separate initial UL BWP for RedCap UEs  - It includes the configuration(s) needed for RedCap UE to perform random access  - Enabling/disabling of frequency hopping for common PUCCH resources  5. Separate initial DL BWP for RedCap UEs  - It includes CSS/CORESET for random access  - For separate initial DL BWP used for paging, CD-SSB is included  - For separate initial DL BWP only used for RACH, SSB may or may not be included  - For separate initial DL BWP used in connected mode as BWP#0 configuration option 1, CD-SSB is included  6. 1 UE-specific RRC configured DL BWP per carrier  7. 1 UE-specific RRC configured UL BWP per carrier  8. RRC reconfiguration of any parameters related to BWP  9. UE-specific RRC configured DL BWP with CD-SSB or NCD-SSB  10. NCD-SSB based measurements in RRC-configured DL BWP |  | Yes |  | Network assumes the UE is not a RedCap UE | Per UE | No | No |  | RedCap UEs do not support carrier aggregation or dual connectivity.  It is up to RAN2 whether/how to capture the capabilities for early indication of RedCap UE in Msg 3 and Msg A  A UE supporting this FG is not required to support FG 6-1 | Optional with capability signaling  RedCap UE must indicate this FG is supported |
| 28. NR\_redcap | 28-1a | RRC-configured DL BWP without CD-SSB or NCD-SSB | RRC-configured DL BWP without CD-SSB or NCD-SSB | 28-1 | Yes |  |  | Per band | N/A | N/A |  |  | Optional with capability signaling |
| 28. NR\_redcap | 28-3 | Half-duplex FDD operation type A for RedCap UE | 1. Half-duplex FDD operation (instead of full-duplex FDD operation) type A for RedCap UE | 28-1 | Yes |  | UE is assumed to support FD-FDD in that band | Per band | FDD only | FR1 only |  |  | Optional with capability signaling |

1. NR\_UE\_pow\_sav\_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 (Sidelink 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 |
| 29. NR\_UE\_pow\_sav\_enh | 29-1 | Paging enhancement | 1. Support receiving paging early indication in DCI format 2\_7  2. Support receiving UE subgroup indication in DCI format 2\_7  3. The set of OFDM symbols within a slot where UE can monitor the PEI PDCCH in Type 2A CSS is the same as the requirement for paging PDCCH in Type 2 CSS for IDLE and INACTIVE mode UEs |  | Yes |  | UE does not support paging enhancement | Per band | N/A | N/A | N/A |  | Optional with capability signalling |
| 29. NR\_UE\_pow\_sav\_enh | 29-2 | TRS resources for idle/inactive UEs | TRS occasions for idle/inactive UEs  1. Support reading TRS configuration from SIB  2. Support receiving L1 indication for TRS availability |  | N |  | UE cannot receive TRS resources for idle/inactive mode | N/A | N/A | N/A | N/A | Receiving L1 indication via DCI format 2\_7 is supported only if the UE supports receiving DCI format 2\_7 | Optional without capability signalling |
| 29. NR\_UE\_pow\_sav\_enh | 29-3a | PDCCH skipping | Support of up to 2-bit indication of PDCCH skipping by scheduling DCI if SSSG is not configured |  | Y |  |  | Per band | N/A | N/A | N/A |  | Optional with capability signaling |
| 29. NR\_UE\_pow\_sav\_enh | 29-3b | 2 search space sets group switching | Support of 1-bit indication of SSSG switching between 2 SSSGs by scheduling DCI, and timer based SSSG switching, if *PDCCHSkippingDurationList* is not configured |  | Y |  |  | Per band | N/A | N/A | N/A | UE supports search space set group switching capability-1 according to Table 10.4-1 of 38.213 | Optional with capability signaling |
| 29. NR\_UE\_pow\_sav\_enh | 29-3c | 3 search space sets group switching | Support of 2-bit indication of SSSG switching among 3 SSSGs by scheduling DCI and timer based SSSG switching, if *PDCCHSkippingDurationList* is not configured | 29-3b | Y |  |  | Per band | N/A | N/A | N/A | UE supports search space set group switching capability-1 according to Table 10.4-1 of 38.213 | Optional with capability signaling |
| 29. NR\_UE\_pow\_sav\_enh | 29-3d | 2 search space sets group switching with PDCCH skipping | Support of 2-bit indication of SSSG switching between 2 SSSGs, PDCCH skipping by scheduling DCI, and timer based SSSG switching | 29-3a, 29-3b | Y |  |  | Per band | N/A | N/A | N/A | UE supports search space set group switching capability-1 according to Table 10.4-1 of 38.213 | Optional with capability signaling |
| 29. NR\_UE\_pow\_sav\_enh | 29-3e | Support Search space set group switching capability 2 for FR1 | Search space set group switching Capability-2 according to Table 10.4-1 of 38.213 for SSSG switching. | 29-3b | Yes |  |  | Per band | N/A | N/A (FR1 only) | N/A | For UE supporting this FG and FG 29-3b, 29-3c, and/or 29-3d, search space set group switching Capability-2 is applied to the FGs | Optional with capability signaling |

1. NR\_cov\_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 (Sidelink 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\_cov\_enh | 30-1 | Increased maximum number of PUSCH Type A repetitions | Maximum value of K (the number of repetitions) = 32  For DG PUSCH, the number of repetitions is indicated in a TDRA list. A row index of the TDRA list is indicated by a DCI.  For Type 1 CG PUSCH, the number of repetitions is indicated by repK-r17  For Type 2 CG PUSCH, the number of repetitions is indicated in a TDRA list or by repK-r17. | One of {5-14, 5-16, 11-6} | Yes | N/A | UE does not support more than 16 repetitions PUSCH. | Per band | N/A | N/A | N/A |  | Optional with capability signalling |
| 30. NR\_cov\_enh | 30-2 | PUSCH Type A repetitions based on available slots | Transmission occasions for repetitions for dynamic and configured grant PUSCH are determined on the basis of available slots. | One of {5-14, 5-16, 5-17} | Yes | N/A | UE does not support dynamic or configured grant PUSCH repetitions counted on the basis of available slots. | Per band | N/A | N/A | N/A |  | Optional with capability signalling |
| 30. NR\_cov\_enh | 30-3 | TB processing over multi-slot PUSCH | Support of TB processing over multi-slot PUSCH for DG and Type 2 CG without repetition in RRC connected mode. |  | Yes | N/A | UE does not support TB processing over multi-slot PUSCH. | Per band | N/A | N/A | N/A |  | Optional with capability signalling |
| 30. NR\_cov\_enh | 30-3a | Repetition of TB processing over multi-slot PUSCH | Support repetition of TB processing over multi-slot PUSCH in RRC connected mode. | 30-3 | Yes | N/A | UE does not support repetition of TB processing over multi-slot PUSCH | Per band | N/A | N/A | N/A |  | Optional with capability signalling |
| 30. NR\_cov\_enh | 30-4 | The maximum duration for DM-RS bundling | The maximum duration during which UE is able to maintain power consistency and phase continuity to support DM-RS bundling for PUSCH/PUCCH |  | Yes | N/A | UE does not support DM-RS bundling for PUSCH/PUCCH | Per band | N/A | N/A | N/A | Candidate values for the maximum duration for FDD are {4, 8, 16, 32}  Candidate values for the maximum duration for TDD are {2, 4, 8, 16}  NOTE: DM-RS bundling is only applicable for UL transmissions with pi/2 BPSK, BPSK, and QPSK modulation orders for the corresponding physical channels. | Optional with capability signalling |
| 30. NR\_cov\_enh | 30-4a | DM-RS bundling for PUSCH repetition type A | Support DM-RS bundling for PUSCH repetition type A over consecutive symbols | 30-4 and one of {5-14, 5-16, 5-17} | Yes | N/A | UE does not Support DM-RS bundling for PUSCH repetition type A | Per band and per BC | N/A | N/A | N/A | This capability is applicable to following multiple carrier scenarios in addition to single carrier scenarios   * FR1+FR2 UL CA, FR1+FR2 DC, and EN-DC with NR on FR2. DMRS bundling configuration is limited to one uplink NR carrier in total on all FRs at a time. * FR1 inter-band DL CA with a “single” uplink band configured, meaning no switching to transmit SRS on another carrier. * DL CA with “additional” UL carrier configured with SRS only (i.e. no PUCCH/PUSCH configured) * FR1 inter-band UL CA with DMRS bundling * SUL with DMRS bundling   For the last three scenarios listed above, DMRS bundling can be applied with the following conditions:   * Concurrent transmissions scheduled/configured over multiple carriers are not expected by UE * Only configuration of a single TAG * Only applicable for the back-to-back case (i.e., zero gap between two transmissions within an actual TDW) * Only one band can be configured with DMRS bundling at a time * Note 1: Under the above conditions, phase continuity and power consistency within any actual TDW on one carrier is not impacted by operations on a different carrier. * Note 2: Under the above conditions, the events defined in section 6.1.7 of TS38.214 for the carrier with DMRS bundling are not triggered by any transmission within any actual TDW on the other carrier. * Note 3: If the modulation scheme higher than QPSK is scheduled for transmission on any carrier configured with DMRS bundling, DMRS bundling is not applicable according to UE feature 30-4 (i.e., the error case and up to UE implementation) | Optional with capability signalling |
| 30. NR\_cov\_enh | 30-4b | DM-RS bundling for PUSCH repetition type B | Support DM-RS bundling for PUSCH repetition type B over consecutive symbols | 30-4, 11-5 | Yes | N/A | UE does not Support DM-RS bundling for PUSCH repetition type B | Per band and per BC | N/A | N/A | N/A | This capability is applicable to following multiple carrier scenarios in addition to single carrier scenarios   * FR1+FR2 UL CA, FR1+FR2 DC, and EN-DC with NR on FR2. DMRS bundling configuration is limited to one uplink NR carrier in total on all FRs at a time. * FR1 inter-band DL CA with a “single” uplink band configured, meaning no switching to transmit SRS on another carrier. * DL CA with “additional” UL carrier configured with SRS only (i.e. no PUCCH/PUSCH configured) * FR1 inter-band UL CA with DMRS bundling * SUL with DMRS bundling   For the last three scenarios listed above, DMRS bundling can be applied with the following conditions:   * Concurrent transmissions scheduled/configured over multiple carriers are not expected by UE * Only configuration of a single TAG * Only applicable for the back-to-back case (i.e., zero gap between two transmissions within an actual TDW) * Only one band can be configured with DMRS bundling at a time * Note 1: Under the above conditions, phase continuity and power consistency within any actual TDW on one carrier is not impacted by operations on a different carrier. * Note 2: Under the above conditions, the events defined in section 6.1.7 of TS38.214 for the carrier with DMRS bundling are not triggered by any transmission within any actual TDW on the other carrier. * Note 3: If the modulation scheme higher than QPSK is scheduled for transmission on any carrier configured with DMRS bundling, DMRS bundling is not applicable according to UE feature 30-4 (i.e., the error case and up to UE implementation) | Optional with capability signalling |
| 30. NR\_cov\_enh | 30-4c | DM-RS bundling for TB processing over multi-slot PUSCH | Support DM-RS bundling for TB processing over multi-slot PUSCH over consecutive symbols | 30-4, 30-3 | Yes | N/A | UE does not Support DM-RS bundling for TB processing over multi-slot PUSCH | Per band and per BC | N/A | N/A | N/A | Note: If a UE reports support of FG 30-3a and 30-4c, the UE supports DMRS bundling for the repetitions of TBoMS  This capability is applicable to following multiple carrier scenarios in addition to single carrier scenarios   * FR1+FR2 UL CA, FR1+FR2 DC, and EN-DC with NR on FR2. DMRS bundling configuration is limited to one uplink NR carrier in total on all FRs at a time. * FR1 inter-band DL CA with a “single” uplink band configured, meaning no switching to transmit SRS on another carrier. * DL CA with “additional” UL carrier configured with SRS only (i.e. no PUCCH/PUSCH configured) * FR1 inter-band UL CA with DMRS bundling * SUL with DMRS bundling   For the last three scenarios listed above, DMRS bundling can be applied with the following conditions:   * Concurrent transmissions scheduled/configured over multiple carriers are not expected by UE * Only configuration of a single TAG * Only applicable for the back-to-back case (i.e., zero gap between two transmissions within an actual TDW) * Only one band can be configured with DMRS bundling at a time * Note 1: Under the above conditions, phase continuity and power consistency within any actual TDW on one carrier is not impacted by operations on a different carrier. * Note 2: Under the above conditions, the events defined in section 6.1.7 of TS38.214 for the carrier with DMRS bundling are not triggered by any transmission within any actual TDW on the other carrier. * Note 3: If the modulation scheme higher than QPSK is scheduled for transmission on any carrier configured with DMRS bundling, DMRS bundling is not applicable according to UE feature 30-4 (i.e., the error case and up to UE implementation) | Optional with capability signalling |
| 30. NR\_cov\_enh | 30-4d | DMRS bunding for PUCCH repetitions | Support DM-RS bundling for PUCCH repetitions for PUCCH formats 1/3/4 over consecutive symbols | 30-4, 4-23 | Yes | N/A | UE does not support DMRS bunding for PUCCH repetitions | Per band and per BC | N/A | N/A | N/A | This capability is applicable to following multiple carrier scenarios in addition to single carrier scenarios   * FR1+FR2 UL CA, FR1+FR2 DC, and EN-DC with NR on FR2. DMRS bundling configuration is limited to one uplink NR carrier in total on all FRs at a time. * FR1 inter-band DL CA with a “single” uplink band configured, meaning no switching to transmit SRS on another carrier. * DL CA with “additional” UL carrier configured with SRS only (i.e. no PUCCH/PUSCH configured) * FR1 inter-band UL CA with DMRS bundling * SUL with DMRS bundling   For the last three scenarios listed above, DMRS bundling can be applied with the following conditions:   * Concurrent transmissions scheduled/configured over multiple carriers are not expected by UE * Only configuration of a single TAG * Only applicable for the back-to-back case (i.e., zero gap between two transmissions within an actual TDW) * Only one band can be configured with DMRS bundling at a time * Note 1: Under the above conditions, phase continuity and power consistency within any actual TDW on one carrier is not impacted by operations on a different carrier. * Note 2: Under the above conditions, the events defined in section 6.1.7 of TS38.214 for the carrier with DMRS bundling are not triggered by any transmission within any actual TDW on the other carrier. * Note 3: If the modulation scheme higher than QPSK is scheduled for transmission on any carrier configured with DMRS bundling, DMRS bundling is not applicable according to UE feature 30-4 (i.e., the error case and up to UE implementation) | Optional with capability signalling |
| 30. NR\_cov\_enh | 30-4e | Enhanced inter-slot frequency hopping with inter-slot bundling for PUSCH | Support enhanced inter-slot frequency hopping with inter-slot bundling for PUSCH | 30-4a or 30-4b or 30-4c | Yes | N/A | UE does not support enhanced inter-slot frequency hopping with inter-slot bundling for PUSCH | Per band | N/A | N/A | N/A |  | Optional with capability signalling |
| 30. NR\_cov\_enh | 30-4f | Enhanced inter-slot frequency hopping for PUCCH repetitions with DMRS bundling | Enhanced inter-slot frequency hopping for PUCCH repetitions with DMRS bundling | 30-4d | Yes | N/A | UE does not support Enhanced inter-slot frequency hopping for PUCCH repetitions with DMRS bundling | Per band | N/A | N/A | N/A |  | Optional with capability signalling |
| 30. NR\_cov\_enh | 30-4g | Restart DM-RS bundling | Support restarting DM-RS bundling after the events triggered by DCI or MAC CE that violate power consistency and phase continuity  Note: Events which are triggered by DCI or MAC CE, but do not require UE capability to resume maintaining power consistency and/or phase continuity as specified in subclause 6.1.7 of 38.214 v17.3.0 are excluded from this feature | 30-4 | Yes | N/A | UE does not support restarting DM-RS bundling after the events triggered by DCI or MAC CE that violate power consistency and phase continuity. Note: Events which are triggered by DCI or MAC CE, but do not require UE capability to resume maintaining power consistency and/or phase continuity as specified in subclause 6.1.7 of 38.214 v17.3.0 are excluded from this feature | Per band and per BC | N/A | N/A | N/A |  | Optional with capability signalling |
| 30. NR\_cov\_enh | 30-4h | DM-RS bundling for non-back-to-back transmission | Support DM-RS bundling for non-back-to-back transmission for consecutive slots for PUSCH and PUCCH only for corresponding supported back-to-back transmission FGs (30-4a, 30-4b, 30-4c, or 30-4d) | 30-4a, 30-4b, 30-4c, or 30-4d | Yes | N/A | UE does not Support DM-RS bundling for non-back-to-back transmission | Per band and per BC | N/A | N/A | N/A | Note: This capability is only applicable when UE is configured with single uplink carrier within a frequency range. | Optional with capability signalling |
| 30. NR\_cov\_enh | 30-5 | Slot based dynamic PUCCH repetition indication | Support slot based dynamic PUCCH repetition indication for PUCCH formats 0/1/2/3/4  support slot based dynamic PUCCH repetition for PUCCH formats 0/1/2/3/4 | 4-23 or 25-2 | Yes | N/A | UE does not support Dynamic PUCCH repetition indication | Per UE | No | No | N/A |  | Optional with capability signalling |
| 30. NR\_cov\_enh | 30-6 | Repetition of PUSCH transmission scheduled by RAR UL grant and DCI format 0\_0 with CRC scrambled by TC-RNTI | Support of repetition of PUSCH transmission scheduled by RAR UL grant and DCI format 0\_0 with CRC scrambled by TC-RNTI |  | Yes | N/A | UE does not support repetition of PUSCH transmission scheduled by RAR UL grant and DCI format 0\_0 with CRC scrambled by TC-RNTI. | Per band | N/A | N/A | N/A |  | Optional with capability signalling |

1. NR\_IAB\_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 |
| 31. NR\_IAB\_enh | 31-1 | Guard symbols | 1) Support Rel-17 DesiredGuardSymbols reporting  2) Support Rel-17 ProvidedGuardSymbols reception | one or more of {31-4, 31-5} | Yes | N/A | Guard symbols reporting and reception associated with Case 6 and 7 timings are not supported | per IAB node | No | No | support mixture of FDD/TDD and/or FR1/FR2 | IAB-MT impact  Note: If an IAB node does not support a certain timing mode, the reported/provided values shall be ignored | Optional with capability signalling. |
| 31. NR\_IAB\_enh | 31-2 | IAB-DU beam restriction indication | Support restricted IAB-DU Beam Indication reception |  | Yes | N/A | Parent-node cannot indicate restricted beams at the IAB-DU. | per IAB node | No | No | support mixture of FDD/TDD and/or FR1/FR2 | IAB-MT impact | Optional with capability signalling. |
| 31. NR\_IAB\_enh | 31-3 | IAB-MT beam recommendation indication | Support recommended IAB-MT Beam Indication transmission  1) IAB-MT DL beam  2) IAB-MT UL beam |  | yes | N/A | IAB-node cannot indicate recommended IAB-MT DL/UL beam to parent node | Per IAB-node | no | no | support mixture of FDD/TDD and/or FR1/FR2 | IAB-MT impact | Optional with capability signalling. |
| 31. NR\_IAB\_enh | 31-4 | Case 6 timing alignment | 1) Support Case 6 timing alignment indication reception  2) Support signalling to the parent-node that Case 6 Timing Mode is required for simultaneous transmission |  | Yes | N/A | Switching across different timing cases (i.e., Case 1 at IAB-node, Case 6 at IAB-node, and/or Case 7 at the  Parent) is not supported.  When to perform Case 6 timing at the IAB-node cannot be controlled by the parent node.  Whether Case 6 timing is required for simultaneous transmission at the IAB node is not known at its parent node. | per IAB node | No | No | support mixture of FDD/TDD and/or FR1/FR2 | IAB-MT impact | Optional with capability signalling. |
| 31. NR\_IAB\_enh | 31-5 | Case 7 timing alignment | 1.) Support Case7 timing offset indication reception  2.) Support Case 7 timing at parent-node indication reception |  | Yes | N/A | Parent-node cannot adopt both (and switch between) Case 1 and Case 7 timing. | per IAB node | No | No | support mixture of FDD/TDD and/or FR1/FR2 | IAB-MT impact | Optional with capability signalling. |
| 31. NR\_IAB\_enh | 31-6 | DL TX power adjustment | 1.) Support Desired DL TX Power Adjustment reporting  2.) Support DL TX Power Adjustment reception |  | Yes | N/A | Parent-node’s DL TX power adjustment reporting and reception is not supported. | per IAB node | No | No | support mixture of FDD/TDD and/or FR1/FR2 | IAB-MT impact | Optional with capability signalling. |
| 31. NR\_IAB\_enh | 31-7 | Desired UL TX power adjustment | Support Desired IAB-MT PSD range reporting |  | Yes | N/A | Desired MT’s UL PSD range reporting is not supported. | per IAB node | No | No | support mixture of FDD/TDD and/or FR1/FR2 | IAB-MT impact | Optional with capability signalling. |
| 31. NR\_IAB\_enh | 31-8 | Dynamic indication of FDM soft resource availability | Support monitoring DCI Format 2\_5 scrambled by AI-RNTI for indication of FDM soft resource availability to an IAB node |  | Yes | N/A | The IAB-node is unable to receive explicit availability indication for FDM soft resources | per IAB node | No | No | support mixture of FDD/TDD and/or FR1/FR2 | IAB-MT impact | Optional with capability signalling |
| 31. NR\_IAB\_enh | 31-9 | Simultaneous transmission and reception from multiple parent nodes | Support simultaneous transmission and reception from multiple parent nodes |  | Yes | N/A | Simultaneous transmission and reception is not supported in DC scenario | per BC | No | No | support mixture of FDD/TDD and/or FR1/FR2 | IAB-MT impact | Optional with capability signalling. |
| 31. NR\_IAB\_enh | 31-10 | Updated T\_delta range | Support updated T\_delta range reception |  | Yes | 31-4 | The updated T\_delta range for an IAB-node operating solely in Case 6 timing is not supported. | Per IAB node | No | No | support mixture of FDD/TDD and/or FR1/FR2 | IAB-MT impact | Optional with capability signalling. |
| 31. NR\_IAB\_enh | 31-11 | Directional Collision Handling in DC operation | Support for directional collision handling between MCG and SCG cell(s) of the dual parent nodes for simultaneous operation in inter-donor and/or intra-donor DC operation |  | Yes | 14-5 | The IAB-node is unable to resolve directional collision between MCG and SCG cells in DC operation | per IAB node | No | No | support mixture of FDD/TDD and/or FR1/FR2 | IAB-MT impact | Optional with capability signalling |

1. NR\_SL\_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 (Sidelink 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 |
| 32. NR\_SL\_enh | 32-2a | Receiving NR sidelink of PSFCH | 1) UE can receive PSFCH with HARQ-ACK information in NR sidelink.  2) UE can receive up to N PSFCH(s) resources in a slot | 32-2b, at least one of 15-2 or 15-3 or 32-4 or 32-4a | Yes | No | The UE cannot receive PSFCH with HARQ-ACK information from other UEs | Per FS | N.A. | N.A. | N.A. | Note: configuration by NR Uu is not required to be supported in a band indicated with only the PC5 interface in 38.101-1 Table 5.2E.1-1  Candidate values for N are {5, 15, 25, 32, 35, 45, 50, 64}  If UE reports more than one FGs of 15-11, FG32-2a and 32-5b-2, the reported value N in each FG is the total number and the same among those FGs | Optional with capability signalling. |
| 32. NR\_SL\_enh | 32-2b | Receiving NR sidelink of S-SSB | 1) UE can receive S-SSB in NR sidelink.  2) UE supports synchronization to a reference UE |  | No | No | The UE does not receive synchronization signalling from other UEs | Per band | N.A. | N.A. | N.A. | Note: configuration by NR Uu is not required to be supported in a band indicated with only the PC5 interface in 38.101-1 Table 5.2E.1-1 | Optional without capability signalling. |
| 32. NR\_SL\_enh | 32-4 | Transmitting NR sidelink mode 2 with partial sensing | 1) UE can transmit PSCCH/PSSCH using NR sidelink mode 2 with partial sensing configured by NR Uu or preconfiguration. Up to B sidelink processes are supported.  2) UE can transmit PSSCH according to the normal 64QAM MCS table.  3) UE supports PT-RS transmission in FR2.  4) UE can perform periodic-based partial sensing and resource allocation operation.  5) UE can perform contiguous partial sensing and resource allocation operation.  6) UE can transmit using the subcarrier spacing and CP length defined for a given band in RAN4  8) Supports 14-symbol SL slot with all DMRS patterns corresponding to {#PSSCH symbols} = {12, 9} for slots w/wo PSFCH. If UE signals support of ECP, support 12-symbol SL slot with all DMRS patterns corresponding to {#PSSCH symbols} = {10,7} for slots w/wo PSFCH.  10) UE can transmit using 30 kHz and normal CP subcarrier spacing in FR1, 120 kHz subcarrier spacing with normal CP FR2  11) DL pathloss based open loop power control when mode 2 is configured by NR Uu | one of {15-4, 32-2b, 32-4b} | Yes | No | UE does not support transmission according to the partial sensing and resource allocation | Per FS | N.A. | N.A. | N.A. | Note: Random selection in the exceptional pool is supported.  Note: configuration by NR Uu is not required to be supported in a band indicated with only the PC5 interface in 38.101-1 Table 5.2E.1-1  Candidate values for B are {8,16}  If UE reports more than one FGs of 15-3, 32-4 and 32-4a, the reported value B in each FG is the total number of SL processes and the same among those FGs.  Note: Component 6 is not required to be signalled in a band indicated with only the PC5 interface in 38.101-1 Table 5.2E.1-1  Component-6 candidate value set in FR1:  {{15 kHz}, {30 kHz}, {60 kHz}, {15, 30 kHz}, {30, 60 kHz}, {15, 60 kHz}, {15, 30, 60 kHz}}  Component-6 candidate value set in FR2:  {{60 kHz}, {120 kHz}, {60, 120 kHz}}  Component-6 candidate value set for CP length: {NCP,NCP and ECP}  (ECP only applies to SCS of 60 kHz)  Note: Component 10 is only required in a band indicated with only the PC5 interface in 38.101-1 Table 5.2E.1-1  Note: Component 11 is not required to be supported in a band indicated with only the PC5 interface in 38.101-1 Table 5.2E.1-1 | Optional with capability signalling. |
| 32. NR\_SL\_enh | 32-4a | Transmitting NR sidelink mode 2 with random resource selection | 1) UE can transmit PSCCH/PSSCH using NR sidelink mode 2 with random resource selection configured by NR Uu or preconfiguration. Up to B sidelink processes are supported.  2) UE can transmit PSSCH according to the normal 64QAM MCS table.  3) UE supports PT-RS transmission in FR2.  4) UE can transmit using the subcarrier spacing and CP length defined for a given band in RAN4  5) Supports 14-symbol SL slot with all DMRS patterns corresponding to {#PSSCH symbols} = {12, 9} for slots w/wo PSFCH. If UE signals support of ECP, support 12-symbol SL slot with all DMRS patterns corresponding to {#PSSCH symbols} = {10,7} for slots w/wo PSFCH.  6) UE can transmit using 30 kHz and normal CP subcarrier spacing in FR1, 120 kHz subcarrier spacing with normal CP FR2  7) DL pathloss based open loop power control when mode 2 is configured by NR Uu | one of {15-4, 32-2b, 32-4b} | Yes | No | UE does not support transmission according to the random resource selection and resource allocation | Per band | N.A. | N.A. | N.A. | Note: Random selection in the exceptional pool is supported.  Note: configuration by NR Uu is not required to be supported in a band indicated with only the PC5 interface in 38.101-1 Table 5.2E.1-1  Candidate values for B are {8,16}  If UE reports more than one FGs of 15-3, 32-4 and 32-4a, the reported value B in each FG is the total number of SL processes and the same among those FGs.  Note: Component 4 is not required to be signalled in a band indicated with only the PC5 interface in 38.101-1 Table 5.2E.1-1  Component-4 candidate value set in FR1:  {{15 kHz}, {30 kHz}, {60 kHz}, {15, 30 kHz}, {30, 60 kHz}, {15, 60 kHz}, {15, 30, 60 kHz}}  Component-4 candidate value set in FR2:  {{60 kHz}, {120 kHz}, {60, 120 kHz}}  Component-4 candidate value set for CP length: {NCP,NCP and ECP}  (ECP only applies to SCS of 60 kHz)  Note: Component 6 is only required in a band indicated with only the PC5 interface in 38.101-1 Table 5.2E.1-1  Note: Component 7 is not required to be supported in a band indicated with only the PC5 interface in 38.101-1 Table 5.2E.1-1 | Optional with capability signalling. |
| 32. NR\_SL\_enh | 32-4b | Synchronization sources for NR sidelink transmission | 1) UE supports GNSS as the synchronization reference according to the synchronization procedure with sl-SyncPriority set to GNSS and sl-NbAsSync set to false.  2) UE can transmit NR sidelink based on the synchronization to an gNB  3) UE additionally supports gNB and GNSS as the synchronization reference according to the synchronization procedure with sl-SyncPriority set to gnbEnb if the UE supports Components 1 and 2  4) UE additionally supports gNB and GNSS as the synchronization reference according to the synchronization procedure with sl-SyncPriority set to GNSS and sl-NbAsSync set to true if the UE supports Components 1 and 2.  5) UE can transmit S-SSB in NR sidelink if it supports 15-2 or 15-3 or 32-4 or 32-4a  6) UE supports synchronization to a reference UE if it supports 15-1. |  | Yes | No |  | Per band | N.A. | N.A. | N.A. | Note: configuration by NR Uu is not required to be supported in a band indicated with only the PC5 interface in 38.101-1 Table 5.2E.1-1  Note: Component 1 is only required to be supported in a band indicated with only the PC5 interface in 38.101-1 Table 5.2E.1-1  Note: Components 2/3/4 are not required to be supported in a band indicated with only the PC5 interface in 38.101-1 Table 5.2E.1-1 | Optional with capability signalling. |
| 32. NR\_SL\_enh | 32-4c | eNB type synchronization sources for NR sidelink transmission | 1) UE can transmit NR sidelink based on the synchronization to an eNB.  2) If UE supports component 1 in FG 32-4b, UE additionally supports eNB and GNSS as the synchronization reference according to the synchronization procedure with sl-SyncPriority set to gnbEnb.  3) If UE supports component 1 in FG 32-4b, UE additionally supports eNB and GNSS as the synchronization reference according to the synchronization procedure with sl-SyncPriority set to GNSS and sl-NbAsSync set to true. | 32-4b | Yes | No |  | Per band | N.A. | N.A. | N.A. | Note: configuration by NR Uu is not required to be supported in a band indicated with only the PC5 interface in 38.101-1 Table 5.2E.1-1 | Optional with capability signalling. |
| 32. NR\_SL\_enh | 32-5a-1 | Transmitting Inter-UE coordination scheme 1 in NR sidelink mode 2 | 1) UE can transmit inter-UE coordination information of preferred resource set/non-preferred resource set in NR sidelink mode 2.  2) UE can receive an explicit request for inter-UE coordination information of both preferred resource set and non-preferred resource set. | one of {15-4, 32-2b, 32-4b} | Yes | Yes | UE does not support transmitting inter-UE coordination scheme 1 in NR sidelink mode 2.  UE cannot receive an explicit request for inter-UE coordination information | Per FS | N.A. | N.A. | N.A. | Note: configuration by NR Uu is not required to be supported in a band indicated with only the PC5 interface in 38.101-1 Table 5.2E.1-1” in FG 32-5a-1/32-5a-2/32-5a-3/32-5b-1/32-5b-2 | Optional with capability signalling. |
| 32. NR\_SL\_enh | 32-5a-2 | Receiving Inter-UE coordination information of preferred resource set in NR sidelink mode 2 | 1) UE can receive inter-UE coordination information of preferred resource set and use the received information in its own resource (re-)selection in NR sidelink mode 2.  2) UE can transmit an explicit request for inter-UE coordination information of preferred resource set only. | one of {15-4, 32-2b, 32-4b} | Yes | Yes | UE does not support receiving inter-UE coordination of preferred resource set in NR sidelink mode 2.  UE does not transmit an explicit request for inter-UE coordination information of preferred resource set only | Per band | N.A. | N.A. | N.A. | Note: configuration by NR Uu is not required to be supported in a band indicated with only the PC5 interface in 38.101-1 Table 5.2E.1-1” in FG 32-5a-1/32-5a-2/32-5a-3/32-5b-1/32-5b-2 | Optional with capability signalling. |
| 32. NR\_SL\_enh | 32-5a-3 | Receiving Inter-UE coordination information of non-preferred resource set in NR sidelink mode 2 | 1) UE can receive inter-UE coordination information of non-preferred resource set and use the received information in its own resource (re-)selection in NR sidelink mode 2.  2) UE can transmit an explicit request for inter-UE coordination information of non-preferred resource set only. | one of {15-4, 32-2b, 32-4b} | Yes | Yes | UE does not support receiving inter-UE coordination of non-preferred resource set in NR sidelink mode 2.  UE does not transmit an explicit request for inter-UE coordination information of non-preferred resource set only | Per band | N.A. | N.A. | N.A. | Note: configuration by NR Uu is not required to be supported in a band indicated with only the PC5 interface in 38.101-1 Table 5.2E.1-1” in FG 32-5a-1/32-5a-2/32-5a-3/32-5b-1/32-5b-2 | Optional with capability signalling. |
| 32. NR\_SL\_enh | 32-5b-1 | Transmitting Inter-UE coordination scheme 2 in NR sidelink mode 2 | 1) UE can transmit inter-UE coordination information of presence of expected/potential resource conflict in NR sidelink mode 2.  2) UE can transmit up to M PSFCH(s) resources in a slot | 32-5b-2, one of {15-4, 32-2b, 32-4b} | Yes | Yes | UE does not support transmitting inter-UE coordination scheme 2 in NR sidelink mode 2. | Per FS | N.A. | N.A. | N.A. | Note: configuration by NR Uu is not required to be supported in a band indicated with only the PC5 interface in 38.101-1 Table 5.2E.1-1  Candidate values for M are {4, 8, 16}  If UE reports more than one FGs of 15-11 and 32-5b-1, the reported value M in each FG is the total number and the same among those FGs. | Optional with capability signalling. |
| 32. NR\_SL\_enh | 32-5b-2 | Receiving Inter-UE coordination scheme 2 in NR sidelink mode 2 | 1) UE can receive inter-UE coordination information of presence of expected/potential resource conflict and use the received information in its own resource re-selection in NR sidelink mode 2.  2) UE can receive up to N PSFCH(s) resources in a slot. | one of {15-4, 32-2b, 32-4b} | Yes | Yes | UE does not support receiving inter-UE coordination scheme 2 in NR sidelink mode 2. | Per band | N.A. | N.A. | N.A. | Note: configuration by NR Uu is not required to be supported in a band indicated with only the PC5 interface in 38.101-1 Table 5.2E.1-1  Candidate values for N are {5, 15, 25, 32, 35, 45, 50, 64}  If UE reports more than one FGs of 15-11, 32-2a and 32-5b-2, the reported value N in each FG is the total number and the same among those FGs. | Optional with capability signalling. |
| 32. NR\_SL\_enh | 32-6-1 | Reception of Scheme 1 inter-UE coordination information over 2nd SCI | 1) UE can receive Scheme 1 inter-UE coordination transmission over 2nd SCI that is used in addition to the MAC-CE carrying the same inter-UE coordination information in the same transmission. | At least one of 32-5a-2 and 32-5a-3 | Yes | Yes | UE is not required to decode SCI 2-C and the associated PSSCH | Per band | N.A. | N.A. | N.A. | Note: configuration by NR Uu is not required to be supported in a band indicated with only the PC5 interface in 38.101-1 Table 5.2E.1-1 | Optional with capability signalling |
| 32. NR\_SL\_enh | 32-6-2 | Reception of Scheme 1 explicit request over 2nd SCI | 1) UE can receive an explicit request for inter-UE coordination information of both preferred resource set and non-preferred resource set over 2nd SCI that is used in addition to the MAC-CE carrying the explicit request in the same transmission | 32-5a-1 | Yes | Yes | UE is not required to decode SCI 2-C and the associated PSSCH | Per band | N.A. | N.A. | N.A. | Note: configuration by NR Uu is not required to be supported in a band indicated with only the PC5 interface in 38.101-1 Table 5.2E.1-1 | Optional with capability signalling |
| 32. NR\_SL\_enh | 32-7 | Determination of expected conflict in Scheme 2 based on RSRP difference | 1) UE can determine a conflict for overlapping resource reservation between UE-B and another UE based on RSRP difference of the two reservations | 32-5b-1 | No | Yes |  | Per band | N.A. | N.A. | N.A. | Note: configuration by NR Uu is not required to be supported in a band indicated with only the PC5 interface in 38.101-1 Table 5.2E.1-1 | Optional with capability signalling |

1. NR\_MBS

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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 (Sidelink 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 |
| 33. NR\_MBS | 33-1 | Broadcast | 1. Support of group-common PDCCH/PDSCH for broadcast with CRC scrambled by MCCH-RNTI.  2. Support of group-common PDCCH/PDSCH for broadcast with CRC scrambled by G-RNTI(s) for MTCH.  3. Support of CFR configuration for broadcast.  4. Support of CORESET and common search space for broadcast.  5. Support of DCI format 4\_0 with CRC scrambled with G-RNTI/MCCH-RNTI for broadcast.  6. Support of inter-slot TDM between unicast PDSCH and MCCH group-common PDSCH or MTCH group-common PDSCH, or between MCCH group-common PDSCH and MTCH group-common PDSCH, or among unicast PDSCH and MCCH group-common PDSCH and MTCH group-common PDSCH in different slots.  7. Support MCCH change notification indication via DCI.  8. support of higher layer configured slot-level repetition up to 8 for MTCH  9. One G-RNTI per UE is supported for broadcast reception  10. Support of FDMed MCCH and PBCH  11. Support of up to 64QAM for FR1/FR2 |  | Up to RAN2 |  |  | Up to RAN2 | Up to RAN2 | Up to RAN2 |  | It is up to RAN2 whether/how to introduce the capability for support of N > 1 G-RNTIs for broadcast for a UE | Up to RAN2 |
| 33. NR\_MBS | 33-1-1 | DCI indicated slot-level repetition up to 16 for broadcast MTCH | Support up to 16 times dynamic slot-level repetition for broadcast MTCH. | 33-1 | Up to RAN2 |  |  | Up to RAN2 | Up to RAN2 | Up to RAN2 |  |  | Up to RAN2 |
| 33. NR\_MBS | 33-1-2 | FDM-ed unicast PDSCH and group-common PDSCH for broadcast | 1. Support FDM between one unicast PDSCH and one group-common PDSCH for broadcast in RRC CONNECTED mode in a slot. | 33-1 | Yes |  |  | Per FSPC | N/A | N/A |  |  | Optional with capability signalling |
| 33. NR\_MBS | 33-2 | Dynamic scheduling for multicast for PCell | 1. Support of group-common PDCCH/PDSCH for multicast with CRC scrambled by G-RNTI for PCell.  2. Support of CFR configuration for multicast.  3. Support of CORESET and common search space configuration for multicast.  4. Support of DCI format 4\_1 with CRC scrambled with G-RNTI for multicast.  5. Support of inter-slot TDM between group-common PDSCH for multicast and other PDSCHs in different slots.  6. Support {2, 4, 8} times semi-static slot-level repetition for group-common PDSCH for multicast |  | Yes |  |  | Per FS | N/A | N/A |  |  | Optional with capability signalling |
| 33. NR\_MBS | 33-2a | Support of ACK/NACK based HARQ-ACK feedback andRRC-based enabling/disabling ACK/NACK-based feedback for dynamic scheduling for multicast | 1) Support of ACK/NACK based HARQ-ACK feedback, and support of enabling/disabling ACK/NACK based HARQ-ACK feedback configured by RRC signalling  2) Support of PTM retransmission for multicast  3) support of Type-1 and Type-2 HARQ-ACK CB for multicast feedback only  4) Support of shared PUCCH resource configurations with unicast | 33-2 | Yes |  |  | Per BC | N/A | N/A |  |  | Optional with capability signalling |
| 33. NR\_MBS | 33-2b | DCI-based enabling/disabling ACK/NACK-based feedback for dynamic scheduling for multicast | Support of DCI-based enabling/disabling ACK/NACK based HARQ-ACK feedback configured per G-RNTI by RRC signaling via DCI format 4\_2 | 33-2a, 33-2f | Yes |  |  | Per band | N/A | N/A |  |  | Optional with capability signalling |
| 33. NR\_MBS | 33-2d | PTP retransmission for multicast dynamic scheduling | Support of PTP retransmission for multicast on the same cell as multicast initial transmission | 33-2a | Yes |  |  | Per BC | N/A | N/A |  |  | Optional with capability signalling |
| 33. NR\_MBS | 33-2e | Multiple G-RNTIs for group-common PDSCHs | Capability on number of G-RNTI for multicast | 33-2 | Yes |  |  | Per UE | [Yes] | Yes |  | Reporting type of FG 33-2e is per UE with [FDD/TDD,] FR1/FR2, licensed/unlicensed, and TN/NTN differentiation, detail signalling is up to RAN2 | Optional with capability signalling |
| 33. NR\_MBS | 33-2f | Dynamic multicast with DCI format 4\_2 | Support of DCI format 4\_2 with CRC scrambled with G-RNTI for multicast | 33-2 | Yes |  |  | Per band | N/A | N/A |  |  | Optional with capability signalling |
| 33. NR\_MBS | 33-2g | MIMO layers for multicast PDSCH | Supported maximal number of MIMO layers for multicast PDSCH | 33-2 | Yes |  | UE supports 1 MIMO layer only for multicast PDSCH | Per FSPC | N/A | N/A |  | Candidate values: {2,4,8}  Note: If UE supports up to 8 layers, the UE supports TB2 | Optional with capability signalling |
| 33. NR\_MBS | 33-2h | Dynamic scheduling for multicast for SCell | Support of group-common PDCCH/PDSCH with CRC scrambled by G-RNTI for SCell. | 33-2 | Yes |  |  | Per FSPC | N/A | N/A |  |  | Optional with capability signalling |
| 33. NR\_MBS | 33-2i | Supported maximal modulation order for multicast PDSCH | 1. For FR1, up to 1024QAM is supported, candidate values {256QAM, 1024QAM}  2. For FR2, up to 256QAM is supported, candidate values {64QAM, 256QAM} | 33-2 | Yes |  | The UE supports the same modulation order as unicast | Per band | N/A | N/A |  | Note: A UE shall support the corresponding mandatory maximum modulation for unicast. | Optional with capability signalling |
| 33. NR\_MBS | 33-2j | Supported maximum modulation order used for maximum data rate calculation for multicast PDSCH | 1. For FR1, up to 1024QAM is supported as maximum modulation order used for maximum data rate calculation for multicast PDSCH, candidate values {256QAM, 1024QAM}  2. For FR2, up to 256QAM is supported as maximum modulation order used for maximum data rate calculation for multicast PDSCH, candidate values {64QAM, 256QAM} | 33-2 | Yes |  |  | Per FSPC | N/A | N/A |  |  | Optional with capability signalling |
| 33. NR\_MBS | 33-3-1 | Dynamic Slot-level repetition for group-common PDSCH | 1. Support up to X times dynamic slot-level repetition for group-common PDSCH for multicast. | 33-2 | Yes |  |  | Per UE | Yes | Yes |  | Candidate values for X is: {8, 16}  This FG is reported for TN and licensed. | Optional with capability signalling |
| 33. NR\_MBS | 33-3-1a | Dynamic Slot-level repetition for group-common PDSCH for NTN and unlicensed | 1. Support up to X times dynamic slot-level repetition for group-common PDSCH for multicast for NTN and unlicensed | 33-2 | Yes |  |  | Per band | N/A | N/A |  | Candidate values for X is: {8, 16}  This FG is reported for NTN and unlicensed | Optional with capability signalling |
| 33. NR\_MBS | 33-3-2 | FDM-ed unicast PDSCH and one group-common PDSCH for multicast | 1. Support FDM between one unicast PDSCH and one group-common PDSCH for multicast in RRC CONNECTED mode in a slot. | 33-2 | Yes |  |  | Per FSPC | N/A | N/A |  | Note: this FG does not support FDMed SPS | Optional with capability signalling |
| 33. NR\_MBS | 33-3-3 | Intra-slot TDM-ed unicast PDSCH and group-common PDSCH | 1. Support TDM between one unicast PDSCH and one group-common PDSCH in a slot.  2. Support TDM between M (M>1) TDMed unicast PDSCHs and one group-common PDSCH in a slot per CC  3. Support TDM among N (N>1) group-common PDSCHs in a slot per CC  4. Support TDM between K (K>1) TDMed unicast PDSCHs and L (L>1) TDMed group-common PDSCHs in a slot per CC  5. The UE maximum number of TDMed PDSCH receptions capability in a slot per CC is kept as for Rel-15/Rel-16, i.e., {2/4/7} based on UE FG5-11/5-11a/5-11b.   * + Note:  Group-common PDSCH(s) are counted as unicast PDSCH(s).   + Note: The max number of (M+1), N, (K+L) are determined based on the numbers reported by FG5-11 and/or FG5-11a and/or FG5-11b.   + Note: up to one broadcast PDSCH is supported in a slot. | 33-1 and/or 33-2, 5-11 and/or 5-11a and/or 5-11b | Yes |  |  | Per FSPC | N/A | N/A |  |  | Optional with capability signalling |
| 33. NR\_MBS | 33-3-3a | FDM-ed Type-1 and Type-2 HARQ-ACK codebooks for multiplexing HARQ-ACK for unicast and HARQ-ACK for multicast | 1. Support of FDM-ed Type-1 HARQ-ACK codebooks for multiplexing HARQ-ACK for unicast and ACK/NACK-based HARQ-ACK for multicast on PUCCH or PUSCH  2. Support of Type-2 HARQ-ACK codebooks for multiplexing HARQ-ACK for unicast and HARQ-ACK for multicast on PUCCH or PUSCH with max number X of G-RNTIs | 33-3-2, at least one of {33-2a, 33-4, 33-5-1a, 33-5-1f} | Yes |  | FFS | Per BC | N/A | N/A |  | Note1: FDM-ed Type-1 HARQ-ACK codebook is generated by concatenating the Type-1 sub-codebook for unicast and the Type-1 sub-codebook for multicast.  Note2: The Type-2 HARQ-ACK codebook is generated by concatenating the Type-2 sub-codebook for unicast and the Type-2 sub-codebook for multicast.  Candidate values of X is {2, 3, 4} with X no larger than max number of G-RNTIs of FG33-2e | Optional with capability signalling |
| 33. NR\_MBS | 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 | 1. Support of Mode 2 TDM-ed Type-1 HARQ-ACK codebook for multiplexing HARQ-ACK for unicast and ACK/NACK-based HARQ-ACK for multicast on PUCCH or PUSCH  2. Support of Type-2 HARQ-ACK codebooks for multiplexing HARQ-ACK for unicast and HARQ-ACK for multicast on PUCCH or PUSCH with max number X of G-RNTIs | 33-2a or 33-4 or 33-5-1a or 33-5-1f | Yes |  | FFS | Per BC | N/A | N/A |  | Note1: Mode 2 TDM-ed Type-1 HARQ-ACK codebook is generated based on the union TDRA tables from unicast and multicast and the union of k1 sets from unicast and multicast.  Note2: The Type-2 HARQ-ACK codebook is generated by concatenating the Type-2 sub-codebook for unicast and the Type-2 sub-codebook for multicast.  Candidate values of X is {2, 3, 4} with X no larger than max number of G-RNTIs of FG33-2e | Optional with capability signalling |
| 33. NR\_MBS | 33-3-4 | Mode 1 for type1 codebook generation | Supports type1-Codebook-Generation-Mode configured as mode 1 | 33-3-3b | Yes |  |  | [Per UE] | [No] | [No] |  | This FG is for multiplexing HARQ-ACK for unicast and HARQ-ACK for multicast on PUCCH or PUSCH | Optional with capability signalling |
| 33. NR\_MBS | 33-3-5 | Feedback multiplexing for unicast PDSCH and group-common PDSCH for multicast with same priority and different codebook type | Support of multiplexing HARQ-ACK for unicast and for multicast with the same priority and different HARQ-ACK codebook types in a PUCCH or in a PUSCH | 33-2a or 33-4 or 33-5-1a or 33-5-1f | Yes |  |  | [Per FSPC] | [No] | [No] |  |  | Optional with capability signalling |
| 33. NR\_MBS | 33-4 | NACK-only based HARQ-ACK feedback for multicast with ACK/NACK transforming | 1. Support NACK-only based HARQ-ACK feedback for dynamic scheduling for multicast, including:  a) A single TB with NACK-only feedback transmitted in PUCCH  b) One or multiple TB with NACK-only feedback transmitted in PUCCH by transforming into ACK/NACK bits  2. Support of shared PUCCH resource configurations with unicast | 33-2a | Yes |  |  | Per BC | N/A | N/A |  |  | Optional with capability signalling |
| 33. NR\_MBS | 33-4a | NACK-only based HARQ-ACK feedback for multicast corresponding to a specific sequence or a PUCCH transmission | 1. Support NACK-only based HARQ-ACK feedback for dynamic scheduling for multicast, including:  a) Multiple TB with NACK-only feedback transmitted in PUCCH by select one PUCCH resource.  2. Support of separate PUCCH resource configurations from unicast | 33-4 | Yes |  |  | Per BC | N/A | N/A |  |  | Optional with capability signalling |
| 33. NR\_MBS | 33-4-1 | DCI-based enabling/disabling NACK-only based feedback for dynamic scheduling for multicast | Support of DCI-based enabling/disabling NACK-only based HARQ-ACK feedback configured per G-RNTI by RRC signalling via DCI format 4\_2 | 33-4 and 33-2f | Yes |  |  | Per band | N/A | N/A |  |  | Optional with capability signalling |
| 33. NR\_MBS | 33-5-1 | SPS group-common PDSCH for multicast | 1. Support one SPS group-common PDSCH configuration for multicast  2. Support {2, 4, 8} times semi-static slot-level repetition for SPS group-common PDSCH | 33-2 | Yes |  |  | Per FS | N/A | N/A |  |  | Optional with capability signalling |
| 33. NR\_MBS | 33-5-1a | Support of ACK/NACK based HARQ-ACK feedback and RRC-based enabling/disabling ACK/NACK-based feedback for SPS group-common PDSCH for multicast | Support of ACK/NACK based HARQ-ACK feedback, and support of enabling/disabling ACK/NACK based HARQ-ACK feedback configured by RRC signalling for SPS group-common PDSCH without PDCCH scheduling, SPS group-common PDSCH activation, and SPS release PDCCH | 33-5-1 | Yes |  |  | Per BC | N/A | N/A |  |  | Optional with capability signalling |
| 33. NR\_MBS | 33-5-1b | DCI-based enabling/disabling ACK/NACK-based feedback for SPS group-common PDSCH for multicast | Support of DCI-based enabling/disabling ACK/NACK based HARQ-ACK feedback configured per G-CS-RNTI for multicast by RRC signaling via DCI format 4\_2 | 33-5-1a, 33-5-1i | Yes |  |  | Per band | N/A | N/A |  |  | Optional with capability signalling |
| 33. NR\_MBS | 33-5-1d | PTP retransmission for SPS group-common PDSCH for multicast | Support of PTP retransmission associated with CS-RNTI for SPS multicast on the cell same as multicast initial transmission | 33-5-1a | Yes |  |  | Per BC | N/A | N/A |  |  | Optional with capability signalling |
| 33. NR\_MBS | 33-5-1e | Dynamic Slot-level repetition for SPS group-common PDSCH for multicast | Support up to X times dynamic slot-level repetition for SPS group-common PDSCH for multicast. | 33-5-1 | Yes |  |  | [Per UE] | [No] | [No] |  | Candidate values for X is: {8, 16} | Optional with capability signalling |
| 33. NR\_MBS | 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 | 1) Support NACK-only based HARQ-ACK feedback, and support of enabling/disabling NACK-only based HARQ-ACK feedback configured by RRC signalling for SPS group-common PDSCH without PDCCH scheduling  2) Support of PTM retransmission associated with G-CS-RNTI for SPS multicast | 33-5-1 | Yes |  |  | [Per UE] | [No] | [No] |  |  | Optional with capability signalling |
| 33. NR\_MBS | 33-5-1g | DCI-based enabling/disabling NACK-only based feedback for SPS group-common PDSCH for multicast | Support of DCI-based enabling/disabling NACK-only based HARQ-ACK feedback configured per G-CS-RNTI for multicast by RRC signaling via DCI format 4\_2 | 33-5-1f | Yes |  |  | [Per UE] | [No] | [No] |  |  | Optional with capability signalling |
| 33. NR\_MBS | 33-5-1h | Multiple G-CS-RNTIs for SPS group-common PDSCHs | Max number of G-CS-RNTIs for SPS multicast | 33-5-1 | Yes |  |  | Per UE | [Yes] | Yes |  | Reporting type of FGs 33-5-1h is per UE with [FDD/TDD,] FR1/FR2, licensed/unlicensed, and TN/NTN differentiation, detail signalling is up to RAN2 | Optional with capability signalling |
| 33. NR\_MBS | 33-5-1i | Multicast SPS scheduling with DCI format 4\_2 | Support of DCI format 4\_2 with CRC scrambled with G-CS-RNTI for multicast SPS scheduling  FFS whether to include retransmission scheduled by DCI format 4\_2 with CRC scrambled with G-CS-RNTI | 33-5-1 | Yes |  |  | FFS | FFS | FFS |  |  | Optional with capability signalling |
| 33. NR\_MBS | 33-5-2 | Multiple SPS group-common PDSCH configuration | 1. Support up to 8 SPS group-common PDSCH configuration per CFR for multicast  2. Support M>=1 activated SPS group-common PDSCH configurations per CFR for multicast  3. The total number of SPS configurations for both multicast and unicast is no larger than 8 [per cell], and activated SPS group-common PDSCH configurations is no larger than M. | 33-5-1 | Yes |  |  | [Per UE] | [No] | [No] |  | Candidate value set for M is {1, 2, …, 8} | Optional with capability signalling |
| 33. NR\_MBS | 33-5-3 | One SPS group-common PDSCH configuration for multicast for Scell | 1. Support one SPS group-common PDSCH configuration for multicast for Scell.  2. Support {2, 4, 8} times semi-static slot-level repetition for SPS group-common PDSCH for Scell. | 33-5-1, 33-2h | Yes |  |  | Per FSPC | N/A | N/A |  |  | Optional with capability signalling |
| 33. NR\_MBS | 33-5-4 | Up to 8 SPS group-common PDSCH configurations per CFR for multicast for SCell | 1. Support up to 8 SPS group-common PDSCH configuration per CFR for multicast for Scell.  2. Support M>=1 activated SPS group-common PDSCH configurations per CFR for multicast for Scell.  3. The total number of SPS configurations for both multicast and unicast is no larger than 8 [per cell], and activated SPS group-common PDSCH configurations is no larger than M.  4. The total number of SPS configurations for both multicast and unicast in a cell group is no larger than 32. | 33-5-3 | Yes |  |  | Per FSPC | N/A | N/A |  | Candidate value set for M is {1, 2, …, 8} | Optional with capability signalling |
| 33. NR\_MBS | 33-6-1 | DL priority indication for multicast in DCI | 1. Support of priority indicator field configured in DCI formats 4\_2 with CRC scrambled with G-RNTI for multicast.  2. Supports two HARQ-ACK codebooks with different priorities to be simultaneously constructed different priorities for multicast and multicast at a UE | 33-2a, 33-2f | Yes |  |  | Per UE | No | No |  |  | Optional with capability signalling |
| 33. NR\_MBS | 33-6-1a | DL priority configuration for SPS multicast | Support of priority indicator field configured in DCI format 4\_2 for multicast HARQ-ACK feedback of SPS multicast | 33-6-1 | Yes |  |  | Per UE | No | No |  |  | Optional with capability signalling |
| 33. NR\_MBS | 33-6-2 | Two HARQ-ACK codebooks simultaneously constructed for supporting HARQ-ACK codebooks with different priorities for unicast and multicast at a UE | 1. Supports two HARQ-ACK codebooks with different priorities to be simultaneously constructed different priorities for unicast and multicast at a UE. | 33-6-1 | Yes |  |  | Per UE | No | No |  |  | Optional with capability signalling |
| 33. NR\_MBS | 33-6-3 | More than one PUCCH for HARQ-ACK transmission for multicast or for unicast and multicast within a slot | 1. Supports two non-overlapping slot-based PUCCHs for ACK/NACK based HARQ-ACK feedback for multicast or for unicast and multicast with different priorities in a slot. | 33-6-1, 33-6-2 | Yes |  |  | Per UE | No | No |  |  | Optional with capability signalling |
| 33. NR\_MBS | 33-8-1 | PUCCH resource configuration for multicast feedback for dynamically scheduled multicast | Support of a PUCCH-Config for multicast HARQ-ACK feedback, separate from that of unicast configurations | 33-2a | Yes |  |  | [Per band or per FSPC] | [No] | [No] |  |  | Optional with capability signalling |
| 33. NR\_MBS | 33-8-2 | Up to 2 PUCCH resources configuration for multicast feedback for dynamically scheduled multicast | Support of a PUCCH-ConfigurationList for multicast HARQ-ACK feedback, separate from that of unicast configurations | 33-8-1, 33-6-1 | Yes |  |  | Per BC | N/A | N/A |  |  | Optional with capability signalling |
| 33. NR\_MBS | 33-8-3 | PUCCH resource configuration for multicast feedback for SPS GC-PDSCH | Support of a SPS-PUCCH-AN-List for multicast HARQ-ACK feedback of all multicast SPS configuration(s), separate from that of SPS unicast configurations | 33-5-1a | Yes |  |  | Per BC | N/A | N/A |  |  | Optional with capability signalling |
| 33. NR\_MBS | 33-9 | Supporting unicast PDCCH to release SPS group-common PDSCH | Supports unicast PDCCH scrambled with CS-RNTI to release SPS group-common PDSCH | [33-5-1] | Yes |  |  | [Per UE] | [No] | [No] |  |  | Optional with capability signalling |
| 33. NR\_MBS | 33-10 | Support group-common PDSCH RE-level rate matching for multicast | 1) Supported SP ZP-CSI-RS for group-common PDSCH RE-mapping patterns  2) Supported P ZP-CSI-RS for group-common PDSCH RE-mapping patterns  3) Support p-ZP-CSI-RS-ResourceSet configured in PDSCH-Config-Multicast same as or different from the p-ZP-CSI-RS-ResourceSet configured in PDSCH-Config  Note 1: The total number of semi-persistent ZP-CSI-RS-ResourceSet that a UE can be configured with is the same as for unicast in Rel-16 | 2-33a, 33-2 | Yes |  |  | Per UE | [Yes] | Yes |  | Reporting type of FG 33-10 is per UE with [FDD/TDD,] FR1/FR2, licensed/unlicensed, and TN/NTN differentiation, detail signalling is up to RAN2 | Optional with capability signalling |

1. NR\_DSS

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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 (Sidelink 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 |
| 34. NR\_DSS | 34-2 | Cross-carrier scheduling from SCell to PCell/PSCell (Type B) | Support of Cross-carrier scheduling (CCS) from sSCell to PCell/PSCell (Type B)   1. Cross-carrier scheduling from sSCell to PCell/PSCell with CIF 2. sSCell USS set(s) (for CCS from sSCell to PCell/PSCell) and search space sets on PCell/PSCell can be configured so that the UE monitors them in overlapping slot of PCell/PSCell and sSCell 3. Configuration of scaling factor α for BD and CCE limit handling and PDCCH overbooking handling on P(S)Cell 4. The number of unicast DCI limits for PCell/PSCell scheduling  * Processing K1 unicast DCI scheduling DL on PCell/PSCell per PCell/PSCell slot and its aligned N consecutive sSCell slot(s) * Processing K2 unicast DCI scheduling UL on PCell/PSCell per PCell/PSCell slot and its aligned N consecutive sSCell slot(s) * N is based on pair of (PCell/PSCell SCS, sSCell SCS): N=1 for(15,15), (30,30), (60,60) and N=2 for (15,30), (30,60) and N=4 for (15, 60)  1. Same numerology between sSCell and P(S)Cell or sSCell SCS is larger than P(S)Cell SCS 2. USS set(s) for DCI format 0\_1,1\_1 configured on sSCell for CCS from sSCell to PCell/PSCell and USS set(s) for DCI format 0\_2,1\_2 configured on sSCell for CCS from sSCell to PCell/PSCell if UE supports FG 11-1 (*dci-Format1-2And0-2-r16*) 3. PDCCH monitoring occasion(s) on sSCell for cross-carrier scheduling to Pcell/PSCell 4. frame boundary alignment between PCell/PSCell and sSCell | 6-5 | Yes | N/A | Cross-carrier scheduling from SCell to PCell/PSCell (Type B) is not supported | Per BC | No | Applicable to FR1 only | No | Candidate value set: One or more of supported SCS combinations ({P(S)Cell SCS in kHz, sSCell SCS in kHz}) from following set are indicated by the UE: {15,15}, {15,30}, (15, 60), {30,30}, {30,60},{60,60})  Candidate value set 2: frequency band pair(s) for {PCell/PSCell, sSCell}  Component 4 candidate values: (K1, K2) = {(1,1) for FDD P(S)Cell; (K1, K2) = (1,2) for TDD P(S)Cell}  Component 7 candidate values:  Value 1: within the first 3 OFDM symbols of sSCell slot overlapping with the first 3 OFDM symbols of PCell/PSCell slot.  Value 2: within the first 3 OFDM symbols of any sSCell slot overlapping with PCell/PSCell slot  Note: The CCS from sSCell to Pcell is applicable to FR1 only but there can be other Scells in FR2 configured for the UE  Note: The SCell configured with Cross-carrier scheduling to PCell/PSCell is referred to as ‘sSCell’  Note: Candidate value set 2 only applies for the following value sets of components 1: {30,30}, {30,60},{60,60}  Note: A UE supporting this FG does not imply that the UE can be configured with sSCell in shared spectrum | Optional with capability signalling |
| 34. NR\_DSS | 34-1 | Cross-carrier scheduling from SCell to PCell/PSCell with search space restrictions (Type A) | Support of Cross-carrier scheduling from sSCell to PCell/PSCell with search space restrictions (Type A)   1. Cross-carrier scheduling from sSCell to PCell/PSCell with CIF 2. Search space restrictions: sSCell USS set(s) (for CCS from sSCell to PCell/PSCell) and following search space sets on PCell/PSCell can only be configured such that UE does not monitor them in overlapping slot of PCell/PSCell and sSCell    * USS sets for DCI formats 0\_1,1\_1,0\_2,1\_2    * USS sets for DCI formats 0\_0,1\_0    * Type3-CSS set(s) for DCI formats 1\_0/0\_0 with C-RNTI/CS-RNTI/MCS-C-RNTI 3. Configuration of scaling factor α for BD and CCE limit handling and PDCCH overbooking handling on P(S)Cell 4. The number of unicast DCI limits for PCell/PSCell scheduling  * Processing K1 unicast DCI scheduling DL on PCell/PSCell per PCell/PSCell slot and its aligned N consecutive sSCell slot(s) * Processing K2 unicast DCI scheduling UL on PCell/PSCell per PCell/PSCell slot and its aligned N consecutive sSCell slot(s) * N is based on pair of (PCell/PSCell SCS, sSCell SCS): N=1 for(15,15), (30,30), (60,60) and N=2 for (15,30), (30,60) and N=4 for (15, 60)  1. Same numerology between sSCell and P(S)Cell or sSCell SCS is larger than P(S)Cell SCS 2. USS set(s) for DCI format 0\_1,1\_1 configured on sSCell for CCS from sSCell to Pcell/PSCell and USS set(s) for DCI format 0\_2,1\_2 configured on sSCell for CCS from sSCell to PCell/PSCell if UE supports FG 11-1 (*dci-Format1-2And0-2-r16*) 3. sSCell USS set(s) (for CCS from sSCell to Pcell/PSCell) and Type0/0A/1/2 CSS sets on Pcell/PSCell can be configured so that the UE monitors them in overlapping slot of Pcell/PSCell and sSCell    * no simultaneous monitoring between ‘USS sets (for P(S)Cell scheduling) on sSCell’ and ‘Type 0/0A/1/2/CSS sets on P(S)Cell for DCI formats with CRC scrambled by C-RNTI/MCS-C-RNTI/CS-RNTI’    * simultaneous monitoring of ‘USS sets (for P(S)Cell scheduling) on sSCell’ and ‘Type 0/0A/1/2/CSS sets on P(S)Cell for DCI formats with CRC not scrambled by C-RNTI/MCS-C-RNTI/CS-RNTI’ 4. PDCCH monitoring occasion(s) on sSCell for cross-carrier scheduling to PCell/PSCell 5. frame boundary alignment between PCell/PSCell and sSCell | 6-5 | Yes | N/A | Cross-carrier scheduling from SCell to PCell/PSCell with search space restrictions (Type A) is not supported | Per BC | No | Applicable to FR1 only | No | Candidate value set: One or more of supported SCS combinations ({P(S)Cell SCS in kHz, sSCell SCS in kHz}) from following set are indicated by the UE: {15,15}, {15,30}, {15, 60}, {30,30}, {30,60},{60,60})  Candidate value set 2: frequency band pair(s) for {PCell/PSCell, sSCell}  Component 4 candidate values: (K1, K2) = {(1,1) for FDD P(S)Cell; (K1, K2) = (1,2) for TDD P(S)Cell}  Component 8 candidate values:  Value 1: within the first 3 OFDM symbols of sSCell slot overlapping with the first 3 OFDM symbols of PCell/PSCell slot.  Value 2: within the first 3 OFDM symbols of any sSCell slot overlapping with PCell/PSCell slot  Note: The CCS from sSCell to PCell is applicable to FR1 only but there can be other SCells in FR2 configured for the UE  Note: The SCell configured with Cross-carrier scheduling to PCell/PSCell is referred to as ‘sSCell’  Note: Candidate value set 2 only applies for the following value sets of components 1: {30,30}, {30,60},{60,60}  Note: A UE supporting this FG does not imply that the UE can be configured with sSCell in shared spectrum | Optional with capability signalling |
| 34. NR\_DSS | 34-1a | DCI formats on PCell/PSCell USS set(s) | Support of monitoring DCI formats 0\_1,1\_1,0\_2 (if supported),1\_2 (if supported) on PCell/PSCell USS set(s) | 34-1 | Yes | N/A | DCI formats on PCell/PSCell USS set(s) is not supported | Per BC | No | Applicable to FR1 only | No |  | Optional with capability signalling |
| 34. NR\_DSS | 34-3 | Disabling scaling factor α when sSCell is deactivated | Support of disabling scaling factor α for Cross-carrier scheduling (CCS) from sSCell to PCell/PSCell (Type A or Type B) when sSCell is deactivated (scaling factor α is not applied for PDCCH overbooking/BD/CCE limit computation when sSCell is deactivated) | 34-1 or 34-2 | Yes | N/A | Disabling scaling factor α when sSCell is deactivated is not supported | Per BC | No | Applicable to FR1 only | No |  | Optional with capability signalling |
| 34. NR\_DSS | 34-4 | Disabling scaling factor α when sSCell is dormant | Support of disabling scaling factor α for Cross-carrier scheduling (CCS) from sSCell to PCell/PSCell (Type A or Type B) when sSCell is switched to dormant BWP (scaling factor α is not applied for PDCCH overbooking/BD/CCE limit computation when sSCell is switched to dormant BWP) | 34-1 or 34-2 | Yes | N/A | Disabling scaling factor α when sSCell is dormant is not supported | Per BC | No | Applicable to FR1 only | No |  | Optional with capability signalling |
| 34. NR\_DSS | 34-5 | Non-aligned frame boundaries between PCell/PSCell and sSCell | CA with non-aligned frame boundaries for PCell/PSCell and sSCell in inter-band CA | 34-1 or 34-2 | Yes | N/A | Non-aligned frame boundaries between Pcell/PSCell and sSCell is not supported | Per BC | No | Applicable to FR1 only | No | Candidate value set 1: One or more of supported SCS combinations ({P(S)Cell SCS in kHz, sSCell SCS in kHz}) from following set are indicated by the UE: {15,15}, {15,30}, (15, 60), {30,30}, {30,60}, {60,60})  Candidate value set 2: frequency band pair(s) for {Pcell/PSCell, sSCell} | Optional with capability signalling |

1. LTE\_NR\_DC\_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 (Sidelink 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 |
| 35. LTE\_NR\_DC\_enh2 | 35-1 | Aperiodic CSI-RS for tracking for fast SCell activation | 1. Aperiodic CSI-RS for tracking for fast SCell activation is triggered by enhanced SCell activation/deactivation MAC CE 2. Aperiodic CSI-RS for tracking for fast SCell activation is triggered within the BWP indicated by firstActiveDownlinkBWP-Id for the SCell 3. Maximum number of aperiodic CSI-RS resource set configurations for tracking for fast SCell activation that can be configured to UE per CC in a reported band 4. Maximum number of aperiodic CSI-RS resource set configurations for tracking for fast SCell activation that can be configured to UE across CCs in a reported band | 6-5 | Yes | N/A | Aperiodic CSI-RS for tracking for fast SCell activation is not supported | Per band | N/A | N/A | N/A | Component 3 candidate values: {8,16,32,48,64,128,255}  Component 4 candidate values: {8,16,32,64,128,256,512,1024}  Note: component 3 and 4 candidate values refer to the number of RS configurations for fast SCell activation that can be indicated by the MAC CE  The NZP-CSI-RS configured as RS for tracking for fast SCell activation are not considered when counting the maximum NZP-CSI-RS configurations of FG2-33 | Optional with capability signalling |
| 35. LTE\_NR\_DC\_enh2 | 35-2 | Aperiodic CSI-RS bandwidth for tracking for fast SCell activation for 10MHz UE channel bandwidth | 1. Indicates the UE supported TRS bandwidths for fast SCell activation, in addition to 52 RBs, for a 10MHz UE channel bandwidth. This only applies for the BWPs configured with 52 RBs size and 15kHz SCS, in FDD bands. | 35-1 | Yes | N/A | Aperiodic CSI-RS bandwidth for tracking for fast SCell activation for 10MHz UE channel bandwidth is not supported | Per band | FDD only | FR1 only | N/A | Candidate values of Set 1: 28, 32, 36, 40, 44, 48 RBs  Candidate values of Set 2: 32, 36, 40, 44, 48 RBs | Optional with capability signalling |

1. NR\_DL1024QAM\_FR1

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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 (Sidelink 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\_DL1024QAM\_FR1 | 36-1 | 1024QAM for PDSCH for FR1 | Support 1024QAM for PDSCH for FR1 including 1024QAM modulation scheme as defined in TS 38.211, MCS and CQI feedback tables based on 1024QAM modulation order as defined in TS 38.214. | pdsch-256QAM-FR1 | Yes | N/A | No support of 1024 QAM for PDSCH | Per Band | N/A | Applicable only to FR1 | N/A | Note from WI objective: DL PDSCH 1024QAM for FR1 should be defined as a per-band UE capability | Optional with capability signalling |
| 36. NR\_DL1024QAM\_FR1 | 36-1a | 1024QAM for PDSCH for FR1 with maximum 2 MIMO layers restriction | Support 1024QAM for PDSCH with maximum 2 MIMO layers for FR1 including 1024QAM modulation scheme as defined in TS 38.211, MCS and CQI feedback tables based on 1024QAM modulation order as defined in TS 38.214. | pdsch-256QAM-FR1 | Yes | N/A | No support of 1024 QAM for PDSCH with maximum 2 MIMO layers restriction | Per Band | N/A | Applicable only to FR1 | N/A | Note from WI objective: DL PDSCH 1024QAM for FR1 should be defined as a per-band UE capability | Optional with capability signalling |
| 36. NR\_DL1024QAM\_FR1 | 36-2 | scalingFactor for 1024QAM | Indicates the scaling factor to be applied to the band in the max data rate calculation for 1024-QAM as defined in 4.1.2 when support of 1024-QAM is signalled for the band | 36-1 or 36-1a | Yes | N/A |  | Per FS | N/A | Applicable only to FR1 | N/A | Candidate component values:  {0.4, 0.75, 0.8, 1.0}  If absent, the scaling factor 1 is applied to the band in the max data rate calculation for 1024-QAM. | Optional with capability signaling |

1. [NR\_RF\_FR1\_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 (Sidelink 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\_RF\_FR1\_enh] | 37-x |  |  |  |  |  |  |  |  |  |  |  |  |

Note: Placeholder as there are no RAN1 UE features for Rel-17 Tx switching agreed until RAN1#109-e.

1. [NR\_SmallData\_INACTIVE]

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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 (Sidelink 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\_SmallData\_INACTIVE] | 38-x |  |  |  |  |  |  |  |  |  |  |  |  |

Note: Placeholder as there are no RAN1 UE features for SDT agreed until RAN1#109-e.

1. TEI17

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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 (Sidelink 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. TEI17 | 39-1 | Parallel SRS and PUCCH/PUSCH transmission across CCs in intra-band non-contiguous CA | Parallel SRS and PUCCH/PUSCH transmission across CCs in intra-band non-contiguous CA |  | Yes | n/a | UE cannot transmit parallel SRS and PUCCH/PUSCH transmission across CCs in intra-band non-contiguous CA | Per BC | No | Yes | n/a | This feature is the same as parallelTxSRS-PUCCH-PUSCH, but for intra-band non-contiguous CA | Optional with capability signaling |
| 39. TEI17 | 39-2 | Parallel PRACH and SRS/PUCCH/PUSCH transmissions across CCs in intra-band non-contiguous CA | Parallel PRACH and SRS/PUCCH/PUSCH transmissions across CCs in intra-band non-contiguous CA |  | Yes | n/a | UE cannot transmit parallel PRACH and SRS/PUCCH/PUSCH transmissions across CCs in intra-band non-contiguous CA | Per BC | No | Yes | n/a | This feature is the same as parallelTxPRACH-SRS-PUCCH-PUSCH, but for intra-band non-contiguous CA. This feature is enabled by a new UE-specific RRC parameter *intraBandNC-PRACH-simulTx-r17* | Optional with capability signaling |
| 39. TEI17 | 39-3-1 | Stay on the target CC for SRS carrier switching | Stay on the target CC when remaining SRS resource set(s) for SRS carrier switching exists | 2-56 | Yes | n/a |  | Per BC | n/a | n/a | n/a | Note1: When UE supports this capability, if the time period between the SRS resource sets is smaller than the total required RF switching time to the source CC and back to the target CC and a higher priority UL transmission and/or DL reception is not scheduled on the source CC in the time period between the two SRS resources sets, the UE stays in the target CC in the period between the SRS resource sets; otherwise, the UE switches back to the source CC after transmitting each SRS resource set  Note2: If the UE does not indicate this capability, the UE falls back to Rel-15 behavior, that is UE switches back to source CC between the SRS resource sets | Optional with capability signaling |
| 39. TEI17 | 39-3-2 | Affected bands for inter-band CA during SRS carrier switching | 1. Indicate which other bands in the band combination are affected by the SRS switch.  2. The dropping rules / timelines apply to the indicated bands when SRS carrier switching on target CC and other UL on source CC are overlapped in the same symbol. | 2-56 | Yes | n/a |  | Per BC | n/a | n/a | n/a | Note: If this new indication is missing, the UE defaults to Rel-15 behavior.  For each “source-target” pair (as indicated by srs-SwitchingTimesListNR), the UE can indicate which other bands in the band combination are affected by the SRS switch. | Optional with capability signaling |
| 39. TEI17 | 39-4 | Parallel MsgA and SRS/PUCCH/PUSCH transmissions across CCs in intra-band non-contiguous CA | Parallel MsgA and SRS/PUCCH/PUSCH transmissions across CCs in intra-band non-contiguous CA | 9-3 | Yes | n/a | UE cannot transmit parallel MsgA and SRS/PUCCH/PUSCH transmissions across CCs in intra-band non-contiguous CA | Per BC | No | Yes | n/a | This feature is the same as *parallelTxMsgA-SRS-PUCCH-PUSCH-r16*, but for intra-band non-contiguous CA. | Optional with capability signaling |