**3GPP TSG RAN WG1 #117 R1-2405564**

**Fukuoka City, Fukuoka, Japan, May 20th—24th, 2024**

**Agenda item:** 8.2

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

**Title:** Updated RAN1 UE features list for Rel-18 NR after RAN1#117

**Document for:** Endorsement

1. Introduction

This contribution includes the updates to the RAN1 UE features list for Rel-18 NR after the RAN1 #116bis meeting.

1. NR\_MIMO\_evo\_DL\_UL

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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 |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-1-1 | Unified TCI with joint DL/UL TCI update for single-DCI based intra-cell multi-TRP with single activated TCI codepoint per CC | 1. Maximum number of configured joint TCI states per CC per BWP  2. Maximum number of activated joint TCI states across all CCs in a band | 23-1-1 | yes | n/a | Unified TCI with joint DL/UL TCI update for single-DCI based intra-cell multi-TRP with single activated TCI codepoint per CC is not supported | Per band | n/a | n/a | n/a | Component 1 candidate values: {8, 12, 16, 24, 32, 48, 64, 128}  Component 2 candidate values: {2, 4, 6, 8, 16, 32}  Note: FG 16-2b-0 can be used to indicate support of two default beams | Optional with capability signalling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-1-1a | Unified TCI with joint DL/UL TCI update for single-DCI based intra-cell multi-TRP with multiple activated TCI codepoints per CC | 1. TCI state indication for update and activation  a) MAC-CE+DCI-based TCI state indication (use of monitored DCI formats 1\_1 and if supported 1\_2) with DL assignment  b) MAC-CE+DCI-based TCI state indication (use of monitored DCI formats 1\_1 and if supported 1\_2) without DL assignment  2. M Maximum number of activated joint TCI states per CC | 40-1-1, 23-1-1b | yes | n/a | Unified TCI with joint DL/UL TCI update for single-DCI based intra-cell multi-TRP with multiple activated TCI codepoints per CC is not supported | Per band | n/a | n/a | n/a | Component 2 candidate values: {2,3, 4, 5, 6, 7, 8}  Note: FG 16-2b-0 can be used to indicate support of two default beams | Optional with capability signalling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-1-8 | TRP-specific BFR with unified TCI framework with Unified TCI | Support for TRP-specific BFR with unified TCI framework with Unified TCI | 23-5-2 | yes | n/a | TRP-specific BFR with unified TCI framework with Unified TCI is not supported | Per band | n/a | n/a | n/a |  | Optional with capability signalling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-1-1c | DCI format 1\_1 and if supported 1\_2 configured with TCI selection field | Support of DCI format 1\_1 and if supported 1\_2 configured with TCI selection field | At least one of {40-1-1/1a/2/2a} | yes | n/a | DCI format 1\_1 and if supported 1\_2 configured with TCI selection field are not supported | Per band | n/a | n/a | n/a |  | Optional with capability signalling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-1-2 | Unified TCI with separate DL/UL TCI update for single-DCI based intra-cell multi-TRP with single activated TCI codepoint per CC | 1. Maximum number of configured DL TCI states per CC per BWP  2. Maximum number of configured UL TCI states per CC per BWP  3. Maximum number of activated DL TCI states across all CCs in a band  4. Maximum number of activated UL TCI states across all CCs in a band | 40-1-1, 23-10-1 | yes | n/a | Unified TCI with separate DL/UL TCI update for single-DCI based intra-cell multi-TRP with single activated TCI codepoint per CC is not supported | Per band | n/a | n/a | n/a | Component 1 candidate values: {4,8,12,16,24,32,48,64,128}  Component 2 candidate values: {4,8,12,16,24,32,48,64}  Component 3 candidate values: {2,4,8,16}  Component 4 candidate values: {2,4,8,16}  Note: FG 16-2b-0 can be used to indicate support of two default beams | Optional with capability signalling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-1-2a | Unified TCI with separate DL/UL TCI update for single-DCI based intra-cell multi-TRP with multiple activated TCI codepoints per CC | 1. TCI state indication for update and activation  a) MAC-CE+DCI-based TCI state indication (use of monitored DCI formats 1\_1 and if supported 1\_2) with DL assignment  b) MAC-CE+DCI-based TCI state indication (use of monitored DCI formats 1\_1 and if supported 1\_2) without DL assignment  2. Maximum number of activated DL TCI states across all CCs in a band  3. Maximum number of activated UL TCI states across all CCs in a band | 40-1-2 | yes | n/a | Unified TCI with separate DL/UL TCI update for single-DCI based intra-cell multi-TRP with multiple activated TCI codepoints per CC is not supported | Per band | n/a | n/a | n/a | Component 2 candidate values: {2,4,8,16}  Component 3 candidate values: {2,4,8,16}  Note: FG 16-2b-0 can be used to indicate support of two default beams | Optional with capability signalling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-1-3 | Per aperiodic CSI-RS resource/resource set configuration for TCI selection in S-DCI based MTRP | Support of per aperiodic CSI-RS resource/resource set configuration for TCI selection in S-DCI based MTRP | 40-1-1 | yes | n/a | Per aperiodic CSI-RS resource/resource set configuration for TCI selection in S-DCI based MTRP is not supported | Per band | n/a | n/a | n/a | Component candidate values: {per resource, per resource set, both}  Note: when the UE supports NCJT CSI under 23-7-1 or CJT CSI under 40-1-4, UE is expected to support “per resource” when the corresponding NCJT CSI or CJT CSI is configured | Optional with capability signalling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-1-3a | Per aperiodic CSI-RS resource/resource set configuration for TCI selection in M-DCI based MTRP | Support of per aperiodic CSI-RS resource/resource set configuration for TCI selection in M-DCI based MTRP | 40-1-7 | yes | n/a | Per aperiodic CSI-RS resource/resource set configuration for TCI selection in M-DCI based MTRP is not supported | Per band | n/a | n/a | n/a | Component candidate values: {per resource, per resource set, both} | Optional with capability signalling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-1-4 | Two TCI states for CJT Tx scheme for PDSCH | Support of two TCI states for CJT Tx scheme for PDSCH | 40-1-1 | yes | n/a | Two TCI states for CJT Tx scheme for PDSCH are not supported | Per band | n/a | n/a | n/a | Component candidate values: {CJT Scheme-A, CJT scheme-B, both}  CJT Scheme-A: PDSCH DMRS port(s) is QCLed with the DL RSs of both indicated joint/DL TCI states with respect to QCL-TypeA  CJT Scheme-B: PDSCH DMRS port(s) is QCLed with the DL RSs of both indicated joint/DL TCI states with respect to QCL-TypeA except for QCL parameters {Doppler shift, Doppler spread} of the second indicated joint/DL TCI state | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-1-7 | Unified TCI with joint DL/UL TCI update for multi-DCI based multi-TRP with single activated TCI codepoint per CORESETPoolIndex per CC | 1. Support of mTRP operation for M-DCI with joint TCI state  3. Maximum number of configured joint TCI states per BWP per CC  4. Maximum number of activated joint TCI states across all CCs in a band per ‘coresetPoolIndex’ value  5. One MAC-CE activates one joint TCI-states per CC in a band for a TRP associated with a ‘coresetPoolIndex’ value | 23-1-1 | yes | n/a | Unified TCI with joint DL/UL TCI update for multi-DCI based multi-TRP with single activated TCI codepoint per CORESETPoolIndex per CC is not supported | Per band | n/a | n/a | n/a | Component 1 candidate values {intra-cell, intra-cell and inter-cell}  Component 3 candidate values: {8, 12, 16, 24, 32, 48, 64, 128}  Component 4 candidate values: {1, 2, 4, 8, 16}  Note: activated joint TCI state(s) include all PDCCH/PDSCH receptions and PUSCH/PUCCH transmissions  Note: FG 16-2a-6 can be used to indicate support of two default beams | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-1-7a | Unified TCI with joint DL/UL TCI update for multi-DCI based multi-TRP with multiple activated TCI codepoints per CORESETPoolIndex per CC | 1. TCI state indication for update and activation  a) MAC-CE+DCI-based TCI state indication (use of monitored DCI formats 1\_1 and if supported 1\_2) with DL assignment b) MAC-CE+DCI-based TCI state indication (use of monitored DCI formats 1\_1 and if supported 1\_2) without DL assignment  2. Maximum number of MAC-CE activated joint TCI states per CC per coresetpoolindex | 40-1-7, 23-1-1b | yes | n/a | Unified TCI with joint DL/UL TCI update for multi-DCI based multi-TRP with multiple activated TCI codepoints per CORESETPoolIndex per CC is not supported | Per band | n/a | n/a | n/a | Component 2 candidate values: {2,3,4,5,6,7,8) | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-1-9 | Unified TCI with separate DL/UL TCI update for multi-DCI based multi-TRP with single activated TCI codepoint per CORESETPoolIndex per CC | 0. Support of mTRP operation for M-DCI with separate DL/UL TCI state  1. Maximum number of configured DL TCI states per BWP per CC  2. Maximum number of configured UL TCI states per BWP per CC  3. Maximum number of activated DL TCI states across all CC in a band  4. Maximum number of activated UL TCI states across all CC in a band  5. One MAC-CE activated DL TCI-state per CC in a band for a TRP associated with a ‘coresetPoolIndex’ value.  6. One MAC-CE activated UL TCI-state per CC in a band for a TRP associated with a ‘coresetPoolIndex’ value. | 40-1-7, 23-10-1 | yes | n/a | Unified TCI with separate DL/UL TCI update for multi-DCI based multi-TRP with single activated TCI codepoint per CORESETPoolIndex per CC is not supported | Per band | n/a | n/a | n/a | Component 0 candidate values {intra-cell, intra-cell and inter-cell}  Component 1 candidate value {8, 12, 16, 24, 32, 48, 64, 128}  Component 2 candidate value {8, 12, 16, 24, 32, 48, 64}  Component 3 candidate values: {1, 2, 4, 8, 16}  Component 4 candidate values: {1, 2, 4, 8, 16} | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-1-9a | Unified TCI with separate DL/UL TCI update for multi-DCI based multi-TRP with multiple activated TCI codepoints per CORESETPoolIndex per CC | 1. TCI state indication for update and activation  a) MAC-CE+DCI-based TCI state indication (use of DCI formats 1\_1 and if supported 1\_2 with DL assignment)  b) MAC-CE+DCI-based TCI state indication (use of DCI formats 1\_1 and if supported 1\_2 without DL assignment)  2. maximum number of activated DL TCI states per CORESETPoolIndex per BWP per CC  3. maximum number of activated UL TCI states per CORESETPoolIndex per BWP per CC | 23-10-1b, 40-1-9 | yes | n/a | Unified TCI with separate DL/UL TCI update for multi-DCI based multi-TRP with multiple activated TCI codepoints per CORESETPoolIndex per CC is not supported | Per band | n/a | n/a | n/a | Component 2 candidate values: {1, 2, 3, 4, 5, 6, 7, 8}  Component 3 candidate values: {1, 2, 3, 4, 5, 6, 7, 8,} | Optional with capability signalling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-1-12 | Common multi-CC TCI state ID update and activation for single-DCI based multi-TRP | 1. Support of common multi-CC TCI state ID update and activation for single-DCI based multi-TRP  2. Maximum number of CC list(s) | 40-1-1 | yes | n/a | Common multi-CC TCI state ID update and activation for single-DCI based multi-TRP is not supported | Per band | n/a | n/a | n/a | Component 2 candidate values: {1,2,3,4} | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-1-13 | Common multi-CC TCI state ID update and activation for multi-DCI based multi-TRP | 1. Support of common multi-CC TCI state ID update and activation for multi-DCI based multi-TRP  2. Maximum number of CC list(s) | 40-1-7 | yes | n/a | Common multi-CC TCI state ID update and activation for multi-DCI based multi-TRP is not supported | Per band | n/a | n/a | n/a | Component 2 candidate values: {1,2,3,4} | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-1-14 | Two PHR reporting for STx2P | Support of PHR reporting related to STx2P | At least one of 40-6-1, 40-6-1a, 40-6-2, 40-6-2a, 40-6-3a, 40-6-3b | yes | n/a | UE will report a PHR for an actual PUSCH transmission and PHR for the first indicated TCI state or PHR associated with coresetPoolIndex0 is reported if actual PUSCH transmission is based on STx2P schemes | Per Band | No | FR2 only | n/a | Note: If gNB does not configure corresponding RRC parameter for this FG, UE will report a PHR for an actual PUSCH transmission and PHR for the first indicated TCI state or PHR associated with coresetPoolIndex0 is reported if actual PUSCH transmission is based on STx2P schemes | Optional with capability signalling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-1-14a | Dynamic switching - scheme A | Support of dynamic switching between single-TRP and PDSCH SFN scheme A by TCI selection field in DCI formats 1\_1, 1\_2 | 40-1-1c, 23-6-1a | Yes | n/a | dynamic switching between single-TRP and PDSCH SFN scheme A by TCI selection field in DCI formats 1\_1, 1\_2 is not supported | Per FS | n/a | n/a | n/a |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-1-14b | Dynamic switching - scheme B | Support of dynamic switching between single-TRP and PDSCH SFN scheme B by TCI selection field in DCI formats 1\_1, 1\_2 | 40-1-1c, 23-6-2a | Yes | n/a | dynamic switching between single-TRP and PDSCH SFN scheme B by TCI selection field in DCI formats 1\_1, 1\_2 is not supported | Per FS | n/a | n/a | n/a |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-2-1 | Basic feature for multi-DCI based intra-cell Multi-TRP operation with two TA enhancement | Support of two TA enhancement for multi-DCI based intra-cell Multi-TRP operation | 16-2a | yes | n/a | Two TA enhancement for multi-DCI based intra-cell Multi-TRP operation is not supported | Per FSPC | n/a | n/a | n/a |  | Optional with capability signalling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-2-2 | Basic feature for multi-DCI based inter-cell Multi-TRP operation with two TA enhancement | 1. Support of two TA enhancement for multi-DCI based inter-cell Multi-TRP operation  2. Maximum number of n-TimingAdvanceOffset value per serving cell | 23-4, 40-1-7 | yes | n/a | Two TA enhancement for multi-DCI based inter-cell Multi-TRP operation is not supported | Per FSPC | n/a | n/a | n/a | Component 2 candidate values: {1,2} | Optional with capability signalling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-2-3 | TAG ID indication via absolute TA command MAC CE | Support indicating one of two TAG IDs configured in the SpCell via absolute TA command MAC CE. | 40-2-1 or 40-2-2 | yes | n/a | TAG ID indication via absolute TA command MAC CE is not supported | Per band | n/a | n/a | n/a |  | Optional with capability signalling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-2-4 | PDCCH order sent by one TRP triggers RACH procedure (specifically PRACH) towards a different TRP based on CFRA for inter-cell | Support of cross-TRP PDCCH order based on CFRA for inter-cell multi-DCI based mTRP | 40-2-2 | yes | N/A | Inter-cell cross-TRP PDCCH ordered PRACH transmission is not supported | Per band | No | No | N/A |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-2-4a | PDCCH order sent by one TRP triggers RACH procedure (specifically PRACH) towards a different TRP based on CFRA for intra-cell | Support of cross-TRP PDCCH order based on CFRA for intra-cell multi-DCI based mTRP |  | yes | N/A | Intra-cell cross-TRP PDCCH ordered PRACH transmission is not supported | Per band | No | No | N/A |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-2-6 | Rx timing difference larger than CP length | 1. Support of the Rx timing difference between the two DL reference timings is larger than CP length |  | yes | N/A | Rx timing difference larger than CP is not supported | Per FSPC | n/a | n/a | n/a |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-2-7 | Two TAs for multi-DCI STxMP PUSCH+PUSCH | Support of two TAs for multi-DCI STxMP PUSCH+PUSCH | 40-2-1 or 40-2-2, 40-6-3a or 40-6-3b | yes | n/a | Two TAs for multi-DCI STxMP PUSCH+PUSCH is not supported | Per FSPC | n/a | n/a | n/a | Note: A UE that support this FG can transmit PUSCH in two consecutive slots using different TA without reducing the later slot | Optional with capability signalling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-2-8 | Maximum number of TAGs across all CCs | Maximum number of TAGs across all CCs in a band combination | 40-2-1 or 40-2-2 | yes | n/a | Maximum number of TAGs across all CCs is unknown when UE supports two TAGs per CC | Per BC | n/a | n/a | n/a | Component candidate values: {2,3,4}  Note: UE only supports the configuration where all UL CCs of the same frequency band are configured with up to 2 Timing Advance Group ID  Note: The same description of “supportedNumberTAG” in 38.306 applies to this FG as well | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-2-9 | Overlapping UL transmission reduction | Support of reducing the overlapping duration of the later of the two time-domain overlapping UL transmissions when the UE is not configured with UL STx2P for multi-DCI based multi-TRP operation with two TA enhancement | 40-2-1 or 40-2-2 | Yes | N/A | Reducing the overlapping duration of the later of the two time-domain overlapping UL transmissions is not supported | Per band | N/A | N/A | N/A | Note: If UE does not support this feature, UE does not expect the two UL transmissions to overlap (i.e., scheduling restriction is applied to avoid overlap between the two UL transmissions) | Optional with capability signalling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-3-1-1 | Basic feature for Rel-16-based CJT type-II codebook | Support of N=N\_TRP only  Support of N\_L=1 only  1. Support of mode 2 for Rel-16 eType-II codebook refinement for multi-TRP CJT  2. Support for PMI subband R=1.  3. Support of parameter combinations with L=2,4  4. Support of rank 1,2  5. A list of supported combinations, up to 16, across all CCs in a band when reported per band, and across all CCs in a band combination when reported per BC simultaneously, where each combination is  a) Maximum number of Tx ports in one NZP CSI-RS resource associated with multi-TRP CJT  b) Maximum total number of NZP CSI-RS resource associated with multi-TRP CJT  c) Maximum total number of Tx ports of NZP CSI-RS resources associated with multi-TRP CJT  6. Supported frequency basis selection mode 2, i.e., common frequency basis selection among different TRPs  7. Scaling factor X for CPU occupation counting for Rel-16-based CJT type-II codebook  8. Maximum number of NZP CSI-RS resources in one NZP CSI-RS resource set associated with multi-TRP CJT | 2-35 | Yes | N/A | Mode 2 for Rel-16-based CJT type-II codebook is not supported | Per band and Per BC | No | N/A | N/A | Component 5 candidate values:  a) {4, 8, 12, 16, 24, 32}  b) {2,3,4 … 64}  c) {4, …, 256}  Component 7 candidate values: {1, 1.5, 2}  Component 8 candidate values: {2,3,4}  Note:  When NTRP=1 TRP is configured, OCPU =1.  When NTRP>1 TRPS are configured, OCPU = ceil(X \* NTRP)  Note: A-CSI is supported, and whether UE supports SP-CSI on PUSCH is dependent on FG2-32b  Note: A UE that supports CSI enhancement for Rel. 16 based type-II CJT must support this FG | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-3-1-1a | Support of mode 1 for Rel-16-based CJT type-II codebook with FD basis selection integer frequency offset | 1. Support of Rel-16 eType-II codebook refinement for multi-TRP CJT with PMI subband R=1.  2. Support of parameter combinations with L=2,4  3. Support of rank 1,2  4. A list of supported combinations, up to 16, across all CCs in a band when reported per band, and across all CCs in a band combination when reported per BC simultaneously, where each combination is  a) Maximum number of Tx ports in one NZP CSI-RS resource associated with multi-TRP CJT  b) Maximum total number of NZP CSI-RS resource associated with multi-TRP CJT  c) Maximum total number of Tx ports of NZP CSI-RS resources associated with multi-TRP CJT  5. Supported frequency basis selection mode 1, i.e., common frequency basis selection among different TRPs with FD basis selection integer frequency offset | 40-3-1-1 | Yes | N/A | Mode 1 for Rel-16-based CJT type-II codebook with FD basis selection integer frequency offset is not supported | Per band and Per BC | N/A | N/A | N/A | Component 4 candidate values:  a) {4, 8, 12, 16, 24, 32}  b) {2,3,4 … 64}  c) {4, …, 256} | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-3-1-2 | Support for FD basis selection fractional offset mode for Rel-16-based CJT codebook with mode1 | Supported frequency basis selection mode 1 with FD basis selection fractional frequency offset for Rel-16 eType-II based CJT codebook | 40-3-1-1a | Yes | N/A | FD basis selection fractional offset mode for Rel-16-based CJT codebook with mode 1 is not supported | Per band and Per BC | N/A | N/A | N/A |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-3-1-3 | Support R=2 for Rel-16-based CJT codebook | 1. Support of Rel-16 eType-II codebook refinement for multi-TRP CJT with PMI subbands R=2  2. {Max # of Tx ports in one resource set, Max # of resource sets, total # of Tx ports}, across all CCs in a band when reported per band, and across all CCs in a band combination when reported per BC simultaneously, with R=2 | 40-3-1-1 | Yes | N/A | R=2 for Rel-16-based CJT codebook is not supported | Per band  Per BC | N/A | N/A | N/A | Component 2 candidate values:  a) {4,8,12,16,24,32}  b) {2 to 64}  c) {4 to 256} | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-3-1-4 | Support pv={1/2,1/2,1/2,1/2} and beta=1/2 for Rel-16-based CJT codebook | 1. Support of Rel-16 eType-II codebook refinement for multi-TRP CJT with parameter combination pv={1/2,1/2,1/2,1/2} and beta=1/2 | 40-3-1-1 | Yes | N/A | pv={1/2,1/2,1/2,1/2} and beta=1/2 for Rel-16-based CJT codebook are not supported | Per band and per BC | N/A | N/A | N/A |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-3-1-5 | Basic feature for Rel-17-based CJT type-II codebook | Support of N=N\_TRP only  Support of N\_L=1 only  1. Support of Rel-17 FeType-II port selection codebook refinement for multi-TRP CJT  2. Support of PMI subband R=1.  3. Support of parameter combinations with M=1  4. Support of rank 1,2  5. A list of supported combinations, up to 16, across all CCs in a band when reported per band, and across all CCs in a band combination when reported per BC simultaneously, where each combination is  a) Maximum number of Tx ports in one NZP CSI-RS resource associated with multi-TRP CJT  b) Maximum total number of NZP CSI-RS resource associated with multi-TRP CJT  c) Maximum total number of Tx ports of NZP CSI-RS resources associated with multi-TRP CJT  6. Supported frequency basis selection mode 2, i.e., common frequency basis selection among different TRPs  7. Scaling factor X for CPU occupation counting for Rel-17-based CJT type-II codebook  8. Maximum number of NZP CSI-RS resources in one NZP CSI-RS resource set associated with multi-TRP CJT | 2-35 | Yes | N/A | Mode 2 for Rel-17-based CJT type-II codebook is not supported | Per band and Per BC | No | N/A | N/A | Component 4 candidate values:  a) {4, 8, 12, 16, 24, 32}  b) {2,3,4 … 64}  c) {4, …, 256}  Component 7 candidate values: {1, 1.5, 2}  Component 8 candidate values: {2,3,4}  Note:  When NTRP=1 TRP is configured, OCPU =1.  When NTRP>1 TRPS are configured, OCPU = ceil(X \* NTRP)  Note: A-CSI is supported, and whether UE supports SP-CSI on PUSCH is dependent on FG2-32b  Note: A UE that supports CSI enhancement for Rel 17 based type-II CJT must support this FG | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-3-1-5a | Support of mode 1 for Rel-17-based CJT type-II codebook with FD basis selection integer frequency offset | 1. Support of Rel-17 FeType-II port selection codebook refinement for multi-TRP CJT with PMI subband R=1.  2. Support of parameter combinations with M=1  3. Support of rank 1,2  4. A list of supported combinations, up to 16, across all CCs in a band when reported per band, and across all CCs in a band combination when reported per BC simultaneously, where each combination is  a) Maximum number of Tx ports in one NZP CSI-RS resource associated with multi-TRP CJT  b) Maximum total number of NZP CSI-RS resource associated with multi-TRP CJT  c) Maximum total number of Tx ports of NZP CSI-RS resources associated with multi-TRP CJT  5. Supported frequency basis selection mode 1, i.e., common frequency basis selection among different TRPs with FD basis selection integer frequency offset | 40-3-1-5 | Yes | N/A | Mode 1 for Rel-17-based CJT type-II codebook with FD basis selection integer frequency offset is not supported | Per band and per BC | N/A | N/A | N/A | Component 4 candidate values:  a) {4, 8, 12, 16, 24, 32}  b) {2,3,4 … 64}  c) {4, …, 256} | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-3-1-6 | Support for FD basis selection fractional offset mode for Rel-17-based CJT codebook with mode1 | 1. Supported frequency basis selection mode 1 with FD basis selection fractional frequency offset for Rel-17 FeType-II port selection based CJT codebook | 40-3-1-5a | Yes | N/A | FD basis selection fractional offset mode for Rel-17-based CJT codebook with mode1 is not supported | Per band and per BC | N/A | N/A | N/A |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-3-1-7 | Support of M=2 and R=1 for Rel-17-based CJT codebook | 1. Support of Rel-17 FeType-II port selection codebook refinement for multi-TRP CJT with M=2 and PMI subband R=1  2. {Max # of Tx ports in one resource set, Max # of resources and total # of Tx ports}, across all CCs in a band when reported per band, and across all CCs in a band combination when reported per BC simultaneously, with M=2 and R=1 | 40-3-1-5 or 40-3-1-5a | Yes | N/A | M=2 and R=1 for Rel-17-based CJT codebook are not supported | Per band and per BC | N/A | N/A | N/A | Component 2 candidate values:  a) {4, 8, 12, 16, 24, 32}  b) {2,3,4 … 64}  c) {4, …, 256} | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-3-1-8 | Support R=2 for Rel-17-based CJT codebook | 1. Support of Rel-17 FeType-II port selection codebook refinement for multi-TRP CJT with PMI subband R=2.  2. {Max # of Tx ports in one resource set, Max # of resources and total # of Tx ports}, across all CCs in a band when reported per band, and across all CCs in a band combination when reported per BC simultaneously, with R=2 | 40-3-1-5 or 40-3-1-5a | Yes | N/A | R=2 for Rel-17-based CJT codebook is not supported | Per band and Per BC | N/A | N/A | N/A | Component 2 candidate values:  a) {4, 8, 12, 16, 24, 32}  b) {2,3,4 … 64}  c) {4, …, 256} | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-3-1-9 | Support for 2NN1N2 >32 for Rel-16 based CJT codebook | Maximum number of ports across all TRPs for one CJT CSI measurement | 40-3-1-1 | Yes | N/A | 2NN1N2 >32 is not supported for Rel-16 based CJT codebook | Per band and Per BC | N/A | N/A | N/A | Component 1 candidate values: {64, 96, 128} | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-3-1-9a | Support for 2NN1N2 >32 for Rel-17 based CJT codebook | Maximum number of ports across all TRPs for one CJT CSI measurement | 40-3-1-5 | Yes | N/A | 2NN1N2 >32 is not supported for Rel-17 based CJT codebook | Per band and Per BC | N/A | N/A | N/A | Component 1 candidate values: {64, 96, 128} | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-3-1-11 | Active CSI-RS resources and ports for mixed codebook types including Type-II-CJT 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 | 40-3-1-1,40-3-1-5,2-36, 2-40 | Yes | N/A | Active CSI-RS resources and ports for mixed Type-II-CJT codebook types in any slot is not supported | Per band and Per BC | N/A | N/A | N/A | Codebook 1 = {Type I SP, Type I MP} (Codebook 2, Codebook 3) = {(eType-II-CJT R=1, NULL), (eType-II-CJT R=2, NULL), (FeType-II-CJT PS R=1 M=1, NULL), (FeType-II-CJT PS R=1 M=2, NULL), (FeType-II-CJT PS R=2 M=2, NULL) }  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} | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-3-1-12 | Support of Rank 3 and 4 for Rel-16-based CJT type-II codebook | 1. Support of Rel-16 eType-II codebook refinement for multi-TRP CJT with rank 3,4 | 40-3-1-1 | Yes | N/A | Rank 3 and 4 for Rel-16-based CJT type-II codebook is not supported | Per band and Per BC | N/A | N/A | N/A |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-3-1-13 | Support of Rank 3 and 4 for Rel-17-based CJT type-II codebook | 1. Support of Rel-17 FeType-II port selection codebook refinement for multi-TRP CJT with rank 3,4 | 40-3-1-5 | Yes | N/A | Rank 3 and 4 for Rel-17-based CJT type-II codebook is not supported | Per band and Per BC | N/A | N/A | N/A |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-3-1-14 | Support of Support of L=6 for Rel-16-based CJT type-II codebook | 1. Support of Rel-16 eType-II codebook refinement for multi-TRP CJT with parameter combination with L=6 | 40-3-1-1 | Yes | N/A | Support of L=6 for Rel-16-based CJT type-II codebook is not supported | Per band and Per BC | N/A | N/A | N/A | Note: Only for N\_TRP=1 | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-3-1-15 | dynamic selection of N<=N\_TRP for Rel-16-based CJT type-II codebook | 1. Support of selection of N <= N\_TRP CSI-RS resource by UE for multi-TRP CJT based on Rel-16 eType-II codebook | 40-3-1-1 | Yes | N/A | Dynamic selection of N<N\_TRP for Rel-16-based CJT type-II codebook is not supported | Per band and per BC | N/A | N/A | N/A |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-3-1-16 | dynamic selection of N<=N\_TRP for Rel-17-based CJT type-II codebook | 1. Support of selection of N <= N\_TRP CSI-RS resource by UE for multi-TRP CJT based on Rel-17 FeType-II port selection codebook | 40-3-1-5 | Yes | N/A | Dynamic selection of N<N\_TRP for Rel-17-based CJT type-II codebook is not supported | Per band and per BC | N/A | N/A | N/A |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-3-1-17 | Support for N\_L>1 combinations of number of SD basis across CSI-RS resources for Rel-16-based CJT type-II codebook | 1. Maximum number of lists for spatial basis selection, i.e., N\_L, for multi-TRP CJT based on Rel-16 eType-II codebook | 40-3-1-1 | Yes | N/A | N\_L>1 combinations across for Rel-16-based CJT type-II codebook is not supported | Per band and Per BC | N/A | N/A | N/A | Candidate values for component 1:  N\_L = {2,4} | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-3-1-18 | Support for N\_L>1 combinations of number of ports across CSI-RS resources for Rel-17-based CJT type-II codebook | 1. Maximum number of lists for ports selection, i.e., NL, for multi-TRP CJT based on Rel-17 FeType-II port selection codebook | 40-3-1-5 | Yes | N/A | N\_L>1 combinations across for Rel-17-based CJT type-II codebook is not supported | Per band and Per BC | N/A | N/A | N/A | Candidate values for component 1:  N\_L = {2,4} | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-3-1-23 | Unequal number of spatial basis selection configuration for multi-TRP CJT | 1. Support of unequal number of spatial basis selection configuration across CSI-RS resources for multi-TRP CJT including Rel-16 eType-II codebook refinement | 40-3-1-1 | Yes | N/A | Unequal number of spatial basis selection configuration for multi-TRP CJT is not supported | Per band and per BC | N/A | N/A | N/A |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-3-1-23a | Unequal number of port selection configuration for multi-TRP CJT | 1. Support of unequal number of port selection configuration across CSI-RS resources for multi-TRP CJT including Rel-17 FeType-II port selection codebook refinement | 40-3-1-5 | Yes | N/A | Unequal number of port selection configuration for multi-TRP CJT is not supported | Per band and per BC | N/A | N/A | N/A |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-3-1-24 | Timeline for regular eType-II-CJT CSI, or for port selection FeType-II-CJT CSI | Timeline relaxation parameter | 40-3-1-1, or 40-3-1-5 | Yes | N/A | Relaxed timeline is not supported | Per band and Per-BC | No | N/A | N/A | Component candidate value: {0, Z2’}  Note: A UE that supports FG 40-3-1-1 or FG 40-3-1-5 must signal this FG | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-3-2-1 | Support of Rel-16-based doppler CSI | 1. Support X=1 CQI based on the first/earliest slot of the CSI reporting window and the first/earliest predicted PMI (TDCQI=’1-1’)  2. Support of Rel-16 eType-II regular codebook refinement for predicted PMI with PMI subband R=1  3. Support parameter combinations with L=2,4  4. Support for rank = 1,2  5. A list of supported combinations, each combination is { Max # of Tx ports in one resource, Max # of resources and total # of Tx ports} across all CCs in a band when reported per band, and across all CCs in a band combination when reported per BC simultaneously  7. Value of Y for CPU occupation (OCPU = Y.N4), when P/SP-CSI-RS is configured for CMR  8. Value of Y for CPU occupation (OCPU = Y.K), when A-CSI-RS is configured for CMR  9. Support for the size of DD-basis, N4=1  10. Scaling factor for active resource counting Kp | 2-35 | Yes | N/A | Rel-16 based Type II doppler codebook is not supported | Per band  and Per BC | N/A | N/A | N/A | Component 5 candidate values  a. {4,8,12,16,24,32}  b. {2,3,4 … 64}  c. {4, …, 256}  Component 7 candidate values: {1, 2, 3}  Component 8 candidate values: {1, 2, 3}  Component 10 candidate values: {1, 2, 4}  Note: When N4=1, OCPU =4  Note: OCPU ≥ 4 when P/SP-CSI-RS is configured for CMR  Note: when K=12, OCPU =8  Note: A UE that supports CSI enhancement for Rel. 16 based type-II doppler must support this FG | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-3-2-1a | Support of Rel-16-based doppler measurement with N4>1 | 1. Support for the size of DD-basis, N4>1  2. A list of supported combinations, each combination is {Max N4, Max # of Tx ports in one resource, Max # of resources and total # of Tx ports} across all CCs in a band when reported per band, and across all CCs in a band combination when reported per BC simultaneously  3. A list of supported combinations, each combination is {Max N4, Max # of Tx ports in one resource, Max # of resources and total # of Tx ports} for one CSI report setting  4. Value of d=m for the DD unit size when A-CSI-RS is configured for CMR | 40-3-2-1 | Yes | N/A | Rel-16 based Type II doppler codebook with N4>1 is not supported | Per band  and Per BC | N/A | N/A | N/A | Component 2 candidate values  a. {1,2,4,8}  b. {4,8,12,16,24,32}  c. {2,3,4 … 64}  d. {4, …, 256}  Component 3 Candidate values  a. {1,2,4,8}  b. {4,8,12,16,24,32}  c. {4,8,12}  d.{4, …, 256} | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-3-2-1a-1 | DD unit size when A-CSI-RS is configured for CMR N4>1 | Value of d=1 for the DD unit size when A-CSI-RS is configured for CMR | 40-3-2-1a | Yes | N/A | DD unit size d=1 is not supported when A-CSI-RS is configured for CMR N4>1 | Per-band  and Per-BC | N/A | N/A | N/A |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-3-2-1b | Maximum number of aperiodic CSI-RS resources that can be configured in the same CSI report setting for Rel-16-based doppler measurement | 1. Maximum number of aperiodic CSI-RS resources that can be configured in the same CSI report setting for Rel-16-based doppler measurement | 40-3-2-1 | Yes | N/A | Maximum number of aperiodic CSI-RS resources that can be configured in the same CSI report setting for Rel-16-based doppler measurement is not known | Per-band  and Per-BC | N/A | N/A | N/A | Component 1 candidate values: {4, 8, 12} | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-3-2-2 | Support R=2 for Rel-16-based doppler codebook | A list of supported combinations {Max # of Tx ports in one resource, Max # of resources and total # of Tx ports}, across all CCs in a band when reported per band, and across all CCs in a band combination when reported per BC simultaneously, with R=2 | 40-3-2-1 | Yes | N/A | R=2 for Rel-16-based doppler codebook is not supported | Per band and per BC | N/A | N/A | N/A | Candidate values for component 1:  - 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 signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-3-2-3 | Support X=1 based on first and last slot of WCSI, for Rel-16-based doppler codebook | Support of TDCQI = ‘1-2’ | 40-3-2-1 | Yes | N/A | X=1 based on first and last slot of WCSI, for Rel-16-based doppler codebook is not supported | Per band and per BC | N/A | N/A | N/A |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-3-2-3a | Support X=2 CQI based on 2 slots for Rel-16-based doppler codebook | Support of TDCQI = ‘2’ | 40-3-2-1 | Yes | N/A | X=2 CQI based on 2 slots for Rel-16-based doppler codebook is not supported | Per band and per BC | N/A | N/A | N/A |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-3-2-4 | Support of Rel-17-based doppler CSI | 1. Support X=1 CQI based on the first/earliest slot of the CSI reporting window and the first/earliest predicted PMI  2. Support of Rel-17 FeType-II port selection codebook refinement for predicted PMI with PMI subband R=1  3. Support of parameter combinations with M = 1  4. Support for rank = 1,2  5: A list of supported combinations, each combination is { Max # of Tx ports in one resource, Max # of resources and total # of Tx ports} for one doppler CSI measurement  7. Value of Y for CPU occupation (OCPU = Y.K), when A-CSI-RS is configured for CMR  8. Support for N4=1  9. Scaling factor for active resource counting Kp | 40-3-2-1, 2-35 | Yes | N/A | Rel-17 based Type II doppler codebook is not supported | Per band  and Per-BC | N/A | N/A | N/A | Component 5 candidate values  a. {4,8,12,16,24,32}  b. {1, 2,3,4 … 64}  c. {4, …, 256}  Component 7 candidate values: {1, 2, 3}  Component 9 candidate values: {1, 2, 4}  Note: OCPU = 4 when P/SP-CSI-RS is configured for CMR  Note: when K=12, OCPU =8  Note: A UE that supports CSI enhancement for Rel. 17-based type-2 doppler must support this FG | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-3-2-4b | Maximum number of aperiodic CSI-RS resources that can be configured in the same CSI report setting for Rel-17-based doppler CSI | 1. Maximum number of aperiodic CSI-RS resources that can be configured in the same CSI report setting for Rel-17-based doppler CSI | 40-3-2-4 | Yes | N/A | Maximum number of aperiodic CSI-RS resources that can be configured in the same CSI report setting for Rel-17-based doppler CSI is unknown | Per-band  and Per-BC | N/A | N/A | N/A | Component 1 candidate values: {4, 8, 12} | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-3-2-5 | Support of M=2 and R=1 for Rel-17-based doppler codebook | 1. Support of Rel-17 FeType-II port selection codebook refinement for predicted PMI with M=2 and PMI subband R=1  2. A list of supported combinations, up to 16, across all CCs in a band when reported per band, and across all CCs in a band combination when reported per BC simultaneously, where each combination is  a) Maximum number of Tx ports in one NZP CSI-RS resource  b) Maximum total number of NZP CSI-RS resource  c) Maximum total number of Tx ports of NZP CSI-RS resources | 40-3-2-4 | Yes | N/A | M=2 and R=1 for Rel-17-based doppler codebook is not supported | Per-band  and Per-BC | N/A | N/A | N/A | Component 2 candidate values:  a) {4, 8, 12, 16, 24, 32}  b) {2,3,4 … 64}  c) {4, …, 256} | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-3-2-6 | Support R=2 for Rel-17-based doppler codebook | 1. Support of Rel-17 FeType-II port selection codebook refinement for predicted PMI with PMI subbands R=2  2. A list of supported combinations, up to 16, across all CCs in a band when reported per band, and across all CCs in a band combination when reported per BC simultaneously, where each combination is  a) Maximum number of Tx ports in one NZP CSI-RS resource  b) Maximum total number of NZP CSI-RS resource  c) Maximum total number of Tx ports of NZP CSI-RS resources | 40-3-2-4 | Yes | N/A | R=2 for Rel-17-based doppler codebook is not supported | Per band and per BC | N/A | N/A | N/A | Component 2 candidate values:  a) {4, 8, 12, 16, 24, 32}  b) {2,3,4 … 64}  c) {4, …, 256} | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-3-2-7 | support of l = (n – nCSI,ref ) for CSI reference slot for Rel-16 based doppler codebook | 1. Support of l = (n – nCSI,ref ) for CSI reference slot when N4=1 and d>1  2. Support of l = (n – nCSI,ref ) for CSI reference slot when N4>1 | 40-3-2-1 | Yes | N/A | l = (n – nCSI,ref ) for CSI reference slot for Rel-16 based doppler codebook is not supported | Per band and per BC | N/A | N/A | N/A |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-3-2-7a | Support of l = (n – nCSI,ref ) for CSI reference slot for Rel-17 based doppler codebook | 1. Support of l = (n – nCSI,ref ) for CSI reference slot when N4=1 and d>1 | 40-3-2-4 | Yes | N/A | l = (n – nCSI,ref ) for CSI reference slot for Rel-17 based doppler codebook is not supported | Per band and per BC | N/A | N/A | N/A |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-3-2-8 | Support of L=6 for Rel-16 based doppler codebook | Support of L=6 for Rel-16 based doppler codebook | 40-3-2-1 | Yes | N/A | L=6 for Rel-16-based doppler codebook is not supported | Per band and per BC | N/A | N/A | N/A |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-3-2-9 | Support of rank equals 3 and 4 for Rel-16 based doppler codebook | Support of rank equals 3 and 4 for Rel-16 based doppler codebook | 40-3-2-1 | Yes | N/A | Rank equals 3 and 4 for Rel-16-based doppler codebook is not supported | Per band and per BC | N/A | N/A | N/A |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-3-2-10 | Support of rank equals 3 and 4 for Rel-17 based doppler codebook | Support of rank equals 3 and 4 for Rel-17 based doppler codebook | 40-3-2-4 | Yes | N/A | Rank equals 3 and 4 for Rel-17-based doppler codebook is not supported | Per band and per BC | N/A | N/A | N/A |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-3-2-11 | Aperiodic CSI report timing relaxation for doppler codebook based on Type-II codebook | 1. Aperiodic CSI report timing relaxation, w, for doppler codebook based on Type-II codebook.  2. Aperiodic CSI report timing relaxation for doppler codebook based on Type-II codebook | At least one of {40-3-2-1, 40-3-2-4} | Yes | N/A | Aperiodic CSI report timing relaxation for doppler codebook based on Type-II codebook is unknown | Per FS | N/A | N/A | N/A | Component 1 candidate values:  UE reports candidate value, w, independently for each SCS in unit of symbols: {14\*(KP–1)\*d, 14\*KP\*d}  Note: Kp is according to Component 10 of FG 40-3-2-1, or according to Component 9 of FG 40-3-2-4  Note: d=4 (minimum periodicity of periodic CSI-RS)  Component 2 candidate values: {CAP1, CAP2}  For N4 = 1  1) For AP CSI-RS: (Z,Z’) = (Z2 + 14\*(K–1)\*m, Z'2)  2) For P/SP CSI-RS: (Z,Z’) = (Z2 + w, Z'2)  For N4 > 1 and CAP1 in component 2  1) For AP CSI-RS: (Z,Z’) = (Z2 + 14\*(K–1)\*m, Z'2)  2) For P/SP CSI-RS: (Z,Z’) = (Z2 + w, Z'2)  For N4 > 1 and CAP2 in component 2  1) For AP CSI-RS: (Z,Z’) = (Z2 + 14\*(K–1)\*m + Z'2, 2Z'2)  2) For P/SP CSI-RS: (Z,Z’) = (Z2 + w + Z'2, 2Z'2)  Z2/Z'2 are defined in Table 5.4-2 in TS38.214  K = {4,8,12}, is the number of AP CSI-RS resources for the CMR in a CSI report setting  M = {1,2}, is the offset between two adjacent AP CSI-RS resources for the CMR in slots  Note: A UE that supports FG 40-3-2-1 or FG 40-3-2-4 must signal this FG | Optional with capability signalling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-3-2-12 | Supported maximum periodicity of CMR when configured as periodic CSI-RS | Maximum periodicity of periodic CSI-RS (in slots) UE can handle for Type-II-Doppler CSI report | At least one of {40-3-2-1, 40-3-2-4} | Yes | n/a |  | Per band | No | n/a | n/a | Component candidate values (in slots): {4, 5, 8, 10, 20}  UE supporting at least one of {40-3-2-1, 40-3-2-4} must report this FG | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-3-3-1 | TDCP (Time Domain Channel Properties) report | 1. Support of Y=1 delay value for TDCP report 2. Basic delay value, component candidate value <= D\_basic = 1 slot  3. Support of amplitude report  4. Value of X for CPU occupation (OCPU=(Y+1).X)  5. Support to configure KTRS = 1 TRS resource set  6. Maximum number of simultaneously active CSI-RS resources for TDCP across all CCs in a band when reported per band, and across all CCs in a band combination when reported per BC | 2-35 | Yes | N/A | Time Domain Channel Properties report is not supported | Per band and Per BC | N/A | N/A | N/A | Component 4 candidate values: {1,2}  Component 6, candidate values {4, 6, 8, 10, 12, 14, 16, 18, 20, 22, …, 60, 62, 64}  Note: counting of simultaneously active CSI-RS resources follows existing specification TS38.214 | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-3-3-2 | Number of delay values | Number Y>1 of delay values for which TDCP is reported | 40-3-3-1 | Yes | N/A | TDCP is not reported for more than 1 delay value | Per FS | N/A | N/A | N/A | Candidate values: {2,3,4} | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-3-3-1a | Supported maximum delay value larger than D\_basic | Support of maximum delay value larger than D\_basic =1 slot | 40-3-3-1 | Yes | N/A | delay value(s) larger than D\_basic are not supported | Per FS | N/A | N/A | N/A | Candidate values: {2 slots, 3 slots, 4 slots, 5 slots, 6 slots, 10 slots}  Note: 10 slots is only applicable for SCS >= 30 kHz, and 6 slots is maximum for SCS = 15 kHz | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-3-3-4 | Phase report | Support of phase report for Y>=1 | 40-3-3-1 | Yes | N/A | Phase report for Y>=1 is not supported | Per FS | N/A | N/A | N/A |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-3-3-5 | Number of CSI-RS resources for TDCP | 1. Maximum number of configured CSI-RS resources for TDCP per CC  2. Maximum number of configured CSI-RS resources for TDCP across all CCs in a band when reported per band, and across all CCs in a band combination when reported per BC  3. Maximum number of simultaneously active CSI-RS resources for TDCP per CC | 40-3-3-1 | Yes | N/A | Number of CSI-RS resources for TDCP is not reported | Per band and Per BC | N/A | N/A | N/A | Component 1 candidate values: {2, 4, 6, 8, 10, 12}  Component 2 candidate values: {2, 4, 6, 8, 12, … 64}  Component 3 candidate values: {2, 4, 6, 8, 12, 16, 20, 24, 28, 32}  Note: counting of simultaneously active CSI-RS resources follows existing specification TS38.214 | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-3-3-6 | Maximum number of TRS resource sets in a report configuration | Max number of TRS resource sets in a single CSI-RS resource setting | 40-3-3-1 | Yes | N/A | More than 1 TRS resource set in a report configuration is not supported | Per FS | N/A | N/A | N/A | Candidate values: {2,3} | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-3-3-7 | Maximum number of TDCP report settings per-BWP | Maximum number of *CSI-ReportConfig* with *reportQuantity* configured as “tdcp”, configured with *resourcesForChannelMeasurement* linked to a same BWP ID | 40-3-3-1 | Yes | N/A | High cost to UE due to low-level memory for aperiodic TDCP report | Per FS | No | N/A | N/A | Candidate value: {1,2,3,4} | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-4-1 | Basic feature of Rel.18 enhanced DMRS ports for PDSCH for scheduling of mapping type A | 1) Support 1 symbol FL DMRS without additional symbol(s)  2) Support 1 symbol FL DMRS and 1 additional DMRS symbol | 2-5 | Yes | n/a | Basic feature of Rel.18 enhanced DMRS ports for PDSCH for scheduling of mapping type A is not supported | Per FS | No | No | n/a |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-4-1a | Basic feature of Rel.18 enhanced DMRS ports for PDSCH for scheduling of mapping type B | 1) Support 1 symbol FL DMRS without additional symbol(s)  2) Support 1 symbol FL DMRS and 1 additional DMRS symbol | 2-6 | Yes | n/a | UE does not support basic feature of Rel.18 enhanced DMRS ports for PDSCH for scheduling of mapping type B | Per FS | No | No | n/a |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-4-1b | 1 symbol FL DMRS and 2 additional DMRS symbols for more than one port for Rel.18 enhanced DMRS ports for PDSCH | Support of 1 symbol FL DMRS and 2 additional DMRS symbols for more than one port for Rel.18 enhanced DMRS ports for PDSCH | 40-4-1, 40-4-1j | Yes | n/a | UE does not support 1 symbol FL DMRS and 2 additional DMRS symbols for more than one port for Rel.18 enhanced DMRS ports for PDSCH | Per FS | No | No | n/a |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-4-1c | Alternative additional DMRS position for co-existence with LTE CRS for Rel.18 enhanced DMRS ports for PDSCH | Support of alternative additional DMRS position for co-existence with LTE CRS for Rel.18 enhanced DMRS ports for PDSCH | 40-4-1, 5-28 | Yes | n/a | UE does not support alternative additional DMRS position for co-existence with LTE CRS for Rel.18 enhanced DMRS ports for PDSCH | Per FS | No | No | n/a |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-4-1d | 2 symbols FL-DMRS for Rel.18 enhanced DMRS ports for PDSCH | Support of 2 symbols FL-DMRS for Rel.18 enhanced DMRS ports for PDSCH | 40-4-1 | Yes | n/a | UE does not support 2 symbols FL-DMRS for Rel.18 enhanced DMRS ports for PDSCH | Per FS | No | No | n/a |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-4-1e | 2-symbol FL DMRS + one additional 2-symbols DMRS for Rel.18 enhanced DMRS ports for PDSCH | Support of 2-symbol FL DMRS + one additional 2-symbols DMRS for Rel.18 enhanced DMRS ports for PDSCH | 40-4-1 | Yes | n/a | UE does not support 2-symbol FL DMRS + one additional 2-symbols DMRS for Rel.18 enhanced DMRS ports for PDSCH | Per FS | No | No | n/a |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-4-1f | 1 symbol FL DMRS and 3 additional DMRS symbols for Rel.18 enhanced DMRS ports for PDSCH | Support of 1 symbol FL DMRS and 3 additional DMRS symbols for Rel.18 enhanced DMRS ports for PDSCH | 40-4-1 | Yes | n/a | UE does not support 1 symbol FL DMRS and 3 additional DMRS symbols for Rel.18 enhanced DMRS ports for PDSCH | Per FS | No | No | n/a |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-4-1g | DMRS type for Rel.18 enhanced DMRS ports for PDSCH | Support of DMRS type for Rel.18 enhanced DMRS ports for PDSCH | 40-4-1 | Yes | n/a | UE does not support DMRS type for Rel.18 enhanced DMRS ports for PDSCH | Per FS | No | No | n/a | Component 1 candidate values: {etype 1, both etype 1 and etype 2}  Note: A UE supporting one of FG 40-4-1 or FG 40-4-1a must signal this FG | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-4-1h | 1 port DL PTRS for Rel.18 enhanced DMRS ports for PDSCH with rank 1-8 | Support of 1 port DL PTRS for Rel.18 enhanced DMRS ports for PDSCH with rank 1-8 | 40-4-1 | Yes | n/a | 1 port DL PTRS for Rel.18 enhanced DMRS ports for PDSCH with rank 1-8 is not supported | Per FS | No | No | n/a |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-4-1i | 2 port DL PTRS for Rel.18 enhanced DMRS ports for PDSCH with rank 1-8 | Support of 2 port DL PTRS for Rel.18 enhanced DMRS ports for PDSCH with rank 1-8 | 40-4-1 or 40-4-1a | Yes | n/a | 2 port DL PTRS for Rel.18 enhanced DMRS ports for PDSCH with rank 1-8 is not supported | Per FS | No | No | n/a |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-4-1j | Support 1 symbol FL DMRS and 2 additional DMRS symbols for at least one port for scheduling of mapping type A | Support of Support 1 symbol FL DMRS and 2 additional DMRS symbols for one port for scheduling of mapping type A | 40-4-1 | Yes | n/a | Support 1 symbol FL DMRS and 2 additional DMRS symbols for one port is not supported for scheduling of mapping type A | Per FS | No | No | n/a |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-4-2 | Capability on the maximum number of configured DMRS types for PDSCH across all DL DCI formats per cell | Maximum number of configured DMRS types for PDSCH across all DL DCI formats per cell | 2-10, 40-4-1g | Yes | n/a | Capability on the maximum number of configured DMRS types for PDSCH across all DL DCI formats per cell is not supported | Per FS | No | No | n/a | Component candidate values: {2, 3, 4} | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-4-4 | Reception of PDSCH without the scheduling restriction for Rel.18 eType1 DMRS ports | Support reception of PDSCH without the scheduling restriction for Rel.18 eType1 DMRS ports | 40-4-1 | Yes | n/a | Reception of PDSCH without the scheduling restriction for Rel.18 eType1 DMRS ports is not supported | Per FS | No | No | n/a | Note: If this feature is not supported, UE expects that gNB shall apply at least the following scheduling restriction for PDSCH for FD-OCC 4 in Rel.18 eType 1 DMRS  1) The number of consecutively scheduled PRBs for PDSCH is even  2) The number of PRBs offset of scheduled PDSCH from point A (common resource block 0) is even | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-4-4a | Reception of PDSCH without the scheduling restriction for Rel.18 eType1 DMRS ports for PDSCH with fdmSchemeA | Support reception of PDSCH without the scheduling restriction for Rel.18 eType1 DMRS ports for PDSCH with fdmSchemeA | 40-4-1 or 40-4-1a | Yes | N/A | Only reception of PDSCH with the scheduling restriction for Rel.18 eType1 DMRS ports for PDSCH with fdmSchemeA is supported | Per FS | N/A | N/A | N/A |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-4-4b | Reception of PDSCH without the scheduling restriction for Rel.18 eType1 DMRS ports for PDSCH with fdmSchemeB | Support reception of PDSCH without the scheduling restriction for Rel.18 eType1 DMRS ports for PDSCH with fdmSchemeB | 40-4-1 or 40-4-1a | Yes | N/A | Only reception of PDSCH with the scheduling restriction for Rel.18 eType1 DMRS ports for PDSCH with fdmSchemeB is supported | Per FS | N/A | N/A | N/A |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-4-5 | Rel-18 DL DMRS with single DCI based M-TRP | Support of Rel-18 DL DMRS with single DCI based M-TRP | 40-4-1 or 40-4-1a | Yes | n/a | Rel-18 DL DMRS with single DCI based M-TRP is not supported | Per FS | No | No | n/a |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-4-5a | Additional row(s) for antenna ports (0,2,3) for Rel.18 DL DMRS ports for single-DCI based M-TRP | Support of additional row(s) for antenna ports (0,2,3) for Rel.18 DL DMRS ports for single-DCI based M-TRP | 40-4-5 | Yes | n/a | Additional row(s) for antenna ports (0,2,3) for Rel.18 DL DMRS ports for single-DCI based M-TRP are not supported | Per FS | No | No | n/a |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-4-7 | Rel-18 DL DMRS with M-DCI based M-TRP | Support of Rel-18 DL DMRS with multi- DCI based M-TRP PDSCH operation | 40-4-1 or 40-4-1a | Yes | n/a | Rel-18 DL DMRS with M-DCI based M-TRP is not supported | Per FS | No | No | n/a |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-4-6 | Basic feature of Rel.18 enhanced DMRS ports for PUSCH for scheduling of mapping type A for Rel.18 enhanced DMRS ports | 1) Support 1 symbol FL DMRS without additional symbol(s)  2) Support 1 symbol FL DMRS and 1 additional DMRS symbols  3) Support 1 symbol FL DMRS and 2 additional DMRS symbols for one port | 2-16 | Yes | n/a | Basic feature of Rel.18 enhanced DMRS ports for PUSCH for scheduling of mapping type A for Rel.18 enhanced DMRS ports is not supported | Per FS | No | No | n/a |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-4-6a | Basic feature of Rel.18 enhanced DMRS ports for PUSCH for scheduling of mapping type B for Rel.18 enhanced DMRS ports | 1) Support 1 symbol FL DMRS without additional symbol(s)  2) Support 1 symbol FL DMRS and 1 additional DMRS symbol | 2-16a | Yes | n/a | Basic feature of Rel.18 enhanced DMRS ports for PUSCH for scheduling of mapping type B for Rel.18 enhanced DMRS ports is not supported | Per FS | No | No | n/a |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-4-6c | DMRS type for Rel.18 enhanced DMRS ports for PUSCH | Support of DMRS type for Rel.18 enhanced DMRS ports for PUSCH | 40-4-6 | Yes | n/a | DMRS type for Rel.18 enhanced DMRS ports for PUSCH is not supported | Per FS | No | No | n/a | Component candidate values: {eType 1, both eType 1 and eType 2}  Note: A UE supporting one of FG 40-4-6 or FG 40-4-6a must support this FG | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-4-6d | 2 symbols front-loaded DMRS (uplink) for Rel.18 enhanced DMRS ports for PUSCH | Support of 2 symbols front-loaded DMRS (uplink) for Rel.18 enhanced DMRS ports for PUSCH | 40-4-6 | Yes | n/a | 2 symbols front-loaded DMRS (uplink) for Rel.18 enhanced DMRS ports for PUSCH is not supported | Per FS | No | No | n/a |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-4-6e | 2-symbol FL DMRS + one additional 2-symbols DMRS for Rel.18 enhanced DMRS ports for PUSCH | Support of 2-symbol FL DMRS + one additional 2-symbols DMRS for Rel.18 enhanced DMRS ports for PUSCH | 40-4-6 | Yes | n/a | 2-symbol FL DMRS + one additional 2-symbols DMRS for Rel.18 enhanced DMRS ports for PUSCH is not supported | Per FS | No | No | n/a |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-4-6f | 1 symbol FL DMRS and 3 additional DMRS symbols for Rel.18 enhanced DMRS ports for PUSCH | Support of 1 symbol FL DMRS and 3 additional DMRS symbols for Rel.18 enhanced DMRS ports for PUSCH | 40-4-6 | Yes | n/a | 1 symbol FL DMRS and 3 additional DMRS symbols for Rel.18 enhanced DMRS ports for PUSCH is not supported | Per FS | No | No | n/a |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-4-6g | 1 port UL PTRS for Rel.18 enhanced DMRS ports for PUSCH with rank 1-4 | Support of 1 port UL PTRS for Rel.18 enhanced DMRS ports for PUSCH with rank 1-4 | at least one of {40-4-6, , 40-4-6a} | Yes | n/a | 1 port UL PTRS for Rel.18 enhanced DMRS ports for PUSCH with rank 1-4 is not supported | Per FS | No | No | n/a |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-4-6h | 1 port UL PTRS for Rel.18 enhanced DMRS ports for PUSCH with rank 5-8 | Support of 1 port UL PTRS for Rel.18 enhanced DMRS ports for PUSCH with rank 5-8 | at least one of {40-4-6, , 40-4-6a} | Yes | n/a | 1 port UL PTRS for Rel.18 enhanced DMRS ports for PUSCH with rank 5-8 is not supported | Per FS | No | No | n/a |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-4-6i | 2 port UL PTRS for Rel.18 enhanced DMRS ports for PUSCH with rank 1-4 | Support of 2 port UL PTRS for Rel.18 enhanced DMRS ports for PUSCH with rank 1-4 | at least one of {40-4-6, , 40-4-6a} | Yes | n/a | 2 port UL PTRS for Rel.18 enhanced DMRS ports for PUSCH with rank 1-4 is not supported | Per FS | No | No | n/a |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-4-6j | 2 port UL PTRS for Rel.18 enhanced DMRS ports for PUSCH with rank 5-8 | Support of 2 port UL PTRS for Rel.18 enhanced DMRS ports for PUSCH with rank 5-8 | at least one of {40-4-6, , 40-4-6a} | Yes | n/a | 2 port UL PTRS for Rel.18 enhanced DMRS ports for PUSCH with rank 5-8 is not supported | Per FS | No | No | n/a |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-4-6k | 1 symbol FL DMRS and 2 additional DMRS symbols for more than one port for Rel.18 enhanced DMRS ports for PUSCH | Support of 1 symbol FL DMRS and 2 additional DMRS symbols for more than one port for Rel.18 enhanced DMRS ports for PUSCH | 40-4-6 | Yes | n/a | UE does not support 1 symbol FL DMRS and 2 additional DMRS symbols for more than one port for Rel.18 enhanced DMRS ports for PUSCH | Per FS | No | No | n/a |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-4-10 | DMRS port configuration for PUSCH with 8Tx | DMRS port configuration for PUSCH with 8Tx for Rel 15 and Rel. 18 |  | Yes | n/a | Port configuration for PUSCH with 8Tx is not supported | Per FS | No | No | n/a | Candidate values: {Rel. 15 DMRS, Rel. 15 DMRS and Rel. 18 DMRS}  Note: A UE supporting 8 Tx must support this FG | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-4-11 | Joint configuration of Rel.18 DMRS ports and Rel.18 dynamic switching between DFT-S-OFDM and CP-OFDM for PUSCH | Support of joint configuration of Rel.18 DMRS ports and Rel.18 dynamic switching between DFT-S-OFDM and CP-OFDM for PUSCH | 40-4-6 or 40-4-6a, 54-3 | Yes |  | Joint configuration of Rel.18 DMRS ports and Rel.18 dynamic switching between DFT-S-OFDM and CP-OFDM for PUSCH is not supported | Per band | n/a | n/a | n/a |  | Optional with capability signalling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-4-12 | Support of Rel-18 DMRS and PDSCH processing capability 2 simultaneously | 1. Support Rel-18 DMRS and PDSCH processing capability 2 simultaneously  2. Additional processing relaxation d3 | 40-4-1/1a, 5-5a/5b | Yes | n/a | Rel-18 DMRS and PDSCH processing capability 2 are not support simultaneously | Per FS | No | No | n/a | Component 2 candidate values:  UE reports candidate value, d3, independently for each SCS in unit of symbols  For 15kHz SCS: {0, 1, 2, 3, 4}  For 30kHz SCS: {0, 1, 2, 3, 4, 5}  For FR1 60kHz SCS: {0, 1, 2, 3, 4, 5, 6, 7}  Note: PDSCH processing capability #2 related UE capability follows legacy FGs 5-5a, 5-5b, 5-13, 5-13a, 5-13c | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-4-13 | Support Rel-18 UL DMRS with single-DCI based M-TRP | 1. Support Rel-18 UL DMRS with Single-DCI based M-TRP |  | Yes | n/a | Rel-18 UL DMRS with single-DCI based M-TRP is not supported | Per FS | No | No | n/a |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-4-14 | Support Rel-18 UL DMRS with M-DCI based M-TRP | 1. Support Rel-18 UL DMRS with M-DCI based M-TRP |  | Yes | n/a | Rel-18 UL DMRS with M-DCI based M-TRP is not supported | Per FS | No | No | n/a |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-5-1 | SRS comb offset hopping | Support of SRS comb offset hopping | 2-53 | Yes | n/a | SRS comb offset hopping is not supported | Per band | n/a | n/a | n/a |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-5-2 | SRS cyclic shift hopping | Support of SRS cyclic shift hopping | 2-53 | Yes | n/a | SRS cyclic shift hopping is not supported | Per band | n/a | n/a | n/a |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-5-2a | Smaller cyclic shift granularity for cyclic shift hopping | Support configuration of cyclic shift hopping with smaller granularity (with factor K=2) | 40-5-2 | Yes | N/A | Configuration of cyclic shift hopping with smaller granularity (with factor K=2) is not supported | Per band | n/a | n/a | n/a |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-5-1c | Comb offset hopping within a subset | Support configuration of subset of comb offsets for comb offset hopping | 40-5-1 | Yes | N/A | Configuration of subset of comb offsets for comb offset hopping is not supported | Per band | n/a | n/a | n/a |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-5-2c | Cyclic shift hopping within a subset | Support configuration of subset of cyclic shifts for cyclic shift hopping | 40-5-2 | Yes | N/A | Configuration of subset of cyclic shifts for cyclic shift hopping is not supported | Per band | n/a | n/a | n/a |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-5-1b | SRS comb offset hopping combined with group/sequence hopping | Support of SRS comb offset hopping combined with group/sequence hopping | 40-5-1 | Yes | n/a | SRS comb offset hopping combined with group/sequence hopping is not supported | Per band | n/a | n/a | n/a |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-5-2b | SRS cyclic shift hopping combined with group/sequence hopping | Support of SRS cyclic shift hopping combined with group/sequence hopping | 40-5-2 | Yes | n/a | SRS cyclic shift hopping combined with group/sequence hopping is not supported | Per band | n/a | n/a | n/a |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-5-3 | SRS cyclic shift hopping combined with SRS comb offset hopping | Support of SRS cyclic shift hopping combined SRS comb offset hopping | 40-5-1, 40-5-2 | Yes | n/a | SRS cyclic shift hopping combined with SRS comb offset hopping is not supported | Per band | n/a | n/a | n/a |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-5-1a | Comb offset hopping time-domain behavior when repetition factor R>1 | Supported comb offset hopping granularity in time when repetition factor R>1 is configured | 40-5-1 | Yes | n/a | Comb offset hopping is not supported when repetition factor R>1 | Per band | n/a | n/a | n/a | Component candidate values: {‘per SRS symbol’,’per R SRS symbols’, ‘both’} | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-5-4 | SRS 8 Tx ports—antenna switching | 1. Support of 8T8R for antenna switching  2. Downgrade antenna switching configurations  3. Report the entry number of the first-listed band with UL in the band combination that affects this DL  4. Report the entry number of the first-listed band with UL in the band combination that switches together with this UL | 2-53 | Yes | n/a | SRS with 8 Tx ports—antenna switching is not supported | Per FS | n/a | n/a | n/a | Component 1 candidate values: {noTDM, TDM and noTDM}  Component 2 candidate value: combination (including empty) of {1T1R, 1T2R, 1T4R, 1T6R, 1T8R, 2T2R, 2T4R, 2T6R, 2T8R, 4T4R, 4T8R}  Component 3 candidate value: {1,2,…,32}  Component 4 candidate value: {1,2,…,32}  Note: UE reports support of SRS with 8 Tx ports and Comb8 mapping —antenna switching via FG 23-8-8 | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-5-5 | Maximum 2 SP and 1 periodic SRS sets for 8T8R antenna switching | Support of maximum 2 SP SRS resource sets and maximum 1 periodic SRS resource set for 8T8R antenna switching | 40-5-4 | Yes | n/a | Maximum one SRS resource set for periodic SRS and maximum one SRS resource set for semi-persistent SRS is supported | Per FS | n/a | n/a | n/a | Note: The two SP-SRS resource sets are not activated at the same time | Optional with capability signalling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-6-1 | Single-DCI based STx2P SDM scheme for PUSCH—codebook | 1. Dynamic switching by DCI 0\_1/0\_2 between single-DCI STxMP SDM and sTRP for PUSCH—codebook  2. 1 PTRS port for single-DCI based STx2P SDM scheme for PUSCH—codebook  3. Support of two SRS resource sets with usage set to 'codebook'  4. Maximum number of SRS resources in one SRS resource set  5. Maximum number of layers of each panel for Single-DCI STx2P with SDM  7. Max number of NZP PUSCH ports associated with one SRS resource set  8. Maximum number of SRS antenna ports for each SRS resource in each SRS resource set | 2-14 | Yes | N/A | Single-DCI based STx2P SDM scheme for PUSCH—codebook is not supported | Per FSPC | No | FR2 only | n/a | Component 4 candidate values: {1, 2 ,4}  Component 5 candidate values: {1, 2}  Component 7 candidate values: {1, 2 ,4}  Component 8 candidate values: {1, 2 ,4}  Note: For component 7, if a row of the TPMI consists of all 0’s, the corresponding PUSCH port is not counted  Note: If value 4 is reported for component 4, UE also reports value 4 in FG 16-5c | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-6-1-1 | 2 PTRS ports for single-DCI based STx2P SDM scheme for PUSCH—codebook | Support of 2 PTRS ports for single-DCI based STx2P SDM scheme for PUSCH—codebook | 40-6-1 | Yes | N/A | 2 PTRS ports for single-DCI based STx2P SDM scheme for PUSCH—codebook is not supported | Per Band | No | FR2 only | n/a |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-6-1a | Single-DCI based STx2P SDM scheme for PUSCH—noncodebook | 1. Dynamic switching by DCI 0\_1/0\_2 between single-DCI STxMP SDM and sTRP for PUSCH—noncodebook  2. 1 PTRS port for single-DCI based STx2P SDM scheme for PUSCH—noncodebook  3. Support of two SRS resource sets with usage set to 'noncodebook'  4. Maximum number of SRS resources in one SRS resource set  5. Maximum number of layers of each panel for Single-DCI STx2P with SDM  8. Maximum number of simultaneous transmitted SRS resources from one SRS resource set in one symbol  9. Maximum number of simultaneous transmitted SRS resources from two SRS resource sets in one symbol | 2-15 | Yes | N/A | Single-DCI based STx2P SDM scheme for PUSCH—noncodebook is not supported | Per FSPC | No | FR2 only | n/a | Component 4 candidate values: {1, 2 ,3, 4}  Component 5 candidate values: {1, 2}  Component 8 candidate values: {1, 2, 3, 4}  Component 9 candidate values: {1, 2, 3, 4, 5, 6, 7, 8} | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-6-1a-1 | 2 PTRS ports for single-DCI based STx2P SDM scheme for PUSCH—noncodebook | Support of 2 PTRS ports for single-DCI based STx2P SDM scheme for PUSCH—noncodebook | 40-6-1a | Yes | N/A | 2 PTRS ports for single-DCI based STx2P SDM scheme for PUSCH—noncodebook is not supported | Per Band | No | FR2 only | n/a |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-6-1b | Association between CSI-RS and SRS for noncodebook single-DCI based STx2P SDM scheme for PUSCH | 1. Support of up to two NZP CSI-RS resources associated with the two SRS resource sets for non-codebook based STxMP SDM scheme for PUSCH  2. Maximum number of periodic SRS resources associated with first and second CSI-RS per BWP  3. Maximum number of aperiodic SRS resources associated with first and second CSI-RS per BWP  4. Maximum number of semi-persistent SRS resources associated with first and second CSI-RS per BWP  5. UE can process Y SRS resources associated with first and second CSI-RS resources simultaneously in a CC. Includes P/SP/A SRS  6. UE can process up to X CSI-RS resources associated with SRS for non-codebook-based transmission simultaneously | 2-15a, 40-6-1a | Yes | N/A | Associated CSI-RS resources for non-codebook single-DCI based STxMP SDM scheme for PUSCH is not supported | Per Band | n/a | FR2 only | n/a | Component 2 candidate values: {1, 2,…,8}  Component 3 candidate values: {1, 2,…,8}  Component 4 candidate values: {0,1, 2,…,8}  Component 5 candidate values: {1, 2,…,16}  Component 6 candidate values: {1,2} | Optional with capability signalling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-6-1-2 | New UL DMRS port entry for single-DCI based SDM scheme for Rel-15 DMRS port and/or Rel-18 DMRS port | Support of new UL DMRS port entry {0, 2, 3} | 40-6-1 or 40-6-1a | Yes | N/A | New UL DMRS port entry for single-DCI based SDM scheme is not supported | Per Band | n/a | FR2 only | n/a |  | Optional with capability signalling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-6-2 | Single-DCI based STx2P SFN scheme for PUSCH—codebook | 2.Dynamic switching by DCI 0\_1/0\_2 between single-DCI STxMP SFN and sTRP  3. 1 PTRS port for single-DCI based STx2P SFN scheme for PUSCH—codebook  4. Support of two SRS resource sets with usage set to 'codebook'  5. Maximum number of SRS resources in one SRS resource set  6. Maximum number of MIMO layers of each SRS resource set for CB PUSCH with SFN scheme  7. Maximum number of SRS antenna ports for each SRS resource in each SRS resource set  9. Max number of NZP PUSCH ports associated with one SRS resource set | 2-14 | Yes | n/a | Single-DCI based STx2P SFN scheme for PUSCH—codebook is not supported | Per FSPC | n/a | FR2 only | n/a | Component 5 candidate values: {1, 2 ,4}  Component 6 candidate values: {1, 2}  Component 7 candidate values: {1, 2, 4}  Component 9 candidate values: {1, 2, 4}  Note: For component 9, if a row of the TPMI consists of all 0’s, the corresponding PUSCH port is not counted  Note: If value 4 is reported for component 5, UE also reports value 4 in FG 16-5c | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-6-2-1 | 2 PTRS ports for single-DCI based STx2P SFN scheme for PUSCH—codebook | Support of 2 PTRS ports for single-DCI based STx2P SFN scheme for PUSCH—codebook | 40-6-2 | Yes | n/a | 2 PTRS ports for single-DCI based STx2P SFN scheme for PUSCH—codebook is not supported | Per Band | n/a | FR2 only | n/a |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-6-2a | Single-DCI based STx2P SFN scheme for PUSCH—noncodebook | 2.Dynamic switching by DCI 0\_1/0\_2 between single-DCI STxMP SFN and sTRP  3. 1 PTRS port for single-DCI based STx2P SFN scheme for PUSCH—noncodebook  4. Support of two SRS resource sets with usage set to 'noncodebook'  5. Maximum number of SRS resources in one SRS resource set  6. Maximum number of MIMO layers of each SRS resource set for NCB PUSCH with SFN scheme  8. Maximum number of simultaneous transmitted SRS resources from one SRS resource set in one symbol  9. Maximum number of simultaneous transmitted SRS resources from two SRS resource sets in one symbol | 2-15 | Yes | n/a | Single-DCI based STx2P SFN scheme for PUSCH—noncodebook is not supported | Per FSPC | n/a | FR2 only | n/a | Component 5 candidate values: {1, 2 ,3, 4}  Component 6 candidate values: {1, 2}  Component 8 candidate values: {1, 2, 3, 4}  Component 9 candidate values: {1, 2, 3, 4, 5, 6, 7, 8} | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-6-2a-1 | 2 PTRS ports for single-DCI based STx2P SFN scheme for PUSCH—noncodebook | Support of 2 PTRS ports for single-DCI based STx2P SFN scheme for PUSCH—noncodebook | 40-6-2a | Yes | n/a | 2 PTRS ports for single-DCI based STx2P SFN scheme for PUSCH—noncodebook is not supported | Per Band | n/a | FR2 only | n/a |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-6-2b | Association between CSI-RS and SRS for noncodebook single-DCI based STx2P SFN scheme for PUSCH | 1. Support of up to two NZP CSI-RS resources associated with the two SRS resource sets for non-codebook based STxMP SFN scheme for PUSCH  2. Maximum number of periodic SRS resources associated with first and second CSI-RS per BWP  3. Maximum number of aperiodic SRS resources associated with first and second CSI-RS per BWP  4. Maximum number of semi-persistent SRS resources associated with first and second CSI-RS per BWP  5. UE can process Y SRS resources associated with first and second CSI-RS resources simultaneously in a CC. Includes P/SP/A SRS  6. UE can process up to X CSI-RS resources associated with SRS for non-codebook-based transmission simultaneously | 2-15a, 40-6-2a | Yes | n/a | Associated CSI-RS resources for non-codebook single-DCI based STxMP SFN scheme for PUSCH is not supported | Per Band | n/a | FR2 only | n/a | Component 2 candidate values: {1, 2,…,8}  Component 3 candidate values: {1, 2,…,8}  Component 4 candidate values: {0,1, 2,…,8}  Component 5 candidate values: {1, 2,…,16}  Component 6 candidate values: {1,2} | Optional with capability signalling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-6-3a | codebook multi-DCI based STx2P PUSCH+PUSCH for DG+DG | 1. Support of multi-DCI based STx2P PUSCH+PUSCH for codebook-based PUSCH with fully overlapping PUSCHs in time and non-overlapping in frequency  2. Support of two SRS resource sets with usage set to 'codebook' associated with two coresetPoolIndex values  3. Maximum number of SRS resources in one SRS resource set  4. Maximum number of layers of each PUSCH of PUSCH+PUSCH overlapping in time domain  5. Maximum number of NZP PUSCH ports for each PUSCH of PUSCH+PUSCH overlapping in time domain  6. Maximum number of PUSCHs per CORESETPoolIndex per slot  7. Maximum total number of layers across two overlapping PUSCH  8. Maximum number of SRS antenna ports for each SRS resource in each SRS resource set | 2-14 | Yes | N/A | Codebook multi-DCI based STx2P PUSCH+PUSCH is not supported | Per FSPC | n/a | FR2 only | n/a | Note: Processing capability 2 is not supported in any CC if at least one CC is configured with two values of CORESETPoolIndex.  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.  Component 4 candidate values: {1,2}  Component 5 candidate values: {1,2,4}  Note: If a row of the TPMI consists of all 0’s, the corresponding PUSCH port is not counted  Component 6 candidate values: {1,2,3,4,7}  Note: per SCS, similar with Rel-15  Component 7 candidate values: {2 ,3, 4}  Component 8 candidate values: {1, 2 ,4} | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-6-3c | Codebook multi-DCI based STx2P PUSCH+PUSCH – Fully overlapping PUSCHs in time and fully overlapping in frequency | Support of fully overlapping PUSCHs in time and fully overlapping in frequency | 40-6-3a | Yes | N/A | Fully overlapping PUSCHs in time and fully overlapping in frequency for codebook multi-DCI based STx2P PUSCH+PUSCH is not supported | Per Band | n/a | FR2 only | n/a |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-6-3d | Codebook multi-DCI based STx2P PUSCH+PUSCH – Fully overlapping PUSCHs in time and partially overlapping in frequency | Support of fully overlapping PUSCHs in time and partially overlapping in frequency | 40-6-3a | Yes | N/A | Fully overlapping PUSCHs in time and partially overlapping in frequency for codebook multi-DCI based STx2P PUSCH+PUSCH is not supported | Per Band | n/a | FR2 only | n/a |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-6-3e | Codebook multi-DCI based STx2P PUSCH+PUSCH – Partially overlapping PUSCHs in time and fully overlapping in frequency | Support of partially overlapping PUSCHs in time and fully overlapping in frequency | 40-6-3a | Yes | N/A | Partially overlapping PUSCHs in time and fully overlapping in frequency for codebook multi-DCI based STx2P PUSCH+PUSCH is not supported | Per Band | n/a | FR2 only | n/a |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-6-3f | Codebook multi-DCI based STx2P PUSCH+PUSCH – Partially overlapping PUSCHs in time, partially overlapping in frequency | Support of partially overlapping PUSCHs in time, partially overlapping in frequency | 40-6-3a | Yes | N/A | Partially overlapping PUSCHs in time, partially overlapping in frequency for codebook multi-DCI based STx2P PUSCH+PUSCH is not supported | Per Band | n/a | FR2 only | n/a |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-6-3g | Codebook multi-DCI based STx2P PUSCH+PUSCH – Partially overlapping PUSCHs in time, non- overlapping in frequency | Support of partially overlapping PUSCHs in time, non-overlapping in frequency | 40-6-3a | Yes | N/A | Partially overlapping PUSCHs in time, non-overlapping in frequencyfor codebook multi-DCI based STx2P PUSCH+PUSCH is not supported | Per Band | n/a | FR2 only | n/a |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-6-3h | Codebook multi-DCI based STx2P PUSCH+PUSCH for CG+CG | Support of multi-DCI based STxMP CG-PUSCH+CG-PUSCH | 40-6-3a | Yes | N/A | Multi-DCI based STx2P for CG+CG is not supported for codebook | Per Band | n/a | FR2 only | n/a |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-6-3i | Codebook multi-DCI based STx2P PUSCH+PUSCH for DG+CG | Support of multi-DCI based STxMP DG-PUSCH+CG-PUSCH | 40-6-3a | Yes | N/A | Multi-DCI based STx2P for DG+CG is not supported for codebook | Per Band | n/a | FR2 only | n/a |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-6-3b | Noncodebook multi-DCI based STx2P PUSCH+PUSCH for DG+DG | 1. Support of multi-DCI based STxMP PUSCH+PUSCH for noncodebook-based PUSCH with fully overlapping PUSCHs in time and non-overlapping in frequency  2. Support of two SRS resource sets with usage set to 'noncodebook' associated with two coresetPoolInde values  3. Maximum number of SRS resources in one SRS resource set  4. Maximum number of layers of each PUSCH of PUSCH+PUSCH overlapping in time domain  5. Maximum number of simultaneously transmitted SRS resources in one symbol per SRS resource set  6. Maximum number of PUSCHs per coresetPoolIndex per slot  7. Maximum total number of layers across two overlapping PUSCH | 2-15 | Yes | N/A | Noncodebook multi-DCI based STx2P PUSCH+PUSCH is not supported | Per FSPC | n/a | FR2 only | n/a | Note: Processing capability 2 is not supported in any CC if at least one CC is configured with two values of CORESETPoolIndex.  Component 3 candidate values: {1,2,3,4}  Component 4 candidate values: {1,2}  Component 5 candidate values: {1,2,3,4}  Component 6 candidate values: {1,2,3,4,7}  Note: per SCS, similar with Rel-15  Component 7 candidate values: {2 ,3, 4} | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-6-3j | Noncodebook multi-DCI based STx2P PUSCH+PUSCH – Fully overlapping PUSCHs in time and fully overlapping in frequency | Support of fully overlapping PUSCHs in time and fully overlapping in frequency for noncodebook multi-DCI based STx2P PUSCH+PUSCH | 40-6-3b | Yes | N/A | Fully overlapping PUSCHs in time and fully overlapping in frequency for noncodebook multi-DCI based STx2P PUSCH+PUSCH is not supported | Per Band | n/a | FR2 only | n/a |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-6-3k | Noncodebook multi-DCI based STx2P PUSCH+PUSCH – Fully overlapping PUSCHs in time and partially overlapping in frequency | Support of fully overlapping PUSCHs in time and partially overlapping in frequency for noncodebook multi-DCI based STx2P PUSCH+PUSCH | 40-6-3b | Yes | N/A | Fully overlapping PUSCHs in time and partially overlapping in frequency for noncodebook multi-DCI based STx2P PUSCH+PUSCH is not supported | Per Band | n/a | FR2 only | n/a |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-6-3l | Noncodebook multi-DCI based STx2P PUSCH+PUSCH – Partially overlapping PUSCHs in time and fully overlapping in frequency | Support of partially overlapping PUSCHs in time and fully overlapping in frequency for noncodebook multi-DCI based STx2P PUSCH+PUSCH | 40-6-3b | Yes | N/A | Partially overlapping PUSCHs in time and fully overlapping in frequency for noncodebook multi-DCI based STx2P PUSCH+PUSCH is not supported | Per Band | n/a | FR2 only | n/a |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-6-3m | Noncodebook multi-DCI based STx2P PUSCH+PUSCH – Partially overlapping PUSCHs in time, partially overlapping in frequency | Support of partially overlapping PUSCHs in time, partially overlapping in frequency for noncodebook multi-DCI based STx2P PUSCH+PUSCH | 40-6-3b | Yes | N/A | Partially overlapping PUSCHs in time, partially overlapping in frequency for noncodebook multi-DCI based STx2P PUSCH+PUSCH is not supported | Per Band | n/a | FR2 only | n/a |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-6-3n | Noncodebook multi-DCI based STx2P PUSCH+PUSCH – Partially overlapping PUSCHs in time, non-overlapping in frequency | Support of partially overlapping PUSCHs in time, non-overlapping in frequency for noncodebook multi-DCI based STx2P PUSCH+PUSCH | 40-6-3b | Yes | N/A | Partially overlapping PUSCHs in time, non-overlapping in frequency for noncodebook multi-DCI based STx2P PUSCH+PUSCH is not supported | Per Band | n/a | FR2 only | n/a |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-6-3o | Noncodebook multi-DCI based STx2P PUSCH+PUSCH for CG+CG | Support of multi-DCI based STxMP CG-PUSCH+CG-PUSCH for noncodebook | 40-6-3b | Yes | N/A | Multi-DCI based STx2P for CG+CG is not supported for noncodebook | Per Band | n/a | FR2 only | n/a |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-6-3p | Noncodebook multi-DCI based STx2P PUSCH+PUSCH for DG+CG | Support of multi-DCI based STxMP DG-PUSCH+CG-PUSCH for noncodebook | 40-6-3b | Yes | N/A | Multi-DCI based STx2P for DG+CG is not supported for noncodebook | Per Band | n/a | FR2 only | n/a |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-6-3b-1 | Associated CSI-RS resources for noncodebook multi-DCI based STx2P PUSCH+PUSCH | 1. Support of up to two NZP CSI-RS resources associated with the two SRS resource sets for multi-DCI non-codebook based STxMP scheme for PUSCH  2. Maximum number of periodic SRS resources associated with first and second CSI-RS per BWP  3. Maximum number of aperiodic SRS resources associated with first and second CSI-RS per BWP  4. Maximum number of semi-persistent SRS resources associated with first and second CSI-RS per BWP  5. UE can process Y SRS resources associated with first and second CSI-RS resources simultaneously in a CC. Includes P/SP/A SRS  6. UE can process up to X CSI-RS resources associated with SRS for non-codebook-based transmission simultaneously | 2-15a, 40-6-3b | Yes | n/a | Associated CSI-RS resources for noncodebook multi-DCI based STx2P PUSCH+PUSCH is not supported | Per Band | n/a | FR2 only | n/a | Component 2 candidate values: {1 to 8}  Component 3 candidate values: {1 to 8}  Component 4 candidate values: {0 to 8}  Component 5 candidate values: {1 to 16}  Component 6 candidate values: {1 to 2} | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-6-4 | Single-DCI based STx2P SFN scheme for PUCCH | 1. Support of single-DCI based STx2P SFN scheme for PUCCH  2. Supported PUCCH formats for STxMP SFN scheme |  | Yes | n/a | Single-DCI based STx2P SFN scheme for PUCCH is not supported | Per FS | n/a | FR2 only | n/a | Component 2 candidate values: {PF0/2, PF1/3/4, PF0-4) | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-6-4a | Dynamic indication of repetition number for SFN scheme for PUCCH | Support STxMP SFN PUCCH scheme together with the Rel-17 dynamic indication of repetition number | 40-6-4, 30-5 | Yes | n/a | Dynamic indication of repetition number for SFN scheme for PUCCH is not supported | Per band | n/a | FR2 only | n/a |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-6-5 | Support grouped-based beam reporting for STx2P | 1. Support group based L1-RSRP reporting for STxMP based transmission  2. 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  3. Maximum number of SSB and CSI-RS resources for measurement in both CMR sets within a slot across all CCs in a band  4. Maximum number of configured SSB and CSI-RS resources for measurement in both CMR sets across all CCs in a band | 23-5-1 | Yes | n/a | Grouped-based beam reporting for STx2P is not supported | Per Band | n/a | FR2 only | n/a | Component 1 candidate values: {JointULandDL, ULOnly, both}  Component 2 candidate values: {1,2,3,4}  Component 3 candidate values: {2,3,4,8,16,32,64}  Component 4 candidate values: {8, 16, 32, 64, 128}  Note: components 3 and 4 are also counted in FG 16-1g, 16-1g-1, and 23-5-1 | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-6-6 | Out-of-order operation for multi-DCI based STx2P PUSCH+PUSCH | Support of out-of-order operation for multi-DCI based STx2P PUSCH+PUSCH | 40-6-3a or 40-6-3b | Yes | N/A | Out-of-order operation for multi-DCI based STx2P PUSCH+PUSCH is not supported | Per FSPC | N/A | FR2 only | N/A |  | Optional with capability signalling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-7-1 | Basic features for Codebook-based 8Tx PUSCH | 1. Maximum number of PUSCH MIMO layers for codebook based PUSCH  2. Maximum number of 8 port SRS resources per SRS resource set with usage set to 'codebook’ for codebook-based 8Tx PUSCH  3. SRS 8 Tx ports—codebook |  | Yes | n/a | Codebook-based 8Tx PUSCH is not supported | Per FSPC | No | No | No | Component 1 candidate values: {1,2 ,3,4 ,5,6,7,8}  Component 2 candidate values: {1,2}  Component 3 candidate values: {noTDM, TDM and noTDM}  Note: the candidate value signalled in component 3 only applies to codebook2/codebook3/codebook4  A UE that supports FG 40-7-1 must support at least one of FGs 40-7-1a/b/c/d | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-7-1a | Codebook-based 8Tx PUSCH—codebook1 | 1. Support of codebook-based 8Tx PUSCH—codebook1  2. Support of (N1, N2) for codebook-based 8Tx PUSCH—codebook1  3. SRS 8 Tx ports—codebook1 | 40-7-1 | Yes | n/a | Codebook-based 8Tx PUSCH—codebook1 is not supported | Per FSPC | No | No | No | Component 2 candidate values: {ng1n4n1, ng1n2n2, both}  Component 3 candidate values: {noTDM, TDM and noTDM} | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-7-1b | Codebook-based 8Tx PUSCH—codebook2 | Support of codebook-based 8Tx PUSCH—codebook2 | 40-7-1 | Yes | n/a | Codebook-based 8Tx PUSCH—codebook2 is not supported | Per FSPC | No | No | No |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-7-1c | Codebook-based 8Tx PUSCH—codebook3 | Support of codebook-based 8Tx PUSCH—codebook3 | 40-7-1 | Yes | n/a | Codebook-based 8Tx PUSCH—codebook3 is not supported | Per FSPC | No | No | No |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-7-1d | Codebook-based 8Tx PUSCH—codebook4 | Support of codebook-based 8Tx PUSCH—codebook4 | 40-7-1 | Yes | n/a | Codebook-based 8Tx PUSCH—codebook4 is not supported | Per FSPC | No | No | No |  | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-7-1e | UL full power transmission mode 0 | Support of UL full power transmission mode of fullpower when UE is capable of 8 Tx codebook based PUSCH operation | 40-7-1 | yes | n/a | UL full power transmission mode 0 is not supported | Per FSPC | n/a | n/a | n/a |  | Optional with capability signalling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-7-1f | UL full power transmission mode 1 | Support of UL full power transmission mode of fullpowerMode1 when UE is capable of 8 Tx codebook based PUSCH operation | 40-7-1 | yes | n/a | UL full power transmission mode 1 is not supported | Per FSPC | n/a | n/a | n/a |  | Optional with capability signalling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-7-1g | UL full power transmission mode 2 with 1/2/4 resources | 1. Support of UL full power transmission mode of fullpowerMode2 when UE is capable of 8 Tx codebook based PUSCH operation  2. Maximum number of SRS resources in one SRS resource set with usage set to 'codebook' for 8Tx codebook based PUSCH for Mode 2 | 40-7-1 | yes | n/a | UL full power transmission mode 2 is not supported | Per FSPC | n/a | n/a | n/a | Component 2 candidate values: {1, 2, 4}  Note: A UE that supports FG 40-7-1g supports at least full power operation with single port | Optional with capability signalling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-7-1g-1 | SRS resources for UL full power transmission mode 2 | 1. SRS configurations with different number of antenna ports per SRS resource for mode 2 | 40-7-1g | yes | n/a | SRS resources for UL full power transmission mode 2 cannot be signaled | Per FSPC | n/a | n/a | n/a | Component 1 candidate values: 3 bit bitmap {b0, b1, b2}  b0 indicates whether SRS resource can be configured with 1 port  b1 indicates whether SRS resource can be configured with 2 port  b2 indicates whether SRS resource can be configured with 4 port | Optional with capability signalling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-7-1g-2 | TPMI group(s) which delivers full power for codebook2 | 1. TPMI group(s) which delivers full power when UE is capable of and configured with 8 Tx codebook based PUSCH operation with codebook2 | 40-7-1g | yes | n/a | TPMI group(s) which delivers full power is unknown | Per FSPC | n/a | n/a | n/a | Component 1 candidate values: {first coherent antenna port group, second coherent antenna port group} | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-7-2 | Basic features for Non-Codebook-based 8Tx PUSCH | 1. Maximum number of PUSCH MIMO layers for non-codebook based PUSCH  2. Maximum number of SRS resources per SRS resource set with usage set to 'nonCodebook’  3. Maximum number of simultaneous transmitted SRS resources at one symbol |  | Yes | n/a | Non-codebook based 8Tx PUSCH is not supported | Per FSPC | No | No | No | Component 1 candidate values: {1,2, 3, 4,5,6,7,8}  Component 2 candidate values: {1,2,3,4,5,6,7,8}  Component 3 candidate values: {1,2, 3, 4,5,6,7,8} | Optional with capability signaling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-7-2a | Association between CSI-RS and SRS for non-codebook case | 1. Support association between NZP-CSI-RS and SRS resource set via RRC parameter "SRS-ResourceSet" for noncodebook 8Tx PUSCH operation  2. A list of supported combinations, each combination is {Max # of Tx ports in one resource, Max # of resources, and total # of Tx ports} simultaneously | 40-7-2 | yes | n/a | Association between CSI-RS and SRS for non-codebook case is not supported | Per FSPC | No | No | No | Component 2 candidate value: Maximum size of the list is 16.  The candidate values for the max # of Tx port in one resource is  {2, 4, 8, 12, 16, 24, 32}  The candidate value set of the max # of resources is:  {1 to 64}  The candidate value set of total # of ports is:  {2 to 256}  Note: Component 2 is reported per BC | Optional with capability signalling |
| 40. NR\_MIMO\_evo\_DL\_UL | 40-7-3 | CBG based 2 CWs PUSCH with rank >4 | Support CBG based transmission for 2 CWs PUSCH | 40-7-1 or 40-7-2 | yes | n/a | CBG based transmission for 2 CWs PUSCH is not supported | Per FSPC | No | No | No |  | Optional with capability signalling |

1. NR\_pos\_enh2

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| Features | Index | Feature group | Components | Prerequisite feature groups | Need for the gNB to know if the feature is supported | Applicable to the capability signalling exchange between UEs (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 |
| 41. NR\_pos\_enh2 | 41-1-1 | Common SL PRS Processing Capability in a SL BWP | 1. Maximum SL PRS bandwidth in MHz in a resource pool for positioning, which is supported and reported by UE for SL-PRS measurement  2. Maximum number of active SL PRS resources across all configured RPs in a slot assuming maximum SL PRS bandwidth in MHz, which is supported and reported by UE  3. Maximum number of slots with active SL PRS resources across all configured RPsassuming maximum SL PRS bandwidth in MHz, which is supported and reported by UE  4. Minimum time after the end of a slot carrying the active SL-PRS resource(s) assuming maximum number of symbols and maximum bandwidth for a UE to finish the SL-PRS resource and the associated PSCCH processing which is supported and reported by UE |  | Yes | No | The UE does not support the reception and processing of SL PRS | Per Band | n/a | n/a | n/a | Component 1 candidate values:  FR1 bands: {5, 10, 20, 40, 50, 80, 100}  FR2 bands: {50, 100, 200, 400}  Component 2 candidate values:  FR1 bands: {1, 2, 4, 6, 8, 12, 16, 24} for each SCS: 15kHz, 30kHz, 60kHz  FR2 bands: {1, 2, 4, 6, 8, 12, 16, 24, 32, 48, 64, 128} for each SCS: 60kHz, 120kHz  Component 3 candidate values:  FR1: {1, 2, 3, 4, 6, 8} FR2: {1, 2, 4, 8, 12, 16, 24, 32, 48, 64}  Component 4 candidate values: {20ms, 30ms, 40ms, 50ms, 80ms, 100ms, 160ms}  Note: a SL PRS resource is considered as active starting at the end of the last symbol of the PSCCH carrying the SCI trigger and the occupancy is released at the end of timeline indicated in component 4  Need for location server/ UE to know if the feature is supported | Optional with capability signaling |
| 41. NR\_pos\_enh2 | 41-1-1a | Common SL PRS Processing Capability | 1. Maximum number of active SL PRS resources across all configured RPs across all bands in a slot assuming maximum SL PRS bandwidth in MHz, which is supported and reported by UE  2. Maximum number of slots with active SL PRS resources across all configured RPsacross all bands assuming maximum SL PRS bandwidth in MHz, which is supported and reported by UE | 41-1-1 | Yes | No | The UE does not support the reception and processing of SL PRS | Per UE | No | No | No | Component 1 candidate values:  FR1 bands: {1, 2, 4, 6, 8, 12, 16, 24} for each SCS: 15kHz, 30kHz, 60kHz  FR2 bands: {1, 2, 4, 6, 8, 12, 16, 24, 32, 48, 64, 128} for each SCS: 60kHz, 120kHz  Component 2 candidate values:  FR1: {1, 2, 3, 4, 6, 8} FR2: {1, 2, 4, 8, 12, 16, 24, 32, 48, 64}  Need for location server/ UE to know if the feature is supported | Optional with capability signaling |
| 41. NR\_pos\_enh2 | 41-1-2 | Receiving SL-PRS in a shared resource pool | 1. Support SL-PRS in shared resource pool  2. Support receiving SCI format 2D | 15-1 41-1-1 | Yes | No | Receiving SL-PRS in a shared resource pool is not supported | Per band | n/a | n/a | n/a | Need for location server/ UE to know if the feature is supported | Optional with capability signaling |
| 41. NR\_pos\_enh2 | 41-1-3 | Receiving SL-PRS in a dedicated resource pool | 1. Support SL-PRS in dedicated resource pool  2. Support receiving SCI format 1B  3. UE can receive X PSCCH in a slot  4. Supported CP type for 60 kHz SCS | 41-1-1 | Yes | No | Receiving SL-PRS in a dedicated resource pool is not supported | Per band | n/a | n/a | n/a | Need for location server/ UE to know if the feature is supported  Component 3 candidate values: {floor (NRB /10 RBs), 2\*floor (NRB /10 RBs)}  Component 4 candidate values: {NCP,NCP and ECP}  Note: NRB is the number of RBs defined per channel bandwidth by RAN4 in 38.101-1 Table 5.3.2-1 for FR1 and 38.101-2 Table 5.3.2-1 for FR2 | Optional with capability signaling |
| 41. NR\_pos\_enh2 | 41-1-4a | Transmitting SL-PRS in a shared resource pool | 1. Support of transmitting SL-PRS in a shared resource pool  2. Support transmitting SCI format 2D | 15-2 or 15-3, 41-1-2 | Yes | No | Transmitting SL-PRS in a shared resource pool is not supported | Per band | n/a | n/a | n/a | The supported resource allocation modes are the same as for communication and signaled in FGs 15-2 and 15-3  Need for location server/UE to know if the feature is supported  Note: If UE indicates support of *p0-OLPC-Sidelink-r17*, the range of P0 values associated with p0-OLPC-Sidelink-r17 is used for SL PRS transmission | Optional with capability signaling |
| 41. NR\_pos\_enh2 | 41-1-4b | Transmitting SL-PRS mode 1 in a dedicated SL PRS resource pool | 1. UE can transmit SL-PRS and PSCCH within a slot without PSSCH in dedicated SL PRS resource pool  2. UE can transmit SL-PRS according to the mapping rule between PSCCH and SL-PRS  3. Support transmitting SCI format 1B  4. Support receiving DCI format 3\_2  5. Support downlink pathloss based open loop power control of SL-PRS | 41-1-3 | Yes | No | Transmitting SL-PRS mode 1 in a dedicated SL PRS resource pool is not supported | Per band | n/a | n/a | n/a | Need for location server/UE to know if the feature is supported  Note: component 5 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 signaling |
| 41. NR\_pos\_enh2 | 41-1-4c | Transmitting SL-PRS mode 2 in a dedicated resource pool | 1. UE can transmit SL-PRS and PSCCH within a slot without PSSCH in dedicated resource pool  2. UE can transmit SL-PRS according to the mapping rule between PSCCH and SL-PRS  3. Support transmitting SCI format 1B | at least one of {41-1-8, 41-1-10} | Yes | No | Transmitting SL-PRS mode 2 in a dedicated resource pool is not supported | Per band | n/a | n/a | n/a | Need for location server/ UE to know if the feature is supported | Optional with capability signaling |
| 41. NR\_pos\_enh2 | 41-1-5 | SL-PRS congestion control in a dedicated resource pool | 1) UE can report SL PRS CBR measurement to gNB when operating in mode 1 and mode 2  2) UE can adjust its radio parameters based on SL PRS CBR measurement and SL PRS CRlimit  3) UE can process SL PRS CBR and SL PRS CR within the time it indicates | 41-1-3, at least one of 41-1-4b or 41-1-4c | Yes | No | SL-PRS congestion control in a dedicated resource pool is not supported | Per band | n/a | n/a | n/a | Component-3 candidate value set  {Congestion process time 1, Congestion process time 2, Congestion process time 3} where  Congestion process time 1: 2, 2, 4, 8 slots for 15, 30, 60, 120 kHz subcarrier spacing.  Congestion process time 2: 2, 4, 8, 16 slots for 15, 30, 60, 120 kHz subcarrier spacing Congestion process time 3: 3, 6, 12, 24 slots for 15, 30, 60, 120 kHz subcarrier spacing  Note: component 1 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 signaling. |
| 41. NR\_pos\_enh2 | 41-1-7a | SL PRS measurement for SL-RSTD | 1. Support SL RSTD measurement based on SL-PRS  2. Support SL RSTD measurement reporting  3. Maximum number of SL RSTD measurement reporting for different SL-PRS reception for the same pair of UEs | 41-1-1 | No | No | UE does not support SL PRS measurement for SL-RSTD | Per band | n/a | n/a | n/a | Need for location server/ UE to know if the feature is supported  Component 3 candidate values: {1,2,3,4} | Optional with capability signaling |
| 41. NR\_pos\_enh2 | 41-1-7b | SL PRS measurement for SL RTOA | 1. Support SL RTOA measurement based on SL-PRS  2. Support SL RTOA measurement reporting  3. Maximum number of SL RTOA measurementreporting for different SL-PRS reception for the same pair of UEs | 41-1-1 | No | No | UE does not support SL PRS measurement for SL RTOA | Per band | n/a | n/a | n/a | Need for location server/ UE to know if the feature is supported  Component 3 candidate values: {1,2,3,4} | Optional with capability signaling |
| 41. NR\_pos\_enh2 | 41-1-7c | SL PRS measurement for UE Rx – Tx time difference without Tx time stamp | 1. Support UE Rx – Tx time difference measurement based on SL PRS  2. Support UE Rx – Tx time difference measurement reporting without Tx time stamp  3. Maximum number of Rx-Tx measurement reporting for different SL-PRS reception for the same pair of UEs | 41-1-1, at least one of 41-1-4a/b/c | No | No | UE does not support SL PRS measurement for Rx – Tx time difference without Tx time stamp | Per band | n/a | n/a | n/a | Need for location server/ UE to know if the feature is supported  Component 3 candidate values: {1,2,3,4} | Optional with capability signaling |
| 41. NR\_pos\_enh2 | 41-1-7d | SL PRS measurement for UE Rx – Tx time difference with Tx time stamp | 1. Support UE Rx – Tx time difference measurement based on SL PRS  2. Support UE Rx – Tx time difference measurement reporting with Tx time stamp  3. Reporting M Rx-Tx measurements for the same SL-PRS transmission (or reception) and different SL-PRS reception (or transmission) for the same pair of UEs  4. Maximum number of Rx-Tx measurement reporting for different SL-PRS reception for the same pair of UEs | 41-1-1, at least one of 41-1-4a/b/c | No | No | UE does not support SL PRS measurement for UE Rx – Tx time difference with Tx time stamp | Per band | n/a | n/a | n/a | Need for location server/ UE to know if the feature is supported  Component 3 candidate values of M={1,2,3,4}  Component 4 candidate values: {1,2,3,4} | Optional with capability signaling |
| 41. NR\_pos\_enh2 | 41-1-7e | SL PRS measurement for SL PRS-RSRP | 1. Support SL PRS-RSRP measurement based on SL-PRS  2. Support SL PRS-RSRP measurement reporting | 41-1-1 | No | No | SL PRS measurement for SL PRS-RSRP is not supported | Per band | n/a | n/a | n/a | Need for location server/ UE to know if the feature is supported | Optional with capability signaling |
| 41. NR\_pos\_enh2 | 41-1-7f | SL PRS measurement for SL PRS-RSRPP | 1. Support SL PRS-RSRPP measurement based on SL-PRS  2. Support SL PRS-RSRPP measurement reporting | 41-1-1 | No | No | SL PRS measurement for SL PRS-RSRPP is not supported | Per band | n/a | n/a | n/a | Need for location server/ UE to know if the feature is supported | Optional with capability signaling |
| 41. NR\_pos\_enh2 | 41-1-7g | SL PRS measurement for SL AoA | 1. Support SL AoA measurement based on SL-PRS  2. Support SL AoA measurement reporting types. Candidate values: bitmap {GCS, LCS with translation, LCS without translation}. | 41-1-1 | No | No | SL PRS measurement for SL AoA is not supported | Per band | n/a | n/a | n/a | Need for location server/ UE to know if the feature is supported | Optional with capability signaling |
| 41. NR\_pos\_enh2 | 41-1-8 | Support of random selection in a dedicated resource pool | 1. Support transmitting SL-PRS and associated PSCCH using random selection in a dedicated resource pool  2 Support DL pathloss based open loop power control when configured by NR Uu |  | Yes | No | UE cannot transmit SL-PRS using random selection in a dedicated resource pool | 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 2 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 signaling |
| 41. NR\_pos\_enh2 | 41-1-10 | Support of full sensing in a dedicated resource pool | 1. UE can transmit SL-PRS and associated PSCCH using full sensing  2. Support DL pathloss based open loop power control when configured by NR Uu  3. UE can receive X PSCCH in a slot |  | Yes | No | UE cannot transmit SL-PRS using full sensing in a dedicated resource pool | Per band | n/a | n/a | n/a | Component 3 candidate values: {floor (NRB /10 RBs), 2\*floor (NRB /10 RBs)}  Note: NRB is the number of RBs defined per channel bandwidth by RAN4 in 38.101-1 Table 5.3.2-1 for FR1 and 38.101-2 Table 5.3.2-1 for FR2  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 2 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: UE supporting this FG also support receiving SCI format 1B | Optional with capability signaling |
| 41. NR\_pos\_enh2 | 41-1-11 | TDM-based multiplexing of SL-PRS reception from different UEs in the same slot in dedicated resource pool | Support of TDM-based multiplexing of SL-PRS reception from different UEs in the same slot in dedicated resource pool | 41-1-3 | No | No | TDM-based multiplexing of SL-PRS reception from different UEs in the same slot is not supported in dedicated resource pool | Per band | n/a | n/a | n/a | Need for location server/UE to know if the feature is supported | Optional with capability signaling |
| 41. NR\_pos\_enh2 | 41-1-12 | Comb-based multiplexing for SL-PRS reception from different UEs in the same slot in dedicated resource pool | Support of comb-based multiplexing for SL-PRS reception from different UEs in the same slot in dedicated resource pool | 41-1-3 | No | No | Comb-based multiplexing for SL-PRS reception from different UEs in the same slot is not supported in dedicated resource pool | Per band | n/a | n/a | n/a | Need for location server/UE to know if the feature is supported | Optional with capability signaling |
| 41. NR\_pos\_enh2 | 41-1-13 | Reporting the additional paths for SL positioning | 1. Maximum number of additional detected path timing reporting for K additional paths for SL positioning  2. Support of RSRPP reporting for additional paths | at least one of 41-1-7a/b/c/d/f/g | No | No | Reporting the additional paths for SL positioning is not supported | Per band | n/a | n/a | n/a | Component 1 candidate values: {1, 2, 4, 6, 8}  Need for location server/UE to know if the feature is supported | Optional with capability signaling |
| 41. NR\_pos\_enh2 | 41-1-14 | LoS/NLoS indicator for SL positioning per measurement | Support of LoS/NLoS indicator for SL positioning per measurement | at least one of 41-1-7a/b/c/d/g | No | No | LoS/NLoS indicator for SL positioning per measurement is not supported | Per band | n/a | n/a | n/a | Component 1 candidate values: {hard value, hard+soft value}  Need for location server/UE to know if the feature is supported | Optional with capability signaling |
| 41. NR\_pos\_enh2 | 41-1-17 | Open loop SL pathloss based power control for SL-PRS and associated PSCCH and SL RSRP report for dedicated resource pool | Support of open loop SL pathloss based power control for SL-PRS and associated PSCCH and SL RSRP report for dedicated resource pool for unicast transmissions | at least one of 41-1-4b or 41-1-4c | Yes | Yes | Open loop SL power control and SL RSRP report for dedicated resource pool is not supported for unicast transmissions | Per band | n/a | n/a | n/a |  | Optional with capability signaling |
| 41. NR\_pos\_enh2 | 41-1-19 | ARP location provision for sidelink as assistance data | Support of ARP location provision for sidelink as assistance data |  | No | No | UE cannot provide ARP location for sidelink as assistance data | Per band | n/a | n/a | n/a | Need for location server/UE to know if the feature is supported | Optional with capability signaling |
| 41. NR\_pos\_enh2 | 41-1-19a | Report of Rx ARP-ID with SL positioning measurements | Support providing Rx ARP-ID with SL positioning measurements |  | No | No | UE cannot report Rx ARP-ID with SL positioning measurements | Per band | n/a | n/a | n/a | Need for location server/UE to know if the feature is supported | Optional with capability signaling |
| 41. NR\_pos\_enh2 | 41-1-19b | Report of Tx ARP-ID to LMF or another UE for the transmitted SL PRS | Support providing Tx ARP-ID for the transmitted SL PRS |  | No | No | Report of Tx ARP-ID to LMF or another UE for the transmitted SL PRS is not supported | Per band | N.A. | N.A. | N.A. | Need for location server/UE to know if the feature is supported | Optional with capability signaling |
| 41. NR\_pos\_enh2 | 41-1-20 | Supports SL PRS Rx for a band configured with SL CA | 1. Support of SL PRS reception in a single carrier for a shared SL PRS resource pool and/or a dedicated SL PRS resource pool for a band configured with SL CA | One of {41-1-2 or 41-1-3}  47-v1 | Yes | No | UE does not support SL PRS reception for a shared SL PRS resource pool and/or a dedicated SL PRS resource pool for a band configured with SL CA | Per band | n/a | n/a | n/a | Need for location server to know if the feature is supported  Note: In a shared SL PRS resource pool in a single SL carrier: Tx power control follows the rule defined for SL CA in NR Rel-18.  Note: In a dedicated SL PRS resource pool in a single SL carrier when the slots (pre)configured for the dedicated SL PRS resource pool do not collide with the slots (pre)configured for any other resource pool or S-SSB resource(s) in other carriers. | Optional with capability signaling |
| 41. NR\_pos\_enh2 | 41-1-21 | Supports SL PRS Tx for a band configured with SL CA | 1. Support of SL PRS transmission in a single carrier for a shared SL PRS resource pool and/or a dedicated SL PRS resource pool for a band configured with SL CA | One of {41-1-4a, 41-1-4b or 41-1-4c}  47-v1 | Yes | No | UE does not support SL PRS transmission for a shared SL PRS resource pool and/or a dedicated SL PRS resource pool for a band configured with SL CA | Per band | n/a | n/a | n/a | Need for location server to know if the feature is supported  Note: In a shared SL PRS resource pool in a single SL carrier: Tx power control follows the rule defined for SL CA in NR Rel-18.  Note: In a dedicated SL PRS resource pool in a single SL carrier when the slots (pre)configured for the dedicated SL PRS resource pool do not collide with the slots (pre)configured for any other resource pool or S-SSB resource(s) in other carriers. | Optional with capability signaling |
| 41. NR\_pos\_enh2 | 41-2-1 | DL RSCP reporting based on DL PRS in RRC\_CONNECTED | 1. Support of DL RSCP reporting based on DL PRS in RRC\_CONNECTED | 13-11 | No | n/a | DL RSCP reporting based on DL PRS in RRC\_CONNECTED is not supported | Per band | n/a | n/a | n/a | Note: DL RSCP is reported together with UE Rx-Tx time difference measurement  Need for location server to know if the feature is supported | Optional with capability signaling |
| 41. NR\_pos\_enh2 | 41-2-1a | DL RSCPD reporting based on DL PRS in RRC\_CONNECTED | 1. Support of DL RSCPD reporting based on DL PRS in RRC\_CONNECTED | 13-6 | No | n/a | DL RSCPD reporting based on DL PRS in RRC\_CONNECTED is not supported | Per band | n/a | n/a | n/a | Note: DL RSCPD is reported along with measurement report for DL-RSTD  Need for location server to know if the feature is supported | Optional with capability signaling |
| 41. NR\_pos\_enh2 | 41-2-2 | DL RSCP reporting based on DL PRS in RRC\_INACTIVE | Support of DL RSCP reporting based on DL PRS measurement in RRC\_INACTIVE | 27-18c | No | n/a | DL RSCP reporting based on DL PRS in RRC\_INACTIVE is not supported | Per band | n/a | n/a | n/a | Note: DL RSCP is reported together with UE Rx-Tx time difference measurement  Need for location server to know if the feature is supported | Optional with capability signaling |
| 41. NR\_pos\_enh2 | 41-2-2a | DL RSCPD reporting based on DL PRS in RRC\_INACTIVE | 1. Support of DL RSCPD reporting based on DL PRS measurement in RRC\_INACTIVE | 27-18a | No | n/a | DL RSCPD reporting based on DL PRS in RRC\_INACTIVE is not supported | Per band | n/a | n/a | n/a | Note: DL RSCPD is reported along with measurement report for DL-RSTD  Need for location server to know if the feature is supported | Optional with capability signaling |
| 41. NR\_pos\_enh2 | 41-2-3 | Measurement on indicated DL PRS resource sets within the indicated time window(s) for UE based and UE assisted | Support of Measurement on indicated DL PRS resource sets within the indicated time window(s) for UE based and UE assisted | 13-1 | No | N.A. | Measurement on indicated DL PRS resource sets within the indicated time window(s) for UE based and UE assisted 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 |
| 41. NR\_pos\_enh2 | 41-2-4 | UE-based Carrier Phase Positioning | 1. Support of carrier phase measurement for UE-based positioning  2. Support of Assistance data for UE-based Carrier Phase Positioning |  | No | N.A. | UE-based Carrier Phase Positioning 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. |
| 41. NR\_pos\_enh2 | 41-2-5 | Reporting timestamp with OFDM symbol index associated with RSCP measurement and RSCPD measurement | Support of Reporting timestamp with OFDM symbol index associated with RSCP measurement and RSCPD measurement | At least one of {41-2-1, 41-2-1a, 41-2-2,41-2-2a} | No | N.A. | Reporting timestamp with OFDM symbol index associated with RSCP measurement and RSCPD measurement 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 |
| 41. NR\_pos\_enh2 | 41-2-6 | Support associating a single Rx-Tx or RSTD measurement with up to N\_sample RSCP/RSCPD measurement | Support associating a single Rx-Tx or RSTD measurement with up to N\_sample RSCP/RSCPD measurement | At least one of {41-2-1, 41-2-1a, or 41-2-2, 41-2-2a} | No | N.A. | The UE can only associate a single Rx-Tx or RSTD measurement with 1 RSCP/RSCPD measurement | Per band | N.A. | N.A. | N.A. | Need for location server to know if the feature is supported. | Optional with capability signaling. |
| 41. NR\_pos\_enh2 | 41-2-7 | DL RSCPD measurement based on DL PRS in RRC\_IDLE | Support of DL RSCPD measurement based on DL PRS measurement in RRC\_IDLE | 41-3-3 | No | n/a | DL RSCPD measurement based on DL PRS measurement in RRC\_IDLE is not supported | Per band | n/a | n/a | n/a | Note: DL RSCPD is reported along with measurement report for DL-RSTD  Need for location server to know if the feature is supported | Optional with capability signaling. |
| 41. NR\_pos\_enh2 | 41-2-8 | Support to perform DL PRS-RSRP, DL PRS-RSRPP, DL RSTD measurements inside the indicated time window only for DL TDoA | Support to perform measurements inside the indicated time window only for DL TDoA | 13-3a | No | N/A | The UE may use the indicated DL PRS resource set(s) occurring outside the indicated time window for PRS measurements for DL TDoA in addition to the indicated DL PRS resource set(s) occurring inside the indicated time window | Per band | No | No | No | Need for location server to know if the feature is supported | Optional with capability signaling |
| 41. NR\_pos\_enh2 | 41-2-9 | Support to perform DL PRS-RSRP, DL PRS-RSRPP, UE Rx-Tx measurements inside the indicated time window only for multi-RTT | Support to perform measurements inside the indicated time window only for multi-RTT | 13-4a | No | N/A | The UE may use the indicated DL PRS resource set(s) occurring outside the indicated time window for PRS measurements for multi-RTT in addition to the indicated DL PRS resource set(s) occurring inside the indicated time window | Per band | No | No | No | Need for location server to know if the feature is supported | Optional with capability signaling |
| 41. NR\_pos\_enh2 | 41-2-10 | Support to perform DL PRS-RSRP, DL PRS-RSRPP measurements inside the indicated time window only for DL AoD | Support to perform measurements inside the indicated time window only for DL AoD | 13-2a | No | N/A | The UE may use the indicated DL PRS resource set(s) occurring outside the indicated time window for PRS measurements for DL AoD in addition to the indicated DL PRS resource set(s) occurring inside the indicated time window | Per band | No | No | No | Need for location server to know if the feature is supported | Optional with capability signaling |
| 41. NR\_pos\_enh2 | 41-2-11 | Finer timing reporting granularity for PRS measurement | Supported ReportingGranularityfactors X |  | No | N.A. | Reporting Granularity cannot be signalled | Per band | N.A. | N.A. | N.A. | Component 1 candidate values for X: {-6, -5, -4, -3, -2, -1}  Need for location server to know if the feature is supported | Optional with capability signaling |
| 41. NR\_pos\_enh2 | 41-3-1 | SRS for positioning configuration in multiple cells for UEs in RRC\_INACTIVE state for initial UL BWP | 1. SRS for positioning configuration in multiple cells for UEs in RRC\_INACTIVE state for initial UL BWP | 27-15 | Yes | n/a | SRS for positioning configuration in multiple cells for UEs in RRC\_INACTIVE state for initial UL BWP 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 signalling |
| 41. NR\_pos\_enh2 | 41-3-1a | UE autonomous TA adjustment | UE autonomously adjust the TA when cell-reselection happens | 41-3-1 | Yes | n/a | UE cannot autonomously adjust the TA when cell-reselection happens | Per band | n/a | n/a | n/a |  | Optional with capability signalling |
| 41. NR\_pos\_enh2 | 41-3-2 | SRS for positioning configuration in multiple cells for UEs in RRC\_INACTIVE state configured outside initial UL BWP | Support of SRS for positioning configuration in multiple cells for UEs in RRC\_INACTIVE state configured outside initial UL BWP | 27-15b, 41-3-1 | Yes | n/a | SRS for positioning configuration in multiple cells for UEs in RRC\_INACTIVE state configured outside initial UL BWP 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 signalling |
| 41. NR\_pos\_enh2 | 41-3-3 | Support of PRS measurement in RRC\_IDLE | Support of DL PRS measurement in RRC\_IDLE for DL-TDOA and/or DL-AoD the UE supports in RRC\_INACTIVE | 13-1, at least one of {27-18a, 27-18b}, 27-6 | No | n/a | PRS measurements in RRC\_IDLE 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. |
| 41. NR\_pos\_enh2 | 41-4-1 | DL PRS processing capabilities for aggregated PRS processing of 2 PFLs in intra-band contiguous within a MG for RRC\_CONNECTED | 1. Maximum aggregated DL PRS bandwidth in MHz, which is supported and reported by UE  2. Maximum DL PRS bandwidth in MHz, per PFL  3. DL PRS buffering capability  4. Duration of DL PRS symbols N in units of ms a UE can process every T ms assuming maximum aggregated DL PRS bandwidth in MHz, which is supported and reported by UE.  5. Maximum number of aggregated DL PRS resources across aggregated PFLs that UE can process in a slot | 13-1 | No | n/a | DL PRS processing capabilities for aggregated PRS processing of 2 PFLs in intra-band contiguous within a MG for RRC\_CONNECTEDis not supported | Per band | n/a | n/a | n/a | Component 1 candidate values:  a) FR1 bands: {10, 20, 40, 50, 80, 100, 160, 200}  b) FR2 bands: {100, 200, 400, 800}  Component 2 candidate values:  a) FR1 bands: {5, 10, 20, 40, 50, 80, 100}  b) FR2 bands: {50, 100, 200, 400}  Note: Component 3 in FG41-4-1 follows buffering capability type reported in FG13-1  Component 4 candidate values:  a) T: {8, 16, 20, 30, 40, 80, 160, 320, 640, 1280} ms  b) N: {0.125, 0.25, 0.5, 1, 2, 4, 6, 8, 12, 16, 20, 25, 30, 32, 35, 40, 45, 50} ms  Note: this value N should be equal or smaller than the value N reported by FG 13-1, or this value T should be equal or larger than the value T reported by FG 13-1  Component 5 candidate values:  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  Note: each two linked PRS resources are counted as 1 resource  Note: this value should be equal or smaller than the value reported by FG 13-1  Note: The above parameters are reported assuming a configured measurement gap and a maximum ratio of measurement gap length (MGL)/measurement gap repetition period (MGRP) of no more than 30% | Optional with capability signaling. |
| 41. NR\_pos\_enh2 | 41-4-1a | DL PRS processing capabilities for aggregated PRS processing of 3 PFLs in intra-band contiguous within a MG for RRC\_CONNECTED | 1. Maximum aggregated DL PRS bandwidth in MHz, which is supported and reported by UE  2. Maximum DL PRS bandwidth in MHz, per PFL  3. DL PRS buffering capability  4. Duration of DL PRS symbols N in units of ms a UE can process every T ms assuming maximum aggregated DL PRS bandwidth in MHz, which is supported and reported by UE.  5. Maximum number of aggregated DL PRS resources across aggregated PFLs that UE can process in a slot | 41-4-1 | No | n/a | DL PRS processing capabilities for aggregated PRS processing of 3 PFLs in intra-band contiguous within a MG for RRC\_CONNECTED is not supported | Per band | n/a | n/a | n/a | Component 1 candidate values:  a) FR1 bands: {15, 20, 30, 40, 50, 60, 80, 100, 120, 140, 150, 160, 180, 200, 240, 300}}  b) FR2 bands: {150, 200, 300, 400, 600, 800, 1000, 1200}  Component 2 candidate values:  a) FR1 bands: {5, 10, 20, 40, 50, 80, 100}  b) FR2 bands: {50, 100, 200, 400}  Note: Component 3 in FG41-4-1a follows buffering capability type reported in FG13-1  Component 4 candidate values:  a) T: {8, 16, 20, 30, 40, 80, 160, 320, 640, 1280} ms  b) N: {0.125, 0.25, 0.5, 1, 2, 4, 6, 8, 12, 16, 20, 25, 30, 32, 35, 40, 45, 50} ms  Note: this value N should be equal or smaller than the value N reported by FG 13-1 or this value T should be equal or larger than the value T reported by FG 13-1  Component 5 candidate values:  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  Note: each three linked PRS resources are counted as 1 resource  Note: this value should be equal or smaller than the value reported by FG 13-1  Note: The above parameters are reported assuming a configured measurement gap and a maximum ratio of measurement gap length (MGL)/measurement gap repetition period (MGRP) of no more than 30% | Optional with capability signaling. |
| 41. NR\_pos\_enh2 | 41-4-1b | DL PRS processing capabilities for aggregated PRS processing of 2 PFLs in intra-band contiguous for RRC\_IDLE and RRC\_INACTIVE | 1. Maximum aggregated DL PRS bandwidth in MHz, which is supported and reported by UE  2. Maximum DL PRS bandwidth in MHz, per PFL  3. DL PRS buffering capability  4. Duration of DL PRS symbols N in units of ms a UE can process every T ms assuming maximum aggregated DL PRS bandwidth in MHz, which is supported and reported by UE.  5. Maximum number of aggregated DL PRS resources across aggregated PFLs that UE can process in a slot | 27-6 | No | n/a | DL PRS processing capabilities for aggregated PRS processing of 2 PFLs in intra-band contiguous for RRC\_IDLE and RRC\_INACTIVE is not supported | Per band | n/a | n/a | n/a | Component 1 candidate values:  a) FR1 bands: {10, 20, 40, 50, 80, 100, 160, 200}  b) FR2 bands: {100, 200, 400, 800}  Component 2 candidate values:a) FR1 bands: {5, 10, 20, 40, 50, 80, 100}  b) FR2 bands: {50, 100, 200, 400}  Note: Component 3 in FG41-4-1b follows buffering capability type reported in FG13-1  Component 4 candidate values:  a) T: {8, 16, 20, 30, 40, 80, 160, 320, 640, 1280} ms  b) N: {0.125, 0.25, 0.5, 1, 2, 4, 6, 8, 12, 16, 20, 25, 30, 32, 35, 40, 45, 50} ms  Note: this value N should be equal or smaller than the value N reported by FG 27-6 or this value T should be equal or larger than the value T reported by FG 27-6  Component 5 candidate values:  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  Note: each two linked PRS resources are counted as 1 resource  Note: this value should be equal or smaller than the value reported by FG 27-6 | Optional with capability signaling. |
| 41. NR\_pos\_enh2 | 41-4-1c | DL PRS processing capabilities for aggregated PRS processing of 3 PFLs in intra-band contiguous for RRC\_IDLE and RRC\_INACTIVE | 1. Maximum aggregated DL PRS bandwidth in MHz, which is supported and reported by UE  2. Maximum DL PRS bandwidth in MHz, per PFL  3. DL PRS buffering capability  4. Duration of DL PRS symbols N in units of ms a UE can process every T ms assuming maximum aggregated DL PRS bandwidth in MHz, which is supported and reported by UE.  5. Max number of aggregated DL PRS resources across aggregated PFLs that UE can process in a slot under it | 41-4-1b | No | n/a | DL PRS processing capabilities for aggregated PRS processing of 3 PFLs in intra-band contiguous for RRC\_IDLE and RRC\_INACTIVE is not supported | Per band | n/a | n/a | n/a | Component 1 candidate values:  a) FR1 bands: {15, 20, 30, 40, 50, 60, 80, 100, 120, 140, 150, 160, 180, 200, 240, 300}  b) FR2 bands: {150, 200, 300, 400, 600, 800, 1000, 1200}  Component 2 candidate values:  a) FR1 bands: {5, 10, 20, 40, 50, 80, 100}  b) FR2 bands: {50, 100, 200, 400}  Note: Component 3 in FG41-4-1c follows buffering capability type reported in FG13-1  Component 4 candidate values:  a) T: {8, 16, 20, 30, 40, 80, 160, 320, 640, 1280} ms  b) N: {0.125, 0.25, 0.5, 1, 2, 4, 6, 8, 12, 16, 20, 25, 30, 32, 35, 40, 45, 50} ms  Note: this value N should be equal or smaller than the value N reported by FG 27-6 or this value T should be equal or larger than the value T reported by FG 27-6  Component 5 candidate values:  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  Note: each three linked PRS resources are counted as 1 resource  Note: this value should be equal or smaller than the value reported by FG 27-6 | Optional with capability signaling. |
| 41. NR\_pos\_enh2 | 41-4-2 | PRS bandwidth aggregation with two PFL combinations | Support of PRS bandwidth aggregation with two PFL combinations | 41-4-1 | No | n/a | PRS bandwidth aggregation with two PFL combinations is not supported | Per band | n/a | n/a | n/a | Need for location server to know if the feature is supported.  Note: More than one combination are measured in TDMed manner | Optional with capability signaling |
| 41. NR\_pos\_enh2 | 41-4-3 | PRS bandwidth aggregation in RRC\_CONNECTED — DL-TDOA | Support of PRS bandwidth aggregation in RRC\_CONNECTED for DL-TDOA | 13-3, 41-4-1 | No | n/a | PRS bandwidth aggregation in RRC\_CONNECTED 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. | Optional with capability signaling |
| 41. NR\_pos\_enh2 | 41-4-3a | PRS bandwidth aggregation in RRC\_CONNECTED —Multi-RTT | Support of PRS bandwidth aggregation in RRC\_CONNECTED FOR Multi-RTT | 13-4, 41-4-1 | No | n/a | PRS bandwidth aggregation in RRC\_CONNECTED 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 |
| 41. NR\_pos\_enh2 | 41-4-4 | PRS bandwidth aggregation in RRC\_ INACTIVE — DL-TDOA | Support of PRS bandwidth aggregation in RRC\_ INACTIVE for DL-TDOA | 27-18a, 41-4-1b | No | n/a | PRS bandwidth aggregation in RRC\_ INACTIVE 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. | Optional with capability signaling |
| 41. NR\_pos\_enh2 | 41-4-4a | PRS bandwidth aggregation in RRC\_ INACTIVE —Multi-RTT | Support of PRS bandwidth aggregation in RRC\_ INACTIVE for Multi-RTT | 27-18a, 41-4-1b | No | n/a | PRS bandwidth aggregation in RRC\_ INACTIVE 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 |
| 41. NR\_pos\_enh2 | 41-4-5 | PRS bandwidth aggregation in RRC\_IDLE — DL-TDOA | Support of PRS bandwidth aggregation in RRC\_IDLE for DL-TDOA | 41-3-3, 41-4-1b | No | n/a | PRS bandwidth aggregation in RRC\_IDLE 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. | Optional with capability signaling |
| 41. NR\_pos\_enh2 | 41-4-6 | Positioning SRS bandwidth aggregation in RRC\_CONNECTED | 1. The number of supported aggregated carriers in intra band contiguous carriers  2. Maximum aggregated UL SRS bandwidth in MHz, which is supported and reported by UE  5. Max number of aggregated SRS resource sets for positioning supported by UE for SRS bandwidth aggregation  6. Maximum number of aggregated SRS resources for bandwidth aggregation  7. Maximum number of aggregated SRS resources for bandwidth aggregation per slot  8. Support the same SRS power reduction across aggregated carriers | 13-8, 6-6 | Yes | n/a | Positioning SRS bandwidth aggregation in RRC\_CONNECTED is not supported | Per FS | n/a | n/a | n/a | Component 1 candidate values: {2,3,2and3}  Component 2 candidate values:  For 2 in Component 1:  FR1 bands: {20, 40, 50, 80, 100, 160, 180, 190, 200}  FR2 bands: {50, 100, 200, 400, 600, 800}  For 3 in Component 1:  FR1 bands: {80, 100, 160, 200, 240, 300}  FR2 bands: {50, 100, 200, 300, 400, 600, 800, 1000, 1200}  Component 5 candidate values: {1, 2, 4, 8, 12, 16}  Component 6 candidate values:  Periodic: {1,2,4,8,16,32,64}  Aperiodic: {0,1,2,4,8,16,32,64}  Semi-persistent: {0,1,2,4,8,16,32,64}  Component 7 candidate values:  Periodic: {1,2,3,4,5,6,8,10,12,14}  Aperiodic: {0,1,2,3,4,5,6,8,10,12,14}  Semi-persistent: {0,1,2,3,4,5,6,8,10,12,14}  Note: For component 1, it shall be less than or equal to the maximum number of the component carrier associated with IE ca-BandwidthClassUL-NR.  Note: For component 2, it shall be less than or equal to the maximum aggregated transmission bandwidth associated with IE ca-BandwidthClassUL-NR. Additionally, it shall be less than or equal to the maximum aggregated bandwidth for the supported CA configuration in Table 5.5A.1-1 in TS 38.101-1 for FR1 bands or Table 5.5A.1-1 in TS 38.101-2 for FR2 bands for the band where aggregated SRS CCs is configured.  Note: The UE supports the simultaneous transmission in a coherent manner of 2 or 3 SRS resources in 2 or 3 intra-band contiguous CCs.  Note: each two or three linked SRS resources are counted as 1 resource  Note: A UE that support FG 13-8a must signal a non-zero value for components 6 and 7 for aperiodic  Need for location server to know if the feature is supported. UE only reports the number on bands for the current configured CA band combination. | Optional with capability signaling |
| 41. NR\_pos\_enh2 | 41-4-6a | Joint triggering by single Rel. 17 DCI | Support a Rel-17 single DCI scheduling positioning SRS resource sets across the linked carriers for SRS bandwidth aggregation in RRC\_CONNECTED state | 41-4-6 | Yes | n/a | Joint triggering by single Rel. 17 DCI is not supported | Per band | n/a | n/a | n/a |  | Optional with capability signaling |
| 41. NR\_pos\_enh2 | 41-4-7 | Positioning SRS bandwidth aggregation independent from UL communication CA in RRC\_CONNECTED | 1. The number of supported aggregated carriers in intra band contiguous carriers  2. Maximum aggregated UL SRS bandwidth in MHz, which is supported and reported by UE  5. Max number of aggregated SRS resource sets for positioning supported by UE for SRS bandwidth aggregation  6. Maximum number of aggregated SRS resources for bandwidth aggregation  7. Maximum number of aggregated SRS resources for bandwidth aggregation per slot  8. Support the same SRS power reduction across aggregated carriers  9. Guard period in microseconds  10. Power class of supported aggregated carriers in intra band contiguous carriers | 13-8 | Yes | n/a | Positioning SRS bandwidth aggregation independent from UL communication CA in RRC\_CONNECTED is not supported | Per FS | n/a | n/a | n/a | Component 1 candidate values: {2,3,2and3}  Component 2 candidate values:  For 2 in Component 1:  FR1 bands: {20, 40, 50, 80, 100, 160, 180, 190, 200}  FR2 bands: {50, 100, 200, 400, 600, 800}  For 3 in Component 1:  FR1 bands: {80, 100, 160, 200, 240, 300}  FR2 bands: {50, 100, 200, 300, 400, 600, 800, 1000, 1200}  Component 5 candidate values: {1, 2, 4, 8, 12, 16}  Component 6 candidate values:  Periodic: {1,2,4,8,16,32,64}  Aperiodic: {0,1,2,4,8,16,32,64}  Semi-persistent: {0,1,2,4,8,16,32,64}  Component 7 candidate values:  Periodic: {1,2,3,4,5,6,8,10,12,14}  Aperiodic: {0,1,2,3,4,5,6,8,10,12,14}  Semi-persistent: {0,1,2,3,4,5,6,8,10,12,14}  Component 9 candidate values: {0, 30, 100, 140, 200}  Component 10 candidate values:   * For 2 in component 1: {PC2, PC3} * For 3 in component 1: {PC2, PC3}   Note: Component 10 is only applicable for FR1 bands  Note: For a given band, independent of the band combination, the UE must signal the same guard period  Note: The UE supports the simultaneous transmission in a coherent manner of 2 or 3 SRS resources in 2 or 3 intra-band contiguous CCs.  Note: each two or three linked SRS resources are counted as 1 resource  Need for location server to know if the feature is supported. UE only reports the number on bands for the current configured CA band combination.  Note: Guard period is needed before and after the aggregated SRS transmissions when SRS resource is configured within a CC without PUSCH/PUCCH is linked for aggregation with an SRS resource configured within an UL active BWP of a UL communication CC | Optional with capability signaling |
| 41. NR\_pos\_enh2 | 41-4-8 | Positioning SRS bandwidth aggregation in RRC\_INACTIVE | 1. The number of supported aggregated carriers in intra band contiguous carriers  2. Maximum aggregated UL SRS bandwidth in MHz, which is supported and reported by UE  5. Max number of aggregated SRS resource sets for positioning supported by UE for SRS bandwidth aggregation  6. Maximum number of aggregated SRS resources for bandwidth aggregation  7. Maximum number of aggregated SRS resources for bandwidth aggregation per slot  8. Support the same SRS power reduction across aggregated carriers  9. Guard period in microseconds  10. Power class of supported aggregated carriers in intra band contiguous carriers | 27-15b | Yes | n/a | Positioning SRS bandwidth aggregation in RRC\_INACTIVE is not supported | Per band | n/a | n/a | n/a | Component 1 candidate values: {2,3,2and3}  Component 2 candidate values:  For 2 in Component 1:  FR1 bands: {20, 40, 50, 80, 100, 160, 180, 190, 200}  FR2 bands: {50, 100, 200, 400, 600, 800}  For 3 in Component 1:  FR1 bands: {80, 100, 160, 200, 240, 300}  FR2 bands: {50, 100, 200, 300, 400, 600, 800, 1000, 1200}  Component 5 candidate values: {1, 2, 4, 8, 12, 16}  Component 6 candidate values:  Periodic: {1,2,4,8,16,32,64}  Semi-persistent: {0,1,2,4,8,16,32,64}  Component 7 candidate values:  Periodic: {1,2,3,4,5,6,8,10,12,14}  Semi-persistent: {0,1,2,3,4,5,6,8,10,12,14}  Component 9 candidate values: {0, 30, 100, 140, 200}  Component 10 candidate values:   * For 2 in component 1: {PC2, PC3} * For 3 in component 1: {PC2, PC3}   Note: Component 10 is only applicable for FR1 bands  Need for location server to know if the feature is supported. | Optional with capability signaling |
| 41. NR\_pos\_enh2 | 41-4-9 | Affected bands if guard period is needed in SRS bandwidth aggregation | Indicate which other bands in the band combination are affected due to the need of a guard period | 41-4-7 or 41-4-8 | Yes | n/a | If not reported, all the bands of the UE are affected when a guard period is needed in SRS bandwidth aggregation | Per FS | n/a | n/a | n/a | For each band in the band combination, the UE can indicate which other bands in the band combination are affected by the SRS switch.  Note: UE may indicate no other bands in the band combination are affected by the SRS switch, in which case, only the band with the aggregated SRS transmissions is affected  Note: Guard period is needed before and after the aggregated SRS transmissions when SRS resource is configured within a CC without PUSCH/PUCCH is linked for aggregation with an SRS resource configured within an UL active BWP of a UL communication CC | Optional with capability signaling |
| 41. NR\_pos\_enh2 | 41-5-1 | PRS measurement with Rx frequency hopping within a MG and measurement reporting RRC\_CONNECTED for RedCap UEs | 1. Maximum DL PRS bandwidth across all hops  3. Maximum number of hops  4. Duration of DL PRS symbols N3 in units of ms a UE can process every T3 ms  5. RF Rx retune times between consecutive hops  6. Overlapping PRB(s) between adjacent hops | 13-1, one of {28-1, 48-1} | Yes | n/a | PRS measurement with Rx frequency hopping within a MG and measurement report in RRC\_CONNECTED for RedCap UEs is not supported | Per band | n/a | n/a | n/a | Component 1 candidate values:  FR1: {40, 50, 80, 100}  FR2: {100, 200, 400}  Component 3 candidate values: {2,3,4,5,6}  Component 4 candidate values:  T3: {8, 16, 20, 30, 40, 80, 160, 320, 640, 1280} ms  N3: {0.125, 0.25, 0.5, 1, 2, 4, 6, 8, 12, 16, 20, 25, 30, 32, 35, 40, 45, 50} ms  Component 5 candidate values:  FR1: {70us, 140us, 210us}  FR2: {35us, 70us, 140us}  Component 6 candidate values: {0, 1, 2, 4}  Note 1: The maximum DL PRS bandwidth per hop follows component 1 of FG 13-1  Note 2: DL PRS buffering capability follows component 2 of FG 13-1  Need for location server to know if the feature is supported. | Optional with capability signalling |
| 41. NR\_pos\_enh2 | 41-5-1a | PRS measurement with Rx frequency hopping in RRC\_INACTIVE for RedCap UEs | Support of PRS measurement with Rx frequency hopping in RRC\_INACTIVE for RedCap UEs | 41-5-1, 27-6 | Yes | n/a | PRS measurement with Rx frequency hopping in RRC\_INACTIVE for RedCap UEs 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 signalling |
| 41. NR\_pos\_enh2 | 41-5-1b | PRS measurement with Rx frequency hopping in RRC\_IDLE for RedCap UEs | Support of PRS measurement with Rx frequency hopping in RRC\_IDLE for RedCap UEs | 41-5-1 | Yes | n/a | PRS measurement with Rx frequency hopping in RRC\_IDLE for RedCap UEs 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 signalling |
| 41. NR\_pos\_enh2 | 41-5-2 | Support of positioning SRS with Tx frequency hopping in RRC\_CONNECTED for RedCap UEs | 1. Maximum SRS bandwidth across all hops  2. Maximum number of hops  3. RF Tx retuning time between consecutive hops  4. Switching time between active BWP and frequency hop  5. Overlapping PRB(s) between adjacent hops  6. Support of {0,1,2,4} overlapping PRB(s) between adjacent hops  7. Maximum number of positioning SRS resources with Tx frequency hopping | 13-8, one of {28-1,48-1} | Yes | n/a | Positioning SRS with Tx hopping in RRC\_CONNECTED is not supported | Per band | n/a | n/a | n/a | Component 1 candidate values:  FR1: {40, 50, 80, 100}  FR2: {100, 200, 400}  Component 2 candidate values: {2,3,4,5,6}  Component 3 candidate values:  FR1: {70us, 140us, 210us}  FR2: {35us, 70us, 140us}  Component 4 candidate values:  {100us, 140us, 200us, 300us, 500us}  Component 7 candidate values:  Periodic: {1,2,4,8,16,32,64}  Aperiodic: {0,1,2,4,8,16,32,64}  Semi-persistent: {0,1,2,4,8,16,32,64}  Note: No additional UE requirements shall be specified for the case of Tx hopping with non-overlapping hops compared to the case of Tx hopping with overlapping hops, e.g., a UE is not responsible for keeping phase continuity across the hops in either case of overlapping or non-overlapping hops  Need for location server to know if the feature is supported | Optional with capability signalling |
| 41. NR\_pos\_enh2 | 41-5-2a | Support of positioning SRS with Tx frequency hopping in RRC\_INACTIVE for RedCap UEs | 1. Maximum SRS bandwidth across all hops  2. Maximum number of hops  3. RF Tx retuning time between consecutive hops  4. Switching time between active BWP and frequency hop  5. Overlapping PRB(s) between adjacent hops  6. Support of {0,1,2,4} overlapping PRB(s) between adjacent hops  7. Maximum number of positioning SRS resources with Tx frequency hopping | 27-15b, one of {28-1,48-1} | Yes | n/a | Positioning SRS with Tx hopping in RRC\_INACTIVE is not supported | Per band | n/a | n/a | n/a | Component 1 candidate values:  FR1: {40, 50, 80, 100}  FR2: {100, 200, 400}  Component 2 candidate values: {2,3,4,5,6}  Component 3 candidate values:  FR1: {70us, 140us, 210us}  FR2: {35us, 70us, 140us}  Component 4 candidate values:  {100us, 140us, 200us, 300us, 500us}  Component 7 candidate values:  Periodic: {1,2,4,8,16,32,64}  Semi-persistent: {0,1,2,4,8,16,32,64}  Note: No additional UE requirements shall be specified for the case of Tx hopping with non-overlapping hops compared to the case of Tx hopping with overlapping hops, e.g., a UE is not responsible for keeping phase continuity across the hops in either case of overlapping or non-overlapping hops  Need for location server to know if the feature is supported | Optional with capability signalling |
| 41. NR\_pos\_enh2 | 41-5-3 | UL Time Window and transmission of SRS for positioning with Tx Frequency hopping within the window | Support of UL Time Window and transmission of SRS for positioning with Tx Frequency hopping within the window | 41-5-2 | No | N.A. | UE does not support the UL time window for SRS for positioning with Tx frequency hopping | Per band | N.A. | N.A. | N.A. |  | Optional with capability signaling |

1. Netw\_Energy\_NR

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Features | Index | Feature group | Components | Prerequisite feature groups | Need for the gNB to know if the feature is supported | Applicable to the capability signalling exchange between UEs (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 |
| 42. Netw\_Energy\_NR | 42-1 | Spatial domain adaptation with CSI feedback based on CSI report sub-configuration(s) for periodic CSI reporting | 1. Support of CSI feedback based on CSI report sub-configuration(s), each containing one port subset configuration/list of CSI-RS resource IDs for periodic CSI reporting  2. The max number of sub-configurations Lmax in one CSI report configuration  4. Supported maximum number of simultaneous NZP-CSI-RS resources per CC  5. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources per CC  6. Supported maximum number of simultaneous NZP-CSI-RS resources in active BWPs across all CCs  7. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources in active BWPs across all CCs  8. Support of single-panel type 1 codebook  9. Supported total number of periodic CSI reporting settings without sub-configurations plus the total number of sub-configurations across periodic CSI report settings with sub-configurations per BWP | FFS | Yes |  | UE does not support spatial domain adaptation for periodicCSI reporting | Per band | No | No | N/A | Component 1 candidate values: {SD-type1, SD-type2, SD-type1and2}  Note: SD-type1 refers to configuration contains one port subset  Note: SD-type2 refers to configuration contains list of CSI-RS resource IDs  Component 2 candidate values: {2,3,4}  Component 4 candidate values: SD Type 1: {1, 2, 3 … 32} SD Type 2: {1, 2, 3 … 32}  Component 5 candidate values: SD Type 1: {8, 16, 24, … 128 } SD Type 2: {8, 16, 24, … 128 }  Component 6 candidate values: SD Type 1: {5, 6, 7, 8, 9, 10, 12, 14, 16, …, 62, 64} SD Type 2: {5, 6, 7, 8, 9, 10, 12, 14, 16, …, 62, 64}  Component 7 candidate value: SD Type 1: {8, 16, 24, …, 248, 256} SD Type 2: {8, 16, 24, …, 248, 256}  Component 9 candidate values: {2, 3, 4}  Note: Components 6 and 7 are signaled per BC  Note: For components 4~7 in FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2b and components 3~6 in FG 42-2a and 42-2c, NZP-CSI-RS resource and CSI-RS ports are counted for reporting settings with and without sub-configurations.  Note: If a UE reports more than one FG from FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c and if the UE is configured with CSI report settings with sub-configurations corresponding to a subset of the reported FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c, then the supported maximum of NZP-CSI-RS resources/ports is determined by the minimum of the reported values from that subset. | Optional with capability signaling |
| 42. Netw\_Energy\_NR | 42-1a | Spatial domain adaptation with CSI feedback based on CSI report sub-configuration(s) for semi-persistent CSI reporting on PUSCH | 1. Support of CSI feedback based on CSI report sub-configuration(s), each containing one port subset configuration/list of CSI-RS resource IDs for semi-persistent CSI reporting on PUSCH  2. The max number of sub-configurations Lmax in one CSI report configuration  3. Report of N CSI sub-report(s) included in one SP-CSI report where each CSI sub-report corresponds to one sub-configuration.  4. Supported maximum number of simultaneous NZP-CSI-RS resources per CC  5. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources per CC  6. Supported maximum number of simultaneous NZP-CSI-RS resources in active BWPs across all CCs  7. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources in active BWPs across all CCs  8. Support of single-panel type 1 codebook  9. Supported total number of semi-persistent CSI reporting settings without sub-configurations plus the total number of sub-configurations across semi-persistent CSI report settings with sub-configurations per BWP | FFS | Yes |  | UE does not support spatial domain adaptation for semi-persistent CSI reporting on PUSCH | Per band | No | No | N/A | Component 1 candidate values: {SD-type1, SD-type2, SD-type1and2}  Note: SD-type1 refers to configuration contains one port subset  Note: SD-type2 refers to configuration contains list of CSI-RS resource IDs  Component 2 candidate values: {2,3,4,5,6,7,8}  Component 3 candidate values: {2,3,4}  Component 4 candidate values: {1, 2, 3 … 32}  Component 5 candidate values: {8, 16, 24, … 128}  Component 6 candidate values: {5, 6, 7, 8, 9, 10, 12, 14, 16, …, 62, 64}  Component 7 candidate values: {8, 16, 24, …, 248, 256}  Component 9 candidate values: {2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12}  Note: Components 6 and 7 are signaled per BC  Note: For components 4~7 in FG42-1, 42-1a/b/c, 42-2, 42-2b and components 3~6 in FG42-2a/c, NZP-CSI-RS resource and CSI-RS ports are counted for reporting settings with and without sub-configurations.  Note: If a UE reports more than one FG from FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c and if the UE is configured with CSI report settings with sub-configurations corresponding to a subset of the reported FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c, then the supported maximum of NZP-CSI-RS resources/ports is determined by the minimum of the reported values from that subset.  Note: If a UE reports both FGs 42-1a and 42-1c and if the UE is configured with CSI report settings with sub-configurations corresponding to both FGs 42-1a and 42-1c, then the supported total number of semi-persistent CSI reporting settings without sub-configurations plus the total number of sub-configurations across semi-persistent CSI report settings with sub-configurations per BWP is determined by the minimum of the reported values from both FGs 42-1a and 42-1c. | Optional with capability signaling |
| 42. Netw\_Energy\_NR | 42-1c | Spatial domain adaptation with CSI feedback based on CSI report sub-configuration(s) for semi-persistent CSI reporting on PUCCH | 1. Support of CSI feedback based on CSI report sub-configuration(s), each containing one port subset configuration/list of CSI-RS resource IDs for semi-persistent CSI reporting on PUCCH  2. The max number of sub-configurations Lmax in one CSI report configuration  3. Report of N CSI sub-report(s) included in one SP-CSI report where each CSI sub-report corresponds to one sub-configuration.  4. Supported maximum number of simultaneous NZP-CSI-RS resources per CC  5. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources per CC  6. Supported maximum number of simultaneous NZP-CSI-RS resources in active BWPs across all CCs  7. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources in active BWPs across all CCs  8. Support of single-panel type 1 codebook  9. Supported total number of semi-persistent CSI reporting settings without sub-configurations plus the total number of sub-configurations across semi-persistent CSI report settings with sub-configurations per BWP | FFS | Yes |  | UE does not support spatial domain adaptation for semi-persistent CSI reporting on PUCCH | Per band | No | No | N/A | Component 1 candidate values: {SD-type1, SD-type2, SD-type1and2}  Note: SD-type1 refers to configuration contains one port subset  Note: SD-type2 refers to configuration contains list of CSI-RS resource IDs  Component 2 candidate values: {2,3,4}  Component 3 candidate values: {2,3,4}  Component 4 candidate values: {1, 2, 3 … 32}  Component 5 candidate values: {8, 16, 24, … 128}  Component 6 candidate values: {5, 6, 7, 8, 9, 10, 12, 14, 16, …, 62, 64}  Component 7 candidate values: {8, 16, 24, …, 248, 256}  Component 9 candidate values: {2, 3, 4}  Note: Components 6 and 7 are signaled per BC  Note: For components 4~7 in FG42-1, 42-1a/b/c, 42-2, 42-2b and components 3~6 in FG42-2a/c, NZP-CSI-RS resource and CSI-RS ports are counted for reporting settings with and without sub-configurations.    Note: If a UE reports more than one FG from FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c and if the UE is configured with CSI report settings with sub-configurations corresponding to a subset of the reported FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c, then the supported maximum of NZP-CSI-RS resources/ports is determined by the minimum of the reported values from that subset.  Note: If a UE reports both FGs 42-1a and 42-1c and if the UE is configured with CSI report settings with sub-configurations corresponding to both FGs 42-1a and 42-1c, then the supported total number of semi-persistent CSI reporting settings without sub-configurations plus the total number of sub-configurations across semi-persistent CSI report settings with sub-configurations per BWP is determined by the minimum of the reported values from both FGs 42-1a and 42-1c. | Optional with capability signaling |
| 42. Netw\_Energy\_NR | 42-1b | Spatial domain adaptation with CSI feedback based on CSI report sub-configuration(s) for aperiodic CSI reporting | 1. Support of CSI feedback based on CSI report sub-configuration(s), each containing one port subset configuration/list of CSI-RS resource IDs for aperiodic CSI reporting  2. The max number of sub-configurations Lmax in one CSI report configuration  3. Report of N CSI sub-report(s) included in one CSI report where each CSI sub-report corresponds to one sub-configuration  4. Supported maximum number of simultaneous NZP-CSI-RS resources per CC  5. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources per CC  6. Supported maximum number of simultaneous NZP-CSI-RS resources in active BWPs across all CCs  7. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources in active BWPs across all CCs  8. Support of single-panel type 1 codebook  9. Supported total number of aperiodic CSI reporting settings without sub-configurations plus the total number of sub-configurations across aperiodic CSI report settings with sub-configurations per BWP | FFS | Yes |  | UE does not support spatial domain adaptation for aperiodic CSI reporting | Per band | No | No | N/A | Component 1 candidate values: {SD-type1, SD-type2, SD-type1and2}  Note: SD-type1 refers to configuration contains one port subset  Note: SD-type2 refers to configuration contains list of CSI-RS resource IDs  Component 2 candidate values: {2,3,4,5,6,7,8}  Component 3 candidate values {2,3,4}  Component 4 candidate values: SD Type 1: {1, 2, 3 … 32} SD Type 2: {1, 2, 3 … 32}  Component 5 candidate values:  SD Type 1: {8, 16, 24, … 128 } SD Type 2: {8, 16, 24, … 128 }  Component 6 candidate values:  SD Type 1: {5, 6, 7, 8, 9, 10, 12, 14, 16, …, 62, 64} SD Type 2: {5, 6, 7, 8, 9, 10, 12, 14, 16, …, 62, 64}  Component 7 candidate values:  SD Type 1: {8, 16, 24, …, 248, 256} SD Type 2: {8, 16, 24, …, 248, 256}  Note: Components 6 and 7 are signaled per BC  Component 9 candidate values: {2, 3, 4, 5, 6, 7, 8, 9, 10, 11,12}  Note: For components 4~7 in FG42-1, 42-1a/b/c, 42-2, 42-2b and components 3~6 in FG42-2a/c, NZP-CSI-RS resource and CSI-RS ports are counted for reporting settings with and without sub-configurations.  Note: If a UE reports more than one FG from FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c and if the UE is configured with CSI report settings with sub-configurations corresponding to a subset of the reported FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c, then the supported maximum of NZP-CSI-RS resources/ports is determined by the minimum of the reported values from that subset. | Optional with capability signaling |
| 42. Netw\_Energy\_NR | 42-2 | Power domain adaptation with CSI feedback based on CSI report sub-configuration(s) for periodic CSI reporting | 1. Support of CSI feedback based on CSI report sub-configuration(s), each containing one power offset for aperiodic CSI reporting  2. The max number of sub-configurations Lmax in one CSI report configuration  4. Supported maximum number of simultaneous NZP-CSI-RS resources per CC  5. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources per CC  6. Supported maximum number of simultaneous NZP-CSI-RS resources in active BWPs across all CCs  7. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources in active BWPs across all CCs  8. Support of single-panel type 1 codebook  9. Supported total number of periodic CSI reporting settings without sub-configurations plus the total number of sub-configurations across periodic CSI report settings with sub-configurations per BWP | FFS | Yes |  | UE does not support power domain adaptation for periodicCSI reporting | Per band | No | No | N/A | Component 2 candidate value: {2,3,4}  Component 4 candidate value: {1, 2, 3 … 32}  Component 5 candidate value: {8, 16, 24, … 128 }  Component 6 candidate value: {5, 6, 7, 8, 9, 10, 12, 14, 16, …, 62, 64}  Component 7 candidate value: {8, 16, 24, …, 248, 256}  Note: Components 6 and 7 are signaled per BC  Component 9 candidate values: {2, 3, 4}  Note: For components 4~7 in FG42-1, 42-1a/b/c, 42-2, 42-2b and components 3~6 in FG42-2a/c, NZP-CSI-RS resource and CSI-RS ports are counted for reporting settings with and without sub-configurations.  Note: If a UE reports more than one FG from FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c and if the UE is configured with CSI report settings with sub-configurations corresponding to a subset of the reported FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c, then the supported maximum of NZP-CSI-RS resources/ports is determined by the minimum of the reported values from that subset. | Optional with capability signaling |
| 42. Netw\_Energy\_NR | 42-2a | Power domain adaptation with CSI feedback based on CSI report sub-configuration(s) for semi-persistent CSI reporting on PUSCH | Support of CSI feedback based on CSI report sub-configuration(s), each containing one power offset for semi-persistent CSI reporting  1. The max number of sub-configurations Lmax in one CSI report configuration on PUSCH  2. Report of N CSI sub-report(s) included in one SP-CSI report where each CSI sub-report corresponds to one sub-configuration.  3. Supported maximum number of simultaneous NZP-CSI-RS resources per CC  4. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources per CC  5. Supported maximum number of simultaneous NZP-CSI-RS resources in active BWPs across all CCs  6. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources in active BWPs across all CCs  7. Support of single-panel type 1 codebook  8. Supported total number of semi-persistent CSI reporting settings without sub-configurations plus the total number of sub-configurations across semi-persistent CSI report settings with sub-configurations per BWP | FFS | Yes |  | UE does not support power domain adaptation for semi-persistent CSI reporting on PUSCH | Per band | No | No | N/A | Component 1 candidate values: {2,3,4,5,6,7,8}  Component 2 candidate values: {2,3,4}  Component 3 candidate values: {1, 2, 3 … 32}  Component 4 candidate values: {8, 16, 24, … 128 }  Component 5 candidate values: {5, 6, 7, 8, 9, 10, 12, 14, 16, …, 62, 64}  Component 6 candidate values: {8, 16, 24, …, 248, 256}  Component 8 candidate values: {2, 3, 4,5,6,7,8,9,10,11,12}  Note: Components 5 and 6 are signaled per BC  Note: For components 4~7 in FG42-1, 42-1a/b/c, 42-2, 42-2b and components 3~6 in FG42-2a/c, NZP-CSI-RS resource and CSI-RS ports are counted for reporting settings with and without sub-configurations.  Note: If a UE reports more than one FG from FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c and if the UE is configured with CSI report settings with sub-configurations corresponding to a subset of the reported FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c, then the supported maximum of NZP-CSI-RS resources/ports is determined by the minimum of the reported values from that subset.  Note: If a UE reports both FGs 42-2a and 42-2c and if the UE is configured with CSI report settings with sub-configurations corresponding to both FGs 42-2a and 42-2c, then the supported total number of semi-persistent CSI reporting settings without sub-configurations plus the total number of sub-configurations across semi-persistent CSI report settings with sub-configurations per BWP is determined by the minimum of the reported values from both FGs 42-2a and 42-2c. | Optional with capability signaling |
| 42. Netw\_Energy\_NR | 42-2c | Power domain adaptation with CSI feedback based on CSI report sub-configuration(s) for semi-persistent CSI reporting on PUCCH | Support of CSI feedback based on CSI report sub-configuration(s), each containing one power offset for semi-persistent CSI reporting on PUCCH  1. The max number of sub-configurations Lmax in one CSI report configuration  2. Report of N CSI sub-report(s) included in one SP-CSI report where each CSI sub-report corresponds to one sub-configuration.  3. Supported maximum number of simultaneous NZP-CSI-RS resources per CC  4. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources per CC  5. Supported maximum number of simultaneous NZP-CSI-RS resources in active BWPs across all CCs  6. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources in active BWPs across all CCs  7. Support of single-panel type 1 codebook  8. Supported total number of semi-persistent CSI reporting settings without sub-configurations plus the total number of sub-configurations across semi-persistent CSI report settings with sub-configurations per BWP | FFS | Yes |  | UE does not support power domain adaptation for semi-persistent CSI reporting on PUCCH | Per band | No | No | N/A | Component 1 candidate values: {2,3,4}  Component 2 candidate values: {2,3,4}  Component 3 candidate values: {1, 2, 3 … 32}  Component 4 candidate values: {8, 16, 24, … 128}  Component 5 candidate values: {5, 6, 7, 8, 9, 10, 12, 14, 16, …, 62, 64}  Component 6 candidate values: {8, 16, 24, …, 248, 256}  Component 8 candidate values: {2, 3, 4}  Note: Components 5 and 6 are signaled per BC  Note: For components 4~7 in FG42-1, 42-1a/b/c, 42-2, 42-2b and components 3~6 in FG42-2a/c, NZP-CSI-RS resource and CSI-RS ports are counted for reporting settings with and without sub-configurations.  Note: If a UE reports more than one FG from FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c and if the UE is configured with CSI report settings with sub-configurations corresponding to a subset of the reported FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c, then the supported maximum of NZP-CSI-RS resources/ports is determined by the minimum of the reported values from that subset.  Note: If a UE reports both FGs 42-2a and 42-2c and if the UE is configured with CSI report settings with sub-configurations corresponding to both FGs 42-2a and 42-2c, then the supported total number of semi-persistent CSI reporting settings without sub-configurations plus the total number of sub-configurations across semi-persistent CSI report settings with sub-configurations per BWP is determined by the minimum of the reported values from both FGs 42-2a and 42-2c. | Optional with capability signaling |
| 42. Netw\_Energy\_NR | 42-2b | Power domain adaptation with CSI feedback based on CSI report sub-configuration(s) for aperiodic CSI reporting | 1. Support of CSI feedback based on CSI report sub-configuration(s), each containing one power offset for aperiodic CSI reporting  2. The max number of sub-configurations Lmax in one CSI report configuration  3. Report of N CSI sub-report(s) included in one CSI report where each CSI sub-report corresponds to one sub-configuration  4. Supported maximum number of simultaneous NZP-CSI-RS resources per CC  5. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources per CC  6. Supported maximum number of simultaneous NZP-CSI-RS resources in active BWPs across all CCs  7. Supported maximum number of total CSI-RS ports in simultaneous NZP-CSI-RS resources in active BWPs across all CCs  8. Support of single-panel type 1 codebook  9. Supported total number of aperiodic CSI reporting settings without sub-configurations plus the total number of sub-configurations across aperiodic CSI report settings with sub-configurations per BWP | FFS | Yes |  | UE does not support power domain adaptation for aperiodic CSI reporting | Per band | No | No | N/A | Component 2 candidate values: {2,3,4,5,6,7,8}  Component 3 candidate values: {2,3,4}  Component 4 candidate values: {1, 2, 3 … 32}  Component 5 candidate values: {8, 16, 24, … 128 }  Component 6 candidate values: {5, 6, 7, 8, 9, 10, 12, 14, 16, …, 62, 64}  Component 7 candidate values: {8, 16, 24, …, 248, 256}  Component 9 candidate values: {2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12}  Note: Components 6 and 7 are signaled per BC  Note: For components 4~7 in FG42-1, 42-1a/b/c, 42-2, 42-2b and components 3~6 in FG42-2a/c, NZP-CSI-RS resource and CSI-RS ports are counted for reporting settings with and without sub-configurations.  Note: If a UE reports more than one FG from FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c and if the UE is configured with CSI report settings with sub-configurations corresponding to a subset of the reported FGs 42-1, 42-1a, 42-1b, 42-1c, 42-2, 42-2a, 42-2b, 42-2c, then the supported maximum of NZP-CSI-RS resources/ports is determined by the minimum of the reported values from that subset. | Optional with capability signaling |
| 42. Netw\_Energy\_NR | 42-4 | Cell DTX and/or DRX operation based on RRC configuration | Support of cell DTX and/or DRX operation by RRC configuration |  | Yes |  | UE does not support Cell DTX and/or DRX operation | Per band | No | No | N/A | Component 1 candidate values: {cell DTX only, cell DRX only, both}  Note: RAN2 may add additional details | Optional with capability signaling |
| 42. Netw\_Energy\_NR | 42-5 | Cell DTX/DRX operation triggered by DCI format 2\_9 | 1) Support of Cell DTX/DRX configuration activation and deactivation via DCI 2\_9 | 42-4 | Yes |  | UE does not support dynamic Cell DTX/DRX operation triggered by DCI format 2\_9 | Per band | No | No | N/A |  | Optional with capability signaling |
| 42. Netw\_Energy\_NR | 42-6 | Joint operation of power domain and spatial domain adaptation | Support of joint operation of power domain and spatial domain adaptation | one of {{42-1 and 42-2} or {42-1a and 42-2a} or {42-1b and 42-2b} or {42-1c and 42-2c}} | Yes |  | UE does not support joint operation of power domain and spatial domain adaptation | Per UE | No | No | N/A |  | Optional with capability signaling |
| 42. Netw\_Energy\_NR | 42-7 | Mixed codebook combination for spatial domain adaptation with CSI feedback based on CSI report sub-configuration(s), each containing one port subset configuration | 1. Indicate the support of active CSI-RS resources and ports for mixed codebook types in any slot. The following codebook combination is a possible mixed codebook combination {Codebook1, Codebook2, Codebook3} for UE supporting CSI feedback based on CSI report sub-configuration(s), each containing one port subset configuration.  2. Indicate the list of supported CSI-RS resources across all bands in a band combination by referring to *codebookVariantsList* for the mixed codebook types. The following parameters are included in *codebookVariantsList* for each code book type:   * *maxNumberTxPortsPerResource* indicates the maximum number of Tx ports in a resource across all bands within a band combination; * *maxNumberResourcesPerBand* indicates the maximum number of resources across all CCs within a band combination, simultaneously; * *totalNumberTxPortsPerBand* indicates the total number of Tx ports across all CCs within a band combination, simultaneously.   3. The UE supporting this feature shall indicate the support of *CodebookComboParametersAddition-r16* and the support of multi-panel operation. | 42-1 or 42-1a or 42-1b or 42-1c | Yes |  | UE does not support the mixed codebook combination {Type 1 Single Panel, Type 1 Multi Panel, Null} for spatial domain adaptation with CSI feedback based on CSI report sub-configuration(s), each containing one port subset configuration | Per band for component 1  Per BC for component 2 | No | No | N/A | Component 1 candidate values: {Type 1 Single Panel, Type 1 Multi Panel, Null}} | Optional with capability signaling |
| 42. Netw\_Energy\_NR | 42-8 | simultaneousCSI-SubReportsPerCC-r18 | Indicates the number of CSI report(s) for which the UE can measure and process reference signals simultaneously in a CC of the band for which this capability is provided. The CSI report comprises periodic, semi-persistent and aperiodic CSI and any latency classes and codebook types. The CSI report in *simultaneousCSI-SubReportsPerCC-r18* includes the beam report, and CSI report without sub-configurations plus CSI sub-report across CSI reports | FFS | Yes |  | UE does not support spatial or power domain adaptation for CSI reporting | Per Band | No | No | N/A | Component 1 candidate values: {1, 2, 3, 4, 5, 6, 7, 8}  Note: UE shall report the value in this feature group being equal to or larger than that in *simultaneousCSI-ReportsPerCC*  Note: UE supporting at least one of FG 42-1/1a/1b/1c/2/2a/2b/2c shall report this FG | Optional with capability signaling |
| 42. Netw\_Energy\_NR | 42-9 | simultaneousCSI-SubReportsAllCC-r18 | Indicates whether the UE supports CSI report framework and the number of CSI report(s) which the UE can simultaneously process across all CCs, and across MCG and SCG in case of NR-DC. The CSI report comprises periodic, semi-persistent and aperiodic CSI and any latency classes and codebook types. The CSI report in *simultaneousCSI-SubReportsAllCC-r18* includes the beam report, and CSI report without sub-configurations plus CSI sub-report across CSI reports. This parameter may further limit *simultaneousCSI-SubReportsPerCC-r18* in MIMO-ParametersPerBand and Phy-ParametersFRX-Diff for each band in a given band combination | FFS | Yes |  | UE does not support spatial or power domain adaptation for CSI reporting | Per BC | No | No | N/A | Component 1 candidate values: {5, 6, 7, ..., 32}  Note: UE shall report the value in this feature group being equal to or larger than that in *simultaneousCSI-ReportsAllCC*  Note: UE supporting at least one of FG 42-1/1a/1b/1c/2/2a/2b/2c shall report this FG | Optional with capability signaling |

1. NR\_netcon\_repeater

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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 |
| 43. NR\_netcon\_repeater | 43-1 | Basic NCR support | 1. Support of fixed beam for C-link/backhaul link  2. Support of TDMed UL transmission of C-link and backhaul link  3. Support of ON-OFF operation for NCR-Fwd based on access link beam indication  4. Support of TDD UL/DL determination for backhaul/access link based on TDD UL/DL configuration of C-link  5. Support of Tx/Rx timing determination for backhaul/access link based on Tx/Rx timing of C-link  6. Support of beam correspondence of the DL/UL of the access link at NCR-Fwd  7.Support periodic beam indication for access link  8. Priority flag for periodic indication  9. Support of simultaneous and TDMed DL reception of C-link and backhaul link |  | Yes | N/A | NCR is not supported | Per NCR-MT | No | No | Yes | An NCR node for which the NCR-MT includes *ncr-NodeIndication* in RRC Setup Complete must support FG 43-1 | Optional without capability signaling |
| 43. NR\_netcon\_repeater | 43-3 | Aperiodic beam indication for access link | 1.Support aperiodic beam indication for access link  2. Supported slot-offset k values for reference slot | 43-1 | Yes | N/A | NCR-MT cannot decode the aperiodic beam indication | Per NCR-MT | No | No | Yes | Component 2 candidate values:   * 15 kHz: {0,1} * 30 kHz: {0,1} * 60 kHz: {0,1,2} * 120 kHz: {0,1,2}   Note: The value of slot offset k is selected based on the SCS of the PDCCH received by the NCR-MT  Note 2: If k = 0 is reported, the NCR expects that the time resource in NCR-AperiodicFwdConfig of the aperiodic beam indication is at least after the end of time resource for PDCCH carrying the DCI for aperiodic beam indication. | Optional with capability signaling |
| 43. NR\_netcon\_repeater | 43-4 | Semi-persistent beam indication for access link | 1.Support semi-persistent beam indication for access link  2. Priority flag for semi-persistent indication  3.Support of MAC CE override of the RRC configured beam index(es) at activation of semi-persistent beam indication | 43-1 | Yes | N/A | NCR-MT cannot decode the semi-persistent beam indication | Per NCR-MT | No | No | Yes |  | Optional with capability signaling |
| 43. NR\_netcon\_repeater | 43-5 | Simultaneous UL transmission of backhaul link and C-link | 1. Simultaneous UL transmission of backhaul link and C-link | 43-1 | Yes | N/A | NCR only supports TDMed UL transmission of C-link and backhaul link | Per NCR-MT | No | No | Yes |  | Optional with capability signaling |
| 43. NR\_netcon\_repeater | 43-6 | Dedicated signalling for backhaul link beam indication | 1. Support dedicated signalling for backhaul link beam indication | 43-1, 43-8 | Yes | N/A | Dedicated signalling for backhaul link beam indication is not supported | Per NCR-MT | No | No | Yes | The reported value is the same as the reported value of FG 43-8 | Optional with capability signaling |
| 43. NR\_netcon\_repeater | 43-8 | Adaptive beam for NCR backhaul link/C-link | Support of backhaul link beam determination based on predefined rule | 43-1, 2-2,2-4, 2-4a | Yes | N/A | The beam for backhaul link and C-link is fixed. | Per NCR-MT | No | No | Yes | Component candidate values: {Rel-15/16 (non-unified TCI) only, Rel-17 (unified TCI) only, both} | Optional with capability signaling |

1. NR\_NTN\_enh

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| Features | Index | Feature group | Components | Prerequisite feature groups | Need for the gNB to know if the feature is supported | Applicable to the capability signalling exchange between UEs (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 |
| 44. NR\_NTN\_enh | 44-1 | PUCCH repetition on common PUCCH resource | 1. Support repetition transmission of PUCCH for Msg4 HARQ-ACK on common PUCCH resource (i.e., PUCCH resource before dedicated configuration is provided)  2. Support receiving repetition factor in system information  3. Support receiving repetition factor in DCI format 1\_0 with CRC scrambled by TC-RNTI scheduling Msg4 PDSCH  4. Support Msg3 to report capability for PUCCH Msg4 HARQ-ACK repetition  5. Extension of the repetition transmission of PUCCH before dedicated PUCCH resource configuration  6. Support of RSRP threshold for Msg4 HARQ-ACK repetition on common PUCCH resources |  | Yes | No | UE does not support PUCCH repetition for common PUCCH resources | Per Band | N/A | N/A | N/A | A UE that includes LCID codepoint = one of {2, 3, 4, 5, 6, 7} for UL CCCH when the LX field is set to 1 must support FG 44-1  Note: This UE feature group is applicable only for bands in Tables 5.2.2-1 and 5.2.3-1 in TS 38.101-5 and HAPS operation bands in Clause 5.2 of TS 38.104 | Optional without capability signaling |
| 44. NR\_NTN\_enh | 44-2 | NTN DMRS bundling enhancement for PUSCH in NGSO scenarios | 1. Support of DM-RS bundling for PUSCH over consecutive slots in NGSO scenarios  2. Support of pre-compensation to keep phase rotation due to timing drift within the phase difference limit  3. Maximum duration during which UE is able to maintain power consistency and phase continuity to support NTN DM-RS bundling for PUSCH over consecutive slots | At least one of {30-4a/b/c}, 26-1 | Yes | No | UE does not support DM-RS bundling enhancement for PUSCH in NGSO scenarios | Per Band | N/A | N/A | N/A | Component 3 candidate values: {4, 8, 16, 32}  Note: This UE feature group is applicable only for bands in Tables 5.2.2-1 in TS 38.101-5 and HAPS operation bands in Clause 5.2 of TS 38.104  Note: a UE that does not report support of this FG and reports support of FG 30-4 for an NTN band can perform DMRS bundling only in GSO scenario in the NTN band  NOTE: DM-RS bundling is only applicable for UL transmissions with pi/2 BPSK, BPSK, and QPSK modulation orders  Note: for bands in Table 5.2.2-1 in TS 38.101-5, reported value in FG 30-4 is applied only for GSO scenario | Optional with capability signaling |
| 44. NR\_NTN\_enh | 44-3 | UE Rx-Tx Measurement and Report for Multi-RTT with single satellite in NTN | 1. Support UE Rx-Tx time difference based on single sample and UE Rx-Tx time difference offset measurement and report for Multi-RTT positioning with single satellite in NTN  2. Support of reporting DL timing drift due to Doppler over the service link associated with the UE Rx-Tx time difference measurement period | 13-4, 13-8 | No | No | UE does not support Multi-RTT positioning with single satellite in NTN | Per Band | N/A | N/A | N/A | Note: This UE feature group is applicable only for bands in Tables 5.2.2-1 and 5.2.3-1 in TS 38.101-5  Need for location server to know if the feature is supported | Optional with capability signaling |

1. NR\_Mob\_enh2

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| Features | Index | Feature group | Components | Prerequisite feature groups | Need for the gNB to know if the feature is supported | Applicable to the capability signalling exchange between UEs (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 |
| 45. NR\_Mob\_enh2 | 45-1 | Intra-frequency L1 measurement and reports for L1-L2 Triggered Mobility (LTM) procedure | 1. Support of intra-frequency L1- RSRP measurement and reporting based on SSB(s) of candidate cell(s)  2. Maximum number of RRC configured candidate cells for intra-frequency L1-RSRP measurement  4. Support of up to L candidate cells and M beams in one report where a SSBRI-RSRP pair is used for each beam report for intra-frequency L1-RSRP measurement  5. Maximum number of LTM CSI report configs | 2-21 or 2-22 or 2-23 or 2-23a | Yes | No | UE does not support intra-frequency L1 measurement and reports for Rel-18 LTM operation | Per BC | No | No | n/a | Component 2 candidate values: {1,2,3,4,5,6,7,8}  Component 4 candidate values:  L: {1, 2,3,4}  M: {1, 2,3,4}  M × L: {1,2,3,4, 6, 8, 9, 12, 16}  Component 5 candidate values:  Aperiodic: {0,1,2,3,4}  Periodic: {1,2,3,4}  Semi-persistent: {0,1,2,3,4} | Optional with capability signalling |
| 45. NR\_Mob\_enh2 | 45-1a | Inter-frequency L1 measurement and reports for L1-L2 Triggered Mobility (LTM) procedure | 1. Support of inter- frequency L1- RSRP measurement and reporting based on SSB(s) of candidate cell(s)  2. Maximum number of RRC configured candidate cells for intra- and inter-frequency L1-RSRP measurement  4. Support of up to L candidate cells and M beams in one report where a SSBRI-RSRP pair is used for each beam report for intra- and inter-frequency L1-RSRP measurement | 2-21 or 2-22 or 2-23 or 2-23a, 45-1 | Yes | No | UE does not support inter-frequency L1 measurement and reports for Rel-18 LTM operation | Per BC | No | No | n/a | Component 2 candidate values: {1,2,3,4,5,6,7,8}  Component 4 candidate values:  L: {1,2,3,4}  M: {1,2,3,4}  M × L: {1,2,3,4, 6, 8, 9, 12, 16} | Optional with capability signalling |
| 45. NR\_Mob\_enh2 | 45-2 | Inclusion of current SpCell in the L1 measurement report | 1. Support of always including the current SpCell in the L1 measurement report | 45-1 | Yes | No | UE does not always include measurement report for SpCell in the L1 measurement report | Per BC | No | No | n/a |  | Optional with capability signalling |
| 45. NR\_Mob\_enh2 | 45-3 | Beam indication with joint DL/UL LTM TCI states | 1. Support of unified TCI with joint DL/UL LTM TCI-state indication for LTM procedure.  2. Maximum number of configured joint LTM TCI state(s) per candidate cell  3. Support of indicating and activating a single joint LTM TCI state in a cell switch command.  4. Supported QCL source RS in the LTM TCI-stateconfiguration  5. Maximum number of configured joint LTM TCI state(s) across candidate cells  6. Maximum number of configured cells for joint LTM TCI states | 23-1-1, RAN2 FG for LTM | Yes | No | UE does not support Beam indication with joint DL/UL LTM TCI states | Per band | No | No | n/a | Component 2 candidate values: {8, 12, 16, 24, 32, 48, 64, 128}  Component 4 candidate values: {SSB, TRS, both}  Component 5 candidate values: {8, 16, 24, 32, …, 1024}  Component 6 candidate values: {1,2,3,4,5,6,7,8} | Optional with capability signalling |
| 45. NR\_Mob\_enh2 | 45-3a | MAC-CE activated joint LTM TCI states | 1. Supported QCL source RS for MAC-CE activated joint LTM TCI states  2. Maximum number of MAC-CE activated joint LTM TCI states per candidate cell  3. Maximum number of MAC-CE activated joint LTM TCI states across candidate cells and serving cells | 45-3 | Yes | No | UE does not support MAC-CE activated joint LTM TCI states | Per band | No | No | n/a | Component 1 candidate values: {SSB, TRS, both}  Component 2 candidate values for K: {1,2,3,4,…,15,16}  Component 3 candidate values: {1,2,3,4,8,16,32}  Note: The maximum number of MAC-CE activated joint TCI states across all servings cells is limited by component 5 in FG 23-1-1 | Optional with capability signalling |
| 45. NR\_Mob\_enh2 | 45-4 | Beam indication with separate DL/UL LTM TCI states | 1. Support of unified TCI with separate DL/UL TCI-state indication for LTM procedure.  2. Maximum number of configured DL TCI state(s) per candidate cell  3. Maximum number of configured UL TCI state(s) per candidate cell  4. Support of indicating and activating a pair of UL/DL TCI-state in a cell switch command.  5. Supported QCL source RS in the LTM TCI-state configuration  7. Maximum number of configured separate DL LTM TCI state(s) across candidate cells  8. Maximum number of configured separate UL LTM TCI state(s) across candidate cells  9. Maximum number of configured cells for separate DL/UL LTM TCI states | 23-10-1, RAN2 FG for LTM | Yes | No | UE does not support Rel-18 LTM operation with separate DL/UL TCI states | Per band | No | No | n/a | Component 2 candidate values: {4, 8, 12, 16, 24, 32, 48, 64, 128}  Component 3 candidate values: {4, 8, 12, 16, 24, 32, 48, 64}  Component 5 candidate values: {SSB, TRS, both}  Component 7 candidate values: {8, 16, 24, 32, …, 1024}  Component 8 candidate values: {4, 8, 12, 16, …, 512}  Component 9 candidate values: {1,2,3,4,5,6,7,8} | Optional with capability signalling |
| 45. NR\_Mob\_enh2 | 45-4a | MAC-CE activated DL/UL LTM TCI states | 1. Supported QCL source RS for MAC-CE activated DL/UL LTM TCI states  2. Maximum number K1 of MAC-CE activated DL TCI states per candidate cell  3. Maximum number K2 of MAC-CE activated UL TCI states per candidate cell  4. Maximum number of MAC-CE activated DL TCI states across all candidate cells and serving cells  5. Maximum number of MAC-CE activated UL TCI states across all candidate cells and serving cells | 45-4 | Yes | No | UE does not support MAC-CE activated DL/UL TCI states | Per band | No | No | n/a | Component 1 candidate values: {SSB, TRS, both}  Component 2 candidate values: {1, 2,3,4,5,6,7,8}  Component 3 candidate values: {1, 2,3,4,5,6,7,8}  Component 4 candidate values: {1,2,4,8,16}  Component 5 candidate values: {1,2,4,8,16}  Note: The maximum number of MAC-CE activated DL/UL TCI states across all servings cells is limited by component 7 and 8 in FG 23-10-1 | Optional with capability signalling |
| 45. NR\_Mob\_enh2 | 45-5 | RACH-based early TA acquisition | 1. Maximum number of candidate cells for TA acquisition based on PDCCH ordered CFRA procedure before receiving cell switch command MAC-CE  2. Power ramping for PRACH retransmission based on PDCCH order indication  3. Support of dropping the serving cell UL to handle the overlap between UL transmission on serving cell(s) and PRACH on candidate cell(s) | 45-7, RAN2 FG for LTM | Yes | No | RACH-based early TA acquisition is not supported | Per band | No | No | n/a | Component 1 candidate values {1,2,3,4,5,6,7,8} | Optional with capability signalling |
| 45. NR\_Mob\_enh2 | 45-5a | RACH-based early TA acquisition with simultaneous transmission | Support of simultaneous transmission to handle the overlap between UL transmission on serving cell(s) and PRACH on candidate cell(s) | 45-5 | Yes | No | Support of RACH-based early TA acquisition with simultaneous transmission is not supported | Per band pair per band combination (between the target band for RACH transmission and band under UE’s current band combo) | No | No | n/a |  | Optional with capability signalling |
| 45. NR\_Mob\_enh2 | 45-6 | UE-based TA measurement | 1. Support of UE-based TA measurement  2. Maximum number of candidate cells that the UE maintains the TA for | RAN2 FG for LTM | Yes | No | UE-based TA measurement is not supported | Per band | No | No | n/a | Component 2 candidate values: {1,2,3,4,5,6,7,8} | Optional with capability signalling |
| 45. NR\_Mob\_enh2 | 45-7 | TA indication in cell switch command | Support of TA indication in cell switch command | RAN2 FG for LTM | Yes | No | TA indication in cell switch command is not supported | Per band | No | No | n/a |  | Optional with capability signalling |

1. NR\_UAV



Void

1. NR\_SL\_enh2

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| Features | Index | Feature group | Components | Prerequisite feature groups | Need for the gNB to know if the feature is supported | Applicable to the capability signalling exchange between UEs (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 |
| 47. NR\_SL\_enh2 | 47-k1 | SL channel access for dynamic channel access mode | UE supports  1. SL Type 1 channel access and contention window size adjustment  2. SL Type 2A channel access  3. SL Type 2B channel access  4. SL Type 2C channel access  5. 20MHz LBT bandwidth  6. CP extension up to 1 symbol in 15kHz SCS if the UE supports 15 kHz SCS  7. CP extension up to 2 symbols in 30kHz SCS  8. CP extension up to 2 symbols if the UE supports 60kHz SCS | At least one of {15-25, 15-3, 32-4, 32-4a} | Yes | No | UE does not support channel access for NR sidelink operation in shared spectrum. | Per band | n/a | n/a |  | The FG is only expected for a band where shared spectrum channel access must be used.  Note: Component 8 is applicable in regions without OCB requirements.  Note1: If UE supports 15-25, the UE is not required to support Component 3 and 4 in 15-2.  Note2: If UE supports 15-3, the UE is not required to support Component 3 in 15-3, and FR2 parts of Component 7 in 15-3.  Note: It is up to RAN2 whether/how to implement the above Notes 1/2 and whether/how to update the prerequisite FGs | Optional with capability signalling  For UE supports NR SL in shared spectrum and when shared spectrum channel access must be used, UE must support this FG |
| 47. NR\_SL\_enh2 | 47- k2 | SL multi-channel access for dynamic channel access mode | 1. UE supports multi-channel access procedures for PSCCH/PSSCH/S-SSB/PSFCH transmission(s) in multiple RB sets in a slot  4) UE supports multi-channel access procedure on N channel(s) with 20MHz LBT bandwidth for each channel. Candidate values of N: {2, 3, 4, 5} | 47-k1 | Yes | No | UE does not support multi-channel access in dynamic channel access mode for NR sidelink operation in shared spectrum. | Per band | n/a | n/a |  | The FG is only expected for a band where shared spectrum channel access must be used.  Note: Support of S-SSB/PSFCH transmission(s) in multiple RB-sets in a slot is according to the support of {47-m11, 47-m11a} and {47-m12, 47-m12a} | Optional with capability signalling |
| 47. NR\_SL\_enh2 | 47- k2-1 | SL multi-channel access allowing PSFCH/S-SSB transmission on a subset of intended number of RB sets based on the outcome of channel access on individual RB sets | UE supports Type A and Type B multi-channel access procedures for PSFCH/S-SSB transmissions on a subset of intended number of RB sets based on the outcome of channel access on individual RB sets in a slot | 47-k2 | No | No |  |  |  |  |  |  | Optional without capability signaling |
| 47. NR\_SL\_enh2 | 47- k3 | Receiving UE to UE COT sharing information | 1. UE supports monitoring SCI to read COT sharing information  2. UE supports transmitting NR SL based on COT sharing information subject to COT sharing conditions | 47-k1 | No | No | UE does not support using UE-to-UE COT sharing information contained in SCI for sharing COT for NR sidelink operation in shared spectrum. |  |  |  |  | The FG is only expected for a band where shared spectrum channel access must be used. | Optional without capability signalling  For UE supports NR SL in shared spectrum where shared spectrum channel access must be used, UE must support this FG |
| 47. NR\_SL\_enh2 | 47-k4 | Transmitting UE to UE COT sharing information | 1. UE supports using ue-toUE-COT-SharingED-Threshold for Type 1 channel access for UE to UE COT sharing  2. UE supports indicating COT sharing information in SCI | 47-k1 | No | Yes | UE does not support transmitting UE-to-UE COT sharing information for sharing COT for NR sidelink operation in shared spectrum. | Per band | n/a | n/a |  | The FG is only expected for a band where shared spectrum channel access must be used. | Optional with capability signalling |
| 47. NR\_SL\_enh2 | 47-k5 | Resource allocation for multi-consecutive slots transmission | UE supports resource (re-)selection for PSCCH/PSSCH transmission on multiple consecutive slots | at least one of {15-3, 32-4} | No | No | UE does not support resource (re-)selection for multi-consecutive slots transmission |  |  |  |  |  | Optional without capability signalling |
| 47. NR\_SL\_enh2 | 47-k6 | Type1 LBT blocking Option 1 | UE supports  1. avoid selection of N consecutive resource(s) before a reserved resource when the L1 SL priority value for the transmission is higher than the L1 SL priority value of the reserved resource. It is up to UE whether to do it  2. avoid selection of M consecutive resource(s) after a reserved resource when the transmitting symbols of the reserved resource overlap with LBT of the selected resource. It is up to UE whether to do it | 47-k1 | Yes | No | UE does not support Type1 LBT blocking Option 1 | Per band | n/a | n/a |  | The FG is only expected for a band where shared spectrum channel access must be used. | Optional with capability signalling |
| 47. NR\_SL\_enh2 | 47-k7 | Type1 LBT blocking Option 2 | UE supports  1. If transmission in slot(s) at least T\_proc,0 before a reserved resource is able to share its initiated COT to the reservation, UE prioritize / select resource(s) in the slot(s) for transmission. It is up to UE whether to do it | 47-k1 | Yes | No | UE does not support Type1 LBT blocking Option 2 | Per band | n/a | n/a |  | The FG is only expected for a band where shared spectrum channel access must be used. | Optional with capability signalling |
| 47. NR\_SL\_enh2 | 47-k8 | CW autonomous update for SL transmission without HARQ feedback | UE support autonomous update of the *CWp* to the next higher allowed value when the same *CWp* ≠ *CWmax*,*p* value is consecutively used for X times for generation of *Ninit* for PSCCH/PSSCH transmission without HARQ feedback. | 47-k1 | No | No | UE does not update *CWp* for PSCCH/PSSCH transmission without HARQ feedback. |  |  |  |  | The FG is only expected for a band where shared spectrum channel access must be used. | Optional without capability signalling |
| 47. NR\_SL\_enh2 | 47-k9 | Sidelink mode 1 resource allocation in shared spectrum | 1. UE can monitor DCI format 3\_0 on a licensed band for NR sidelink dynamic scheduling and configured grant type 2 for transmitting PSCCH/PSSCH on a shared spectrum  2. UE supports reporting NACK to gNB when transmitting PSCCH/PSSCH on scheduled resource(s) is failed due to LBT failure | 47-k1 | Yes | No | UE does not perform PSCCH/PSSCH based on mode 1 resource allocation in a shared spectrum. | Per band | N/A | N/A |  | The FG is only expected for a band where shared spectrum channel access must be used. | Optional with capability signalling |
| 47. NR\_SL\_enh2 | 47-m1 | Interlace RB-based SL transmission/reception | 1. UE supports interlace RB-based SL transmissions for the physical layer channels that it is capable of transmit  2. UE supports interlace RB-based SL receptions for the physical layer channels that it is capable of receive | At least one of {15-25, 15-3, 32-4, 32-4a} | Yes | No | UE does not support Interlace RB-based PSCCH/PSSCH/PSFCH transmission/reception | Per band | N/A | N/A |  | This is the basic FG for NR sidelink in shared spectrum, where PSD and/or OCB requirements are defined by regulation.  Note1: If UE supports 15-25, the UE is not required to support Component 3 and 4 in 15-2.  Note2: If UE supports 15-3, the UE is not required to support Component 3 in 15-3, and FR2 parts of Component 7 in 15-3.  Note: It is up to RAN2 whether/how to implement the above Notes 1/2 and whether/how to update the prerequisite FGs | Optional with capability signalling  For UE supports NR sidelink in shared spectrum, where PSD and/or OCB requirements are defined by regulation, UE must support this FG. |
| 47. NR\_SL\_enh2 | 47-m3 | Transmitting PSCCH/PSSCH from 2nd starting symbol in a slot | 1. UE supports transmitting PSCCH/PSSCH from 2nd starting symbol in a slot in addition to the first starting symbol | 47-k1, At least one of {15-25, 15-3, 32-4, 32-4a} | No | No | UE transmits PSCCH/PSSCH only from 1st starting symbol in a slot |  |  |  |  | Note1: If UE supports 15-25, the UE is not required to support Component 3 and 4 in 15-2.  Note2: If UE supports 15-3, the UE is not required to support Component 3 in 15-3, and FR2 parts of Component 7 in 15-3.  Note: It is up to RAN2 whether/how to implement the above Notes 1/2 and whether/how to update the prerequisite FGs  The FG is only expected for a band where shared spectrum channel access must be used. | Optional without capability signalling |
| 47. NR\_SL\_enh2 | 47-m4 | Receiving PSCCH/PSSCH from 2nd starting symbol in a slot | 1. UE supports receiving PSCCH/PSSCH transmitted from 2nd starting symbol in a slot in addition to the first starting symbol  2. UE can monitor a total up to X PSCCHs in a slot in the 1st and 2nd starting symbols | 15-1 | No | No | UE receives PSCCH/PSSCH transmitted only from 1st starting symbol in a slot |  |  |  |  | The value X is the same as the reported value in FG 15-1  The FG is only expected for a band where shared spectrum channel access must be used. | Optional without capability signalling  For UE supports NR sidelink in shared spectrum and when shared spectrum channel access must be used, UE must support this FG. |
| 47. NR\_SL\_enh2 | 47-m5 | Multiple PSFCH occasions per PSCCH/PSSCH | 1. UE supports PSFCH transmission/reception on N PSFCH occasion(s) per PSCCH/PSSCH | 15-11 | Yes | No | UE supports only one PSFCH occasion per PSCCH/PSSCH transmission | Per band | N/A | N/A |  | Candidate values for N are {1,2,3,4}  The FG is only expected for a band where shared spectrum channel access must be used. | Optional with capability signalling |
| 47. NR\_SL\_enh2 | 47-m6 | Transmitting SSB repetitions within one RB set | 1. UE supports transmitting S-PSS/S-SSS/PSBCH multiple times by repetition in frequency domain within one RB set | 15-4 | No | No | UE does not support transmitting S-PSS/S-SSS/PSBCH multiple times by repetition in frequency domain within one RB set |  |  |  |  | This is the basic FG for NR sidelink in shared spectrum where PSD and/or OCB requirements are defined by regulation.  It is up to UE implementation whether S-SSB RX UE monitors more than one S-SSB repetition in frequency domain within one RB set as long as RAN4 requirements are satisfied  The FG is only expected for a band where shared spectrum channel access must be used. | Optional without capability signalling  For UE supports NR sidelink in shared spectrum where PSD and/or OCB requirements are defined by regulation, UE must support this FG. |
| 47. NR\_SL\_enh2 | 47-m8 | Transmitting S-SSB on additional S-SSB occasion(s) | 1. UE supports transmitting S-SSB on additional S-SSB occasion(s) | 15-4 | No | No | UE does not support transmitting S-SSB on additional S-SSB occasion(s) but supports to exclude those occasion(s) from SL resource pool(s) |  |  |  |  |  | Optional without capability signalling |
| 47. NR\_SL\_enh2 | 47-m9 | Receiving S-SSB on additional S-SSB occasion(s) | 1. UE supports receiving S-SSB on additional S-SSB occasion(s) | 15-4 | No | No | UE does not support receiving S-SSB on additional S-SSB occasion(s) but supports to exclude those occasion(s) from SL resource pool(s) |  |  |  |  |  | Optional without capability signalling |
| 47. NR\_SL\_enh2 | 47-m10 | Contiguous RB-based PSCCH/PSSCH transmission/reception | 1. UE supports contiguous RB-based PSCCH/PSSCH transmission/reception  2. UE supports resource (re-)selection for contiguous RB-based PSCCH/PSSCH transmission | At least one of {15-25, 15-3, 32-4, 32-4a} | Yes | No | UE does not support contiguous RB-based PSCCH/PSSCH transmission/reception | Per band | N/A | N/A |  | The FG is only expected for a band where shared spectrum channel access must be used.  Note1: If UE supports 15-25, the UE is not required to support Component 3 and 4 in 15-2.  Note2: If UE supports 15-3, the UE is not required to support Component 3 in 15-3, and FR2 parts of Component 7 in 15-3.  Note: It is up to RAN2 whether/how to implement the above Notes 1/2 and whether/how to update the prerequisite FGs | Optional with capability signalling |
| 47. NR\_SL\_enh2 | 47-m11 | PSFCH transmissions in multiple contiguous RB sets | UE supports PSFCH transmissions in multiple contiguous RB sets | at least one of {47-k2, 47-k2-1} | Yes | Yes | UE does not support PSFCH transmissions in multiple contiguous RB sets | Per band | N/A | N/A |  | The FG is only expected for a band where shared spectrum channel access must be used. | Optional with capability signalling |
| 47. NR\_SL\_enh2 | 47-m11a | PSFCH transmissions in multiple non-contiguous RB sets | UE supports PSFCH transmissions in multiple non-contiguous RB sets | 47-m11 | Yes | Yes | UE does not support PSFCH transmissions in multiple non-contiguous RB sets | Per band | N/A | N/A |  | The FG is only expected for a band where shared spectrum channel access must be used. | Optional with capability signalling |
| 47. NR\_SL\_enh2 | 47-m12 | S-SSB transmissions in multiple contiguous RB sets | UE supports S-SSB transmissions in multiple contiguous RB sets | at least one of {47-k2, 47-k2-1} | No | No | UE does not support S-SSB transmissions in multiple contiguous RB sets |  |  |  |  | The FG is only expected for a band where shared spectrum channel access must be used. | Optional without capability signalling |
| 47. NR\_SL\_enh2 | 47-m12a | S-SSB transmissions in multiple non-contiguous RB sets | UE supports S-SSB transmissions in multiple non-contiguous RB sets | 47-m12 | No | No | UE does not support S-SSB transmissions in multiple non-contiguous RB sets |  |  |  |  | The FG is only expected for a band where shared spectrum channel access must be used. | Optional without capability signalling |
| 47. NR\_SL\_enh2 | 47-m13 | Transmissions/receptions of multiple dedicated PRBs in common interlace-based PSFCH | 1. UE can transmit PSFCH(s) on up to a total of K dedicated PRBs for PSFCH in a slot in addition to common PRBs.  2. UE can receive PSFCH(s) on up to a total of L dedicated PRBs for PSFCH in a slot | 47-m1 | Yes | No | Transmissions/receptions of multiple dedicated PRBs in common interlace-based PSFCH is not supported. | Per band | N/A | N/A |  | The FG is only expected for a band where shared spectrum channel access must be used.  Candidate values for K are {4, 5, 8, 15, 16, 20}  Candidate values for L are{5, 6, 15, 16, 25, 26, 32, 35, 45, 46, 50, 64, 65} | Optional with capability signalling  For UE supports NR sidelink in shared spectrum, where PSD and/or OCB requirements are defined by regulation, UE must support this FG. |
| 47. NR\_SL\_enh2 | 47-m13a | Transmissions/receptions of multiple interlaces in dedicated interlace-based PSFCH | 1. UE can transmit PSFCH(s) on up to a total of M dedicated interlaces for PSFCH in a slot.  2. UE can receive PSFCH(s) on up to a total of N dedicated interlaces for PSFCH in a slot | 47-m1 | Yes | No | Transmissions/receptions of multiple interlaces in dedicated interlace-based PSFCH is not supported. | Per band | N/A | N/A |  | The FG is only expected for a band where shared spectrum channel access must be used.  Candidate values for M are {1, 2, 3}  Candidate values for N are {1, 2, 3, 4, 5} | Optional with capability signalling |
| 47. NR\_SL\_enh2 | 47-s1 | Transmission/Reception using dynamic resource pool sharing | 1) Avoidance of NR PSCCH/PSSCH/PSFCH overlapping with EUTRA SL resources in dynamic resource pool sharing using LTE sidelink resource reservation information in NR mode2 resource (re)selection  2) UE supports NR sidelink TXs and RXs in a resource pool in 15kHz and 30kHz SCSs and uses the SCS that is (pre)configured for a SL BWP. | 15-3, 15-6, 15-11 | Yes | No | UE does not support transmission/reception using dynamic resource pool sharing | Per band | N/A | N/A |  | Component 2 does not imply that two different SCSs can be (pre)configured simultaneously in a SL BWP | Optional with capability signalling |
| 47. NR\_SL\_enh2 | 47-v1 | NR SL communication with SL CA | 1) UE supports transmitting/receiving PSCCH/PSSCH/PSFCH simultaneously over multiple X SL carriers:   * 1-1) Maximum number of simultaneous PSCCH/PSSCH TX, equal to X and 1 per carrier * 1-2) For the number of PSCCH decodes:   + UE can receive Z\* floor (NRB,*i* /10 RBs) PSCCH in a slot on carrier *i* of the X carriers. * 1-3) For the number of non-overlapped PRBs over aggregated SL carriers:   + UE can attempt to decode NRB,i non-overlapping RBs in a slot on carrier i of the X carriers. * 1-4) UE can aggregate up to total bandwidth Y MHz.   2) UE can adjust the transmission power of the PSCCH/PSSCH/PSFCH across aggregated carriers such that its total transmission power does not exceed the maximum transmission power. | 15-3, 15-11 | Yes | Yes |  | Per band | N/A | N/A |  | Component 1: Candidate value of X = {2, 3, 4, 5, 6, 7, 8}  Component 1-2 candidate value set: Z={1, 2}  NRB,*i* is the number of RBs defined per channel bandwidth of carrier *i* by RAN4 in 38.101-1 Table 5.3.2-1 for FR1  Component 1-4 candidate value set: Y={20, 30, 40, 50, 60, 70}  Note: this feature is supported only in a band indicated with the PC5 interface in 38.101-1 Table 5.2E.1A-1 for FR1 | Optional with capability signalling |
| 47. NR\_SL\_enh2 | 47-v2 | Synchronization for SL CA | 1-1) UE supports transmitting S-SSB on one selected or all candidate synchronization carriers with the same sync reference from Set-B  1-2) UE supports receiving S-SSB from all candidate synchronization carriers with the same sync reference from Set-B  2) UE can adjust the transmission power of the S-SSB across aggregated carriers such that its total transmission power does not exceed the maximum transmission power. | 47-v1, 15-4 | Yes | No |  | Per band | N/A | N/A |  | Note: Option of UE selection of one selected SL synchronization carrier with the same sync reference from Set-B is not based on limited Tx capability  Note: Component 1-2 does not require simultaneous reception of S-SSB on all candidate synchronization carriers with the same sync reference from Set-B | Optional with capability signalling |
| 47. NR\_SL\_enh2 | 47-v3 | PSFCH for SL CA | 1) UE supports receiving X PSFCH resources in a slot over all aggregated SL carriers   * 1-1) UE is capable of receiving at least one PSFCH resource on each of the aggregated carriers in a slot   2) UE supports transmitting Y PSFCH resources in a slot over all aggregated SL carriers according to PSFCH procedures   * 2-1) UE is capable of transmitting at least one PSFCH resource on each of the aggregated carriers | 47-v1 | Yes | No |  | Per band | N/A | N/A |  | Candidate values for X are {5, 15, 25, 32, 35, 45, 50, 64, 100}  Candidate values for Y are {4, 8, 16, 24}  Note: for component 1-1, it is up to UE implementation which PSFCH(s) to receive | Optional with capability signalling |

1. NR\_redcap\_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 |
| 48. NR\_redcap\_enh | 48-1 | RedCap UE with reduced peak data rate and reduced baseband bandwidth in FR1 | The following components are the same as for *supportOfRedCap-r17* (28-1):  1. Maximum FR1 RedCap UE bandwidth is 20 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  The following components are new compared to *supportOfRedCap-r17* (28-1):  11. DL/UL peak data rate target of 10 Mbps corresponding to *vLayers*·*Qm*·*f* = 3.2  12. Maximum number of PDSCH/PUSCH PRBs that can be scheduled/configured for unicast is 25 PRBs for 15 kHz SCS and is 12 PRBs for 30 kHz SCS  13. Relaxed processing timeline of 1/0.5 ms for 15/30 kHz SCS when the RAR PDSCH and MsgB PDSCH (if supported) is larger than 25/12 PRBs for 15/30 kHz SCS  14. Network-configurable additional separate early indication in Msg1 for Rel-18 eRedCap UEs  15. Maximum number of Msg4 PDSCH PRBs, which is scheduled by DCI scrambled by a TC-RNTI, that can be decoded and maximum number of Msg 3 PUSCH PRBs and Msg A PUSCH PRBs (if supported), which is scheduled by RAR UL grant or by a DCI scrambled by a TC-RNTI, or is configured for a Type-2 random access procedure, that can be transmitted is 25 PRBs for 15 kHz SCS and is 12 PRBs for 30 kHz SCS |  | Y |  | Network assumes the UE is not a RedCap UE with reduced peak data rate and reduced baseband bandwidth in FR1. | Per UE | No | FR1 only |  | A UE supporting this FG is not required to support FG 6-1.  A UE supporting this FG is not allowed to support FG 28-1.  The specifications for a UE supporting FG 28-1 (‘RedCap UE’) also apply for a UE supporting this FG (FG 48-1) unless stated otherwise.  It is up to RAN2 whether/how to capture the capabilities for early indication of RedCap UE in Msg 3 and Msg A.  It is up to RAN2 whether/how to capture the capabilities for additional separate early indication of Rel-18 eRedCap UE in Msg 3 and Msg A PUSCH. | Optional with capability signaling  UEs supporting Rel-18 eRedCap UE complexity reduction feature(s) indicate support of this FG instead of FG 28-1 (*supportOfRedCap-r17*). |
| 48. NR\_redcap\_enh | 48-2 | RedCap UE with reduced peak data rate without reduced baseband bandwidth in FR1 | The capabilities of FG 48-2 are the same as for FG 48-1 with following exceptions  Component 11 in FG 48-1 does not apply for FG 48-2, and instead FG 48-2 has DL/UL peak data rate target of 10 Mbps corresponding to *vLayers*·*Qm*·*f* = 0.75 when *vLayers* = 1 and *vLayers*·*Qm*·*f* = 0.8 when *vLayers* = 2  Component 12 in FG 48-1 does not apply for FG 48-2.  Component 13 and Component 15 in FG 48-1 are supported by FG 48-2 only for CBRA. | 48-1 | Y |  | Network assumes the UE is not a RedCap UE with reduced peak data rate without reduced baseband bandwidth in FR1. | Per UE | No | FR1 only |  |  | Optional with capability signaling |

1. NR\_MC\_enh

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| Features | Index | Feature group | Components | Prerequisite feature groups | Need for the gNB to know if the feature is supported | Applicable to the capability signalling exchange between UEs (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 |
| 49. NR\_MC\_enh | 49-1 | Multi-cell PDSCH scheduling by DCI format 1\_3 on a scheduling cell with same SCS between scheduling cell and cells in the set | 1) UE supports monitoring DCI format 1\_3 for DL scheduling with same SCS between scheduling cell and cells in the set  2) Scheduling cell is PCell if set of cells includes PCell, and scheduling cell is PCell or an SCell if set of cells includes only SCells.  3) Scheduling cell and co-scheduled cells have same SCS/carrier type: value set: {FR1 licensed FDD, FR1 licensed TDD, FR1 unlicensed TDD, FR2-1, FR2-2}, UE reports one or multiple of values from the value set  4) Max number of co-scheduled cells per set of cells supported by UE is reported with candidate value set of {2, 3, 4}  5) Max number of sets of cells supported by UE across PUCCH groups: Candidate value set of {1, 2, 3, 4, 5, 6, 7, 8}  6) Max number of sets of cells supported by UE for a same scheduling cell: Candidate value set of {1, 2, 3, 4}  7) Supported HARQ feedback types, candidate values: {type 1, type2, type 1 and type 2}, Note: the UE shall report the same value for all supported BC for FG 49-1  8) Supported co-scheduled cell indication schemes: Candidate value set of {FDRA field based, co-scheduled cell indicator field based, both}  9) Support Type-2 for ‘Antenna port(s)’ field  10) The number of unicast DL DCIs to process per slot of scheduling cell for a set of cells configured for multi-cell PDSCH scheduling by DCI format 1\_3   * One DCI format 1\_3 for the set of cells and, * One unicast DL DCI formats 1\_0/1\_1/1\_2 (if supported) for each of the cells that are not scheduled by DCI 1\_3   11) Monitoring SS set(s) for DCI format 1\_3 for a set of cells for the following cases   * 1) Search space set configuration for DCI format 1\_3 for the set of cells is provided only on the scheduling cell, or; * 2) Search space set configurations for DCI format 1\_3 for the set of cells with the same searchSpaceId are provided on both the scheduling cell and a serving cell in the set of cells with the scheduling cell being NOT in the set of cells * UE supporting FG 49-1 can additionally report whether the UE support following case   + 3) Search space set configurations for DCI format 1\_3 for the set of cells with the same searchSpaceId are provided on both the scheduling cell and a serving cell in the set of cells with the scheduling cell being in the set of cells   12) When multiple component 3 values are reported and if scheduling cell is not included in the set of cells, support multi-cell PDSCH scheduling by DCI format 1\_3 from one carrier type, indicated in component 3, to another carrier type, indicated in component 3, for the following scheduling cases:   * FR1 licensed TDD to FR1 unlicensed TDD * FR2-1 to FR2-2 * UE can additionally report the support of {FR1 licensed FDD from/to FR1 licensed TDD} |  | Yes |  | UE does not support multi-cell PDSCH scheduling by DCI format 1\_3 on a scheduling cell with same SCS between scheduling cell and cells in the set | Per BC | N/A | N/A | N/A | Note: Support of CCS with DL DCI formats 1\_1/1\_2 is according to FG 6-10 | Optional with capability signaling |
| 49. NR\_MC\_enh | 49-1b | Multi-cell PDSCH scheduling by DCI format 1\_3 on a scheduling cell not included in a set of cells with different SCS/carrier type between scheduling cell and cells in the set | 1) UE supports monitoring DCI format 1\_3 for DL scheduling where scheduling cell is not included in a set of cells in same PUCCH group.  2) Scheduling cell is PCell or SCell, and a set of cells includes only SCells.  3a) Scheduling cell and co-scheduled cells have different SCS. The set of co-scheduled cells share the same SCS and carrier type  Candidate value set for component 3a:   * {Scheduling cell of lower SCS and scheduled cells of higher SCS, Scheduling cell of higher SCS and scheduled cells of lower SCS, both}   3b) Scheduling cell and co-scheduled cells have same or different carrier type (FR1 licensed FDD or FR1 licensed TDD or FR1 unlicensed TDD or FR2-1 or FR2-2).  Candidate value set for component 3b:   * Indication of support/not support for each of applicable combinations of scheduling cell from {FR1 licensed FDD, FR1 licensed TDD, FR1 unlicensed TDD, FR2-1, FR2-2} and scheduled cells from {FR1 licensed FDD, FR1 licensed TDD, FR1 unlicensed TDD, FR2-1, FR2-2} from the band combinations   4) Max number of co-scheduled cells per set of cells supported by UE is reported with candidate value set of {2, 3, 4}  5) Max number of sets of cells supported by UE across PUCCH groups: Candidate value set of {1, 2, 3, 4, 5, 6, 7, 8}  6) Max number of sets of cells supported by UE for a same scheduling cell: Candidate value set of {1, 2, 3, 4}  7) Supported HARQ feedback types, candidate values: {type 1, type2, type 1 and type 2}, Note: the UE shall report the same value for all supported BC for FG 49-1b  8) Supported co-scheduled cell indication schemes: Candidate value set of {FDRA field based, co-scheduled cell indicator field based, both}  9) Support Type-2 for ‘Antenna port(s)’ field  10) The number of unicast DL DCIs to process per N consecutive slots of scheduling cell for a set of cells configured for multi-cell PDSCH scheduling by DCI format 1\_3   * One DCI format 1\_3 for the set of cells and, * One unicast DL DCI formats 1\_0/1\_1/1\_2 (if supported) for each of the cells that are not scheduled by DCI 1\_3 * For low-to-high SCS, N = 1. * For high-to-low SCS, N is based on pair of (scheduling CC SCS, scheduled CC SCS): N=2 for (30,15), (60,30), (120,60) and N=4 for (60,15), (120,30), N = 8 for (120,15)   11) Monitoring SS set(s) for DCI format 1\_3 for a set of cells for the following cases   * 2) Search space set configurations for DCI format 1\_3 for the set of cells with the same searchSpaceId are provided on both the scheduling cell and a serving cell in the set of cells |  | Yes |  | UE does not support multi-cell PDSCH scheduling by DCI format 1\_3 on a scheduling cell which is not included in a set of cells with different SCS/carrier type scheduling cell and cells in the set | Per BC | N/A | N/A | N/A | Note: Support of CCS with DL DCI formats 1\_1/1\_2 is according to FG 18-5 | Optional with capability signaling |
| 49. NR\_MC\_enh | 49-2 | Multi-cell PUSCH scheduling by DCI format 0\_3 on a scheduling cell with same SCS between scheduling cell and cells in the set | 1) UE supports monitoring DCI format 0\_3 for UL scheduling with same SCS between scheduling cell and cells in the set  2) Scheduling cell is PCell if set of cells includes PCell, and scheduling cell is PCell or an SCell if set of cells includes only SCells.  3) Scheduling cell and co-scheduled cells have same SCS/carrier type:value set: {FR1 licensed FDD, FR1 licensed TDD, FR1 unlicensed TDD, FR2-1, FR2-2}, UE reports one or multiple of values from the value set  4) Max number of co-scheduled cells per set of cells supported by UE is reported with candidate value set of {2, 3, 4}  5) Max number of sets of cells supported by UE across PUCCH groups: Candidate value set of {1, 2, 3, 4, 5, 6, 7, 8}  6) Max number of sets of cells supported by UE for a same scheduling cell: Candidate value set of {1, 2, 3, 4}  7) Supported co-scheduled cell indication schemes: Candidate value set of {FDRA field based, co-scheduled cell indicator field based, both}  8) Support Type-2 for ‘Antenna port(s)’, ‘Precoding information and number of layers’ and ‘SRS resource indicator’ fields  9) The number of unicast UL DCIs to process per slot of scheduling cell for a set of cells configured for multi-cell PUSCH scheduling by DCI format 0\_3   * For FDD scheduling cell   + Up to one DCI format 0\_3 for the set of cells and,   + Up to one unicast UL DCI formats 0\_0/0\_1/0\_2 (if supported) for each of the cells   + For a cell in a set of cells, no more than one DCI scheduling PUSCH for the cell * For TDD scheduling cell   + Up to two DCI format 0\_3 for the set of cells and,   + Up to two unicast UL DCI formats 0\_0/0\_1/0\_2 (if supported) for each of the cells   + For a cell in a set of cells, no more than two DCI scheduling PUSCH for the cell   10) Monitoring SS set(s) for DCI format 0\_3 for a set of cells for the following cases   * 1) Search space set configuration for DCI format 0\_3 for the set of cells is provided only on the scheduling cell, or; * 2) Search space set configurations for DCI format 0\_3 for the set of cells with the same searchSpaceId are provided on both the scheduling cell and a serving cell in the set of cells with the scheduling cell being NOT in the set of cells * UE supporting FG 49-2 can additionally report whether the UE support following case   + 3) Search space set configurations for DCI format 0\_3 for the set of cells with the same searchSpaceId are provided on both the scheduling cell and a serving cell in the set of cells with the scheduling cell being in the set of cells   11) - When multiple component 3 values are reported and if scheduling cell is not included in the set of cells, support multi-cell PUSCH scheduling by DCI format 0\_3 from one carrier type, indicated in component 3, to another carrier type, indicated in component 3, for the following scheduling cases:   * FR1 licensed TDD to FR1 unlicensed TDD * FR2-1 to FR2-2 * UE can additionally report the support of {FR1 licensed FDD from/to FR1 licensed TDD} |  | Yes |  | UE does not support multi-cell PUSCH scheduling by DCI format 0\_3 on a scheduling cell with same SCS between scheduling cell and cells in the set | Per BC | N/A | N/A | N/A | Note: Support of CCS with UL DCI formats 0\_1/0\_2 is according to FG 6-10 | Optional with capability signaling |
| 49. NR\_MC\_enh | 49-2b | Multi-cell PUSCH scheduling by DCI format 0\_3 on a scheduling cell not included in a set of cells with different SCS/carrier type between scheduling cell and cells in the set | 1) UE supports monitoring DCI format 0\_3 for UL scheduling where scheduling cell is not included in a set of cells in same PUCCH group.  2) Scheduling cell is PCell or SCell, and a set of cells includes only SCells.  3a) Scheduling cell and co-scheduled cells have different SCS. The set of co-scheduled cells share the same SCS and carrier type  Candidate value set for component 3a:   * {Scheduling cell of lower SCS and scheduled cells of higher SCS, Scheduling cell of higher SCS and scheduled cells of lower SCS, both}   3b) Scheduling cell and co-scheduled cells have same or different carrier type (FR1 licensed FDD or FR1 licensed TDD or FR1 unlicensed TDD or FR2-1 or FR2-2).  Candidate value set for component 3b:   * Indication of support/not support for each of applicable combinations of scheduling cell from {FR1 licensed FDD, FR1 licensed TDD, FR1 unlicensed TDD, FR2-1, FR2-2} and scheduled cells from {FR1 licensed FDD, FR1 licensed TDD, FR1 unlicensed TDD, FR2-1, FR2-2} from the band combinations   4) Max number of co-scheduled cells per set of cells supported by UE is reported with candidate value set of {2, 3, 4}  5) Max number of sets of cells supported by UE across PUCCH groups: Candidate value set of {1, 2, 3, 4, 5, 6, 7, 8}  6) Max number of sets of cells supported by UE for a same scheduling cell: Candidate value set of {1, 2, 3, 4}  7) Supported co-scheduled cell indication schemes: Candidate value set of {FDRA field based, co-scheduled cell indicator field based, both}  8) Support Type-2 for ‘Antenna port(s)’, ‘Precoding information and number of layers’ and ‘SRS resource indicator’ fields  9) The number of unicast UL DCIs to process per N consecutive slots of scheduling cell for a set of cells configured for multi-cell PUSCH scheduling by DCI format 0\_3   * For FDD scheduling cell   + Up to one DCI format 0\_3 for the set of cells and,   + Up to one unicast UL DCI formats 0\_0/0\_1/0\_2 (if supported) for each of the cells   + For a cell in a set of cells, no more than one DCI scheduling PUSCH for the cell * For TDD scheduling cell   + Up to two DCI format 0\_3 for the set of cells and,   + Up to two unicast UL DCI formats 0\_0/0\_1/0\_2 (if supported) for each of the cells   + For a cell in a set of cells, no more than two DCI scheduling PUSCH for the cell * For low-to-high SCS, N = 1. * For high-to-low SCS, N is based on pair of (scheduling CC SCS, scheduled CC SCS): N=2 for (30,15), (60,30), (120,60) and N=4 for (60,15), (120,30), N = 8 for (120,15)   10) Monitoring SS set(s) for DCI format 0\_3 for a set of cells for the following cases   * 2) Search space set configurations for DCI format 0\_3 for the set of cells with the same searchSpaceId are provided on both the scheduling cell and a serving cell in the set of cells |  | Yes |  | UE does not support multi-cell PUSCH scheduling by DCI format 0\_3 on a scheduling cell which is not included in a set of cells with different SCS/carrier type scheduling cell and cells in the set | Per BC | N/A | N/A | N/A | Note: Support of CCS with UL DCI formats 0\_1/0\_2 is according to FG 18-5b | Optional with capability signaling |
| 49. NR\_MC\_enh | 49-3x | Advanced UE capability for larger number of unicast DL DCI | Processing up to X unicast DCI scheduling PDSCH per scheduled cell in a set of cells configured for multi-cell PDSCH scheduling by DCI format 1\_3:   * Up to X DCI formats 1\_3 for the set of cells, and * Up to X unicast DL DCI formats 1\_0/1\_1/1\_2 (if supported) for each of the cells in the set of cells * For each cell in the set of cells, no more than X DCIs scheduling PDSCH for the cell * X is based on pair of (scheduling CC SCS, scheduled CC SCS):   + Candidate value(s) of X     - X={2,4} for (15,120), (15,60), (30,120) and X={2} for (15,30), (30,60), (60,120 kHz)   + X applies per slot of scheduling CC | 49-1b | Yes |  |  | Per BC | N/A | N/A | N/A |  | Optional with capability signaling |
| 49. NR\_MC\_enh | 49-3y | Advanced UE capability for larger number of unicast UL DCI | Processing up to X unicast DCI scheduling PUSCH per scheduled cell in a set of cells configured for multi-cell PUSCH scheduling by DCI format 0\_3   * Up to X DCI formats 0\_3 for the set of cells, and * Up to X unicast UL DCI formats 0\_0/0\_1/0\_2 (if supported) for each of the cells in the set of cells * For a cell in the set of cells, no more than X DCIs scheduling PUSCH for the cell * X is based on pair of (scheduling CC SCS, scheduled CC SCS):   + Candidate value(s) of X     - X={2,4} for (15,120), (15,60), (30,120) and X={2} for (15,30), (30,60), (60,120 kHz)   + X applies per slot of scheduling CC | 49-2b | Yes |  |  | Per BC | N/A | N/A | N/A |  | Optional with capability signaling |
| 49. NR\_MC\_enh | 49-4a | Nominal RBG size of Configuration 3 for FDRA type 0 for DCI format 1\_3 | 1) Support of nominal RBG size of Configuration 3 for FDRA type 0 for DCI format 1\_3 | At least one of {49-1, 49-1b} | Yes |  |  | Per UE | No | No | No |  | Optional with capability signaling |
| 49. NR\_MC\_enh | 49-4b | Nominal RBG size of Configuration 3 for FDRA type 0 for DCI format 0\_3 | 1) Support of nominal RBG size of Configuration 3 for FDRA type 0 for DCI format 0\_3 | At least one of {49-2, 49-2b} | Yes |  |  | Per UE | No | No | No |  | Optional with capability signaling |
| 49. NR\_MC\_enh | 49-4c | Configurable Type-1A fields for DCI format 0\_3/1\_3 | 1) Support Type-1A for ‘Antenna port(s)’ field for DCI format 1\_3  2) Support Type-1A for ‘Antenna port(s)’, ‘Precoding information and number of layers’ and ‘SRS resource indicator’ fields for DCI format 0\_3 | At least one of {49-1, 49-1b, 49-2, 49-2b} | Yes |  |  | Per UE | No | No | No |  | Optional with capability signaling |
| 49. NR\_MC\_enh | 49-4d | FDRA Type 1 granularity of 2, 4, 8, or 16 consecutive RBs based RIV for DCI format 1\_3/0\_3 | 1) Support of FDRA Type 1 granularity of 2, 4, 8, or 16 consecutive RBs based RIV for DCI format 0\_3  2) Support of FDRA Type 1 granularity of 2, 4, 8, or 16 consecutive RBs based RIV for DCI format 1\_3 | At least one of {49-1, 49-1b, 49-2, 49-2b} | Yes |  |  | Per UE | No | No | No |  | Optional with capability signaling |
| 49. NR\_MC\_enh | 49-5a | Trigger Type 3 HARQ CB based feedback using DCI format 1\_3 | 1. Support feedback of type 3 HARQ-ACK codebook, triggered by a DCI 1\_3 scheduling at least a PDSCH  2. Support feedback of type 3 HARQ-ACK codebook, triggered by a DCI 1\_3 without scheduling a PDSCH using a reserved FDRA value | At least one of {49-1, 49-1b} | Yes |  | UE does not support HARQ feedback based on Type 3 HARQ codebook triggered by DCI format 1\_3 | Per BC | N/A | N/A | N/A | Upon triggering, UE reports A/N for all HARQ processes and all CCs in a PUCCH group. | Optional with capability signaling |
| 49. NR\_MC\_enh | 49-5b | Trigger enhanced Type 3 HARQ CB based feedback using DCI format 1\_3 | 1. Support feedback of enhanced type 3 HARQ-ACK codebook, triggered by a DCI 1\_3  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\_3  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 49-6)  5. Supported maximum number of actual PUCCH transmissions for type 3 or enhanced type 3 HARQ-ACK codebook feedback within a slot | At least one of {49-1, 49-1b} | Yes |  | UE does not support HARQ feedback based on enhanced Type 3 HARQ codebook triggered by DCI format 1\_3 | Per BC | 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}.  For component 2 and 5, same values as for FG25-6 are reported (if the UE also report FG25-6) | Optional with capability signaling |
| 49. NR\_MC\_enh | 49-6 | Two HARQ-ACK codebooks with up to one sub-slot based HARQ-ACK codebook simultaneously constructed for supporting HARQ-ACK codebooks with different priorities by DCI format 1\_3 | 1. Supports two HARQ-ACK codebooks with different priorities to be simultaneously constructed with the restriction up to one sub-slot based HARQ-ACK codebook.  2. Supports separate PUCCH configuration for different HARQ-ACK codebooks.  3. Supports 2-level priority of HARQ-ACK for dynamically scheduled PDSCH and SPS PDSCH.  4. Supports a DCI format 1\_3 scheduling PDSCH with different HARQ-ACK priorities when only DCI format 0\_3/1\_3 is configured per BWP.  5. Supports separate configuration of parameters PDSCH-HARQ-ACK-Codebook, UCI-OnPUSCH and 'codeBlockGroupTransmission" for different HARQ-ACK codebooks.  6. Supported maximum number of actual PUCCH transmissions for HARQ-ACK within a slot   * Candidate values for the component 6 of this FG is: For NCP, {4, 5, 6, 7} for 2-symbol\*7 sub-slot configuration; For ECP, the candidate value is {4,5,6} for 2-symbol\*6 sub-slot configuration   7. Support intra-UE multiplexing/prioritization of UL overlapping channels/signals with two priority levels for HARQ-ACK | At least one of {49-1, 49-1b} | Yes |  |  | Per FS | N/A | N/A | N/A | If a UE reports both 11-3 and this FG, it can support two slot-based HARQ-ACK codebooks, and one slot-based and one-sub-slot-based HARQ-ACK codebooks. If a UE reports this FG but not 11-3, it can only support two slot-based HARQ-ACK codebooks.  The number of PUCCHs for CSI reporting per slot is not impacted compared with Rel-15 by introducing the new HARQ-ACK CBs  Component 6 is applied to the sub-slot HARQ-ACK codebook. It is assumed that only 1 actual PUCCH transmission for HARQ-ACK within a slot for slot-based HARQ-ACK codebook.   * Component 6 is reported for 2-symbol\*7 sub-slot configuration. For 7-symbol\*2 sub-slot configuration, the value of component 6 is {2} for both NCP and ECP cases.   For component 6, maximum of 1 actual PUCCH transmission for HARQ-ACK within a slot for slot-based HARQ-ACK codebook. Thus value reported for component 6 has no meaning for "slot-based + slot based".  For component 6, same values as for FG11-4 are reported (if the UE also report FG11-4) | Optional with capability signaling |
| 49. NR\_MC\_enh | 49-6a | Two HARQ-ACK codebooks with two sub-slot based HARQ-ACK codebook simultaneously constructed for supporting HARQ-ACK codebooks with different priorities by DCI format 1\_3 | 1. Supports two subslot based HARQ-ACK codebooks with different priorities to be simultaneously constructed.  2. Supports separate PUCCH configuration for different HARQ-ACK codebooks.  3. Supports 2-level priority of HARQ-ACK for dynamically scheduled PDSCH and SPS PDSCH.  4. Supports a DCI format 1\_3 scheduling PDSCH with different HARQ-ACK priorities when only DCI format 0\_3/1\_3 is configured in USS per BWP.  5. Supports separate configuration of parameters PDSCH-HARQ-ACK-Codebook, UCI-OnPUSCH and "codeBlockGroupTransmission" for different HARQ-ACK codebooks.  6. Supported maximum number of actual PUCCH transmissions for HARQ-ACK within a slot.   * Candidate values for the component 6 of this FG is: For NCP, {4, 5, 6, 7} for 2-symbol\*7 sub-slot configuration; For ECP, the candidate value is {4,5,6} for 2-symbol\*6 sub-slot configuration. | 11-3, 49-6 | Yes |  |  | Per FS | N/A | N/A | N/A | The number of PUCCHs for CSI reporting per slot is not impacted compared with Rel-15 by introducing the new HARQ-ACK CBs  Component 6 is applied to the two sub-slot HARQ-ACK codebooks, respectively.  Component 6 is reported for 2-symbol\*7 sub-slot configuration. For 7-symbol\*2 sub-slot configuration, the value of component 6 is {2} for both NCP and ECP cases.  For component 6, same values as for FG11-4a are reported (if the UE also report FG11-4a) | Optional with capability signaling |
| 49. NR\_MC\_enh | 49-6b | DL priority indication in DCI with mixed DCI formats including DCI format 1\_3 | Support of priority indicator field configured in DCI formats 1\_3 and (1\_1 or 1\_2) in a BWP when configured to monitor both DCI formats 1\_3 and (1\_1 or 1\_2) in the BWP | 49-6 |  |  |  | Per UE | No | No | N/A |  | Optional with capability signaling |
| 49. NR\_MC\_enh | 49-7 | UL intra-UE multiplexing/prioritization of overlapping channel/signals with two priority levels in physical layer for DCI format 1\_3/0\_3 | Support intra-UE multiplexing/prioritization of overlapping PUCCH/PUCCH and PUCCH/PUSCH with two priority levels in physical layer (PHY) for DCI format 1\_3/0\_3  1) Configuration of PHY priority level for CG PUSCH and SR, and dynamic indication of priority level for dynamic PUSCH with a single DCI format 0\_3  2) Multiplexing/prioritization between UL channels/signals with the same PHY priority level  3) Prioritization between UL channels/signals with different PHY priority levels  4) Additional number of symbols (d1) needed beyond the PUSCH preparation time for cancelling a low priority UL transmission.  5) Additional number of symbols (d2) of the preparation time needed for the high priority UL transmission that cancels a low priority UL transmission | At least one of {49-1, 49-1b, 49-2, 49-2b} |  |  |  | Per FS | N/A | N/A | N/A | Candidate value set for component 4: {0, 1, 2}  Candidate value set for component 5: {0, 1, 2}  For component 4 and 5, same values as for FG12-1 are reported (if the UE also report FG12-1) | Optional with capability signaling |
| 49. NR\_MC\_enh | 49-7a | UL priority indication in DCI with mixed DCI formats including DCI format 0\_3 | Support of priority indicator field configured in DCI formats 0\_3 and (0\_1 or 0\_2) in a BWP when configured to monitor both DCI formats 0\_3 and (0\_1 or 0\_2) in the BWP | 49-7 |  |  |  | Per UE | No | No | N/A |  | Optional with capability signaling |
| 49. NR\_MC\_enh | 49-8 | Triggered HARQ-ACK codebook re-transmission for DCI format 1\_3 | 1. Support HARQ-ACK re-transmission from an earlier PUCCH slot based on the triggering information in DCI format 1\_3  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 49-6)  3. Supported minimum value M for the HARQ re-tx offset  4. Supported maximum value N for the HARQ re-tx offset | at least one of {49-1, 49-1b} |  |  |  | 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 this FG is valid for HARQ CBs consisted of HARQ Processes with a single HARQ bit per HARQ Process ID  For component 3 and 4, same values as for FG25-7 are reported (if the UE also report FG25-7) | Optional with capability signaling |
| 49. NR\_MC\_enh | 49-9 | SCell dormancy indication within active time in DCI format 0\_3/1\_3 | Support for SCell dormancy indication sent within the active time on PCell with DCI format 0\_3/1\_3 | 6-5, at least one of {49-1, 49-1b, 49-2,49-2b} |  |  |  | Per BC | N/A | N/A | N/A | One dormant BWP and one non-dormant BWP is supported per carrier  More than one non-dormant BWP per carrier is supported only if UE feature 6-3/6-4 is also supported  One dormant BWP and one non-dormant BWP are UE specific BWPs even for UEs not supporting 6-2 or 6-3 | Optional with capability signaling |
| 49. NR\_MC\_enh | 49-10 | Dynamic indication of applicable minimum scheduling restriction by DCI format 0\_3/1\_3 | 1) Dynamic indication of applicable minimum scheduling restriction by DCI format 0\_3 and 1\_3  2) minimumSchedulingOffset K0 configuration for PDSCH and aperiodic CSI-RS triggering offset  3) minimumSchedulingOffset K2 configuration for PUSCH  4) Support of extended value range for aperiodic CSI-RS triggering offset | At least one of {49-1, 49-1b, 49-2,49-2b} |  |  |  | Per UE | No | No | N/A |  | Optional with capability signaling |
| 49. NR\_MC\_enh | 49-11 | PHY priority indication for one-shot HARQ-ACK feedback triggered by DCI format 1\_3 | Support transmission of type 3 HARQ-ACK codebook using the first or second PUCCH configuration based on PHY priority indication in the triggering DCI format 1\_3 | 49-5a and 49-6 |  |  |  | Per UE | No | No | N/A |  | Optional with capability signaling |
| 49. NR\_MC\_enh | 49-12 | Unified TCI with joint DL/UL TCI update by DCI format 1\_3 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  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, At least one of {49-1, 49-1b} |  |  |  | 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  Note: For component 2 and 3, same values as for FG23-1-1b are reported (if the UE also report FG23-1-1b) | Optional with capability signaling |
| 49. NR\_MC\_enh | 49-12a | Unified TCI with separate DL/UL TCI update by DCI format 1\_3 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  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, At least one of {49-1, 49-1b} |  |  |  | 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  [Candidate values] | Optional with capability signaling |
| 49. NR\_MC\_enh | 49-X | Supported switching option for each band pair in the band combination for UL Tx switching across more than 2 bands | Indicate supported switching option for each band pair in the band combination for UL Tx switching across more than 2 bands  Candidate value set is {switchedUL, dualUL, both} |  | Yes |  | UL Tx switching across more than 2 bands cannot be supported for the band pair in the band combination | Per band pair per band combination, details up to RAN2 | N/A | N/A | N/A | This FG is based on the following agreements. RAN1 will not discuss the detail of this FG and the detail is up to RAN2  Agreement  Ask RAN2 to consider following alternatives for UE capability reporting about the supported UL Tx switching options   * Alt.1: report {switchedUL, dualUL, both} for each band pair in the band combination   Agreement in RAN2#121  For UE capability of switching options, introduce a per-band-pair UE capability to report supported switching options for Rel-18 UL Tx switching. | Optional with capability signaling |
| 49. NR\_MC\_enh | 49-Y | Minimum separation time for two uplink switching on more than 2 bands within any two consecutive reference slots | If two uplink switchings are triggered and UL transmissions involved in the two uplink switchings are on more than 2 bands within any two consecutive reference slots, then the time duration between the start of all transmission(s) after the first uplink switching and the start of all transmission(s) after the second uplink switching within the two reference slots is expected to be not less than a minimum separation time   * The minimum separation time is a maximum of X us and the switching gap required for the second uplink switching, and X us is reported with a candidate value set of {0us, 500us} * The reported value X is applied to both one TAG case and two-TAG case (if UE supports two-TAG case)   Note: If the UE reports 0us, the minimum separation time is not applied | 49-X | Yes |  |  | Per BC | N/A | N/A | N/A |  | Optional with capability signaling |

1. NR\_XR\_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 |
| 50. NR\_XR\_Enh | 50-1 | Multi-PUSCHs for Configured Grant | 1. Determination of time-domain resource allocation for CG-PUSCHs associated to a multi-PUSCHs CG  2. Maximum supported number of consecutive slots configured for CG-PUSCH TOs in one CG period, candidate value set: {16, 32} | One or both of {5-19, 5-20} | Yes | N/A | UE is not able to support Multi-PUSCHs per one period in Configured grant in licensed band | Per band | N/A | N/A | N/A |  | Optional with capability signaling |
| 50. NR\_XR\_Enh | 50-1a | Multiple active multi-PUSCHs configured grant configurations for a BWP of a serving cell | 1. Supported maximum number of configured/active configured grant configurations in a BWP of a serving cell  Candidate values for component 1: {1, 2, 4, 8, 12}  2. Supported maximum number of configured/active configured grant configurations across all serving cells, and across MCG and SCG in case of NR-DC  Candidate values for component 2: {2, …, 32} | 50-1 | Yes | N/A |  | Per band | N/A | N/A | N/A | When UE supports both FG 11-9 and 50-1a, the total number which can be configured for CG with single-PUSCH TO in one CG period and CG with multi-PUSCH TO in one CG period should not exceed the value reported by FG 11-9  For all the reported bands in FR1, a same X1 value is reported for component 2. For all the reported bands in FR2, a same X2 value is reported for component 2.  The total number of configured/active configured grant configurations across all serving cells in FR1 is no greater than X1.  The total number of configured/active configured grant configurations across all serving cells in FR2 is no greater than X2.  If there are some serving cell(s) in FR1 and some serving cell(s) in FR2, the total number of configured/active configured grant configurations across all serving cells is no greater than max(X1, X2).  Regarding the interpretation of UE capabilities in case of cross-carrier operation, support of FG50-1a is based on the support of this capability for the band of the scheduled/triggered/indicated cell only  Note: separate release of different multi-PUSCHs configuration grant Type 2 configuration, i.e., one DCI release one multi-PUSCHs configured grant Type 2 configuration is supported with this FG | Optional with capability signaling |
| 50. NR\_XR\_Enh | 50-1b | Joint release in a DCI for two or more configured grant Type 2 configurations, including multi-PUSCH CG configuration(s), for a given BWP of a serving cell | M<=4 bits indication in the Release DCI is used for indicating which CG configuration(s) is/are released, where the association between each state indicated by the indication and the CG configuration(s) is   * Up to 2^M states are higher layer configurable, where each of the state can be mapped to a single or multiple CG configurations to be released * In case of no higher layer configured state(s), separate release is used where the release corresponds to the CG configuration index indicated by the indication | One of {50-1, 50-1a} | Yes | N/A |  | Per band | N/A | N/A | N/A | Regarding the interpretation of UE capabilities in case of cross-carrier operation, support of FG50-1b is based on the support of this capability for the band of the scheduled/triggered/indicated cell only  Note: For the case of joint release in a DCI for two or more configured grant Type 2 configurations, including multi-PUSCH CG configuration(s), for a given BWP of a serving cell, the reporting of this FG applies, i.e., irrespective of FG 11-9a  If UE supports 11-9a but does not support this FG, the UE does not expect to be indicated for joint release including multi-PUSCH CG configuration(s) | Optional with capability signaling |
| 50. NR\_XR\_Enh | 50-1c | Multi-PUSCHs Type 2 configured grant release by DCI format 0\_1 | Support of Multi-PUSCHs type 2 configured grant release by DCI format 0\_1 | 5-20 | Yes | N/A |  | Per UE | No | No | N/A | A UE supporting this feature and 11-1 (DCI format 0\_2/1\_2) shall also support 11-11 (Type 2 configured grant release by DCI format 0\_2). | Optional with capability signaling |
| 50. NR\_XR\_Enh | 50-1d | Multi-PUSCHs Type 2 configured grant release by DCI format 0\_2 | Support of Multi-PUSCHs type 2 configured grant release by DCI format 0\_2 | 5-20, 11-10 | Yes | N/A |  | Per UE | No | No | N/A | A UE supporting this feature shall also support 11-10 (Type 2 configured grant release by DCI format 0\_1). | Optional with capability signaling |
| 50. NR\_XR\_Enh | 50-2 | UCI indication of unused CG-PUSCH transmission occasions | 1. Multiplexing of the Unused transmission occasions UCI (UTO-UCI) on a CG-PUSCH | One or both of {5-19, 5-20} | Yes | N/A | UE is not able to indicate the unused resources in CG | Per band | N/A | N/A | N/A |  | Optional with capability signaling |
| 50. NR\_XR\_Enh | 50-3 | PDCCH monitoring resumption after UL NACK | Support PDCCH monitoring resumption after UL NACK | 29-3a | Yes | N/A |  | Per band | N/A | N/A | N/A |  | Optional with capability signaling |

1. NR\_FR1\_lessthan\_5MHz\_BW

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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 |
| 51. NR\_FR1\_lessthan\_5MHz\_BW | 51-1 | Support for 3 MHz symmetric channel bandwidth in DL and UL | 1) Reception of 12 PRB PBCH based on RB-level puncturing  2) Short RACH preamble formats with 15kHz SCS, and long PRACH formats with 1.25kHz SCS  3) Reception of 15 PRB CORESET0 |  | Yes | N/A | UE is not able to support 3 MHz symmetric channel bandwidth | Per Band | FDD only | FR1 only | N/A | This FG is supported for 15 kHz SCS only  This FG is applicable only when an associated SS/PBCH block is located according to Table 5.4.3.3-2 in TS 38.101-1 in Rel-18  Note: The UE supporting this FG supports configuration of 15 PRB BWP operation in DL and UL  This FG is only applicable to single-carrier operation.  This FG is not applicable to UEs indicating supportOfRedCap-r17 (i.e., FG 28-1) or supportOfERedCap-r18 (i.e., FG 48-1). | Optional with capability signalling |
| 51. NR\_FR1\_lessthan\_5MHz\_BW | 51-1a | Support for 3 MHz channel bandwidth in uplink with larger than 3 MHz channel BW in DL | 1) Short RACH preamble formats with 15kHz SCS, and long PRACH formats with 1.25kHz SCS |  | Yes | N/A | UE is not able to support 3 MHz channel bandwidth in uplink with larger than 3 MHz channel BW in DL. | Per UE | FDD only | FR1 only | N/A | This FG is supported for 15 kHz SCS only  Note: This FG is applicable only when an associated SS/PBCH block is located at n28 according to Table 5.4.3.3-1 in TS 38.101-1 in Rel-18  Note: The UE supporting this FG supports configuration of 15 PRB UL BWP operation  This FG is only applicable to single-carrier operation.  This FG is not applicable to UEs indicating supportOfRedCap-r17 (i.e., FG 28-1) or supportOfERedCap-r18 (i.e., FG 48-1). | Optional with capability signalling |
| 51. NR\_FR1\_lessthan\_5MHz\_BW | 51-2a | Support 12 PRB CORESET0 | 1) Reception of 12 PRB CORESET0 with an associated SS/PBCH block that is located according to Table 5.4.3.1-2 in TS 38.101-1 | 51-1 | Yes | N/A | UE is not able to support 3 MHz channel bandwidth with 12 PRB CORESET0 | Per Band | FDD only | FR1 only | N/A | This FG is supported for 15 kHz SCS only  Note: The UE supporting this FG supports configuration of 12 PRB BWP operation  This FG is only applicable to single-carrier operation.  This FG is not applicable to UEs indicating supportOfRedCap-r17 (i.e., FG 28-1) or supportOfERedCap-r18 (i.e., FG 48-1). | Optional with capability signalling |
| 51. NR\_FR1\_lessthan\_5MHz\_BW | 51-2b | Support 12 PRB CORESET0 with an associated SS/PBCH block located at GSCN 41637 | 1) Reception of 12 PRB CORESET0 with an associated SS/PBCH block located at GSCN 41637 | 51-1 | Yes | N/A | UE is not able to support 3 MHz channel bandwidth with 12 PRB CORESET0 when an associated SS/PBCH block is located in band n100 at frequency GSCN 41637 of Table 5.4.3.1-3 in TS 38.101-1 | Per UE | FDD only | FR1 only | N/A | This FG is supported for 15 kHz SCS only  This FG is only applicable when an associated SS/PBCH block is located in band n100 at GSCN 41637 of Table 5.4.3.1-3 in TS 38.101-1 in Rel-18.  Note: The UE supporting this FG supports configuration of 12 PRB BWP operation  This FG is only applicable to single-carrier operation.  This FG is not applicable to UEs indicating supportOfRedCap-r17 (i.e., FG 28-1) or supportOfERedCap-r18 (i.e., FG 48-1). | Optional with capability signalling |
| 51. NR\_FR1\_lessthan\_5MHz\_BW | 51-3 | Support 5 MHz channel bandwidth with 20 PRB CORESET0 | 1) Short RACH preamble formats with 15kHz SCS, and long PRACH formats with 1.25kHz SCS  2) Reception of 20 PRB CORESET0 |  | Yes | N/A | UE is not able to support 5 MHz channel bandwidth with 20 PRB CORESET0 | Per UE | FDD only | FR1 only | N/A | This FG is supported for 15 kHz SCS only  This FG is only applicable when an associated SS/PBCH block is located in band n100 at GSCN 41638 of Table 5.4.3.1-3 in TS 38.101-1 in Rel-18.  Note: The UE supporting this FG supports configuration of 20 PRB BWP operation  This FG is only applicable to single-carrier operation.  This FG is not applicable to UEs indicating supportOfRedCap-r17 (i.e., FG 28-1) or supportOfERedCap-r18 (i.e., FG 48-1). | Optional with capability signalling |

1. NR\_DSS\_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 |
| 52. NR\_DSS\_enh | 52-1 | Reception of NR PDCCH candidates overlapping with LTE CRS REs | Reception of NR PDCCH candidates that overlap with LTE CRS REs within a NR carrier using 15 kHz SCS  1) Reception of NR PDCCH candidates in REs that overlap with LTE CRS when UE is provided with LTE CRS RM pattern by configuration of one CRS rate matching pattern via lte-CRS-ToMatchAround  2) Reception of a NR PDCCH candidate in REs that overlap with LTE CRS: candidate value set {a) when at least one symbol of the NR PDCCH candidate and the DMRS for demodulation of the NR PDCCH candidate is not overlapped with LTE CRS, b) when some or all of symbols of NR PDCCH candidate overlap with LTE CRS}  3) Reception of NR PDCCH candidates that overlap with LTE CRS REs on the X-th symbols of an NR slot. Candidate values for X: {only 2nd symbol, 1st and 2nd symbols}  4) NR PDCCH that overlaps with LTE CRS REs is in Type-1 CSS with dedicated RRC configuration, Type-3 CSS, and/or USS that are monitored within the first 3 OFDM symbols of a slot | 5-28 | Yes | N/A | UE is not required to support reception of NR PDCCH candidates overlapping with LTE CRS REs when it is provided with LTE CRS RM pattern by higher layers | Per Band | N/A | FR1 only | N/A | For component 2, RAN1 considers support value b) in component 2 only if RAN4 performance requirements for value b) are not defined  Note: it is RAN1 understanding that the feature is supported by UE performing channel estimation with a regular Rel-15 DMRS pattern in frequency dimension, i.e., no change to UE assumption on PDCCH DMRS RE positions/pattern in a symbol that are used for the purpose of channel estimation. | Optional with capability signaling |
| 52. NR\_DSS\_enh | 52-1a | Reception of NR PDCCH candidates overlapping with LTE CRS REs with multiple non-overlapping CRS rate matching patterns | 1) Reception of NR PDCCH candidates in REs that overlap with LTE CRS when UE is provided with LTE CRS RM patterns by configuration of one or multiple non-overlapping CRS rate matching patterns via lte-CRS-PatternList1-r16 if the UE supports FG 14-1 or lte-CRS-PatternList3-r18 if the UE supports FG 52-2 | 52-1, at least one of {14-1, 52-2} | Yes | N/A |  | Per Band | N/A | FR1 only | N/A | Note: it is RAN1 understanding that the feature is supported by UE performing channel estimation with a regular Rel-15 DMRS pattern in frequency dimension, i.e., no change to UE assumption on PDCCH DMRS RE positions/pattern in a symbol that are used for the purpose of channel estimation. | Optional with capability signaling |
| 52. NR\_DSS\_enh | 52-1b | NR PDCCH reception that overlaps with LTE CRS within a single span of 3 consecutive OFDM symbols that is within the first 4 OFDM symbols in a slot | 1) NR PDCCH that overlaps with LTE CRS REs is in Type-1 CSS with dedicated RRC configuration, Type-3 CSS, and/or USS that are monitored within a single span of 3 consecutive OFDM symbols that is within the first 4 OFDM symbols in a slot | 52-1, 22-12 | Yes | N/A |  | Per Band | N/A | FR1 only | N/A |  | Optional with capability signaling |
| 52. NR\_DSS\_enh | 52-2 | Two LTE-CRS overlapping rate matching patterns within a part of NR carrier using 15 kHz overlapping with a LTE carrier (regardless of support or configuration of multi-TRP) | 1) Support of two LTE-CRS overlapping rate matching patterns configured by lte-CRS-PatternList3-r18 and lte-CRS-PatternList4-r18 within a part of NR carrier using 15 kHz overlapping with a LTE carrier (regardless of support or configuration of multi-TRP) for the case when crs-RateMatchPerCoresetPoolIndex is not configured  2) Maximum number of LTE-CRS rate matching patterns in total within a NR carrier using 15 kHz SCS with candidate value set: {2,3,4,5,6}  3) Maximum number of LTE-CRS non-overlapping rate matching patterns within a NR carrier using 15 kHz SCS with candidate value set: {1,2,3} | 5-28 | Yes | N/A | UE does not support two LTE-CRS overlapping rate matching patterns configured by lte-CRS-PatternList3-r18 and lte-CRS-PatternList4-r18 within a part of NR carrier using 15 kHz overlapping with a LTE carrier | Per Band | N/A | FR1 only | N/A | If a UE supports FG52-2 and FG14-1, FG14-1 is reported for list1/2 and FG52-2 is reported for list3/4 | Optional with capability singaling |
| 52. NR\_DSS\_enh | 52-2a | Two LTE-CRS overlapping rate matching patterns with two different values of coresetPoolIndex within a part of NR carrier using 15 kHz overlapping with a LTE carrier | Support of two LTE-CRS overlapping rate matching patterns configured by lte-CRS-PatternList3-r18 and lte-CRS-PatternList4-r18 with two different values of coresetPoolIndex within a part of NR carrier using 15 kHz overlapping with a LTE carrier for the case when crs-RateMatchPerCoresetPoolIndex is configured | 52-2, 16-2a | Yes | N/A |  | Per Band | N/A | FR1 only | N/A |  | Optional with capability singaling |

1. NR\_BWP\_wor

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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 |
| 53. NR\_BWP\_wor | 53-1 | Support RLM/BM/BFD and gapless L3 intra-frequency measurements based on CD-SSB outside active BWP without interruptions | 1. UE performs RLM/BM/BFD measurements based on CD-SSB without interruptions, where the CD-SSB is outside active DL BWP but is within the bandwidth of the corresponding carrier(s) to be measured.  2. Bandwidth of UE-specific RRC configured BWP may not include bandwidth of the CORESET#0 (if CORESET#0 is present) and CD-SSB for PCell/PSCell (if configured) and bandwidth of the UE-specific RRC configured BWP may not include CD-SSB for SCell  3. CD-SSB outside active DL BWP but within the bandwidth of the corresponding carrier(s) to be measured can be used as the QCL source for other reference signal.  4. UE performs L3 intra-frequency measurements without gaps based on CD-SSB, where the CD-SSB is outside the active DL BWP but is within the bandwidth of the corresponding carrier(s) to be measured. |  | Yes | n/a | UE cannot support RLM/BM/BFD and gapless L3 intra-frequency measurements based on CD-SSB outside active BWP without interruptions | Per FS | No | No | n/a | Note: The CD-SSB is still within the bandwidth of the carrier configured by SCS-SpecificCarrier of downlinkChannelBW-PerSCS-List in ServingCellConfig  Note: If a UE is configured with more than one UE-specific DL BWP configurations, the CD-SSB is within the bandwidth of at least one of the UE-specific DL BWP configurations.  Note: If a UE additionally indicates support of *NeedForGap* or *NeedForGapNCSG* and/or *NeedForInterruption*, the UE shall report no gap and no interruption/no NCSG for intra-frequency measurement.  This FG is not applicable to RedCap or eRedCap UEs. | Optional with capability signalling |
| 53. NR\_BWP\_wor | 53-3 | Support RLM/BM/BFD measurements based on NCD-SSB within active BWP | 1. UE performs RLM/BM/BFD and gapless L3 intra-frequency measurements based on NCD-SSB, where the NCD-SSB is within the active DL BWP.  2. Bandwidth of UE-specific RRC configured BWP may not include bandwidth of the CORESET#0 (if CORESET#0 is present) and CD-SSB for PCell/PSCell (if configured) and bandwidth of the UE-specific RRC configured BWP may not include CD-SSB for Scell  3. NCD-SSB within the active DL BWP can be used as the QCL source for other reference signal.  4. UE performs L3 intra-frequency measurements without gaps based on NCD-SSB, where the NCD-SSB is within the active DL BWP. |  | Yes | n/a | UE cannot support RLM/BM/BFD and gapless L3 intra-frequency measurements based on NCD-SSB within active BWP | Per band | No | No | n/a | Note: This FG applies only to PCell and PSCell (if configured)  This FG is not applicable to RedCap or eRedCap UEs. | Optional with capability signalling |
| 53. NR\_BWP\_wor | 53-4 | Support RLM/BM/BFD measurements based on CSI-RS when CD-SSB is outside active BWP | 1. UE performs RLM/BM/BFD measurements based on CSI-RS, when CD-SSB is outside active DL BWP.  2. Bandwidth of UE-specific RRC configured BWP may not include bandwidth of the CORESET#0 (if CORESET#0 is present) and CD-SSB for PCell/PSCell (if configured) and bandwidth of the UE-specific RRC configured BWP may not include CD-SSB for SCell  3. CSI-RS within active DL BWP for RLM/BM/BFD measurements can be QCLed with CD-SSB outside active DL BWP but within the bandwidth of the corresponding carrier(s) | 1-7, 2-24, 2-31 | Yes | n/a | UE cannot support RLM/BM/BFD measurements based on CSI-RS when CD-SSB is outside active BWP | Per band | No | No | n/a | Note: The CD-SSB is still within the bandwidth of the carrier configured by SCS-SpecificCarrier of downlinkChannelBW-PerSCS-List in ServingCellConfig  This FG is not applicable to RedCap or eRedCap UEs.  UEs indicating the support of this feature group shall not indicate the support of FG 6-1a. | Optional with capability signalling |

1. NR\_cov\_enh2

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| Features | Index | Feature group | Components | Prerequisite feature groups | Need for the gNB to know if the feature is supported | Applicable to the capability signalling exchange between UEs (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 |
| 54. NR\_cov\_enh2 | 54-1 | PRACH coverage enhancements | Support of multiple PRACH transmissions with the same Tx spatial filter.  Support {2, 4, 8} for the number of multiple PRACH transmissions with same Tx spatial filter. |  | Yes |  | UE doesn’t support multiple PRACH transmissions with the same Tx spatial filter. | Per band | N/A | N/A | N/A |  | Optional with capability signalling. |
| 54. NR\_cov\_enh2 | 54-1a | PRACH repetitions with less than N symbols gap | Support of transmitting two PRACH repetitions when a gap between the last symbol of a PRACH repetition in the first slot and the first symbol of a PRACH repetition in the second slot is less than N symbols, where N=2 for μ=0 or μ=1, N=4 for μ=2 or μ=3, N=16 for μ=5, N=32 for μ=6, and μ is the SCS configuration for the UL BWP with the PRACH | 54-1 | Yes |  | UE doesn’t support PRACH repetitions with less than N symbols gap | Per band | N/A | N/A | N/A |  | Optional with capability signalling. |
| 54. NR\_cov\_enh2 | 54-3 | Dynamic waveform switching | Support of dynamic waveform switching for DCI format 0\_1/0\_2 when configured with only 1 UL carrier in the band. |  | Yes |  | Dynamic waveform switching is not supported | Per band | N/A | N/A | N/A | If UE supporting this FG supports FG 11-1, the UE supports FG 54-3 with DCI format 0\_2 | Optional with capability signaling. |
| 54. NR\_cov\_enh2 | 54-3a | PHR enhancement for dynamic waveform switching | Reporting of power headroom information for an assumed PUSCH using target waveform different from waveform of actual PUSCH | 54-3 | Yes | N/A | UE does not report *PCMAX,f,c* for the assumed PUSCH for the band | Per band | N/A | N/A | N/A | Note: A UE can be configured to use either the single entry PHR with assumed PUSCH MAC CE or the multiple entry PHR with assumed PUSCH MAC CE for a cell group if the UE indicates support for FG54-3a in any one cell of the cell group | Optional with capability signaling. |
| 54. NR\_cov\_enh2 | 54-3b | Dynamic waveform switching for intra-band UL CA | Support of dynamic waveform switching for DCI format 0\_1/0\_2 for intra-band UL CA with up to X CCs in the band. | 54-3 | Yes |  | Dynamic waveform switching for intra-band UL CA is not supported for the band | Per band | N/A | N/A | N/A | Candidate value for X are {2,3,4,5,6,7,8} | Optional with capability signaling. |

1. TEI18

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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 |
| 55. TEI18 | 55-1 | *additionalSR-Periodicities-r18* | Indicates whether the UE supports the following SR periodicities in the *periodicityAndOffset* parameter as specified in TS 38.331:  -5sl for 30 kHz SCS  -5sl and 10sl for 120 kHz SCS  Candidate values {30 kHz SCS, 120 kHz SCS, both} |  | Yes | N/A | If the network implements the TS 38.331 CR on new SR periodicities and the UE does not according to the capability indication, the network will not assign the new SR periodicities. | Per UE | No | No | N/A |  | Optional with capability signaling |
| 55. TEI18 | 55-2a | 1-symbol PRS for MG-based measurement in RRC\_CONNECTED state | 1. Support of 1-symbol PRS with comb sizes from {2, 4, 6, 12}  2. Max number of single-symbol DL PRS resources it can process in a slot inside a MG in RRC\_CONNECTED state  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 | 13-1 | No | n/a | 1-symbol PRS is not supported for MG-based measurement in RRC\_CONNECTED state | per band | n/a | n/a | n/a | Need for location server to know if the feature is supported | Optional with capability signaling |
| 55. TEI18 | 55-2b | 1-symbol PRS for outside MG in RRC\_CONNECTED state | 1. Support of 1-symbol PRS with comb sizes from {2, 4, 6, 12}  2. Max number of single-symbol DL PRS resources it can process in a slot outside a MG in RRC\_CONNECTED state  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 | 27-3-3 | No | n/a | 1-symbol PRS is not supported for outside MG in RRC\_CONNECTED state | per band | n/a | n/a | n/a | Need for location server to know if the feature is supported | Optional with capability signaling |
| 55. TEI18 | 55-2c | 1-symbol PRS in RRC\_INACTIVE state | 1. Support of 1-symbol PRS with comb sizes from {2, 4, 6, 12}  2. Max number of single-symbol DL PRS resources it can process in a slot in RRC\_INACTIVE state  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 | 27-6 | No | n/a | 1-symbol PRS is not supported in RRC\_INACTIVE state | per band | n/a | n/a | n/a | Need for location server to know if the feature is supported | Optional with capability signaling |
| 55. TEI18 | 55-2d | 1-symbol PRS for PDC | 1. Support of 1-symbol PRS with comb sizes from {2, 4, 6, 12}  2. Max number of single-symbol DL PRS resources it can process in a slot for PDC  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 | 25-19a | Yes | n/a | 1-symbol PRS is not supported for PDC | per band | n/a | n/a | n/a |  | Optional with capability signaling |
| 55. TEI18 | 55-3 | Multiple PUSCHs scheduling by single DCI for non-consecutive slots in FR1 | 1. Multi-PUSCH scheduling by single DCI format 0\_1 for the operation with non-contiguous allocation | 10-17 | Yes | N/A | For operation on FR1, scheduling multiple PUSCHs by a DCI format 0\_1 in non-contiguous slots is not supported. | Per Band | N/A | N/A | N/A |  | Optional with capability signalling |
| 55. TEI18 | 55-4a | Multiplexing Type-1 HARQ-ACK codebook in a PUSCH for PDSCH scheduled after UL grant | 1. UE multiplexes Type-1 HARQ-ACK codebook on a repetition of a PUSCH transmission other than a first repetition, where ACK/NACK is generated for the HARQ-ACK codebook including HARQ-ACK information associated with PDSCH reception(s) scheduled after the UL grant scheduling the PUSCH transmission. | 4-11, one of {5-17, 11-5} | Yes | N/A | UE does not support to multiplex Type-1 HARQ-ACK codebook in a PUSCH repetition when the Type-1 codebook includes HARQ-ACK information for a PDSCH scheduled after the UL grant scheduling the PUSCH. | Per Band and Per BC | N/A | N/A | N/A | UE does not expect to determine a different codebook size in a PUCCH slot from the codebook size determined based on HARQ-ACK information associated with PDSCH reception(s) scheduled before a UL grant that schedules a PUSCH in a slot overlapping with the PUCCH slot unless the UE reports support of FG 55-4e.  UE does not expect to determine a different PUCCH time domain resource in a slot from the PUCCH time domain resource determined based on HARQ-ACK information associated with PDSCH reception(s) scheduled before a UL grant that schedules a PUSCH in that slot unless the UE reports support of FG 55-4d. | Optional with capability signaling |
| 55. TEI18 | 55-4b | Multiplexing Type-2 HARQ-ACK codebook in a PUSCH for PDSCH scheduled after UL grant | 1. UE multiplexes Type-2 HARQ-ACK codebook on a repetition of a PUSCH transmission other than a first repetition, where the HARQ-ACK codebook includes HARQ-ACK information associated with PDSCH reception(s) scheduled after the UL grant scheduling the PUSCH transmission. | 4-10, one of {5-17, 11-5} | Yes | N/A | UE does not support to multiplex Type-2 HARQ-ACK codebook in a PUSCH repetition when the Type-2 codebook includes HARQ-ACK information for a PDSCH scheduled after the UL grant scheduling the PUSCH. | Per Band and Per BC | N/A | N/A | N/A | UE does not expect to determine a different codebook size in a PUCCH slot from the codebook size determined based on HARQ-ACK information associated with PDSCH reception(s) scheduled before a UL grant that schedules a PUSCH in a slot overlapping with the PUCCH slot unless the UE reports support of FG 55-4e.  UE does not expect to determine a different PUCCH time domain resource in a slot from the PUCCH time domain resource determined based on HARQ-ACK information associated with PDSCH reception(s) scheduled before a UL grant that schedules a PUSCH in that slot unless the UE reports support of FG 55-4d. | Optional with capability signaling |
| 55. TEI18 | 55-4c | Multiplexing Type-3 HARQ-ACK codebook in a PUSCH for PDSCH scheduled after UL grant | 1. UE multiplexes Type-3 HARQ-ACK codebook on a repetition of a PUSCH transmission other than a first repetition, where the HARQ-ACK codebook includes HARQ-ACK information associated with PDSCH reception(s) scheduled after the UL grant scheduling the PUSCH transmission | 10-16, one of {5-17, 11-5} | Yes | N/A | UE does not support to multiplex Type-3 HARQ-ACK codebook in a PUSCH repetition when the Type-3 codebook includes HARQ-ACK information for a PDSCH scheduled after the UL grant scheduling the PUSCH. | Per Band and Per BC | N/A | N/A | N/A | UE does not expect to determine a different codebook size in a PUCCH slot from the codebook size determined based on HARQ-ACK information associated with PDSCH reception(s) scheduled before a UL grant that schedules a PUSCH in a slot overlapping with the PUCCH slot unless the UE reports support of FG 55-4e.  UE does not expect to determine a different PUCCH time domain resource in a slot from the PUCCH time domain resource determined based on HARQ-ACK information associated with PDSCH reception(s) scheduled before a UL grant that schedules a PUSCH in that slot unless the UE reports support of FG 55-4d. | Optional with capability signaling |
| 55. TEI18 | 55-4d | Determining a different PUCCH resource to transmit HARQ-ACK for PDSCH scheduled after UL grant | 1. Support determining a different PUCCH resource in a slot from the PUCCH resource indicated by the last DCI format before a UL grant in the slot, to include HARQ-ACK information associated with PDSCH reception(s) scheduled after the UL grant scheduling a PUSCH transmission with repetitions and the HARQ-ACK information are multiplexed on a repetition of the PUSCH transmission other than a first repetition in the same slot. | One of {FG 55-4a, 55-4b, 55-4c} | Yes | N/A | UE does not support to determine a different PUCCH time domain resource to transmit HARQ-ACK for PDSCH scheduled after UL grant. | Per Band and Per BC | N/A | N/A | N/A |  | Optional with capability signaling |
| 55. TEI18 | 55-4e | Determining different codebook size to transmit HARQ-ACK for PDSCH scheduled after UL grant | 1. Support determining different codebook size in a PUCCH slot from the size determined based on HARQ-ACK information associated with PDSCH reception(s) scheduled before a UL grant, to include HARQ-ACK information associated with PDSCH reception(s) scheduled after the UL grant scheduling a PUSCH transmission with repetitions and the HARQ-ACK information are multiplexed on a repetition of the PUSCH transmission other than a first repetition in the same slot. | One of {FG 55-4a, 55-4b, 55-4c} | Yes | N/A | UE does not support to determine different codebook size to transmit HARQ-ACK for PDSCH scheduled after UL grant. | Per Band and Per BC | N/A | N/A | N/A |  | Optional with capability signaling |
| 55. TEI18 | 55-5 | Enable MAC CE based pathloss RS updates for Type 1 CG-PUSCH | Support configuration of *enablePL-RS-UpdateForType1CG-PUSCH-SRS-r18* | 5-19, 16-1e | Yes | N/A | MAC CE based pathloss RS updates for Type 1 CG-PUSCH is not supported | Per UE | No | No |  |  | Optional with capability signalling |
| 55. TEI18 | 55-6 | (2, 2) span-based PDCCH monitoring with additional restriction(s) | Support of (2, 2) span-based PDCCH monitoring as per FG11-2 with the following additional restriction(s)  There is at least one OFDM symbol gap between two PDCCH monitoring occasions |  | Yes | N/A |  | Per FS | N/A | N/A |  | This capability is signalled for SCS 15 kHz and 30 kHz  This capability is reported for processing capability #1 and for processing capability #2 respectively  When a UE reports both FG11-2 and this FG, the union of supported span patterns in FG 11-2 and this FG establishes the multiple combinations (X,Y) used to determine per-span BD/CCE limit as described in Clause 10 of TS38.213 | Optional with capability signalling |
| 55. TEI18 | 55-6a | Capability on the number of CCs for monitoring a maximum number of BDs and non-overlapped CCEs per span when configured with DL CA with Rel-16 PDCCH monitoring capability on all the serving cells | 1.Capability on the number of CCs for monitoring a maximum number of BDs and non-overlapped CCEs per span when configured with DL CA with Rel-16 PDCCH monitoring capability on all the serving cells  - Candidate value for the component: {2, 3, …, 16)  2.Supported span arrangement for CA  -Candidate value for the component: {aligned spans only, aligned spans and non-aligned spans} | FG11-2 for (7, 3) or (4, 3) span based PDCCH monitoring;  FG55-6 for (2, 2) span based PDCCH monitoring with additional restriction(s) | Yes | N/A |  | Per BC | N/A | N/A |  | When a UE reports both FG 11-2a and this FG, the value reported in this FG is used if the configured span pattern of any serving cell satisfies FG 55-6 | Optional with capability signalling |
| 55. TEI18 | 55-6b | Mix of Rel-16 PDCCH monitoring capability and Rel. 15 PDCCH monitoring capability on different carriers | Support Rel-15 monitoring capability and Rel-16 PDCCH monitoring capability on different serving cells | FG11-2 for (7, 3) or (4, 3) span based PDCCH monitoring;  FG55-6 for (2, 2) span based PDCCH monitoring with additional restriction(s) | Yes | N/A |  | Per FS | N/A | N/A |  | When a UE reports both FG 11-2b and this FG, the value reported in this FG is used if the configured span pattern of any serving cell satisfies FG 55-6 | Optional with capability signalling |
| 55. TEI18 | 55-6c | Number of carriers for CCE/BD scaling with DL CA with mix of Rel. 16 and Rel. 15 PDCCH monitoring capabilities on different carriers | 1.Supported combination(s) of (pdcch-BlindDetectionCA-R15, pdcch-BlindDetectionCA-R16)  - Candidate values for pdcch-BlindDetectionCA-R15 is 1 to 15  - Candidate values for pdcch-BlindDetectionCA-R16 is 1 to 15  2. Supported span arrangement for CA  - Candidate value for the component: {aligned spans only, aligned spans and non-aligned spans} | FG11-2b for (7, 3) or (4, 3) span based PDCCH monitoring;  FG55-6b for (2, 2) span based PDCCH monitoring with additional restriction(s) | Yes | N/A |  | Per BC | N/A | N/A |  | When a UE reports both FG 11-2c and this FG, the value reported in this FG is used if the configured span pattern of any serving cell satisfies FG 55-6  The minimum of the summation of capability on the number of CCs with Rel-15 PDCCH monitoring capability and the capability on the number of CCs with Rel-16 PDCCH monitoring capability is 3 | Optional with capability signalling |
| 55. TEI18 | 55-6d | Capability on the number of CCs for monitoring a maximum number of BDs and non-overlapped CCEs per span for MCG and for SCG when configured for NR-DC operation with Rel-16 PDCCH monitoring on all the serving cells | Supported combination of (pdcch-BlindDetectionMCG-UE-r16, pdcch-BlindDetectionSCG-UE-r16) | FG11-2 for (7, 3) or (4, 3) span based PDCCH monitoring;  FG55-6 for (2, 2) span based PDCCH monitoring with additional restriction(s) | Yes | N/A |  | Per BC | N/A | N/A |  | When a UE reports both FG 11-2d and this FG, the value reported in this FG is used if the configured span pattern of any serving cell satisfies FG 55-6   * If the UE reports pdcch-BlindDetectionCA-r16,   + Candidate values for pdcch-BlindDetectionMCG-UE-r16 is 1 to pdcch-BlindDetectionCA-r16-1   + Candidate values for pdcch-BlindDetectionSCG-UE-r16 is 1 to pdcch-BlindDetectionCA-r16-1   + pdcch-BlindDetectionMCG-UE-r16 + pdcch-BlindDetectionSCG-UE-r16 >= pdcch-BlindDetectionCA-r16 * Otherwise, if N\_(NR-DC,max,r16)^(DL,cells) is a maximum total number of downlink cells for which the UE is provided monitoringCapabilityConfig-r16 = r16monitoringcapability and the UE is configured on both the MCG and the SCG for NR-DC as indicated in UE-NR-Capability   + the value of pdcch-BlindDetectionMCG-UE-r16 or of pdcch-BlindDetectionSCG-UE-r16 is 1,   + pdcch-BlindDetectionMCG-UE-r16 + pdcch-BlindDetectionSCG-UE-r16 >= N\_(NR-DC,max,r16)^(DL,cells) * Note: If a UE supports FG 55-6a or FG 55-6f, then the capability defined by FG 55-6a or FG 55-6f is applied to FG 55-6d. | Optional with capability signalling |
| 55. TEI18 | 55-6e | Number of carriers for CCE/BD scaling for MCG and for SCG when configured for NR-DC operation with mix of Rel. 16 and Rel. 15 PDCCH monitoring capabilities on different carriers | Supported combination(s) of (pdcch-BlindDetectionMCG-UE-r15, pdcch-BlindDetectionSCG-UE-r15, pdcch-BlindDetectionMCG-UE-r16, pdcch-BlindDetectionSCG-UE-r16) | FG11-2b for (7, 3) or (4, 3) span based PDCCH monitoring;  FG55-6b for (2, 2) span based PDCCH monitoring with additional restriction(s) | Yes | N/A |  | Per BC | N/A | N/A |  | When a UE reports both FG 11-2e and this FG, the value reported in this FG is used if the configured span pattern of any serving cell satisfies FG 55-6   * ‘One combination of (pdcch-BlindDetectionMCG-UE-r15, pdcch-BlindDetectionSCG-UE-r15, pdcch-BlindDetectionMCG-UE-r16, pdcch-BlindDetectionSCG-UE-r16) corresponds to one combination of (pdcch-BlindDetectionCA-r15, pdcch-BlindDetectionCA-r16)’ * 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, if N\_(NR-DC,max,r15)^(DL,cells) is a maximum total number of downlink cells for which the UE is provided monitoringCapabilityConfig-r16 = r15monitoringcapability   + Candidate values for pdcch-BlindDetectionMCG-UE-r15 is [0, 1, 2]   + Candidate values for pdcch-BlindDetectionSCG-UE-r15 is [0, 1, 2]   + pdcch-BlindDetectionMCG-UE-r15 + pdcch-BlindDetectionSCG-UE-r15 >= N\_(NR-DC,max,r15)^(DL,cells) * 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-r16 + pdcch-BlindDetectionSCG-UE-r16>= pdcch-BlindDetectionCA-r16 * Otherwise, if N\_(NR-DC,max,r16)^(DL,cells) is a maximum total number of downlink cells for which the UE is provided monitoringCapabilityConfig-r16 = r16monitoringcapability   + Candidate values for pdcch-BlindDetectionMCG-UE-r16 is [0, 1]   + Candidate values for pdcch-BlindDetectionSCG-UE-r16 is [0, 1]   + pdcch-BlindDetectionMCG-UE-r16 + pdcch-BlindDetectionSCG-UE-r16 >= N\_(NR-DC,max,r16)^(DL,cells) * Note: If a UE supports FG 55-6c or FG 55-6g, then the capability defined by FG 55-6c or FG 55-6g is applied to FG 55-6e. | Optional with capability signalling |
| 55. TEI18 | 55-6f | Capability on the number of CCs for monitoring a maximum number of BDs and non-overlapped CCEs per span when configured with DL CA with Rel-16 PDCCH monitoring capability on all the serving cells with restriction for non-aligned span case | 1.Capability on the number of CCs for monitoring a maximum number of BDs and non-overlapped CCEs per span when configured with DL CA with Rel-16 PDCCH monitoring capability on all the serving cells  -Candidate value for the component: {2, 3, …, 16}  2.UE supports aligned span and non-aligned span  In case of non-aligned span when the configured number of cells with Rel-16 PDCCH monitoring is larger than the UE reported value, PDCCH monitoring occasion(s) should be configured only on same symbol(s) every slot | FG11-2 for (7, 3) or (4, 3) span based PDCCH monitoring;  FG55-6 for (2, 2) span based PDCCH monitoring with additional restriction(s) | Yes | N/A |  | Per BC | N/A | N/A |  | When a UE reports both FG 11-2f and this FG, the value reported in this FG is used if the configured span pattern of any serving cell satisfies FG 55-6 | Optional with capability signalling |
| 55. TEI18 | 55-6g | Number of carriers for CCE/BD scaling with DL CA with mix of Rel. 16 and Rel. 15 PDCCH monitoring capabilities on different carriers with restriction for non-aligned span case | 1.Supported combination(s) of (pdcch-BlindDetectionCA-R15, pdcch-BlindDetectionCA-R16)  -Candidate values for pdcch-BlindDetectionCA-R15 is 1 to 15  -Candidate values for pdcch-BlindDetectionCA-R16 is 1 to 15  2.UE supports aligned span and non-aligned span  In case of non-aligned span when the configured number of cells with Rel-16 PDCCH monitoring is larger than the UE reported value, PDCCH monitoring occasion(s) should be configured only on same symbol(s) every slot | FG11-2b for (7, 3) or (4, 4) span based PDCCH monitoring;  FG55-6b for (2, 2) span based PDCCH monitoring with additional restriction(s) | Yes | N/A |  | Per BC | N/A | N/A |  | When a UE reports both FG 11-2g and this FG, the value reported in this FG is used if the configured span pattern of any serving cell satisfies FG 55-6  The minimum of the summation of capability on the number of CCs with Rel-15 PDCCH monitoring capability and the capability on the number of CCs with Rel-16 PDCCH monitoring capability is 3 | Optional with capability signalling |
| 55. TEI18 | 55-6h | 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 in a band | FG23-2-1, and;  FG11-2 for (7, 3) or (4, 4) span based PDCCH monitoring;  FG55-6 for (2, 2) span based PDCCH monitoring with additional restriction(s) | Yes | N/A |  | Per FS | N/A | N/A |  | Component 3: {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 w.r.t. 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   When a UE reports both FG 23-2-1e and this FG, the value reported in this FG is used if the configured span pattern of any serving cell satisfies FG 55-6  This capability is signalled for SCS 15 kHz and 30 kHz. | Optional with capability signalling |
| 55. TEI18 | 55-7 | Two QCL TypeD for CORESET monitoring in multi-DCI based multi-TRP | Support of determining two QCL-TypeD for time-domain overlapping CORESETs in the same CC or for intra-band CA associated with coresetPoolIndex value 0 and 1 | 16-2a | Yes | N/A |  | Per FSPC | N/A | FR2 only | N/A |  | Optional with capability signalling |

1. NR\_ATG

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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 |
| 56. NR\_ATG | 56-1 | Uplink Time and Frequency pre-compensation and timing relationship enhancements | Support of UE specific TA calculation based on its GNSS-acquired position and the indicated BS location.  Support of open (i.e. UE autonomous TA estimation) and closed (i.e., received TA commands) loop control for TA update in RRC\_CONNECTED state.  Support of pre-compensation of the calculated TA in the uplink transmissions.  Support of frequency pre-compensation to account for the Doppler experienced on the service link.  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.  Support of UE receiving cell-specific K\_offset in system information. |  | Yes | N/A | If UE does not support this feature, the performance of ATG UE cannot be guaranteed due to the large propagation delay. | Per UE | No | FR1 only | N/A | Note: This UE feature group is applicable only for bands defined in Section 5.2J in TS 38.101-1 | Mandatory with capability signaling for UE supports NR communication via ATG |
| 56. NR\_ATG | 56-2 | UE reporting of TA information | Support UE reporting of TA information | 56-1 | Yes | N/A | If UE does not support this feature, UE cannot report the TA information to network. | Per UE | No | FR1 only | N/A | Note: This UE feature group is applicable only for bands defined in Section 5.2J in TS 38.101-1 | Optional with capability siganling |
| 56. NR\_ATG | 56-3 | Increasing the number of HARQ processes | The maximal supported HARQ process number is X for UL and Y for DL |  | Yes | N/A | If UE does not support this feature, the HARQ process is number is limited. | Per UE | No | FR1 only | N/A | Candidate component values for (X,Y): {(16,32),(32,16),(32,32)}  Note: This UE feature group is applicable only for bands defined in Section 5.2J in TS 38.101-1 | Optional with capability signalling |
| 56. NR\_ATG | 56-4 | K1 range extension | Support of extended K1 value range of (0..31) for unpaired spectrum |  | Yes | N/A | If UE does not support this feature, K1 value is limited. | Per UE | TDD only | FR1 only | N/A | Note: This UE feature group is applicable only for bands defined in Section 5.2J in TS 38.101-1 | Optional with capability signalling |

1. NR\_MBS\_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 |
| 57. NR\_MBS\_enh | 57-1 | Dynamic scheduling for multicast in RRC\_INACTIVE state | 1. Support of group-common PDCCH/PDSCH for multicast with CRC scrambled by Multicast MCCH-RNTI.  2. Support of group-common PDCCH/PDSCH for multicast with CRC scrambled by G-RNTI.  3. Support of CFR configuration for multicast.  4. Support of CORESET and common search space configuration for multicast.  5. Support of DCI format 4\_0 with CRC scrambled with Multicast MCCH-RNT for multicast MCCH.  6. Support of DCI format 4\_1 with CRC scrambled with G-RNTI for multicast MTCH.  7. Support one G-RNTI for multicast reception.  8. Support of inter-slot TDM between group-common PDSCH for multicast and other PDSCHs in different slots. |  | Yes | N/A |  | Per band | N/A | N/A | N/A |  | Optional with capability siganling |
| 57. NR\_MBS\_enh | 57-2 | Intra-slot TDM-ed unicast PDSCH and group-common PDSCH for multicast in RRC\_INACTIVE state | 1. Support TDM between one unicast PDSCH (e.g., small data transmission PDSCH) and one group-common PDSCH for multicast in a slot.  2. For any two consecutive slots n and n+1, if there are more than 1 multicast/unicast PDSCH in either slot, whether to require the minimum time separation between starting time of any two multicast/unicast PDSCHs within the duration of these slots is 4 OFDM symbol for 30kHz and 7 OFDM symbol for 60kHz | 57-1 | Yes | N/A |  | Per band | N/A | N/A | N/A | Candidate value for component 2: require the minimum time separation time {yes, no}  Note: UE indicating this FG shall support multicast reception and unicast reception e.g., SDT in RRC\_INACTIVE state. | Optional with capability siganling |